

LEADER IN ENERGY TRANSITION

Annual Registration Statement / Annual Report 2021

[Form 56-1 One Report]

Bangchak Corporation Public Company Limited



Bangchak

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In case this Annual Registration Statement / Annual Report (Form 56-1 One Report) references information disclosed on the Company's website, the disclosed information shall be deemed to be part of Form 56-1 One Report. The Board of Directors certifies the correctness and completeness of disclosed information and annual information disclosure in Form 56-1 One Report.



Message from the Chairman

2021 saw the world, and Thailand, continue to bear the brunt of the COVID-19 pandemic that intensified and persisted throughout the year. Nonetheless, Bangchak Group was able to deliver the highest achievements on record – largely due to our business expansion and well-balanced diversification that helped ease fluctuation in operations. Furthermore, our organization structure has been adjusted for added agility, efficient liquidity management, and promptness to handle scenario changes. Bangchak Group in 2021 achieved the highest-ever performance since our inauguration in 1984, with a high revenue from sales and services of 199,417 million Baht, an increase of 46% from 2020, EBITDA of 25,818 million Baht, up 529% or 21,714 million Baht from 2020, and with a net profit of 7,624 million Baht or a profit of 5.25 Baht per share.

By focusing on timely business diversification and adjustment with market situation, even with lower domestic oil demand and the planned maintenance Turnaround of Bangchak Refinery in Q1, we were still able to accelerate the expansion of the UCO (Unconverted Oil) export market thus resulting in the refining capacity increase of such product that yielded a volume twice as large as in 2020.

Our Marketing Product Business Group also achieved an all-time high sales in 3 areas in 2021: retail oil, lubricants, and Inthanin Coffee business, while we further pursued non-oil business expansions such as Food Truck and EV-Charger to fulfill the requirements of every generation of clients.

The escalating world prices of crude oil and refined petroleum products together with the changing of OKEA's investment cost booking resulted in the highest revenue from sales of oil and natural gas through the investment in natural resources in Norway in 2021.

Furthermore, the Business Process Redesign (BPR) to increase the internal work procedure efficiency and to reduce cost that began in 2020 helped to lessen costs to the Group in 2021, by more than 1,600 million Baht.

In the Power Business, Bio Business, and other new businesses that the Group has been continuing to expand

investment such as BCPG Plc.'s investment in power generation from renewable energy in Taiwan ROC and Lao PDR and the expansion of investment to the Large Electrical Power Storage System business or Vanadium Redox Flow Batteries, the Series A Funding by Winnonie electrical motorcycles service platform provider, investing in the oil transport pipeline and logistics through BFPL or the scale-up from biofuel business to High Value Bio-based Products by BBGI Plc., all were initiated in concert with the investment direction through Greenovation as a leader in energy transition. This leads up to our aspiration to render our support in the resolution of the world climate issue in the Net Zero GHG Emission in 2050 with the first target being set on attaining Carbon Neutrality status in 2030.

All of these reflect Bangchak Group's readiness as an organization to tackle business changes on a foundation of financial stability. 2021 was recognized as a period of transition that clearly showcased the Group's positive transformation, reflecting in our agile organizational structure and business operations structure that have become more sound and sustainable. We have a clear risk mitigation practice that helps curb the fluctuation of revenue and profit, to securely generate growth for Bangchak Group as a leader in energy transition, while preserving our vigilance to being an organization that generate both values and value for the Thai society. An organization where all the directors, the management, and employees highly value our corporate culture of "Sustainable Innovative Business Development in Harmony with the Environment and Society."

On this final note and on behalf of the Bangchak Group, I would like to express our gratitude and sincere appreciation to our shareholders and stakeholders who have steadfastly supported our business undertakings and endorsed the Group in our drive to be a sustainable organization.

(Signed) Pichai Chunhavajira

(Mr. Pichai Chunhavajira)

Chairman of the Board of Directors

Financial Highlights

Consolidated Financial Statements	2021	2020	2019
Statement of Income (Million Baht)			
Sales and service revenue	199,417	136,450	190,489
Gross profit (loss)	23,673	4,328	10,232
EBITDA ^{1/}	25,818	4,104	8,709
Gain (loss) from derivative	(1,274)	17	160
Gain (loss) from foreign exchange	251	732	614
Net profit ^{2/}	7,624	(6,967)	1,732
Statement of Financial Position (Million Baht)			
Total assets	201,785	148,323	127,788
Total liabilities	132,226	90,006	68,973
Shareholders' equity	69,559	58,316	58,815
Share capital			
– Registered share capital	1,377	1,377	1,377
– Issued & fully paid-up share capital	1,377	1,377	1,377
Financial Ratios (%)			
EBITDA / sales and service revenue	12.95	3.01	4.57
Net profit / sales and service revenue	4.94	(4.23)	1.31
Rate of return on assets	9.51	(3.90)	3.47
Debt to Equity ratio : D/E ^{3/}	1.90	1.54	1.17
Net IBD to Equity ^{3/}	0.81	0.85	0.69
Operating Outcomes (Baht per share)			
Net earnings per share ^{2/}	5.25	(5.50)	1.18
Book value per share ^{3/}	32.06	26.83	30.26

Remarks: ^{1/} EBITDA = Earnings Before Interest, Taxes, Depreciation and Amortization, gain/loss on foreign exchange, loss from impairment of assets

^{2/} Net profit (loss) of the owners of the parent

^{3/} Only the equity of the Company

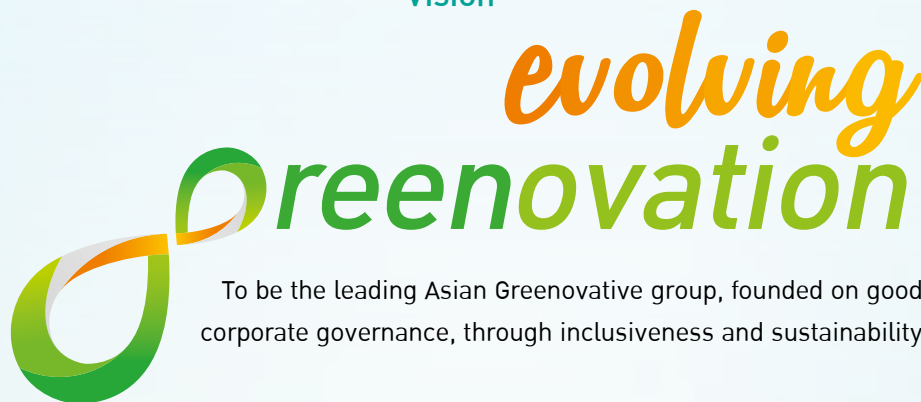
Part 1 Business Operation and Performance

1. Bangchak Group Structure and Operation

1.1 Policy and Business Overview

1.1.1 Vision, Mission, Objectives, and Goals

Vision



To be the leading Asian Greenovative group, founded on good corporate governance, through inclusiveness and sustainability

Mission

Bangchak is committed in bringing disruptive and inclusive Greenovation to delight our customers, being a trusted partner and value creator for all stakeholders and promoting sustainable development to society.

We emphasize inclusive and sustainable business, pursue domestic and overseas expansion, embrace good corporate governance principles, and nurture a high-performance organization, learning culture and happy workplace.

Core Values



Corporate Culture

Sustainable Innovative Business Development in Harmony with the Environment and Society

Employee Culture

To be virtuous, knowledgeable, and contributive to others

Objectives and goals

Bangchak Corporation Public Company Limited is committed to being a Thai energy company that conducts business in parallel with stewardship of the environment and society, while striving for balance between value and virtue, and engaging in the quality of life improvement for Thai society.

Valuing sustainable corporate growth, Bangchak strives to internationalize its management excellence while humbly applying the royal Sufficiency Economy to business management for adequate profits, nurturing of growth and sustainability by promoting and developing innovation and technology with due regard for conscientious consumption of natural resources, pursuing the leading Asian Greenovation Group vision as well as business, social, and environmental goals by 2025. Below are the highlights.

1. Business Goals

Refinery Business Group To relentlessly sharpen competitiveness through refining efficiency improvement and optimizing refining reliability while reducing greenhouse gas emissions under the Greenovation Vision with state-of-the-art green technology and an environment-friendly refinery. With the FAST+ development concept, Bangchak ceaselessly increases the values of its products, decreases energy consumption throughout processes, maximizes efficiency of transport and delivery of raw materials, feedstock and products, and improves refining reliability to consistently maintain the crude run capacity at 120 KBD. Bangchak is also conducting a study to expand the turnaround cycle from a 2-year to a 3–4-year period.

In addition, Bangchak is aggressively developing niche refinery products, including unconverted oil (UCO) from a dedicated hydrocracking unit. UCO is known to be a monomer for lube base oil and paraffin wax production, essential feedstock for the wax industry, paper-coating industry and glue industry. The dedicated hydrocracking unit was modified to produce UCO at up to 75 million liters per month. The modification also finetunes the production of solvent known as “BCP White Spirit – 3040”, an essential monomer for products of paint, thinner, and resin industries.

As for the trading side, Singapore-based BCP Trading Pte. Ltd. (BCPT) plans to add distribution volumes through the company by focusing on the strategy of expanding the proportions of out-out trading of crude oil (procuring crude oil from overseas producers for overseas sale). To this end, the trading market has been continually expanded to new business partners, including emerging countries. Plans were in place to grow to the specialty product group and new models of services concerning the group in a bid to extend existing products and services.

Marketing Business Group To relentlessly promote the retail business to become the market leader. In 2021 Bangchak successfully maintained its status as the 2nd market share leader in the overall sales for the period between January and December. With a 16.2% market share in overall retail sales, Bangchak was ranked as the leader for two Euro IV standard fuels: E20 S EVO gasohol and Hi-Premium Diesel S. The ranking was a clear result of successful development of high-standard and environmentally friendly gasoline and lube oil, leading to a higher standard of the overall domestic market and maximum customer satisfaction. Moreover, Bangchak was rated as number 1 on the net promoter score (NPS) on customer relations management and continuous service improvement. Under the Greenovative Destination concept, Bangchak introduced a digitalization system to provide extraordinary service experience with unique design service station in conjunction with more and more non-oil retail alliances, all intended to provide better services to meet modern lifestyles of Thai customers, enabling everyone in society to live happily while looking after the environment in line with sustainable development goals. Bangchak consistently strengthens the business of Inthanin coffee, moving to become number 3 in the domestic coffee retail industry with additional expansion toward the target of 1,000 branches in 2022.

Green Power Business The goal is to become a leader in clean-energy power business in Asia-Pacific. Bangchak plans to grow its businesses worldwide and garner investors' confidence for relentless growth and driving



through the five strategic pillars:

- Aggressive business growth through organic and inorganic growth, meaning acquiring brownfield businesses or greenfield businesses by focusing investment growth on domestic investment and expansion to neighboring countries with due regard for cost-effective returns and risks along with investment portfolio balance.
- Relentless efficiency improvement of current projects through the strategy of engineering, technical, and financial improvement embracing Bangchak's own assets and Bangchak's jointly owned ones.
- More powerful drive for the digital and innovation business to shape new income channels under the digital energy and infrastructure businesses.
- Efficient management of capital and balance sheets together with identification of suitable capital sources and financial ratios to enable Bangchak to achieve goals.
- Enhancement of personnel competency and restructuring in line with Bangchak's future growth businesses with plans to recruit and develop personnel that suit such future businesses.

During 2021, BCPG Public Company Limited (BCPG) pursued its growth strategy with business expansion into the manufacturing and distribution of large-scale power storage, including the acquisition of convertible debentures of VRB Energy Inc. at USD 24 million, the signing of a 25-year power purchase agreement (PPA) with Vietnam Electricity to procure power from a 600-MW plant located near the border

between Laos and Vietnam, and the issuance of a Baht 12-billion Green Bond by BCPG to the public to obtain cash to repay a higher-interest debt from an earlier investment in a geothermal power plant and to develop and invest in future solar power plants under an environmental conservation business theme.

o Bio-based Products Business Group

The group continuously increases and expands capacities of bio-based fuels and ethanol, as well as consistent upgrade of biodiesel and ethanol. Bangchak kicked off a process to produce refined glycerine with a capacity of 80 tons per day. These programs were initiated to generate higher value and maintain Bangchak's status as the largest bio-based fuel oil producer and distributor in Thailand. To pursue the high-value bio-based business goal, Bangchak made an investment via Manus Bio Inc., a worldwide reputable company in high-value, bio-based technology, particularly on advanced bio-fermentation with well-known products and a patented recipe of sweetness nutrients, including Neotame, as an official distributor in Thailand and ASEAN.

BBGI Public Company Limited (BBGI) began to market nutrient foods and food supplements with two different products: the ASTA-IMMU antioxidant food supplement for skin care, derived from astaxanthin red algae under the B Nature Plus brand, and a pharmaceutical-grade hand sanitizer manufactured under the GMP-HACCP manufacturing standard.

In September, BBGI submitted a filing of registration statement and a draft of prospectus to the Securities and Exchange Commission (SEC) for its initial public offering (IPO) for up to 433.20 million shares, equivalent to 30% of the total common shares issued and fully paid up at a par value of Baht 2.50. The capital raised from the IPO goes into business expansion, future businesses, outstanding loan repayment and working capital.

o Natural Resources and New Business Group

To development the businesses of petroleum exploration and production (E&P) and alternative natural resources:

- Petroleum E&P: Bangchak, through its subsidiary OKEA ASA, currently holds several licenses in producing and exploration of crude oil and natural gas in Norway. OKEA ASA is committed to a search for business growth through additional investments including merger and acquisition of other assets.
- Alternative natural resources: BCP Innovation Pte. Ltd. (BCPI) pursues businesses and investments related to lithium and various startups. BCPI currently holds a Lithium Purchase Agreement with Lithium Americas Corp. for purchasing of up to 6,000 metric tons per year of lithium from the Cauchari-Olaroz project. BCPI has been investing in several startups on many projects.

o Organizational Development, Corporate Management and Innovation

To relentlessly sharpen competitiveness on corporate



management and organizational development with targets to become an employer of choice and human resource excellence, encouraging employee engagement toward development of innovation on work processes, new products, or alternative business models in alignment with the corporate vision. Under the corporate value of “I AM BCP” and the sustainable development framework defined by the international Dow Jones Sustainability Indices (DJSI), Bangchak has adopted a transformation program to ceaselessly improve the organization in all areas of the economic, environmental, and social aspects under a good governance code aimed to ensure customer confidence in its capability to generate stable performance and long-term return on investment. Under the leadership of the Bangchak Initiative and Innovation Center (BiIC), the Ecosystem and Incubation division has continuously organized activities under “The Intrapreneur – Turning Our Members into Entrepreneurs” program with forums for employees to participate and engage in innovation development through brainstorming on value creation from existing businesses or from alternative business models to cope with the ongoing shift in business landscape, particularly with the current and post-COVID-19 situations. Bangchak successfully kicked off the internal startup “Winnonie” (Thai wordplay for debt-free motorcycle-taxi stand) in 2020 and injected capital in 2021 to drive the startup with businesses in rental service of electric motorcycle-taxis, charging and exchanging of batteries, and other related services in the future. This startup exemplifies the efforts to become an industry leader under the Greenovation vision. In addition, Bangchak launched “Krathing”, Thailand’s first digital fuel dispenser, boosting the quality of life of rural communities. People in rural communities can get access to high-quality and high-standard fuels, while Bangchak can further develop the service on this platform economy with other additional fuels and non-oil products to boost the quality of life in all aspects of living quality. The same platform can help support the development of growth of local startups and connect with other research and development (R&D) institutions with various activities under the coordination of BiIC.

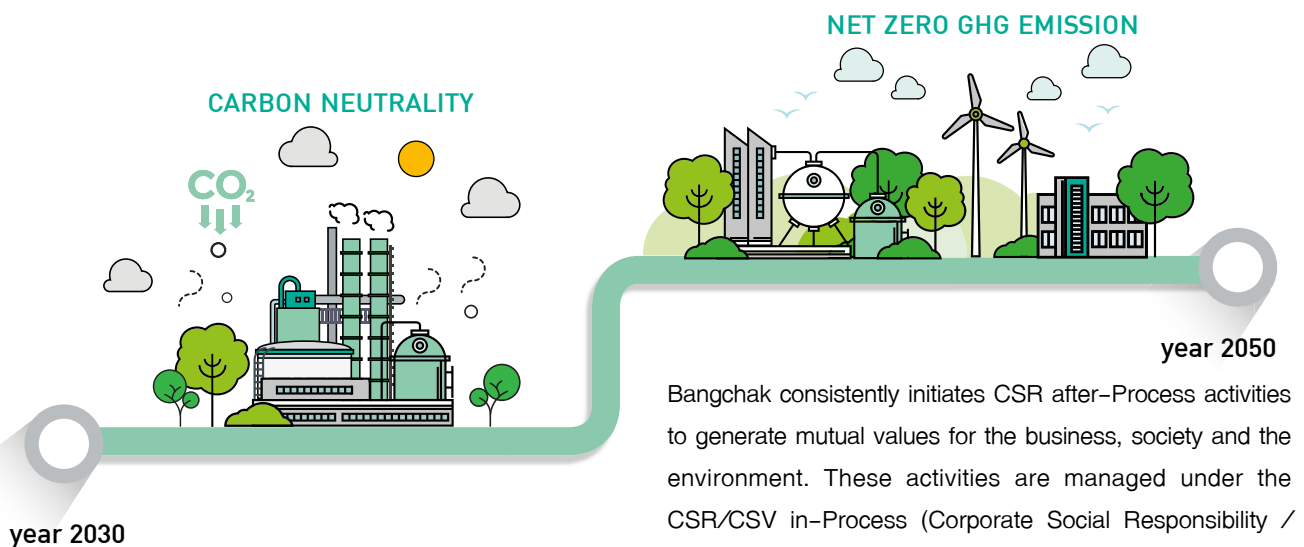
o Being open, transparent, and auditable:

Open, transparent, and accountable: Bangchak engages in open, transparent, and accountable business conduct, whether information disclosure of transparent conduct under corporate governance or other applicable rules.

2 Environmental and Social Goals

2.1 To advance Bangchak Group's greenhouse gas emissions reduction to the level that can critically drive the Group to become a Carbon-Neutral Organization by 2030 and a Net-Zero GHG Emission company by 2050.

Using the carbon neutrality and net-zero GHG emissions targets, Bangchak aggressively formed a special taskforce with representatives from all business units within the Group to become fully aligned on the true understanding of the targets, appropriate approaches directed to achieve the planned targets, with a focus on energy and resource consumption efficiency, reforestation, effective development, and project review of green innovation businesses, among others.



2.2 Development of business, the environment and society as a whole

With an ultimate goal on the development of the quality of life and community adhesion for society, Bangchak manages all its businesses collectively with positive value creation for the environment and society under the principles of sustainable development. With the corporate vision of “Evolving Greenovation” and the “4 Green” business strategy, Bangchak drives its businesses with innovations, technologies, and the BCG economic model to optimize the exploitation of resources to develop projects creating high value for society as a whole, to generate economic value and societal values to meet the needs of all stakeholders, and eventually to achieve sustainable development goals. The targeted sustainable development goals consist of SDG13: Climate action; SDG12: Responsible consumption and production; SDG7: Affordable, clean and modern energy; SDG9: Foster innovation to better the quality of life through support and assistance to startups and social enterprises toward utilization efficiency of clean and environment-friendly resources; and SDG8: Decent work and economic growth. In addition,

Bangchak consistently initiates CSR after-Process activities to generate mutual values for the business, society and the environment. These activities are managed under the CSR/CSV in-Process (Corporate Social Responsibility / Creating Shared Value in Process), such as the registration of Winnonie Company Limited (“Winnonie”) to promote the Service business of electric motorcycle-taxis and services of charging and changing of batteries. These activities are part of businesses initiated under the objective to become an industry leader in green innovation. From the social viewpoint, Winnonie also helps solve chronic problems for riders of motorcycle-taxis and food-delivery riders. Under a social responsibility obligation, Bangchak initiated several programs to support state authorities and social groups to alleviate the suffering borne by the COVID-19 pandemic. Bangchak’s social programs included “SAVE Samut Sakhon”, delivery of Andrographolide (local Thai herb) to early COVID-19-infected ‘green’ patients under the home isolation program, “Pun Gun Im” program (food sharing scheme) providing more than 50,000 meals to sufferers, free distribution of longan and mangosteen at Bangchak retail stations, and “Pun Sook Pineapples” program introducing the renowned ‘Phu Lae’ pineapples to nationwide field hospitals and prisons, thus helping sufferers as well as pineapple farmers during the high season oversupply that were unable to sell and export during the COVID-19 outbreak.

1.1.2 Business Strategies

To achieve its short-term and long-term goals, Bangchak relies on the 3S Strategy.

S1

Security

1) Security (S1)

Upstream energy represents Bangchak's core businesses leading to national energy security. Bangchak carries out this strategy jointly through its Refinery, Marketing, Natural Resource, and Bio-based Product Businesses by supplying, producing, and distributing refined products and biofuels to meet the demand of the business sector and the public—governed by the overall trend of energy demand. Though EVs command a growth outlook, today Bangchak still see these businesses as a necessity for growing national energy demand.

S2

Stability

2) Stability (S2)

Bangchak manages its portfolio for growth with an investment focus on businesses with steady revenue streams as well as steady returns and low external risks (domestic and abroad), including green power plants (via BCPG) featuring streams of income. To diversify risks, the company engages in risk management throughout its production chain covering assorted businesses in order to sustain volatility.

S3

Sustainability

3) Sustainability (S3)

To cope with the dynamic work environment and modern technologies, Bangchak continuously develops and leverages its core businesses toward sustainable growth. Examples included investment and development of the lithium battery business in preparation for EVs and development of high-value bio-based specialties with investment through Manus Bio Inc., a reputed global company with leading bio-innovative technology on advanced bio-fermentation. BiiC is a dedicated institute under Bangchak in charge of promoting innovations for the environment and society through investments in startups and partnering with external R&D organizations to advance Bangchak's green businesses and development of bio-based specialties for domestic and international markets. Beginning with the launch of "Winnonie" as an internal startup in 2020, Bangchak invested sizable capital in this startup to commercialize the business of "Winnonie" on rental service, charging and exchanging of batteries for motorcycle-taxis, and to set up a platform for additional businesses. This example is in line with the corporate goal to become a true industrial leader on Greenovation. Another example of Bangchak's Greenovation business for sustainability is the launching of "Krathing", a digital fuel dispenser for small and remote communities to provide accessibility for rural people to high-quality standard fuels to boost their quality of life in rural communities as well as to develop a platform for future oil and non-oil businesses for Bangchak.

To frame its businesses and investment for sustainability, Bangchak leverages its 4 Green (4Gs) strategies.

The 4 GREEN Strategies are made up of:



1 Green Business

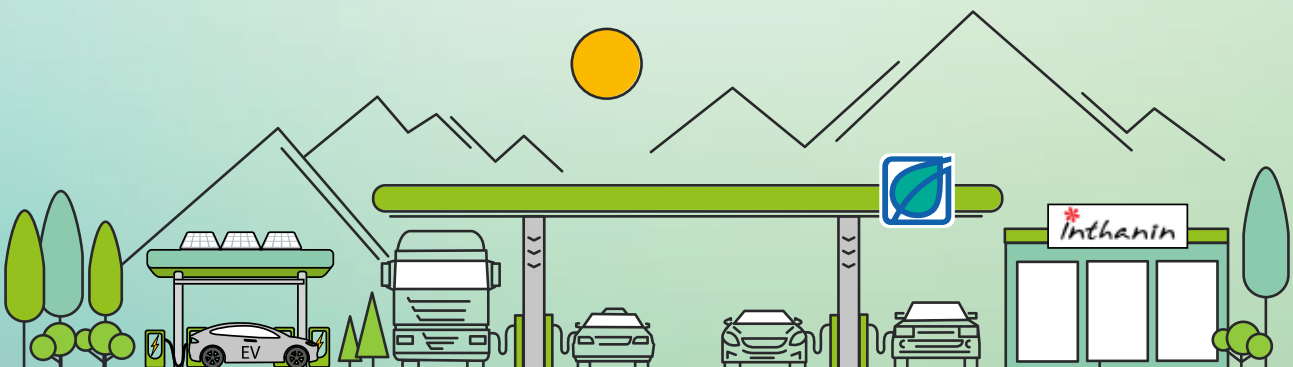
Bangchak strives for investment in businesses that foster sustainable values. Besides growing revenue from new undertakings, this strategy is the green initiatives applied to businesses, including high-value bio-based products derived from agricultural produce by way of biotechnological innovation, in turn extended from former biofuel production and sales. The company also values green power businesses and energy management, among others, involving BiiC, which incubate startups that could further Bangchak’s businesses in the future.

2 Green Production

Promoting environmentally friendly and safe operations with optimum utilization efficiency of water and energy resources is the ultimate goal of Bangchak. To achieve these goals, Bangchak has adopted the operating systems certified by ISO 14001, ISO 50001 and Green Industry (Green Network) Level 5 of the Ministry of Industry’s standards in addition to the occupational health and safety standard of ISO 45001 and the advanced operating system under Process Safety Management (PSM).

3 Your Greenovative Destination

Emphasizing the creation of customer experience and Greenovation with modern looks of service stations to meet the expectations of modern Thai society, where everyone can live happily and collectively with care and preservation of the environment toward sustainability.



- **Green Experience** Bangchak values the structural design of a business model to deliver ‘green experience’ through its products and services beyond expectations to its customers collectively with environmental care perceived by all customers during their visits.
 - **Greenovative Product** Bangchak is fully committed to developing high-quality and environmentally friendly products to meet customers’ demand. All its current products are certified under Euro IV standards and fully comply with state regulations. Bangchak also provides special-grade E20 S EVO gasohol and Hi-Premium Diesel S with low sulfur, higher-quality standard Euro V.
 - **Innovative Service Station** Bangchak continuously improves its retail stations under a unique design to meet customers’ expectations in parallel with the caring of the quality of life of its customers and surrounding communities. This unique design provides room for additional services on non-oil businesses and the integration of 4Rs concept of renewable, recycle, reuse and reduce. Some of the integration included installation of solar rooftops, a collection system of rainfall and used water for watering plants, selection of materials and consumables that are energy-saving and minimal resources, expansion of green and shaded areas, and mounting of various equipment for personal use, such as toilets for the elderly and the handicapped, and automatic tire inflators. The uniquely-designed service station and the integration of services provide optimal convenience and service experience to all customers to maintain Bangchak’s ranking as number 1 on the net promoter score (NPS) among customers.
 - **BCP Mind** BCP Mind is the corporate culture developed and nurtured among staff to provide service with care, eagerness, speed and efficiency. In addition, BCP Roadside Assistant is developed for Bangchak’s service staff to be constantly ready to help customers on travel-related troubles such as jump-starting and changing of spare tires.
- **Green Innovations** Bangchak relentlessly seeks and develops value-added innovations for its customers and businesses. A series of technology and information systems have been applied to level up value and experience for customers, including development of customer databases, development and implementation of the Smart Digital Payment at service stations to minimize physical contact and maximize speed, development of online training for frontline service staff and contractors, especially on the interface with electronic data and work processes anytime, anywhere, development of auxiliary features designed for expansion of customer base such as the “Ying Own Ying Dai” joint program with AIS to use collected points for higher values, and the “Own Gun Dai Laek Ngai Kuen” joint program with Krungsri Credit Card Company Limited to transfer points collected in the credit cards to Bangchak membership cards.
- **Green Sustainability** Under a concept to provide extraordinary service experience to customers with opportunities for customers to participate in activities for communities, the environment and preserving good local cultures, a series of activities are routinely developed by Bangchak to strive for business growth collectively with care of the environment and society. Providing opportunity and space at Bangchak’s retail stations for local farmers to sell their produce during oversupply periods, promotion of local products that are environmentally friendly, creating more local job opportunities, and providing local hires for the handicapped are examples routinely adopted by Bangchak. The same concept of environmental care accompanies non-oil businesses. Creation of the Inthanin coffee concept of “Inthanin Natural Cup” was an example of an Eco-brand of business with environmental care. Coffee served at every Inthanin shop is 100% Arabica, procured direct from local farmers and carefully brewed under the process with social responsibility. Inthanin coffee is packed with bio-packaging, a bio-degradable polylactic acid (PLA) packaging and is served in specially designed straw-less coffee cups at all branches to reduce plastic waste.



4 Green Society

Green Society is one of the sustainability principles Bangchak strictly adheres to. With this principle to care for the environment and society, Bangchak aggressively sets out to achieve carbon neutrality by 2030 and to become a net-zero GHG emissions company by 2050. These targets were officially announced at the annual corporate seminar under a theme entitled ‘Exponential Path to Net Zero’ – Bangchak 100x: 100 ideas toward global sustainability, leading to subsequent work programs cascaded to all business units under Bangchak Group.

2021 was, nevertheless, a very challenging year driven by the COVID-19 pandemic. Bangchak Group accordingly shifted its work patterns to better respond to the critical situation in four major areas:

1. **Strengthening public health capability and active prevention for the community**

Some of these activities are support to provide biosafety mobile units to detect the COVID-19 outbreak area in the community, support to the Department of Thai Traditional and Alternative Medicine on setting up six Bangchak service stations as distribution centers and delivering Thai traditional medicine Andrographolide (Fah Thalai Jone) to COVID-19-infected patients who registered through ‘Fah First Aid’ mobile application by ‘Winnonie’ motorcycle-taxis under the community isolation and home isolation, providing essential consumables such as drinking water and essential medical equipment such as sanitizers and alcoholic gel for field hospitals and community hospitals, and general support in conjunction with more than 130 voluntary networks, temples and various civil society groups.

2. **Local economic stimulation**

Bangchak initiated its ‘Bangchak Cares-Fight COVID-19’ campaign to alleviate trouble related to oversupply of local produce and onsite food retails due to lockdown measures and inaccessibility to export. The campaign supported farmers and business owners on setting up distribution centers and delivery systems for agricultural produce and instant food through several programs such as ‘Pun Gun Im’, ‘SAVE salt farmers’ who were affected by losses in revenue and orders from frozen food factories in Samut Sakhon that were shut down by state order after identified as COVID-19 clusters, ‘Pineapple Pun Sook’ – purchasing of famous Phu Lae pineapples from Chiang Rai farmers affected by inaccessibility to export and a lack of tourists during the lockdown periods.

3. **Social support during the quarantine periods.**

Bangchak launched several assistance programs

including ‘Pun Nam Jai’, delivery of rice purchased from farmer members of cooperative networks to construction labor workers quarantined during the outbreak, sharing of drinking water with customers visiting Bangchak’s retail stations, and donating drinking water to numerous field hospitals and medical centers, especially those lying in risky areas.

4. **Fundraising campaign for frontline organizations, temples, foundations and civil volunteer groups**

‘Pun Nam Jai X2’ was one of the campaigns initiated by Bangchak for fundraising to alleviate troubled social units during the COVID-19 outbreak. Bangchak made financial contribution at the same amount as that contributed by the public, executives and employees. The total fund raised under this program provided free gasoline to several frontline organizations and volunteer groups to transport infected patients to hospitals, including those who wanted to return to their hometowns for medical treatment. Beyond these initiatives related to responses to COVID-19, Bangchak firmly continues its obligation on all activities under the Circular Economy scheme, such as ‘Rak Pun Sook Junior’, a pilot campaign jointly initiated with SCG Chemicals Company Limited to support nationwide schools, beginning with those surrounding the refining complex, to manage waste properly and effectively.

In addition, Bangchak actively continues close community engagement of those living around refining facilities with numerous community engagement activities covering eight facets related to the quality of life, resulting in an 86% engagement score, reflecting a level of good friendship, good societal benefit, and high confidence in safety.

1.1.3 Significant transitions and development milestones in 2021

Bangchak submitted a notification to SET on the change of its major shareholding structure following the sale and transfer of 71,899,000 common shares or 5.22% of the total fully-paid shares of Bangchak, previously owned by the Ministry of Finance, to Vayupak Fund 1 (VAYU1) – MFCfund, managed by MFC Asset Management Public Company Limited and Vayupak Fund 1 (VAYU1) – KTAM, managed by Krung Thai Asset Management Public Company Limited, completed on January 19, 2021. After the transaction, the Ministry of Finance now holds 65,543,767 common shares or 4.76%; VAYU1-MFCfund 136,886,300 shares or 9.94%; and VAYU1-KTAM 136,886,300 shares or 9.94% of the total shares.

Bangchak submitted a notification to SET on its investment in Winnonie Company Limited (“Winnonie”) through its wholly-owned subsidiary, BCV Innovation Company Limited (“BCVI”). The investment included an acquisition of 99.8% of the total shares of Winnonie at Baht 50 million for the purposes of business related to electric motorcycles including rental service, charging and replacement of batteries and other value-added services. The investment, fully completed in April, was made in line with the Greenovation Vision and contributing to Bangchak green innovation leadership.

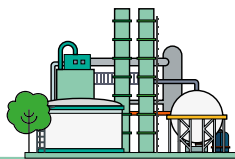
January



March



April



February

A 39-day major turnaround or planned maintenance shutdown was sanctioned from February 15 to March 25, 2021, on crude distillation and auxiliary units. With a recovery preparedness plan, a sufficient inventory of refined products to meet customers’ demand and regulatory compliance on the minimum volume of fuels were unaffected. Maintenance was completed, and the crude distillation and auxiliary units began to run smoothly in March.

With the resolution of the 2021 AGM, the majority vote of the shareholders who attended the meeting approved payout dividends for 2020 annual performance at Baht 0.40 a share, totaling Baht 543 million, with a payment date of April 22, 2021.

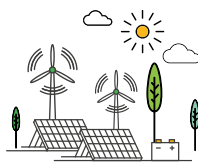
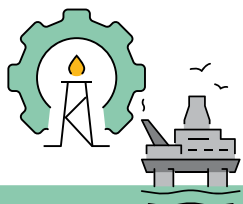
With clear evidence and supportive documents for the operations and reporting of the joint venture OKEA ASA (“OKEA”), it became inevitable that Bangchak Group has assumed a controlling power over OKEA on key operating activities, as opposed to the previous interpretation of having only a significant influence but not controlling power. The joint-venture status of OKEA officially became a subsidiary was effective as of July 1, 2021.

Bangchak submitted a notification to SET on the founding of a Carbon Markets Club, established in conjunction with members of the Group, including BCPG Public Company Limited and BBGI Public Company Limited, as well as other leading domestic organizations. Under the same purpose toward the reduction of greenhouse gas emissions, Bangchak and business partners are fully committed to promoting and supporting clean development mechanisms, including carbon credit trading and development of a digital trading platform compatible with international standards, in line with the Greenovation Vision and long-term strategy of Bangchak to become a leading Thai energy entity pursuing its businesses sustainably with environmental stewardship and close participation with communities to pursue a better quality of life of Thai citizens and sustainable development of the world.

Bangchak submitted a notification to SET on the total sales of shares in its wholly-owned subsidiary registered in Singapore, BCP Energy International Pte., Ltd. (“BCPE”) to Sargasco Limited, a listed company on the Australian Stock Exchange. The transaction was fully completed on July 2, 2021 and did not create any impact on the overall businesses of Bangchak.

On July 20, 2021, Bangchak exercised its right to purchase additional common shares of BCPG Public Company Limited (“BCPG”) under the BCPG-W1 capital increase program. The purchase involved 69.15 million shares with an exercise price of Baht 8 per share and a total cash placement of Baht 553 million. Bangchak holds 61.31% of BCPG’s total shares, with the same extent of controlling power in BCPG.

July



August

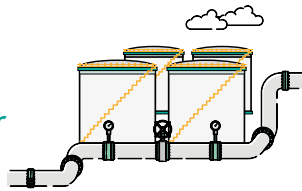
Bangchak submitted a notification to SET on the change of names and business objectives, the increase in registered capital and the disposition of shares held by its subsidiaries following the resolution of the Board meeting to approve the investment and development of the liquified natural gas (LNG) business to meet future market demand. Under the plan, BCP Partnership Company Limited (“BCVP”), a wholly-owned subsidiary of Bangchak, would become BTSG Company Limited (“BTSG”) with a business objective to procure and distribute LNG and manage related LNG businesses under the Baht 200-million registered capital (Baht 20 million initially paid-up). After the change in registered capital structure, Thai Special Gas Company Limited would acquire 49% of BTSG with equity injection leading to an equity structure of BTSG holding 51%, thus complying with the subsidiary definition.

Bangchak announced interim dividend payment for the first six-month period of the 2021 fiscal year at Baht 1 per share, totaling Baht 1.357 billion. The dividend payment was executed and delivered to shareholders on September 21, 2021.

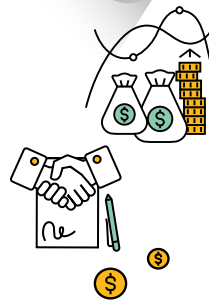
The Board of Directors granted an approval to establish a new wholly-owned subsidiary, Bangkok Fuel Pipeline and Logistics Company Limited (BFPL), with an initial registered capital of Baht 1 million and business objectives to pursue transport of fuels and logistics operations. BFPL was officiated on October 4, 2021.

Bangchak issued name-registered unsubordinated, unsecured debentures with debenture-holders' representative service restricted to institutional investors and/or high net worth investors for a total amount of Baht 7 billion. The issuance was made in four sets of debentures with tenors of 2, 5, 8 and 10 years with interest rates of 1.45%, 2.29%, 3.11%, and 3.43% per annum.

October



November



December



The Board of Directors approved Bangkok Fuel Pipeline and Logistics Company Limited (BFPL), a wholly-owned subsidiary, to sign the Agreement for the Grant of Right to Manage the Fuel Pipeline Systems (Bangkok – Bang Pa-in) dated December 30, 2021, with Fuel Pipeline Transportation Limited (FPT) in the total amount of Bath 1,600 Million for 20 years starting from January 1, 2022 to December 21, 2041.

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Leadership and Management – 6 Awards

Corporate Governance and Sustainability – 16 Awards

Innovation – 5 Awards | Quality, Safety, and Others – 5 Awards |

Corporate Image and Corporate Social Responsibility – 7 Awards |

Human Resources and Knowledge Management – 3

1.1.4 Awards and Recognition of 2021

Leadership and Management Category

HRH Princess Maha Chakri Sirindhorn Awards and Distinguished Award at Thailand Corporate Excellence Awards 2021



- Corporate Improvement Excellence Award bestowed by HRH Princess Maha Chakri Sirindhorn
- Product/Service Excellence Award bestowed by HRH Princess Maha Chakri Sirindhorn
- Leadership Excellence (Distinguished Award) demonstrates the widely accepted performance driven by green innovation and reflects the strong commitment to organizational development in all dimensions, including business administration, products and services, and innovation promotion.



Organized by the Thailand Management Association (TMA) in conjunction with Sasin School of Management, Chulalongkorn University, bestowed on organizations with the highest scores from an assessment of executive feedback from leading organizations in Thailand, to honor organizations with excellence in various fields, recognized as model business entities for others to drive their development.

Asian Excellence Award 2021

- Asian Excellence Award 2021 – Asia’s Best CEO (Investor Relations) for the 6th consecutive year.
- Asian Excellence Award 2021 – Asia’s Best CFO (Investor Relations) for the 3rd consecutive year.
- Asian Excellence Award 2021 – Best Investor Relations Company (Thailand) for the 7th consecutive year for outstanding performance in investor relations.

Organized by Corporate Governance Asia, Asia’s leading financial magazine, assessed from scores and feedback from Corporate Governance Asia (Hong Kong) readers and analysts etc., to honor leaders and organizations with outstanding international performance, corporate governance, financial management, investor relations, and corporate social responsibility.



Corporate Governance and Sustainability Category

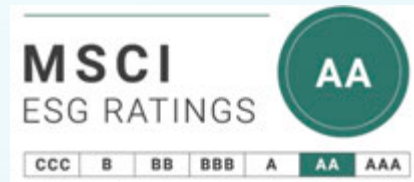
S&P Global Sustainability Award 2021 (Silver Class) – Global Top 3



Sustainability Award
Silver Class 2022
S&P Global

The S&P Global Sustainability Award 2021 (Silver Class) by S&P Global, the assessor of the Dow Jones Sustainability Indices (DJSI), with an ESG – Environmental, Social, and Governance and Economics score among the Top 3 in the oil and gas refining and trading segment in the 2021 S&P Global Corporate Sustainability Assessment of the 56 business entities assessed in the industry, demonstrating its commitment to sustainable business innovation in harmony with the environment and society following international good corporate governance practices.

“AA” MSCI ESG Ratings for corporate resilience (Highest score for the energy sector in Thailand)



Bangchak received the MSCI ESG Ratings of “AA” for the 3rd consecutive year, beginning in 2019, from Morgan Stanley Capital International (MSCI) ESG Ratings conducted by MSCI ESG Research which specializes and is trusted by ESG indices internationally, reflecting sustainable ESG (Environmental, Social and Governance) performance.

Thailand Sustainability Investment (THSI) Index 2021

Selected to join the Thailand Sustainability Investment (THSI) Index or sustainable stocks of the Stock Exchange of Thailand for the 7th consecutive year, from 2015 – 2021, as a listed company with sustainable ESG performance (Environmental, Social and Governance or ESG) providing an alternative for investors interested in Responsible Investment.

SET Awards 2021 – Sustainability Excellence, Sustainability Awards of Honor

SET Awards 2021 for Sustainability Excellence – Sustainability Awards of Honor, recognizing business operations as the Leader in Energy Transition following principles of sustainable development. Bangchak has received the Sustainability Excellence award for the 5th consecutive year, and the 3rd consecutive Sustainability Award of Honor. The SET Awards honor listed-companies, securities companies, and mutual fund management companies with outstanding operational and qualitative performance, organized by the Stock Exchange of Thailand and the Money and Banking magazine.



Outstanding Low-Carbon Organization Award from Thailand Greenhouse Gas Management Organization (TGO)

As one of the 14 organizations selected for the low-carbon and sustainability awards following TGO assessment, which assesses such indicators as corporate governance principles, sustainability report, business-size in relation to economic, environmental, and social criteria that are aligned with the country's sustainable development goals. Bangchak, pursuing long-term sustainability, was honored to be a model organization in the low-carbon era. It is an important mission for it to take part in monitoring global temperatures, reducing greenhouse gases, and growing the national economy.

Asian Excellence Award 2021 – Best Environmental Responsibility

Asian Excellence Award 2021 – Best Environmental Responsibility for the 5th consecutive year, as an organization with outstanding socio-environmental responsibility. Organized by Corporate Governance Asia, Asia's leading financial magazine, assessed from scores and feedback from Corporate Governance Asia (Hong Kong) readers and analysts etc., to honor leaders and organizations with outstanding international performance, corporate governance, financial management, investor relations, and corporate social responsibility.

Global Brand Awards 2021 - Excellence in Sustainable Greenovation – Thailand



Global Brand Awards 2021 – Excellence in Sustainable Greenovation – Thailand, an international award that acknowledges and honors brands from various industries with exceptional experience and service delivery worthy of global recognition, selected by a panel of leading international marketeers from organizational performance in sustainability and green innovation.

Global Good Governance (3G) Awards 2021 for the 4th consecutive year



- 3G Best of the Best in Corporate Governance Award 2021 – as an organization with integrated sustainable business operations and outstanding corporate governance, transparency, and social responsibility
- 3G Championship Award in Sustainability Performance 2021 – in recognition of its sustainability performance excellence, following its commitment to organizational development and business conduct for sustainability
- 3G Best Sustainability Report Award – for its remarkable Sustainability Report showing interconnected business strategies that cover social, environmental, and economic aspects.

Organized by Cambridge IFA International Financial Advisory, United Kingdom.

Sustainability Disclosure Award from Thaipat Institute

The Sustainability Disclosure Award, bestowed by Thaipat Institute at a ceremony to promote public disclosure of sustainability information, which covers ESG (environmental, social, and governance) aspects in addition to financial data presented in the sustainability report. Such information benefits not only stakeholders, but also support organizational development toward long-term sustainability while showing recognition for business entities that align themselves with Item 12.6 of the Sustainability Development Goals (SDGs).

Carbon Reduction Label and Trophy: 10-years of dedicated greenhouse gas emissions to reduction

The Carbon Reduction Label and renewable of carbon reductions for buildings in Bangchak refinery as an organization with measures for energy conservation and environmental management, which covers electricity and water consumption, use of cooling agents, waste management, tree planting, and reduction or support for reduction of greenhouse gases. Assessment is carried out by the Thailand Business Council for Sustainable Development (TBCSD) in collaboration with TEI, and received a trophy recognizing its 10-year dedication to reducing greenhouse gas emissions at the ‘Green Label and Carbon Reduction Label Award Ceremony’, also organized by TEI.



The Thai Chamber of Commerce Business Ethics Standard Award 2021



Thai Chamber of Commerce Business Ethics Standard Award at the Outstanding Code of Conduct Certificate ceremony 2021, organized by the Thai Chamber of Commerce, praises, honors, and encourages private entities that conduct business ethically in accordance with corporate governance principles upholding transparency, honesty, accountability to customers and consumers, sharing the benefits back to society and the community as well as being conscious of the cost-effective use of resources and sustainability. It has earned the trust of all stakeholders consistent with the company’s corporate culture which aims to develop sustainable business in harmony with the environment and society.

Integrity Awards

The 10th NACC Integrity Awards organized by the National Anti-Corruption Commission demonstrates the commitment of executives and employees to jointly develop an anti-corruption system and create a transparent and anti-corruption culture in the organization.

ACES Awards 2021 – Top Community Care Companies in Asia

The Asia Corporate Excellence & Sustainability Awards (ACES) 2021 for Top Community Care Companies in Asia, reflecting how it conducts business in harmony with providing care for society, communities, environmental conservation as well as ensuring that stakeholders can grow sustainably. It is a widely accepted organization for its responsibility and tangibly adhering to ethical and just practices, and respect for the law aligned with good corporate governance principles, as well as a policy to provide added value to the organization and wider society.

Organized by MORS Group, Malaysia, a renowned organization in the Asia-Pacific and Middle East.

Innovation Category

SET Awards 2021 – Business Excellence, Best Innovative Company Awards



SET Awards – Business Excellence, Best Innovative Company Awards for Winnonie – Environmental friendly Green Innovation. The SET Awards honor listed-companies, securities companies, and mutual fund management companies with outstanding operational and qualitative performance, organized by the Stock Exchange of Thailand and the Money and Banking magazine.

Thailand Corporate Excellence Awards 2021 – Innovation Excellence (Distinguished Award)

Innovation Excellence (Distinguished Award) reflecting performance driven by green business innovation and strong commitment to organizational commitment in all dimensions, including business administration, products and service, and innovation promotion.

Organized by the Thailand Management Association (TMA) in conjunction with Sasin School of Management, Chulalongkorn University, these awards honor organizations with excellence in various fields that are recognized as model business entities for others to drive their development.

Global CFI.co Award 2021 – Best Sustainable Innovation Strategy (Thailand)

The Global CFI.co Award 2021 (Capital Finance International) for Best Sustainable Innovation Strategy (Thailand) for a leading organization applying green innovation to drive socio-economic progress, internationally recognized as the Leader in Energy Transition, with diversified and balanced businesses to spur sustainable growth. Nomination for CFI.co Awards is considered by a panel and the editor of CFI.co Magazine, a printed and online medium offering business, economic, and financial news in the United Kingdom.



Global Brands Awards 2021 – Best in Corporate Governance & Sustainability Performance -Thailand

Global Brands Awards 2021 – Best in Corporate Governance & Sustainability Performance – Thailand, an international award that acknowledges and honors brands from various industries with exceptional experience and service delivery worthy of global recognition, selected by a panel of leading international marketers assessed from organizational performance in corporate governance and sustainability.

5th Panus Thailand LogTech Award 2021 – Platform-as-a-Service: Mobility & Logistics

Winnonie was selected for the 5th Panus Thailand LogTech Award 2021, as the winner for the ‘Platform-as-a-Service: Mobility & Logistics’ category. The youth, general public, and business operators with an interest in program and software development, or smart systems or equipment with national development potential to strengthen and enhance future skill development. Winnonie, an E-motorbike rental platform with an automated battery swapping network, addresses the issue of professional operation costs faced by motorcycle-taxis and riders in order to foster financial and social security for its users. Organized by the Business Incubation Center (BIC) of the National Science and Technology Development Agency, Panus Assembly Co., Ltd., and Artificial Intelligence Association of Thailand (AIAT) co-hosted the event.

Quality, Safety, and Other Categories



Thailand Quality Class (TQC) 2021



- The Refining and Oil Trading Business Group received the Thailand’s first Thailand Quality Class Plus: Innovation Award (TQC+ Innovation 2020)
- The Marketing Business Group received the Thailand Quality Class – TQC, another success for Bangchak Group which has continuously applied TQA business principles

Organized by Thailand Quality Award Secretariat Office, Thailand Productivity Institute (FTPI), and Network Institute, Ministry of Industry.

Zero Accident Campaign 2021 – Silver Class

Silver Class (plaque) for the Zero Accident Campaign 2021 from the Thailand Institute of Occupational Safety and Health (Public Organization) (T-OSH), Ministry of Labor.

Green Industry Award (level 5)

The Green Industry Award (Level 5) 2020 – 2021 organized by Department of Industrial Works, Ministry of Industry to promote Green Network that has expanded to include the entire value chain, with tangible environmental activities with communities and supporting business partners and allies to actively pursue Green Industry accreditation.



Occupational Health Safety and Workplace Environment Award – Diamond Class

Bangchak refinery received the Occupational Health Safety and Workplace Environment Award from the Department of Labor Protection and Welfare, Ministry of Labor, Diamond Class for the 5th consecutive year.

Corporate Image, Branding, and Corporate Social Responsibility Category

Superbrands 2021

'Bangchak' received the Superbrands title for the 4th consecutive year, and 'Inthanin' received its first Superbrands title.

The Superbrands title honors organizations with strong brands, well accepted internationally and taking into consideration brand quality, reliability, and distinction. Such brands must be highly popular among Thai consumers and recognized by marketing gurus, brand-building experts, public relations professionals, the media, and an independent panel following a nationwide market survey.



Top Influential Brands Award (Thailand)



Top Influential Brands Top Brand 2021, an award for the top-of-mind brand among the new generation. Bangchak was the only brand in the energy industry to receive the award following a consumer satisfaction assessment by Influential Brands, renown for in-depth surveys among consumers in Asia for over two decades. The survey was conducted online among Thai consumers aged 29–39 (the millennials), who are considered a young generation and regarded by global marketers as the group of consumers with the highest influence on brand selection. The Awards are jointly organized by Neo Target, a Thai organizational reputation consultant.

Asia Responsible Enterprise Awards (AREA) 2021 – Investment in People

The Fun Reading, Writing & Learning Project, initiated by Bangchak's Bai Mai Pun Suk Foundation, secured the top award in the Asia Responsible Enterprise Awards (AREA) 2021 event in the Investment in People category. The award was for the Fun Reading, Writing & Learning – Growing Whiz Kids Project.

AREA is a regional contest organized by Enterprise Asia, a leading NGO promoting the potential of responsible business operators in Asia. AREA honors businesses and leaders in Asia with outstanding social and environmental responsibility as well as sustainable organizational development.



The 38th Catholic Media Awards 2021 – Commercial Film “Khao Gaeng - Sustainable Happiness, Sustainable Returns”

The 38th Catholic Media Awards 2021 for Commercial Film for ‘Khao Gaeng – Sustainable Happiness, Sustainable Returns’ commemorating Bangchak’s 35th anniversary in November 2019 to reflect its business philosophy, which not only values business return but also treasures the surrounding society. The film, posted online and well received by the public, was further presented in various countries with over 30 million views reported so far.



The Media Awards, jointly organized by the Thai Catholic Media and the Catholic Education Council of Thailand, the Faculty of Communication Arts of Saint John’s University, Assumption University, Saint Louis College, Saint Theresa International College, and Saengtham College to support and honor media creators that value morals and ethics, which will result in a stronger social and family bond in Thailand.



Scan to view
“Khao Gaeng”
Commercial Film

UN Women 2021 Thailand WEPs Awards – Community Engagement and Partnerships (Honourable Mention)



The UN Women 2021 Thailand WEPs Awards – Community Engagement and Partnerships (Honourable Mention) from the UN Women 2021 Thailand Women’s Empowerment Principles Awards (WEPs), acknowledging organizations advancing gender equality and inclusivity in the workplace, and promoting and empowering women in business.

Bangchak’s policies support Refinery community engagement to advance women’s rights and objectively engage community development with the “Khun Jaew Clean Service” campaign, supporting career development opportunities for women in the Bangchak Refinery communities to provide professional cleaning services for residential areas such as private houses, condominiums, and other areas that require such services.

Asian Excellence Award 2021 – Asia’s Best CSR

Asian Excellence Award 2021 – Asia’s Best CSR presented to organizations with outstanding social, environmental, and community responsibility, organized by Corporate Governance Asia, Asia’s leading financial magazine, assessed from scores and feedback from Corporate Governance Asia (Hong Kong) readers and analysts etc., to honor leaders and organizations with outstanding international performance, corporate governance, financial management, investor relations, and corporate social responsibility.

Human Resources and Knowledge Management Category

UN Women 2021 Thailand WEPs Awards Gender-Inclusive Workplace (1st Runner-up)



The 1st runner-up UN Women 2021 Thailand WEPs Awards for Gender-Inclusive Workplace, acknowledging organizations that advance gender equality and inclusivity in the workplace, and awarded to organizations and leaders behind initiatives to drive practices that promoting and empowering women in business.

The Company participated and expressed its intent to join the WEPs network recognizing the importance of diversity and gender equality in organizational strength and promote genuine inclusivity in the workplace aligned with the National Action Plan (NAP) and the UN Sustainability Development Goals SDG Gender Equality / SDG16: Peace & Justice and SDG17: Partnerships for the Goals from the UN Women 2021 Thailand Women's Empowerment Principles Awards (WEPs).

The WEPs Award was organized as part of the UN Women WeEmpowerAsia Campaign sponsored by the European Union and Investing in Women Organization, which was organized by UN Women, Securities and Exchange Commission (SEC), ASEAN Women Entrepreneur Network, and Global Compact Network Thailand, with the Franco-Thai Chamber of Commerce (FTCC) and European Chamber of Commerce Thailand (EABC) promoting the awards.

Most Innovative Knowledge Enterprise Award (MIKE Award 2021 -Thailand)

The Most Innovative Knowledge Enterprise Award 2021 (MIKE Award) – Silver, as an excellent organization with innovation and knowledge, capable of turning knowledge into innovation. It promotes knowledge and innovation within the organization and applies them to products and services, thus delivering better usefulness to customers.

Global MIKE Awards are recognized as world-class awards for over 23 years. Organizations worldwide with best practices are screened to find out ones with outstanding knowledge management and innovation. Panel members come from various countries.



Thailand Innovation HR Award 2021 – Honorable Mention

Thailand Innovation HR Award 2021 – Honorable Mention for the “I AM BCP Everywhere with You” contest, 1 of 6 projects shortlisted from a total of 52, started as HR staff compiled the various programs and regulations staff regularly need and, for convenience, kept them in one place using a program designed and administered by staff themselves without any company budget. This channel has been expanded to give away Inthanin e-coupons, with more staff activities to be added to the program.

The Thailand Innovation HR Award 2021 was organized to promote innovation in human resource management and development to enhance organizational strength and efficiency organized by Personnel Management Association of Thailand (PMAT), Thailand Productivity Institute (FTPI) and Graduate School of Human Resource Development, National Institute of Development Administration (NIDA).

1.1.5 Fund spending objectives

Spending from the sale offer of BCP19PA in 2019

Spending	Approx. amount spent (Baht million)	Approx. spending period	Details / update of spending / reasons and measures for not spending under the objectives
1. Loan repayment from debt instrument issuance	3,000	By August 2020	To repay Bangchak Plc's bonds No. 1/2018, tranche 1, due for maturity in 2020 (BCP208A), with 2.13% interest rate, due for maturity on August 10, 2020
2. Loan repayment	400	By 2020	To repay loans to other financial institutions that have no relationship with the bond issuers as financial advisers or bond distribution managers, in the best interests of the bond issuers
3. Working capital in businesses and for business investment	2,600 – 6,600	By 2020	Spent as working capital as envisaged

Spending from the sale offer of BCP225PA, BCP275A, and BCP305A in 2020

Spending	Approx. amount spent (Baht million)	Approx. spending period	Details / update of spending / reasons and measures for not spending under the objectives
Investment, general working capital, or loan repayment, or all of these	8,000	By May 8, 2021	<ul style="list-style-type: none"> - To repay Bangchak Plc.'s bonds No. 1/2014, tranche 3, due for maturity in 2021 (BCP214A), with 4.81% interest rate, due for maturity on April 11, 2021, for a ceiling of Baht 2.5 billion - Spent as working capital

Spending from the sale offer of BCP23NA , BCP26NA, BCP29NA, BCP31NA in 2021

Spending	Approx. amount spent (Baht million)	Approx. spending period	Details / update of spending / reasons and measures for not spending under the objectives
Loan repayment from debt instrument issuance	4,000	By May 2022	<ul style="list-style-type: none"> - To repay Bangchak Plc's bonds No.1/2012, tranche 2 (BCP224A), due for maturity in 2022, with 5.35% interest rate and due for maturity on April 30, 2022, for a total value of Baht 1 billion - To repay Bangchak Plc's bonds No.1/2020, tranche 1 (BCP225A), due for maturity in 2022, with 2.6% interest rate and due for maturity on May 8, 2022, for a total value of Baht 3 billion
Working capital	3,000	By 2022	Spent as working capital as envisaged

Note that the terms of reference for the enforced rights and laws are to be enforced and interpreted by Thai law.

Leader in Energy Transition

Bangchak Corporation Plc., Thailand's leading energy company, is best known for its support for environmental sustainability and commitment to enhance national energy security.

For almost four decades, Bangchak Group has grown from a Thai refinery into a transnational energy corporation. It is now taking the lead in energy transition

by accelerating its green portfolio through green power business, bio-based value chain, and lithium value chain.

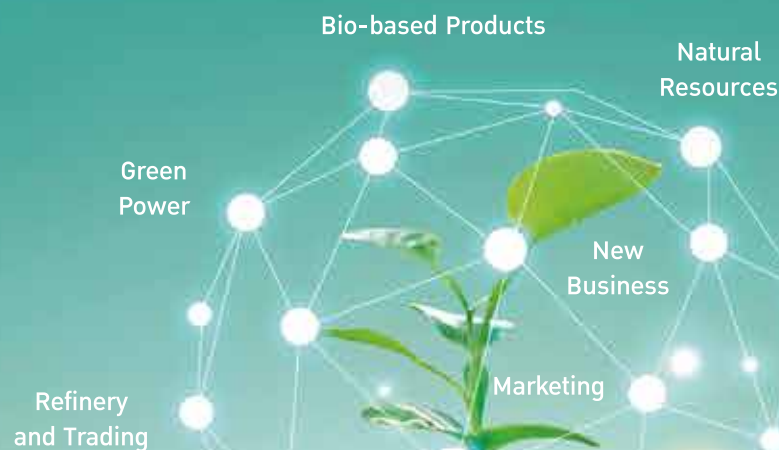
As an active organization in respect of ESG (environmental, social and corporate governance), Bangchak Group has made it a mission to become **a carbon neutral company** by 2030.

Bangchak Group aspires to become a sustainable 100 years and beyond organization; Bangchak 100X

The Group has also taken a pivotal step in combating climate change by setting two clear targets; carbon neutrality in 2030 and net zero GHG emissions target by 2050.



www.bangchak.co.th



1.2 Business Description

Bangchak Corporation Public Company Limited is a Thai energy company that operates in tandem with socio-environmental responsibility. Its core business is petroleum refining to produce high-standard products from domestic and international sources. With a capacity of 120,000 barrels per day (120 KBD), Bangchak produces and

distributes its products through more than 1,200 service stations nationwide. It has expanded its businesses to oil trading, green power, bio-based products, and natural resources and business development. Its ultimate goal is to enhance national energy security and expand new investments so that its businesses may be sustained.

Refinery Business Group

(Capacity of 120,000 barrels per day)



Marketing Business Group

(More than 1,200 service stations)



Green Power Business Group



Bio Based Products Business Group



Natural Resources and New Business Group





Refinery Business Group

Bangchak refinery is a modern complex refinery with a daily capacity of 120,000 barrels. Refinery yields are mostly premium products in the gasoline and diesel groups and are of the government-required Euro 4 standard. Notably, Bangchak was the first company in Asia to produce Gasohol E20 and premium diesel of the Euro 5 standard, an environment-friendly fuel with less than 10 ppm (parts per million) of sulfur content, down by five times from Euro 4 specifications. Bangchak will strive further to raise process energy efficiency by using electricity and steam from its own cogeneration power plant, where environment-friendly natural gas is used in place of fuel oil. The FAST+ project was launched to further raise the refining process to maximum capacity. As a result of the fluctuation in the oil industry in line with the world's ongoing economic slump, particularly the COVID-19 outbreak, which affected oil demand, Bangchak has achieved the following to cope with the situation:

- Raising business potential and expanding business opportunities while reducing costs and expenses

ranging from crude procurement, production processes, oil storage tanks, oil intake/offtake pipelines, to oil cargo vessels to ensure refining efficiency. The daily average production in 2021 was recorded at 98.5 KBD, with a 39-day major maintenance shutdown during February-March 2021.

- Drawing up a crude procurement and order placement plan to obtain appropriate GRMs while using roll-month derivatives to save crude procurement cost, resulting in the year's average GRM of USD 4.35 per barrel.
- Starting up a project to enhance production and refining capacity under the 3E project to ensure a stable daily refining capacity of 120,000 barrels. This is in addition to the refining process upgrade for better operating flexibility in keeping with oil market demand while minimizing fuel costs to achieve power security in refining processes.
- Continuously developing the international oil trading business through BCP Trading Pte. Ltd. (BCPT) with emphasis on expanding out-out trading (i.e., procuring and trading oil through companies other than Bangchak) for key products such as crude, gasoline, diesel, fuel oil, as well as naphtha and solvent products, of which new business partners have been reached in new countries including Taiwan, the Philippines, Pakistan, Qatar, and UAE. BCPT, moreover, was able to trade new products, such as MTBE, and was able to generate more income from developing low-sulfur fuel oil for IMO bunkers. Cordial relationship with partners and favorable market conditions have raised trading volumes for BCPT.



Marketing Business Group



In 2021, over 69% of refined products were sold directly to consumers through Bangchak's retail network of 1,277 stations across the country. Of the number, 662 are standard service stations and 615 are community stations (as of December 31, 2021), and sold to industrial user, transport sectors, aviation, marine, construction sector, and agricultural customers. Most newly launched stations during the year were large-scale ones bearing a modern and unique design with non-oil businesses and various services offered. Bangchak could, therefore, maintain its position as player No.2 in market shares. At its service stations, emphasis has been placed upon the sale of high-performance and environment-friendly renewable fuels in both gasoline and diesel groups. Bangchak stations are also readily equipped with non-oil businesses and various services, including convenience stores, coffee shops, oil changing, and carwash service, to attract more customers.

The 'Bangchak Food Truck' business was launched in 2021. Designed to minimize exposure to COVID-19, Bangchak

Food Truck is intended to be a convenient, fast, and safe shopping site for the new generation. Bangchak has joined various leading brands to offer the 'Grab & Go' service in response to the 'New Normal' way of life at 9 sites (as of December 31, 2021). Notably, Bangchak, after having worked on EV charging development with business partners, is offering Quick EV Charger (DC) service at 70 stations (as of the end of 2021) on major roads. Bangchak is now the service station brand offering the highest number of EV charging points around the country, ready to assist EV motorists on all routes.

As of December 31, 2021, Bangchak recorded a total number of 817 branches of Inthanin coffee shop, managed by Bangchak Retail Co., Ltd. (BCR). In addition to locations at Bangchak stations, Inthanin Coffee has its presence outside them, such as in shopping malls, office buildings, government offices, hospitals, leading education institutes, and city electric train stations. As a result of the COVID-19 outbreak, new outlet forms have been developed, namely

online and kiosk, to increase the sales volume. Bangchak plans to open more Inthanin branches at new service stations and high-potential locations.

Regarding non-oil businesses, more products and services have been added to Bangchak stations. BCR secured the rights to expand and manage the Dakasi pearl milk tea business at Bangchak service stations and, as of December 31, 2021, 15 Dakasi branches had been launched. Leading convenience store brands who are Bangchak's business allies have now opened their outlets at Bangchak stations, comprising 14 Tops Daily, 22 Family Mart, and 133 Mini Big C and 1 Lawson branches. Bangchak continuously expanded the car care business under 'Wash Pro', 'FURIO Care', 'Green Wash', and 'Tyre Care' brands while launching more outlets with a business ally. Other offerings regarding non-oil businesses include Fast Fit business, restaurants, laundry service outlets, goods delivery points, and vending machines.

Bangchak's community station business, which started in 1990 under the 'rice for oil' initiative, has continuously grown and entered its 31st year of business operation in collaboration with community organizations. Bangchak has a policy to further develop community stations toward sustainability by upgrading both the station and service to the required standard so that these stations may become a mechanism to drive the community's sustainable economy. In 2021, support for community stations was carried on through the COOP Bonding project, which focuses on community station improvement, offering of more product variety to high-potential cooperatives, and the project to boost its sales volume in response to the vision to grow the business on a participative and sustainable path.



Scan to view
"Lhong Bangchak"
Commercial Film

Bangchak pays attention to managing a sustainable business by adopting the 4R process, i.e., Renewable, Recycle, Reuse, and Reduce. This includes installation of solar rooftop panels for power generation at service stations, installation of EV chargers, use of materials produced from processes that save energy and resources for station construction, and increase in green space at service stations. For Inthanin coffee shops, the business is run under the concept of 'Inthanin Nature cup'. Not only is the coffee brewed from 100% arabica coffee beans delicately roasted for customers, but it is also responsible consumption. Inthanin is the leader in using bio-packaging items made from PLA (polylactic acid), a degradable plastic, in an attempt to reduce the use of plastics in business operations.

Apart from fuel products, Bangchak produces and sells lubricants and specialty products like transmission fluids, brake fluids, grease, and others under the BCP Lubricants brand. Also, there are premium lubricants under the FURiO brand that saves on fuels, prevents engine wear, and protects engines. Bangchak sold to domestic markets via its service stations, outlets, industrial works, original equipment manufacturer (OEM) markets, as well as exported.





Green Power Business Group

Bangchak invests in the green power business through BCPG Public Company Limited (BCPG) (a Bangchak subsidiary) particularly established for production and distribution of electricity generated from renewables and new forms of clean energy in Thailand and abroad. As of December 31, 2021, a total of 504.7 MW of electricity was generated from:

- Solar farms in Thailand, with 175.1 MW produced (operating solar rooftops included)
- Solar farms in Japan, with 34.7 MW in operation
- Wind farm in the Philippines, with 14.4 MW in operation (equity capacity)
- Geothermal plants in Indonesia, with 157.5 MW in operation (equity capacity)
- Lom Ligor Wind Power Plant in Nakhon Si Thammarat, with 9.0 MW in operation
- Hydro power plant in Laos, with 114 MW in operation

In addition, Bangchak has invested in convertible bonds of VRB Energy Co., Ltd., a producer and distributor of utility-scale energy storage systems (Vanadium Redox Flow battery) worth USD 24 million. A 25-year contract with Vietnam Electricity was also signed to produce 600 MW of electricity on the Laos-Vietnam border.



Bio Based Products Business Group

Bangchak engages in bio-based product business, including ethanol and biodiesel, as it recognizes the value of renewable energy. The goal is to lower trade deficits due to fuel imports, contribute to national energy security, support farmers, and preserve the environment. It has long advocated the blending of ethanol with gasoline and biodiesel with diesel to yield gasohol 91, gasohol 95, gasohol E20, gasohol E85, and Hi-Diesel.

Toward the end of 2017, Bangchak merged BBP Holdings Co., Ltd. (one of Bangchak subsidiaries) with KSL Green Innovation Plc. (a subsidiary of Khon Kaen Sugar Industry Public Co., Ltd.) to establish BBGI Co., Ltd., which was converted into BBGI Public Company Limited (BBGI) in April 2018 with Bangchak holding 60%. BBGI is the country's largest business entity engaging in the production and sale of biofuels with a combined production of 1,600,000 liters per day from its subsidiaries and affiliates. The total production comprises 600,000 liters of ethanol and 1,000,000 liters of biodiesel. Later in 2020, Bangchak's investment in bio-based products was expanded by having BBGI buy shares in Manus Bio Inc., a world-scale leader in premium bio-based product business, while entering into a joint venture to establish Win Ingredients Co., Ltd. to run a biotechnology business. Subsidiaries and affiliates in this business arm consist of:

- **Bangchak Biofuel Co., Ltd. (BBF):** Located in Amphoe Bang Pa-in, Phra Nakhon Si Ayutthaya, BBF engages in biodiesel production, mainly from crude palm oil with an installed capacity of 1 million liters/day, with raw glycerin as a byproduct. A project is being implemented on quality improvement for new-standard biodiesel, defined by the Department of Energy Business, for the production of B7, B10, and B20 biodiesel. A construction project has begun for the pure glycerin plant with a capacity of 80 tons/day to grow the values of BBF's products.
- **Bangchak Bioethanol (Chachoengsao) Co., Ltd. (BBE):** Located in Amphoe Phanom Sarakham, Chachoengsao, produces ethanol mainly from cassava, molasses, and sugar, with a capacity of 150,000 liters per day.
- **KSL Green Innovation Plc. (KGI):** Producing and selling ethanol derived from molasses as the key raw material, KGI commands a capacity of 450,000 liters/day. The Nam Phong plant, located in Amphoe Nam Phong, Khon Kaen, commands a capacity of 150,000 liters/day (around 49.50 million liters/year), which is currently being expanded by 200,000 liters/day. The other plant, located in Amphoe Bo Phloi, Kanchanaburi, holds a capacity of 300,000 liters/day (99 million liters/year). KGI's capacity totaled 148.50 million liters/year.
- **BBGI Utility and Power Co., Ltd.:** Produces and distributes bio-based energy, electricity, and utilities.
- **Win Ingredients Co., Ltd.:** Produces, distributes, imports, and exports various bio-based products and chemicals. The company's sweetener, Neotame, has won a food recipe certificate for distribution in Thailand and ASEAN.

Other investments are in Ubon Bio Ethanol Plc. (UBE): Located in Amphoe Na Yia, Ubon Ratchathani, UBE engages in ethanol production with a capacity of 400,000 liters per day from fresh cassava, cassava chips, and molasses. UBE also produces tapioca starch with a capacity of 700 tons per day, while generating power from the effluents of ethanol and tapioca starch processes.





Natural Resources and New Business Group

- **Petroleum exploration and production:** Through investment in OKEA ASA, Bangchak established BCPR Pte. Ltd. in Singapore for oil and gas production from oil fields named Draugen, Gjoa, Ivar Aasen, and Yme (with production starting in Q4 of 2021). BCPR is also developing or holding rights in Grevling, Aurora, and Falk oil and fields as well as a number of petroleum concessions in Norway. OKEA ASA, moreover, is the operator of various oil fields and is continually expanding its business along with M&As.
- **Natural resources business and new business development:** Bangchak established BCP Innovation Pte. Ltd. (BCPI) in Singapore to run and invest in the lithium business and innovation businesses outside Thailand. BCPI currently holds rights under a lithium purchase agreement with Lithium Americas Corp. to buy up to 6,000 tons per year from the Cauchari-Olaroz Project. BCPI has also invested in several other startups.





Innovation Management

Bangchak established the Bangchak Initiative and Innovation Center (BiIC) to create a green ecosystem for driving various innovations with a focus on green energy and bio-based products to in turn grow its domestic and international businesses derived from R&D and corporate venture capital while engaging in business ecosystems and incubation. In short, Bangchak strives to be among Asia's leading green innovative companies.

1. Research & Development (R&D)

This year the R&D group installed and commissioned a prototype plant to make high-value products derived from microalgae and test the efficiency of high-value substances derived from the plant. In addition, it engages in academic cooperation and project development with research institutions and universities, including the National Nanotechnology Center (NANOTEC), Thailand Institute of Scientific and Technological Research (TISTR), Thailand Science Research and Innovation (TSRI), Chulalongkorn University, and the Asian Institute of Technology (AIT).

Bangchak's Expenditure for R&D and Innovation

Year	Action	Amount (Baht)
2018	Production of astaxanthin from algae and selection of algae strains for treating effluents of bioethanol plants so as to obtain astaxanthin	5,400,000
2019	Production of astaxanthin from algae, production of bioplastics, production of bio-base oil, wastewater treatment	9,200,000
2020	<ul style="list-style-type: none">• Establishment of a microalgae nursery laboratory and construction of an astaxanthin pilot plant• Production of prototype bioplastics, plant-based protein substitutes, and treatment of wastewater from a gasoline service station	10,000,000 5,450,000
2021	<ul style="list-style-type: none">• Construction and commissioning of a prototype astaxanthin plant and product efficiency testing• Production of prototype bioplastics and plant-based protein substitutes	7,400,000 2,650,000

- Remarks:
- In 2019 Bangchak won Baht 2.8 million in tax privileges from TISTR along with Baht 2.3 million in supporting research fund from the Thailand Research Fund (TRF).
 - In 2020 Bangchak won about Baht 1 million in tax privileges from TISTR.

2. Corporate Venture Capital (CVC)

In early 2021, CVC extended its investment scope from a focus on the green energy group and bio-based business group to the life science and biopharmaceutical group. In addition, the green energy group extended its scope to the hydrogen economy and carbon capture and carbon utilization in line with Bangchak's policy.

This year CVC has invested 44% of its entire investment outlay, most of which focused on direct investment in startups, namely follow-on investment and initial investment. One of the invested startups is Winnonie of Bangchak Group, which introduces a green energy innovation consumed by electric motorcycles to improve the quality of life of motorcycle taxi chauffeurs.

3. Ecosystem and Incubation (E&I)

Bangchak laid down a notion of employee stewardship under The Best Employer guidelines, with a goal to develop all employees to drive the company and sustain dynamic changes in the world. E&I under BiiC launched "The Intrapreneur" project as a forum for those wishing to participate in innovation development (involvement). Ideas were brainstormed among employees about extension of current businesses or choices of emerging businesses to pursue income. To this end, a presentation of business development projects by Bangchak and Bangchak Group employees was staged, leveraging the Design Thinking concept in designing products and services as well as supporting and improving components before entering the incubation process for greater commercial capability.

In 2020 Bangchak launched the Winnonie internal startup, a word plays from win (Thai term for motorcycle queue), no (without), and nie (Thai Term for debt). The project arose from applied business thinking with Design Thinking under BiiC's sponsorship through The Intranear project. This is therefore an innovation push from inside Bangchak, from ideas to a viable business that can extend itself through Bangchak's business. So, 2020 was the first year of development from ideas to the incubation process in the form of an internal startup.

In 2021 Bangchak developed a vending service station project called "Krathing" to introduce innovation to remote communities. Apart from serving fuels, services currently include mobile phone top-ups and payment of electricity and water bills, with financial services soon to follow.

In addition, E&I drives the establishment of a Thailand Synthetic Biology Consortium in conjunction with 17 agencies as a network of cooperation in driving innovation and the domestic synthetic biotechnology industry and linking cooperation and sharing of experience among operators and researchers worldwide. The aim is commercial innovation, which is in line with the national strategic plan on upgrading industrial development under the BCG Model. The initial phase of cooperation network consisted of the National Innovation Agency (Public Organization) (NIA), the Office of National Higher Education Science Research and Innovation Policy Council (NXPO), and BBGI Plc.



1.2.1 Revenue Structure

Operated by	% share holding	2021		2020		2019	
		Revenue (million baht)	%	Revenue (million baht)	%	Revenue (million baht)	%
Revenue from Oil refining and related businesses^{1/}							
Bangchak Corporation Plc.	–	112,500	55.5	84,336	61.2	118,261	61.5
Bangchak Green Net Co., Ltd.	49	28,518	14.1	24,470	17.8	34,300	17.8
Bangchak Retail Co., Ltd.	100	709	0.3	775	0.5	902	0.5
BCP Trading Pte. Ltd.	100	40,701	20.1	19,936	14.5	31,277	16.3
Nido Petroleum Pty. Ltd.	100	–	–	–	–	9	–
OKEA ASA	45.71	10,069	5.0	–	–	–	–
BTSG Co., Ltd.	51	24	–	–	–	–	–
Total		192,521	95.0	129,517	94.0	184,749	96.1
Revenue from Power production							
BCPG Group	57.46	4,661	2.3	4,223	3.1	3,427	1.8
Total		4,661	2.3	4,223	3.1	3,427	1.8
Revenue from Bio-Based Products							
BBGI Group	60	2,235	1.1	2,710	2	2,313	1.2
Total		2,235	1.1	2,710	2	2,313	1.2
Total revenue from sales and services		199,417	98.4	136,450	99.1	190,489	99.1
Other^{2/} Bangchak and subsidiaries		3,306	1.6	1,281	0.9	1,674	0.9
Total		202,723	100	137,731	100	192,163	100

Remark: Revenues of Bangchak and its subsidiaries are net values derived from external parties.

^{1/} Revenue from domestic fuel sales in 2021, 2020, and 2019 accounted for 75.5%, 81.2%, and 91.4% respectively.

^{2/} Other revenues include investment, profit from derivatives, foreign exchange profit, the share of profit from investments in associates and joint ventures using the equity method, gain on fair value adjustments of investments and profit from the disposal of investment.

1.2.2 Product Data

Products and Services

Bangchak sells four product groups, namely:

1) **Fuels:** comprising of

1.1) **LPG**

LPG is a mixture of hydrocarbons, that is, propane and butane, bottled in the form of liquid in high–pressured iron cylinders. LPG is mostly used as cooking gas in households and can also be used in the industrial sector, such as for refrigerator–paint heating, tobacco heating, glass cutting, iron welding, and iron sheet cutting. Besides, it is an optional fuel for modified gasoline–engine vehicles.

1.2) **Odorless LPG**

Resembling LPG, this hydrocarbon compound also contains propane and butane (at over 80% in volumetric ratio) and is derived from the hydro–desulfurization cracking unit, ridding it of the LPG odor. This odorless LPG is used for producing aerosol.



1.3) **Gasoline**

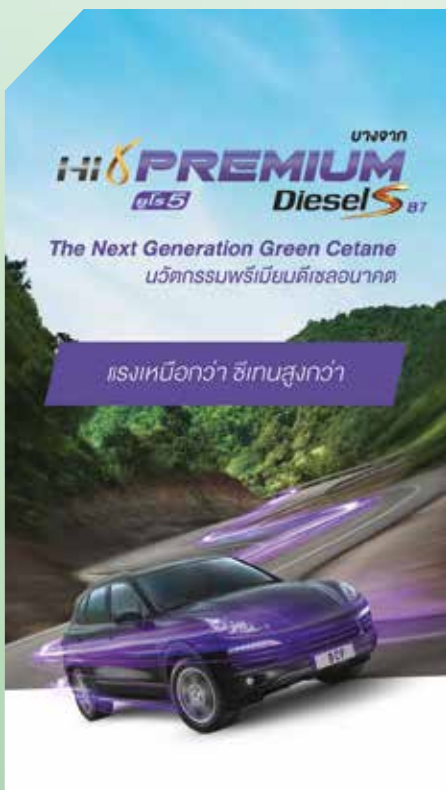
Gasoline is classified by the octane number indicating anti–knock properties. Gasoline has the MTBE (methyl tertiary butyl ether) additive that raises the octane number, whereas gasohol employs ethanol for the same purpose. Gasohol consumption benefits the public in various ways, including air pollution reduction, foreign exchange saving from importing MTBE (Methyl Tertiary Butyl Ether), cushioning of impacts of high oil prices, improvement of agricultural produce prices, which implies investment decentralization and rural employment. Today Bangchak has developed gasohol formulas that fit GDIs (Gasoline Direct Injection Engine) and PFIs (Port Fuel Injection), known as “Bangchak S EVO Family”.

1.4) **Jet fuels**

Catering to jet plans, Bangchak’s product is known as Jet A–1, suiting passenger plans or commercial plans in general. Bangchak’s crude oil and distillation process yields low–sulfur jet fuels for lower air pollution and environmental care.

1.5) **High–speed diesel**

This fuel suits high–speed diesel engines of the EURO4 standard of the Department of Energy Business for automobiles, trucks, fishing vessels, passenger boats, and tractors, among others. Bangchak has improve diesel formulas known as “**Hi Diesel S**”, “**Hi Premium Diesel S B7**”, “**Hi Diesel S B7**”, and “**Hi Diesel S B20**” as premium–grade diesel with special additives to raise combustion efficiency, add engine power, lower combustion pollution, and preserve the environment. Besides, Hi Premium Diesel S B7 contains low sulfur meeting the EURO5 standard, so it suits new European car models.



2) Lubricants Lubricants are used to coat engine surfaces to reduce friction so as to slow down the engine’s wear and tear while helping in cooling, power transmitting, and cleaning of soot and metal dirt caused by friction. Bangchak sells three types of lubricant products:

2.1) Auto lubes

Bangchak sells “BCP Lubricants”, which include the GE SERIES for gasoline engines, D3 SERIES for diesel engines, lubes for motorcycles, transmission fluids, and brake fluids.

It also sells premium lubricants of the “FURiO” brand with Respoplex Technology, which contributes to molecules that coat engine parts, marked by power, anti-wear properties for heavy-duty engines, thus protecting engines under all conditions.

2.2) Industrial lubricants

Lubricants in this category include hydraulic oil, industrial gear oil, heat transfer oil, turbine oil, air compressor oil, and cutting fluid.

2.3) Grease

Grease products comprise of multi-purpose grease, heavy-duty and heat-resistant grease, and grease for food industry.

Bangchak lubricants meet API standards, European standards, and standards set by major car manufacturers. In 2008, Bangchak was awarded ISO 9001: 2008 from The United

Kingdom Accreditation Service (UKAS) and Thailand’s National Accreditation Council (NAC) for its integrated lubricant business (ranging from procurement, product development, and marketing), and ISO/TS 16949: 2009 International Automotive Task Force (IATF) for its product development and for being the first in Thailand entrusted for producing lubricants for the automotive industry. In 2016, Bangchak successfully achieved ISO 9001:2015, and in 2017, its product was met new standard IATF16949:2016 International Automotive Task Force (IATF) with additional regard for stakeholders, including suppliers, communities, and consumers, with impacts on its processes for standard quality.

3) Feedstock for refineries and petrochemical plants:

comprising

3.1) Straight Run Fuel oil (Long Residue)

This is an intermediate raw material for feeding the refining process with a cracking unit.

3.2) Unconverted Oil

means heavy oil whose molecules are not cracked at HCU, thus high-quality fuel oil with low sulfur and nitrogen contents. UCO is a raw material for basic lube oil production.



<https://www.bangchaklubricants.com>



3.3) **Reformate**

Reformate is petrochemical feedstock. It is extracted to produce aromatics or gasoline.

3.4) **Isomerate**

Isomerate is feedstock for petroleum refining processes in the production of gasoline.

4) **By-product**

4.1) **Sulphur**, which is naturally associated with oil, is considered a by-product. Sulphur can be extracted for several direct uses, such as for blending in the production of sulfuric acid, car tires, pesticides, bleaching, sugar, and shampoo, and for production of Sulphur compounds.

4.2) **Solvents** are hydrocarbon compounds derived from Bangchak's processes through a variety of processes as needed by the market. Bangchak began solvent production by the BCP White Spirit 3040 market name, with applications as a blending agent in oil-based paints and other paints, lacquer, and varnish, in cleaning greasy patches, in cleaning machinery and metallic parts, and in lowering asphalt viscosity.

November and will do the same again in December 2021. Meanwhile the ECB lowered its asset purchase under the Pandemic Emergency Purchase Programme (PEPP) in Q4 while keeping policy interest rates low to support the still uncertain economic recovery. The Central Bank of Japan likewise kept interest rates low.

For 2022 the IMF projected the world economy to grow by 4.4%, with continued growth but at lower rates than in 2021. The trend is, however, good due to narrowing gaps in the economic recovery of each region, in turn due to greater improvement of economies in the developing economic group. Yet, one must stay alert of risk factors due to disrupted supply chains on the raw material and labor sides, which could affect inflation rates in several countries, the severity of the omicron strain of COVID-19, the mutation of these viruses, debt and treasury problems, and geopolitical problems arising in several countries.

As for the economic situation in Asia Pacific in 2021, the World Bank assessed that growth would stand at 7.7%, echoing China's continuous recovery. Yet, the prolonged COVID-19 pandemic and slow vaccine distribution in several countries, apart from the effects of natural calamities on economic recovery, would result in 5.3% continued economic growth in Asia Pacific.

1.2.3 **Marketing and Competition**

World Economy 2021

The world economy continued to grow from the beginning of the year due to the progress made in vaccine production and distribution in several countries. Yet, the rate of recovery was gradual due to the mutation of COVID-19 strains, which enabled infections in some countries to return to critical and disrupted economic activities, thus affecting supply chains. Besides the COVID-19 pandemic, the uncertain relations between the USA and China remained tense while geopolitical factors continued to impact the overall economy. The IMF projected that on average the world economy would grow by 5.9% from the previous year, when it contracted 3.1%. At any rate, due to rising inflation rates in several countries caused by labor shortages and rising energy prices, the FED and the ECB lowered their asset purchases in Q4 2021, as the economies gradually recovered, and inflation rates stayed higher than targets. The FED announced QE tempering in

Oil Market 2021

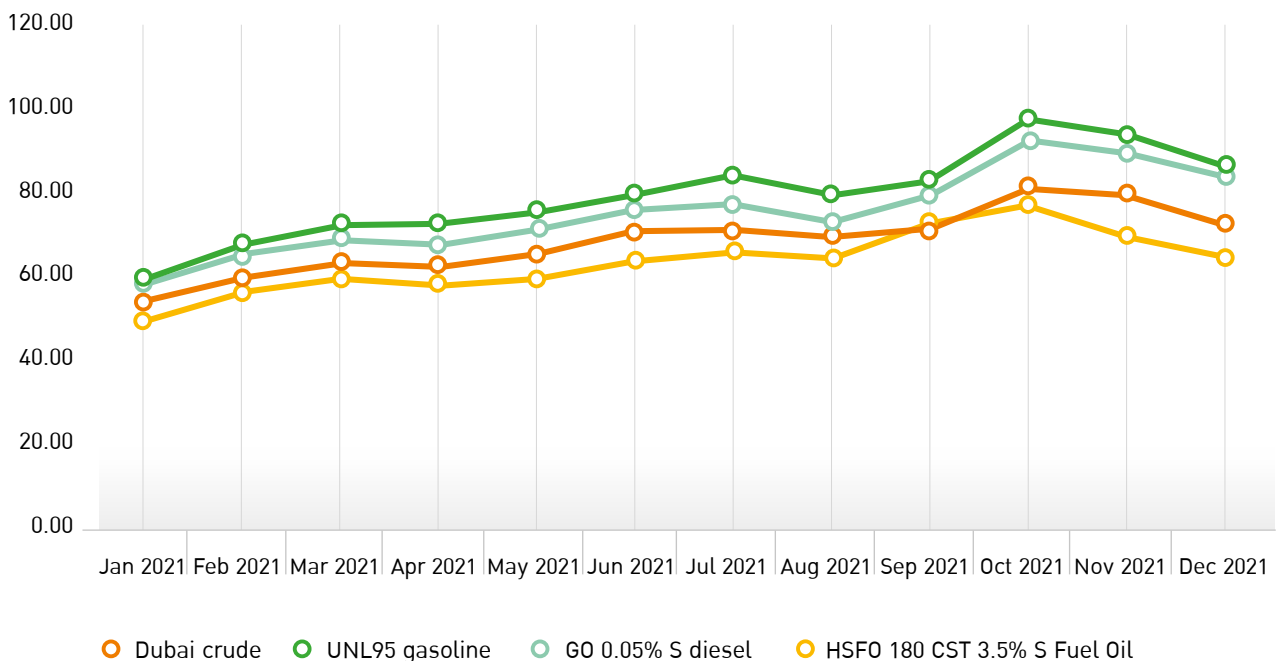
In 2021 Dubai averaged USD 69.39 per barrel, a 64.16% or USD 21.24 per barrel surge from that of last year, which was USD 42.27 per barrel. In the first half of the year, crude prices started picking up, buoyed by accelerated vaccination against COVID-19 in several countries, which brought down the number of infected people, in turn easing the pandemic. Investors therefore hoped that the economy would pick up more rapidly in 2021 and that oil demand would likewise rise. Besides, OPEC countries and their allies had agreed to maintain their output curbs while Saudi Arabia had volunteered to lower its output by 1 million barrels per day in February to April 2021 to maintain market equilibrium. In the latter half of the year, crude oil prices continued to surge, following progress made in worldwide vaccination, which continued to depress the number of new infections, while lockdown measures gradually eased, notably in the USA and Europe, coupled with the rising trend for summer travel. Meanwhile, supply by OPEC and allies rose mildly after their decision to gradually raise their output capacities. In addition, as the world approached winter, energy shortages worldwide, notably in Europe and

China, hiked the demand for oil substituting for natural gas and coal. The IEA projected that the worldwide energy shortage would hike oil demand by 500,000 barrels per day, while the power and heavy-industry sectors would switch from costly energy sources to oil.

Through the year, crude oil prices continued to gain, especially after several countries had accelerated vaccination, thus lowering the number of the infected and easing the COVID-19 epidemic while enabling economic activities to continue to recover in the face of limited rises in supply. OPEC and allies raised their outputs gradually and with collective discipline, aided by delays in producers' return. Meanwhile, oil industrial investment paused with the transition to clean energy, thus causing producers to hesitate to invest more. Then the global energy shortage lifted the demand for oil replacing natural gas and coal and tightened the crude oil market. Toward the end of 2021, crude oil prices were pressured in the wake of market concerns about the omicron strain of COVID-19, which spread quickly and was resistant to vaccines. In short, this phenomenon could pressure economic recovery and affect oil demand.

2021 World Oil Price Movement

Unit : USD per barrel



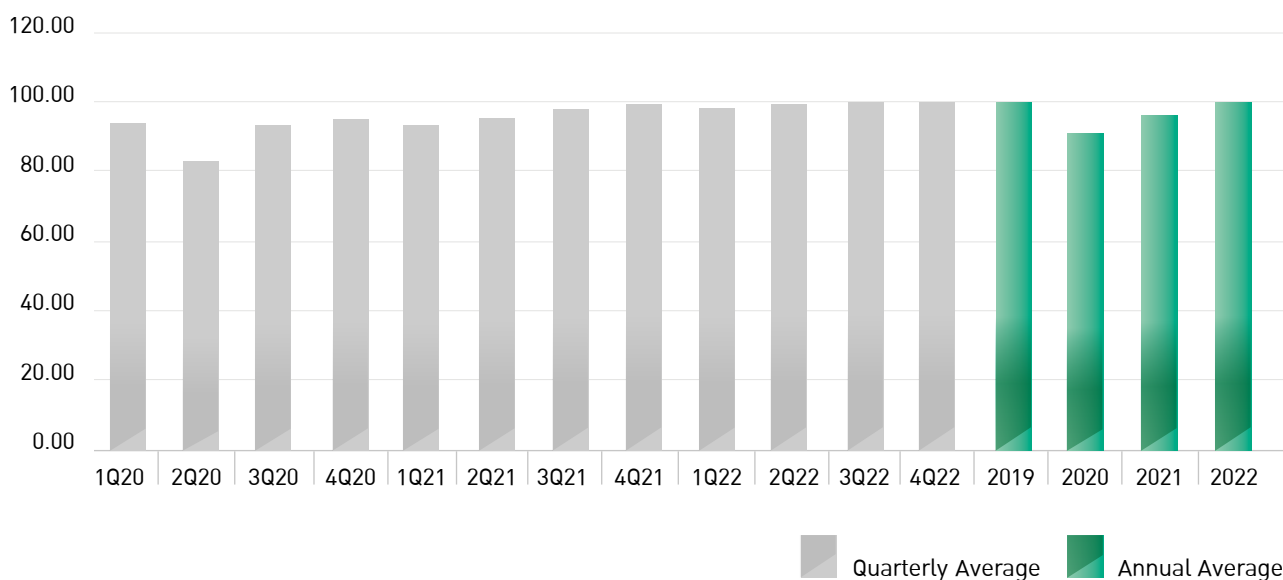
Unit : USD per barrel

Item	2020		2021		YoY
	Avg.	High	Low	Avg.	%
Dubai Crude Oil	42.27	84.34	50.45	69.39	+64.16%
Gasoline 95 UNL	46.70	107.16	55.50	80.50	+72.38%
Diesel GO	48.42	97.14	54.38	76.12	+57.21%
Fuel oil HSFO	39.30	81.70	47.51	64.51	+64.15%

Oil Market Outlook 2022

World Oil Demand

Unit : Million barrels per day



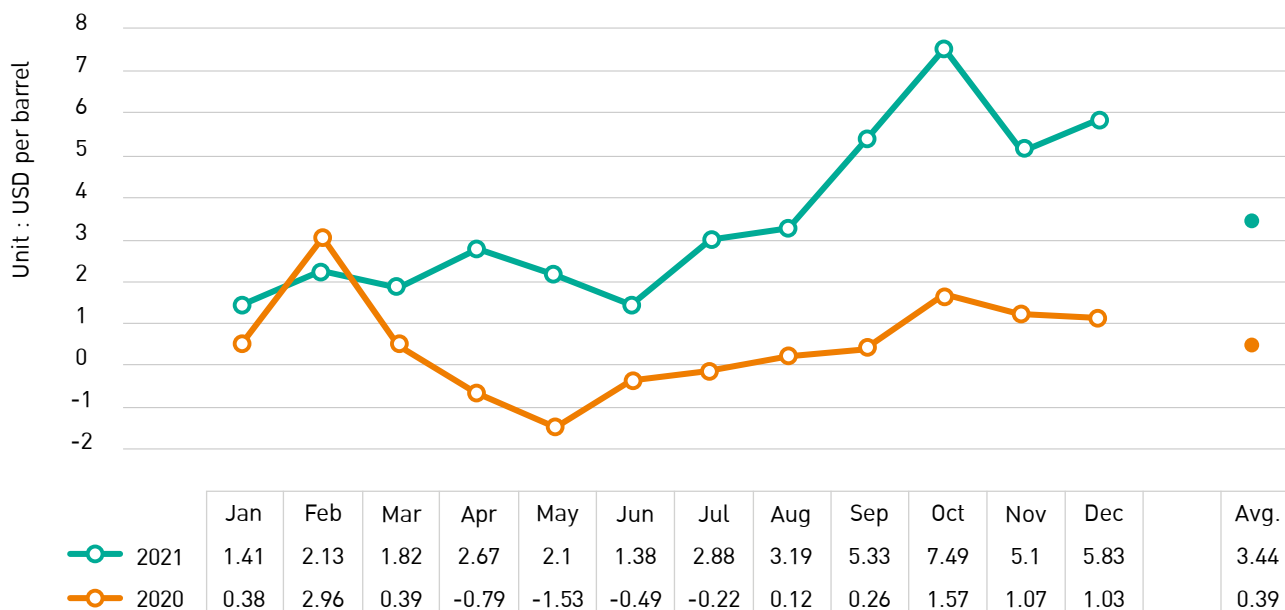
Source: International Energy Agency (IEA)

The IEA projected that world oil demand would grow by 3.34 million barrels per day in 2022 against growth of 5.37 million barrels per day in 2021. The agency forecast that the world oil market would face a market glut from early 2022 amid the omicron strain of COVID-19's impacts on international travel. To elaborate, the soaring number of COVID-19 cases and the rise of omicron would strike a blow to worldwide oil demand, while rising output would exceed demand in 2022.

According to one assessment, the Dubai crude in 2022 would move in the USD 75–85 per barrel band, buoyed by the continually rising demand after the eased COVID-19 epidemic and many countries' decisions to "live with the virus". Yet, in the second half of the year, supply would likely pick up with the output of the USA and supply return of Iran. Finally, sustainable economic growth is unlikely because of the COVID-19 mutation, lockdowns, and unfavorable inflation rates.

Refining Margin Overview 2021

Dubai-based hydrocracking (DB HC) refining margin in singapore, 2020 VS. 2021



Source: Reuters

The refining margins of cracking refineries in Singapore averaged USD 3.44 per barrel, a rise from those of last year (USD 0.39 per barrel) with the recovery of refined product demand and widespread COVID-19 vaccination in countries around the world, in turn easing lockdown measures and aiding worldwide economic recovery. Meantime, several refineries' capacities dropped with shutdowns and turnarounds, causing refined product stock drops in key countries. The margin between gasoline and Dubai prices improved after the quick recovery in demand as a result of eased lockdowns in several countries and more extensive driving of personal vehicles. The margin between diesel and Dubai prices saw a slight rise amid recovering economic activities and the partial recovery in aviation demand made possible by a return to domestic and international flights. Yet, the margin between the fuel oil and Dubai prices was pressured by OPEC's quota increase, notably heavy oil, which raised fuel oil demand.

Unit : USD per barrel

Price Spread	2020		2021		YoY
	Avg.	High	Low	Avg.	%
UNL95 - DB	4.43	23.25	4.61	11.11	+150.79%
GO - DB	6.14	13.20	2.85	6.73	+9.61%
HSFO - DB	-2.98	3.49	-10.74	-4.88	-63.76%

Refining Margin Outlook 2022

The refining margins for cracking refineries in Singapore are likely to keep rising from the levels of 2021, with demand for refined products expected to recover along with eased concerns about the COVID-19 pandemic, in turn due to more extensive vaccination and adjustment to the New Normal, thus restoring economic growth. It was expected that demand for gasoline and diesel would continue to rise and that demand for air travel would clearly rise. At any rate, the recovery in oil demand could be affected by virus mutation, thus causing countries to take measures to handle the new wave of infections. Also, rising supply accompanying the launches of new refineries and refineries with deferred launches, as well as fewer turnarounds, would pressure the supply rise of refined products.

Thai Economic Overview 2021

The domestic economy appeared to assume gradual growth. The Bank of Thailand projected Thai economic growth to stay around 0.9%, a mild rise over last year (6.1% contraction) and projected that it would take some time for the economy to return to the level before COVID-19 struck. This is because the pandemic, which proved severe in the first half of the year, had far different effects on the recovery of individual economic sectors. To elaborate, the service sector associated with tourism tended to recover more slowly than others. The labor market was still fragile, with slower economic recovery than the overall economy, in addition to the effects of floods this year. At any rate, the more vibrant economic growth of the second half of the year accompanied fewer infections, successful vaccine distribution, and healthy export growth accompanying world economic recovery. Yet, the rise in omicron infections poses risks to the economy in the days and months ahead.

As for the general inflation rate of 2021, one saw it move within the target range. This year inflation rose with the prices of fresh food temporarily affected by floods along with the still-high prices of energy in keeping with the world oil price. The inflation rate is projected at 1.2%, a gain over last year, when the inflation rate contracted by 0.8%. The Bank of Thailand continued to relax monetary measures, keeping the policy interest rate at 0.5%, continuing from 2020.

In 2022 the domestic economy is projected to grow by 3.4%, further recovering from 2021. The temporary spike in inflation rates should ease by 2022. The omicron strain of COVID-19 should also wield its impacts on the tourism and export sectors, and domestic and international supply chain disruption should still affect prices of goods and services, while domestic economic scars (more business closures, a fragile labor market, and debt burdens) should still impede economic recovery in the months ahead. Still, we expect private consumption and investment to keep growing.

Thailand's Economics Projection			
% y-o-y	2020	2021*	2022*
Economics growth	-6.1	0.9	3.4
General inflation	-0.8	1.2	1.7

Source: Bank of Thailand

* Estimated

Domestic Oil Industry Competition

Domestic demand for oil products in 2021 (January to December) fell by 6.70 million liters per day (by 6.10%) from last year to 103.01 million liters per day because of the COVID-19 pandemic as well as lockdown and other measures designed to keep the pandemic at bay, thus disrupting oil product demand of Q2 and Q3. As a result, demand for the gasoline and diesel groups shrank 8.26% and 3.51% respectively while demand for jet fuels was most affected, falling by 35.16%.

Domestic Demand for Refined Products

Product	Demand (Million liters/day)		
	Jan-Dec 2020	Jan-Dec 2021	Growth
Gasoline Group	31.99	29.49	-7.84%
Regular Gasoline	1.07	1.12	+4.49%
Gasohol	30.92	28.37	-8.26%
Diesel Group	65.43	63.13	-3.51%
Jet fuel	7.50	4.86	-35.16%
Fuel oil	4.78	5.53	+15.61%
Total	109.70	103.01	-6.10%

Source: Department of Energy Business

As for domestic supply, the six domestic refineries (Thai Oil, IRPC, PTT Global Chemical, Esso, Star Petroleum, and Bangchak) commanded a total output of 971 KBD (January – November data), a 1.0% drop from that of last year as a result of the continuing COVID-19 pandemic.

Average Refinery Throughput

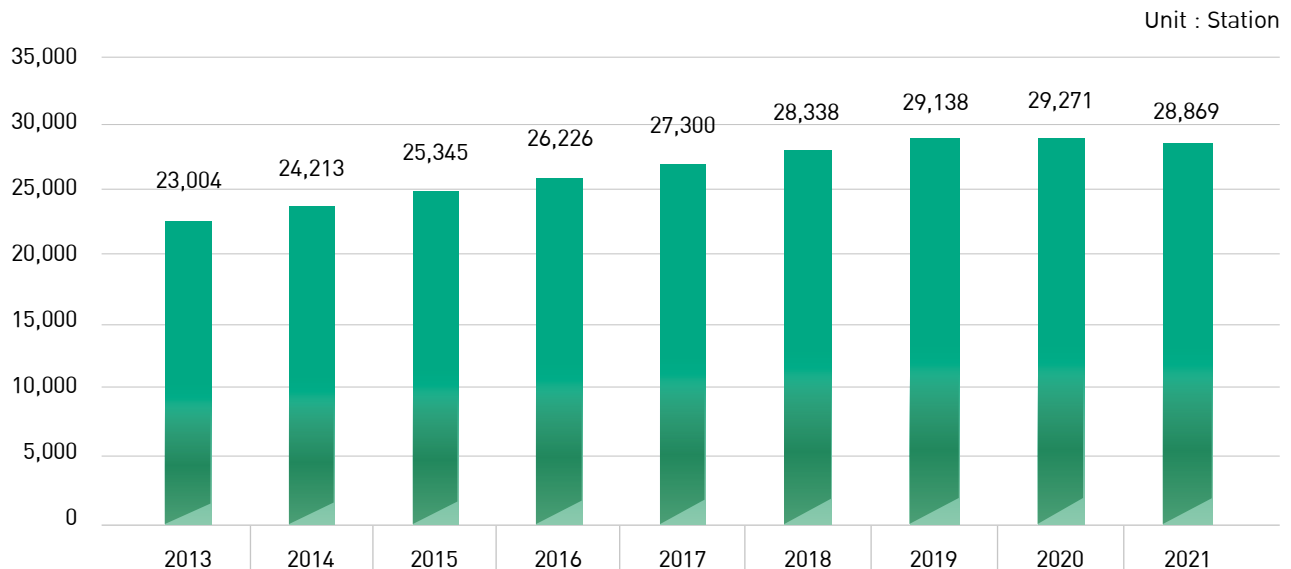
Refinery	Throughput (KBD)		
	2020	2021*	Growth
Thai Oil	264	261	-1.1%
IRPC	192	194	1.0%
Esso	117	124	6.0%
Star Petroleum	145	137	-5.5%
PTT Global Chemical	168	159	-5.4%
Bangchak	95	96	1.1%
Total	981	971	-1.0%

Source: Department of Energy Business

* January – November 2021

As a result of the pandemic, the number of minor service stations fell. The total count of domestic Article 11 service stations as of December 31, 2021, and December 31, 2020, reduced by 402, (1.37%) although all key Article 7 traders' stations grew by 342 to 28,869 nationwide over last year. The service stations offering gasohol E20 and E85 numbered 4,921 and 1,235 respectively.

Number of Service Stations (Unit: Station)



Source: Department of Energy Business

As far as oil industrial competition in 2022 is concerned, the outlook is for continuing fierce competition from last year despite a positive outlook for economic recovery. Still, the new wave of COVID-19 infections together with higher prices of diesel should still depress tourism and oil demand, although the effect should be milder than in 2021 because of the higher number of those vaccinated, the severity of the new COVID-19 strain, and medication progress. Meanwhile, more key traders are coming in, based on the rising number of service stations, image revamp for modernization, and development of new services to meet users' needs, with non-oil businesses introduced to raise competitiveness and create investment returns.

Clear Fuel Sale through Service Stations, January - December 2020-2021

	Average Sales volume (Million liters / month)			Market share (%)		
	2021	2020	Δ*	2021	2020	Δ
PTT	798.8	853.3	-6.1%	38.0	38.1	-0.1
Bangchak	339.7	348.7	-2.3%	16.2	15.6	+0.6
Esso	244.9	258.9	-5.1%	11.6	11.6	+0.0
Shell	204.8	246.5	-16.7%	9.7	11.0	-1.3
Thai Oil	212.2	214.5	-0.8%	10.1	9.6	+0.5
Caltex	89.3	93.2	-3.9%	4.2	4.2	+0.0
PTTRM	72.6	87.6	-16.9%	3.4	3.9	-0.5
IRPC	56.5	54.3	+4.5%	2.7	2.4	+0.3
PTG Energy	51.0	45.5	+12.5%	2.4	2.0	+0.4
Susco Group	32.3	34.2	-5%	1.5	1.5	+0.0
Other	1.1	0.5	+118.7%	0.1	0.0	+0.1
Total	2,103.2	2,237.2	-5.7%	100	100	

Source: Department of Energy Business

* Percent change per day

As for the lubricating oil (through Article 7 traders) market, the numbers from the Department of Energy Business as of December 31, 2021, indicated that domestic sales amounted to 3.76 million liters per month, growing by 12.8% from last year, as opposed to the domestic market for ready-made (bottled) lubricating oil, which shrank 8.2% amid the economy bearing the brunt of COVID-19.

Product distribution and distribution channels:

Bangchak products are distributed through:

- 1) Service stations** – This is the usual retail channel, which is, through service stations scattered around the country. Also, in this category are community service stations, intended for sale to members. All products are delivered via tanker trucks.

Bangchak's retail stations are operated in five formats, namely:

Station Format	Number (station)	Share (%)
1. Company Own Company Operate (COCO): Bangchak is the investor and operates the station through Bangchak Green Net Co., Ltd. Bangchak takes control of the policy and business model. COCO stations are mostly large stations located on major roads, and, under Bangchak's direct supervision, serve as prototype stations.	228	17.8%
2. Company Own Dealer Operate (CODO): Bangchak is the investor and land owner, while the station management is carried out by experienced operators, who rent the stations.	51	4.0%
3. Joint Venture (JV): This is a joint investment between Bangchak and operators interested in running the service station business.	59	4.6%
4. Dealer Own Dealer Operate (DODO): The operator is the station owner, land owner, and sole investor, as well as a distribution agent.	324	25.4%
5. Co-Operative (CO-OP): These stations are invested by the community. In most cases, the community is the land owner and investor.	615	48.2%
Total	1,277	100%

Remarks: Bangchak Corporation Plc., as of December 31, 2021

- 2) Industrial sale** – This sales channel serves industrial plants and businesses with fuel demand for heating and producing products and services, such as food, textiles, paper, chemical, iron, and metal industries. Customers deal directly with the company, and deliveries are arranged by tanker trucks, except for some factories with their own piers.
- 3) B2B** – This channel serves businesses with large purchase volumes like airlines, cargo/passenger, land and marine transport companies, as well as construction companies. These customers deal direct with the company, and deliveries are carried out by pipeline (for airlines), boat, and tanker truck.
- 4) Sale to other oil companies** – This is the sales channel among large and medium-sized oil traders who own oil depots. Purchased products are distributed through customers' own networks to end-customers. Deliveries are normally carried out by pipeline or customers' trucks.

5) **Sale to refineries and petrochemical plants** – This is the sale of refined products in the form of feedstock to petroleum or petrochemical production process, such as Naphtha for the aromatics unit. Deliveries are normally carried out by boat.

6) **Export sale** – Deliveries are normally carried out by marine vessel to overseas oil traders. In some case, traders in neighboring countries directly handle truck transport from Bangchak’s depots in Thailand to their facilities.

Types of customers – Bangchak’s customers can be classified by purchasing method:

1) **Outlet & End-User Customers** – This group of customers are those buying Bangchak brand oil products through stations operated by the company, dealers, cooperatives or communities. Also, in this group are corporate customers like factories, construction companies, airlines, cargo and passenger boats, and government agencies and state enterprises.

2) **Supply Sales Customers** – These customers are small and large oil traders, who order finished products from Bangchak for further distribution. Deliveries are made direct to customers’ sites or outlets in their networks.

3) **Export Customers** – These customers are overseas oil traders who buy Bangchak oil to feed their production process or distribute internationally, such as Low Sulphur Waxy Residue (LSWR) sold to customers in Singapore, Malaysia, and China to fuel power generators and feed their cracking units for producing higher-value gasoline and diesel for further distribution.

Bangchak’s sales volume, categorized by type of customer

Unit : thousand barrels/day

Type	2021		2020		2019	
	Volume	%	Volume	%	Volume	%
1. Outlet & End-User Customer	82.34	65.2	86.7	71.3	105.4	74.9
2. Supply Sales Customers	16.92	13.4	16.2	13.3	14.9	10.6
3. Export Customer	27.05	21.4	18.7	15.4	20.5	14.6
Total	126.3	100	121.6	100	140.8	100

Source: Bangchak Corporation Plc.

Sales value of Bangchak's products and services

Products	2021		2020		2019	
	million baht	%	million baht	%	million baht	%
Domestic Sale						
1. High-speed diesel	84,434	51.8	64,979	54.0	86,760	51.3
2. Fuel oil	1,968	1.2	1,661	1.4	1,529	0.9
3. Gasoline	43,564	26.7	36,324	30.2	46,248	27.3
4. Other products and services	7,935	4.9	7,290	6.1	18,413	10.9
Total domestic sale	137,901	84.7	110,254	91.7	152,950	90.4
Export Sale						
1. High-speed diesel	5,127	3.1	1,956	1.6	1,991	1.2
1. Fuel oil	18,550	11.4	6,999	5.8	13,126	7.8
3. Gasoline	353	0.2	484	0.4	510	0.3
4. Other products and services	928	0.6	541	0.4	526	0.3
Total export sale	24,958	15.3	9,980	8.3	16,153	9.6
Combined sales value						
1. High-speed diesel	89,561	54.97	66,935	55.67	88,751	52.5
2. Fuel oil	20,518	12.63	8,660	7.20	14,655	8.7
3. Gasoline	43,917	26.96	36,808	30.61	46,758	27.7
4. Other products and service	8,863	5.44	7,831	6.51	18,939	11.2
Total sales value	162,859	100	120,234	100	169,103	100
% increase/decrease	35.45		-28.90		-4.13	

Source: Bangchak Corporation Plc.

1.2.4 Supplies of products and services

1) Production capacity and production volume

Bangchak's complex refinery, located on 210 Sukhumvit 64, Phra Khanong, Bangkok, boasts a refining capacity of 120,000 barrels per day and performs a 24-hour operation.

Production capacity (measured in 'barrels per day') means the refining system, piping system, and storage system that receive crude for turning into finished products at the maximum volume per day through the quality improvement system, piping system, blending system, storage system, and product distribution system. Every 18–24 months, Bangchak shuts down the system for maintenance, which normally lasts about 30 days, to keep up or upgrade the system's performance. The shutdown schedule depends on operational and economic circumstances.

Bangchak has, over time, upgraded and expanded its refining unit. Today's operation is considered efficient with high safety standards and environment management, which exceed standards.

Bangchak's refining capacity and refining volume

Unit : thousand barrels/day

	2021	2020	2019
Nameplate capacity ^{1/}			
: thousand barrels per refining day	120	120	120
: thousand barrels per calendar day (A)	113.4	113.4	113.4
Output volume (by product)			
1. Diesel	51.99	58.11	57.10
2. UCO	8.87	4.56	4.42
3. Fuel oil	11.58	8.77	12.78
4. Gasoline ^{2/}	19.78	19.43	20.39
5. Solvent ^{3/}	0.31	0.16	-
6. Aviation fuel, kerosene	4.03	3.69	15.07
7. LPG	2.06	2.57	2.7
8. Products for internal use and product loss during operation	0.03	-0.10	0.13
Total output volume (B)	99.04	97.19	112.59
% increase of output volume	1.9	-13.7	2.9
% of capacity utilization (B/A)	87.33	85.71	99.29

Source: Bangchak Corporation Plc.

Remarks: ^{1/} Bangchak runs refining operation with three shifts of staff working eight hours per shift. Maintenance shutdowns are regularly scheduled to keep up or upgrade the refining process.

^{2/} The gasoline output excludes the amount of ethanol in the production of Gasohol.

^{3/} Started to produce solvent in 2020



2) Refining process

- **Fractional Distillation** – The refining process starts from breaking up crude oil into fractions in the refining unit by heating it at 370 degrees Celsius. Then, 60% – 70% of the crude will vaporize to the top of the refining column, where it finds the lowest temperature. When that vapor cools down, it condenses into a liquid and flow onto layers of trays, depending on their boiling points, as detailed below:
 1. The top layer, with the lowest temperature, is LPG.
 2. The second layer is Light Virgin Naphtha (LVN).
 3. The third layer is Heavy Virgin Naphtha (HVN) (both LVN and HVN will be blended with some additives to produce gasoline).
 4. The fourth layer is kerosene and aviation fuel.
 5. The fifth layer is diesel.
 6. The remaining liquid crude stays at the bottom of the distillation column, where the temperature is the highest. The liquid is known as the “Atmospheric Residue”.

Vaporization and condensation of crude oil from one tray to another is an ongoing steady-state process in a separate pipe placed beside the distillation column. This separate part is known as a ‘straight run’. Yields from the straight run process, including diesel, contain high cetane and ignite easily, thus easing complete combustion and making engines clean. The resulting fuel oil still has some blend of light yields, making it easy to ignite, thus giving complete combustion. While the excess air can be reduced, resulting in lower fuel and maintenance costs in the long run.

- **Treating:** Treating is to make quality improvement to crude and products by removing unwanted contents, such as Sulphur. Treating units include the gas treating

unit, naphtha production unit, low-sulphur diesel production unit of Euro 4 standard, and fuel oil treating unit, as well as gasoline production unit of Euro 4 standard.

- **Conversion:** Conversion is the process of changing oil molecule structures to achieve an oil product of higher quality and value. Conversion units include the gasoline production unit (isomerization, reforming) and fuel oil conversion unit.
- **Blending:** Blending is to mix at least two products together or to mix so some additives into a product to achieve a product of higher quality.

Fuel oil upgrading unit: Since demand for fuel oil has been falling over time while Bangchak realizes the optimal use of resource, fuel oil produced in the straight run process is treated to achieve cleaner products of higher value, for example, fuel gas, cooking gas (LPG), light naphtha, heavy naphtha, aviation fuel, and diesel.

The above-mentioned treating method starts from moving the fuel oil from the distillation column to the vacuum distillation unit to remove Vacuum Gas Oil. The fuel oil molecules will then be broken up into fractions to produce the desired products. Here, hydrogen from the hydrogen production unit is fed in to help molecule fractioning complete. At the bottom of the vacuum distillation column, heavy fuel oil will be further treated for sale.

Products derived from molecule fractioning, comprising fuel gas, cooking gas (LPG), light naphtha, heavy naphtha, aviation fuel, and diesel, will be sent to the product separation unit.

Fuel gas obtained from the process will be refined by removing the sulphur content. Treated fuel oil, diesel after sulphur content removal under the Euro 4 standard, aviation fuel, and cooking gas are kept in storage tanks for sale.

under the Euro 4 standard. The product will then be sent to the gasoline production unit (reforming) to raise the octane number before flowing further to the production unit of Euro 4 standard gasoline.

Low-sulphur diesel production unit of Euro 4 standard

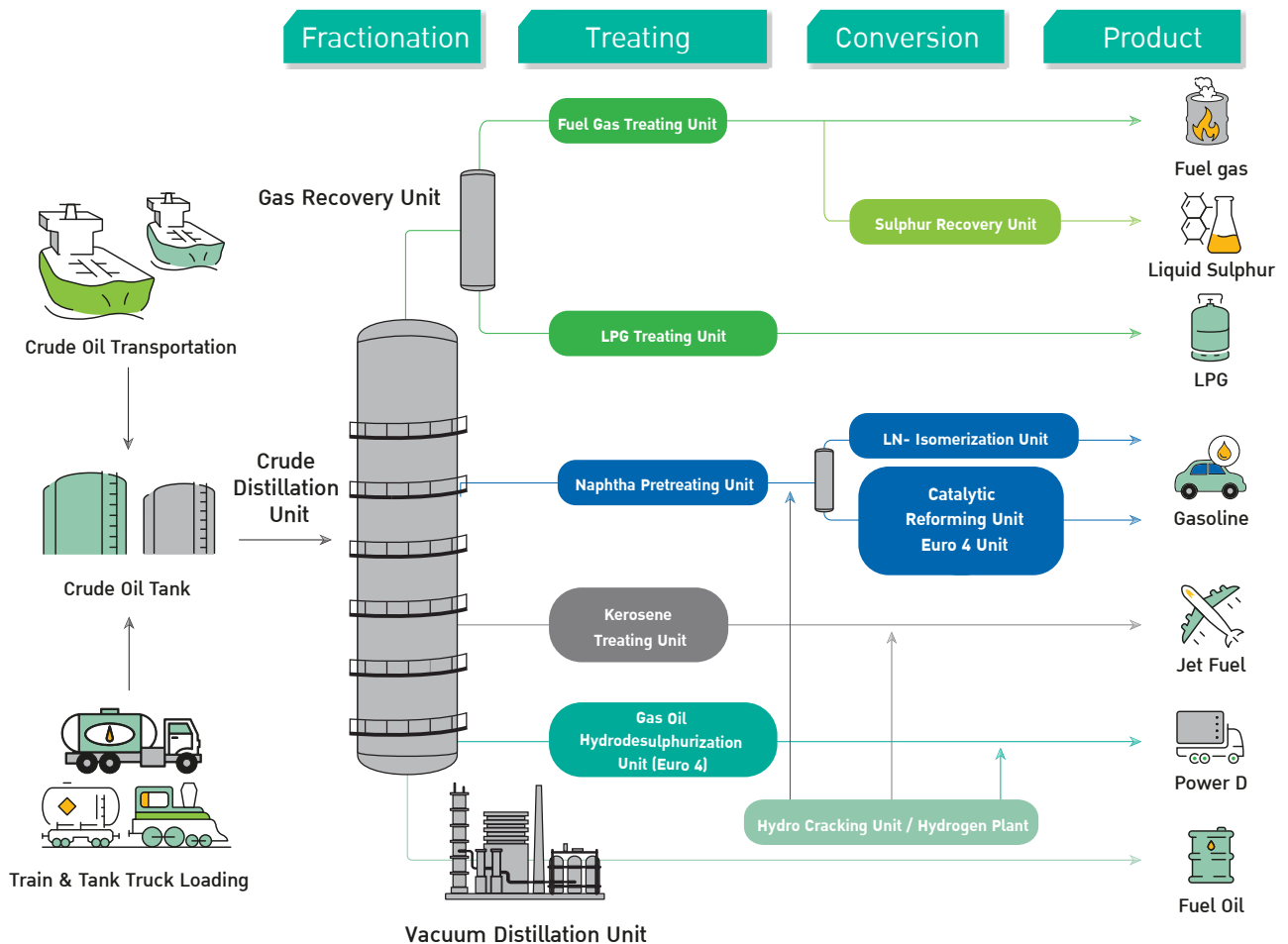
– This is quality improvement for diesel, using hydrogen in combination with a catalyst under specified pressure. By the Euro 4 standard, sulphur content in diesel will be reduced sevenfold to achieve a highly pure product, which will be kept in storage tanks for sale.

Production unit of gasoline / gasohol of Euro 4 standard

– This is the quality improvement for gasoline by using hydrogen, in combination with a catalyst under specified pressure, to reduce the benzene content under the Euro 4 standard. The product will be highly pure with ten times less sulphur content and 3.5 times less benzene. The product is kept in the storage tanks for sale.

Light naphtha and heavy naphtha will be sent to the naphtha production unit to reduce the sulphur content by tenfold

BCP Complex Refinery process



3) Raw materials and suppliers

The main raw material of the refining business is ‘crude oil’, natural hydrocarbons created by compression of organic materials, that is, animals and plants, over millions of years under the earth’s surface. Thailand holds its own crude sources at various places, such as the along the seams of Phitsanulok and Kamphaeng Phet provinces, in Suphan Buri province, Sukhothai, Fang district in Chiang Mai, and in the Gulf of Thailand. However, the volume of crude oil produced indigenously is not enough to satisfy the demand posed by the six domestic refineries. Thus, most of the crude needs to be imported. The major import sources of crude are countries in the Middle East like the Oman, as well as those in Southeast Asia, such as Malaysia, Indonesia, Brunei, and Australia. Crude imports from the Middle East require 15 – 20 days for transport and those from the Far East require 3–7 days. Normally, Bangchak keeps a crude stock of around 30 days in running its refinery.

Indigenous sources of crude oil

unit : thousand barrels/day

Crude Field	2021		2020		2019	
	Volume	%	Volume	%	Volume	%
1. Sirikit	26,728	27.0	29,294	24.7	30,029	23.9
2. Tantanwan	14,931	15.1	17,698	14.9	20,718	16.5
3. Erawan	16,345	16.5	24,489	20.6	25,748	20.5
4. Nasanun/Nasanun East	386	0.4	489	0.4	731	0.6
5. Jasmine	10,043	10.2	10,750	9.1	10,808	8.6
6. Manora	6,909	7.0	6,016	5.1	5,342	4.2
7. Others	23,567	23.8	29,904	25.2	32,513	25.8
Total	98,909	100	118,640	100	125,889	100

Source: Energy Policy and Planning Office, Ministry of Energy

To achieve its goal on crude procurement security at the lowest cost and desired quality, Bangchak sources crude oil from both indigenous and overseas sources at suitable proportions, taking into consideration refining economics. Also, there are times when Bangchak orders petroleum products for sale, known as physical swaps with other producers.

In 2021, Bangchak procured indigenous crude oil from many fields in domestics, totaling 5,916.10 thousand barrels, which mainly from Sirikit Field (Phet), Benchamas Field, Pattani Field and others.

This year, Bangchak imported crude 28,691.22 thousand barrels. There are 58.12% Crude from the Far East fields, such as Banyu Urib and Belanuk from Indonesia, KIMANIS and Bunga Kekwa from Malaysia. Also, there are 37.99% crude from other sources, such as Buatifel and SARIR MESLA from Lybya.

In addition to crude oil, Bangchak procures semi-finished products to make finished products, while some finished products are also procured for sale.

Bangchak's Cost of Feedstock

Crude Type	2021		2020		2019	
	Million Baht	%	Million Baht	%	Million Baht	%
Cost of indigenous feedstock						
1. Crude and semi-finished products	28,526	25.22	25,309	23.12	37,911	34.64
2. Finished products	12,129	10.72	7,321	6.69	10,174	9.30
Total	40,656	35.94	32,630	42.82	48,086	43.93
Cost of imported feedstock						
1. Crude and semi-finished products	67,474	59.65	38,899	35.54	53,876	49.22
2. Finished products	4,987	4.41	4,666	4.26	7,495	6.85
Total	72,462	64.06	43,565	57.18	61,371	56.07
Combined costs of indigenous and imported feedstock						
1. Crude and semi-finished products	96,001	84.87	64,208	84.27	91,788	83.86
2. Finished products	17,116	15.13	11,987	15.73	17,669	16.14
Total feedstock cost	113,117	100	76,195	100	109,457	100

Source: Bangchak Corporation Plc.

1.2.5 Review of business assets

Asset	Ownership	Book value Baht million ^{1/}	Obligation
Refinery land	Long-term lease	247	None
Other properties	Ownership	2,369	None
Buildings	Ownership	170	None
Machinery & distillation tower equipment	Ownership	25,342	None
Power generators	Ownership	51	None
Sales and office equipment	Ownership	3,258	None
Platinum catalysts ^{2/}	Ownership	239	None
Vehicles	Ownership	63	None
Other assets ^{3/}	Ownership	18	None
Works in progress	Ownership	1,546	None
Total	-	33,303	-

Note: ^{1/} This year, the allowance for impairment of assets consists of machinery and equipment of the distillery tower in the amount of Baht 121 million.

^{2/} “Platinum catalysts”: platinum-based catalysts (found in the octane enhancement unit’s reactor), the contents of which are set by their producers.

^{3/} “Other assets”: oil palm plantations in Pathumthani and Nakhon Nayok province.

Trademarks

Trademark	Number of registered trademarks	Goods/services under trademark	Expiry ¹
Copyrights			
1. Bangchak leaf	11	All fuels, cold tissue paper, pure drinking water, plastic polymers, pens, pencils, notebooks, folders, asphalt, activated carbon	Aug. 30, 2029 Oct.15, 2029 Aug. 20, 2026
2. GRENA ZENITH SJ	1	Lubricant	Nov. 5, 2026
3. ISO GREEN	1	Gasoline	Jun. 30, 2024
4. GE GOLD	7	Synthetic gasoline-engine lubricant	Feb. 12, 2022 Jan. 13, 2023
		Semi-synthetic gasoline-engine lubricant	Jan.15, 2027 Nov. 19, 2031 Dec. 24, 2031

Trademarks

Trademark	Number of registered trademarks	Goods/services under trademark	Expiry ¹
5. GE PLUS	4	Gasoline-engine lubricant	Jan. 13, 2023 Jan. 15, 2027 Nov. 19, 2031 Dec. 24, 2031
6. GE SILVER	3	Semi-synthetic gasoline-engine lubricant	Nov. 4, 2024 Jan. 15, 2027 Dec. 24, 2031
7. Green Plus	1	Gasoline	Sep. 14, 2024
8. Green Plus 91	1	Gasoline	Sep. 14, 2024
9. Green Plus 95	1	Gasoline	Sep. 14, 2024
10. LOWCOST	1	All fuels	Jun. 23, 2025
11. D3 GOLD	2	Synthetic diesel-engine lubricant Synthetic diesel-engine lubricant 100%	Oct. 9, 2023 Jan.15, 2027
12. D3 COMMONRAIL	1	Diesel-engine lubricant	Oct. 30, 2028
13. D3 TURBO PLUS COMMONRAIL	1	Semi-synthetic diesel-engine lubricant	Oct. 30, 2028
14. D3 Max	1	Diesel-engine lubricant	May 14, 2027
15. D3 EXTRA PLUS	1	Diesel-engine lubricant	Jan. 15, 2027
16. D3 PICK UP PLUS	1	Diesel-engine lubricant	Jan. 15, 2027
17. D3 TURBO PLUS	1	Semi-synthetic diesel-engine lubricant	Jan. 15, 2027
18. BANGCHAK POWER D	1	High-speed diesel	Jul. 10, 2028
19. SUPER POWER D B5 (EURO 4)	1	High-speed diesel	May 2, 2022
20. SUPER POWER D (EURO 4)	1	High-speed diesel	May 2, 2022
21. GE NGV	1	Semi-synthetic gasoline-engine lubricant	Dec. 24, 2031
22. GE PLATINUM	1	Synthetic gasoline-engine lubricant	Dec. 24, 2031
23. Bangchak Max Drive	1	Gasoline Fuel Conditioner	Dec. 25, 2026
24. Super HDX	1	Diesel Fuel Conditioner	Jan. 15, 2027
25. FURIO	1	Lubricant	Mar.2, 2027
26. FURIO F2	1	Lubricant	Feb.11, 2028
27. FURIO F2 DIESEL	1	Lubricant	Feb.11, 2028

Service Marks

Service logo	Number of registered logos	Goods/services under logos	Expiry ¹
Copyrights			
1. Bangchak leaf	3	Goods sales management	Dec. 20, 2028
2. Bangchak colored strips, Bangchak characters, and Bangchak leaf	1	Vehicle service station	Aug. 6, 2023
3. Colored strips and Bangchak leaf	1	Vehicle service station	Aug. 6, 2023
4. Colored strips	1	Vehicle service station	Nov. 3, 2023
5. Bangchak colored strips	1	Vehicle service station	Aug. 6, 2023
6. Hornbill photo	2	Goods sales management	Oct. 10, 2026
7. Gold food plate (black & white)	1	Sale of goods, foods, and drinks	Sep. 4, 2023
8. Gold food plate (colored)	1	Sale of goods, foods, and drinks	Sep. 4, 2023
9. GREEN AUTO SERVICE	1	Automotive maintenance & repair	Jul. 24, 2025
10. GREEN SERVE	1	Automotive maintenance & repair	Sep. 1, 2025
11. Green Wash	1	Automotive maintenance & Vehicle cleaning	Sep. 1, 2025
12. GREEN WASH AUTOCARE	2	Automotive maintenance & Vehicle cleaning	Jul. 25, 2026
13. GREEN WASH EXPRESS	1	Automotive maintenance & Vehicle cleaning	Jul. 25, 2026
14. GREEN BIKE EXPRESS	1	Automotive maintenance & Motorbike maintenance	Jul. 25, 2026
15. GREEN TYRE EXPRESS	2	Tyre sale & mending	Aug. 15, 2026
16. Baichak	1	Food & drink sale	Mar. 15, 2021
17. Baichak Mart	2	Food & fresh coffee business management, Miscellaneous goods for consumers' convenience	Jan. 18, 2022 Apr. 1, 2023
18. Bangchak colored strips, three colors leaf	1	Vehicle service station	Sep. 24, 2023
19. BUBBLY TEA	1	Food & drink sale	Jun. 4, 2024
20. HURRICANE ICE	1	Food & drink sale	Jun. 4, 2024
21. MILK AND BREAD	1	Food & drink sale	Jun. 4, 2024
22. LOW COST	1	Vehicle service station	Apr. 28, 2025
23. RESPOPLEX	1	Technology	Aug.28, 2027

Trademarks and Service Marks advertised abroad

Trademark	Number of registered trademarks	Goods/services under trademark	Expiry ¹
1. Bangchak leaf and Chinese characters (registered in PRC (China))	1	Gasoline, diesel, and lubricants	Dec. 27, 2030
2. Bangchak leaf and BANGCHAK LUBRICANTS – Registered in Myanmar ² – Registered in LPDR (Laos)	2	Fuel products	– Mar. 20, 2023
3. Bangchak leaf and BCP LUBRICANTS (Registered in Myanmar) ²	1	Fuel products	–
4. Bangchak leaf and BANGCHAK (Registered in Myanmar) ²	2	Fuel products, service stations	–
5. Bangchak leaf and characters (Registered in LPDR (Laos))	2	Fuel products, service stations	Mar. 20, 2023
6. Bangchak leaf and BCP LUBRICANTS (Registered in Vietnam)	1	Fuel products	Jul. 13, 2022
7. Bangchak leaf and BCP LUBRICANTS (Registered in Cambodia)	1	Fuel products	Jul. 5, 2022
8. Bangchak leaf and BCP LUBRICANTS (Registered in Lebanon)	1	Fuel products	Feb. 26, 2029
9. Bangchak leaf and BCP (Registered in Myanmar) ²	2	Fuel products & Vehicle service station	–
10. Bangchak leaf and BANGCHAK (Registered in Cambodia)	2	Fuel products & Vehicle service station	Nov. 20, 2023
11. Bangchak leaf (Registered in PRC (China))	1	Fuel products	Jan. 6, 2031
12. Bangchak leaf and BCP LUBRICANTS (Registered in Jordan)	1	Fuel products	Nov. 24, 2023
13. Bangchak leaf and BCP LUBRICANTS (Registered in Philippines) ³	1	Fuel products	Sep.10, 2025
14. Bangchak leaf and BCP LUBRICANTS (Registered in Kenya)	1	Fuel products	Dec. 10, 2023
15. Bangchak leaf and BCP LUBRICANTS (Registered in OAPI countries) ⁴	1	Fuel products	Dec. 6, 2023

Trademark	Number of registered trademarks	Goods/services under trademark	Expiry ¹
16. Bangchak leaf and BCP LUBRICANTS (Registered in Malaysia)	1	Fuel products	Jun. 10, 2025
17. BAICHAK MART (Registered in PRC (China))	1	Miscellaneous goods for consumers' convenience	Jan. 27, 2025
18. BAICHAK MART (Registered in Vietnam)	1	Miscellaneous goods for consumers' convenience	Sep. 3, 2023
19. BAICHAK MART (Registered in LPDR (Laos))	1	Miscellaneous goods for consumers' convenience	Dec. 5, 2024
20. GREEN SERVE (Registered in LPDR (Laos))	1	Vehicle maintenance	Dec. 5, 2024
21. Bangchak leaf and BANGCHAK (Registered in PRC (China))	1	Service stations	Jan. 27, 2025
22. Bangchak leaf and BANGCHAK (Registered in LPDR (Laos))	1	Fuel products, service stations	Dec. 5, 2024
23. Bangchak leaf and BANGCHAK (Registered in Vietnam)	2	Fuel products, service stations	Sep.30, 2023 Nov. 19, 2023
24. Bangchak leaf and BCP (Registered in PRC (China))	2	Fuel products, service stations	Jan. 13, 2025 Oct. 20, 2025
25. Bangchak leaf and BCP (Registered in LPDR (Laos))	2	Fuel products, service stations	Dec. 5, 2024
26. Bangchak leaf and BCP (Registered in Vietnam)	2	Fuel products, service stations	Sep.30, 2023
27. Bangchak leaf and Bangchak (Registered in Cambodia)	1	Fuel products, service stations	Oct. 1, 2023
28. Bangchak leaf and BCP (Registered in Cambodia)	2	Fuel products, Service stations	Oct. 1, 2023
29. Bangchak leaf and BCP LUBRICANTS (Registered in LPDR (Laos))	2	Fuel Products	Jan. 17, 2024
30. Bangchak leaf and BANGCHAK (Registered in PRC (China))	1	Fuel products	Jan. 27, 2025
31. BANGCHAK MART (Registered in Cambodia)	1	Miscellaneous goods for consumers' convenience	Sep. 5, 2023
32. GREEN SERVE (Registered in Cambodia)	1	Vehicle maintenance	Sep. 5, 2023
33. Bangchak leaf and BCP LUBRICANTS (Registered in PRC (China))	1	Fuel products	Aug. 13, 2025

Trademarks and Service Marks advertised abroad

Trademark	Number of registered trademarks	Goods/services under trademark	Expiry ¹
34. Bangchak leaf and BCP LUBRICANTS (Registered in Turkmenistan)	1	Fuel products	Jun. 23, 2025
35. FURIO (Registered in Myanmar) ²	1	Fuel products	–
36. FURIO (Registered in the Philippines) ³	1	Fuel products	Aug. 16, 2028
37. FURIO (Registered in LPDR (Laos))	1	Fuel products	Apr. 2, 2029
38. FURIO (Registered in PRC (China))	1	Fuel products	Feb. 6, 2029
39. FURIO (Registered in Cambodia)	1	Fuel products	Apr. 4, 2028
40. FURIO (Registered in Vietnam)	1	Fuel products	Apr. 2, 2028

Trademarks and Service Marks under deliberation in Thailand

Trademark	Number of registered trademarks	Goods/services under trademark	Remarks
1. BCP LUBRICANTS	1	Lubricant	Filed May 3, 2019
2. MIDORI	1	Sanitizer & supplements Automatic fuel vending	Filed Oct. 22, 2020
3. Krathing	1	Machine and coin-operated type	Filed Nov. 26, 2021

Trademarks and Service Marks under deliberation abroad

Trademark	Number of registered trademarks	Goods/services under trademark	Remarks
1. Bangchak leaf and BCP LUBRICANTS, (Registered in Iraq)	1	Fuel products	Filed on Aug. 3, 2015
2. Bangchak leaf and BCP LUBRICANTS (Registered in Bangladesh)	1	Fuel products	Filed on Nov. 18, 2019

- Note: ¹ Registered trademarks and service logos are in effect 10 years from registration dates and extendable every 10 years
- ² In registering trademarks in Myanmar, one must submit declaration(s) of trademark ownership and place advertisement(s) to that effect in local newspapers every 2–3 years
- ³ In registering trademarks in Philippines, one must submit Declaration of Actual Use within 3 years from filing.
- ⁴ OAPI countries: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Congo, Equatorial Guinea, Gabon, Guinea, Guinea Bissau, Ivory Coast, Mali, Mauritania, Niger, Senegal, and Togo

Patent and Petty Patent

Patent / Petty Patent	Assignee	Expiry date ¹
1. Gallon design patent	Bangchak	Aug. 15, 2022
2. Gallon design patent	Bangchak	Aug. 15, 2022
3. Gallon design patent	Bangchak	Feb. 19, 2028
4. Gallon design patent	Bangchak	Feb. 19, 2028
5. Lid design patent	Bangchak	Feb. 19, 2028
6. Oil cone design patent	Bangchak	Feb. 19, 2028

- Note: ¹ Product design patents are valid for 10 years from the date of application

Policy of investment in subsidiaries and associates

Bangchak's investment policy for businesses is based on a combination of factors to support and promote its own businesses, including business growth trends, investment that adds value and is economically sound, and contribution to Bangchak's competitiveness. Investment is made through itself, subsidiaries, associates, or other companies, with the main consideration on suitability and potential of the company in question.

Bangchak has defined its affiliate governance guidelines for operations of a uniform standard and alignment with Bangchak's policy, underlined by corporate governance.

Credit Policy

Bangchak and subsidiaries have established guidelines for trade credit and formulate a credit policy and credit management to be a guideline for reviewing, monitoring and supervising those involved to take appropriate action against the Group's risks. Continual review of the trade credit policy to comply with economic conditions and market competition or when there are significant changes in related policies. To set the credit limit and the terms of payment must be consistent with the quantity and value of the products that will be purchased from the Group, debt servicing ability and consider each customer's risks through approval by the Company's authorized person.

However, in practice, the credit limit is set and setting terms of payment at the group companies considered to customers and classified by each business group as follows:

Business Group	Credit term
Oil Business	5 – 105 days
Green Power Business	30 – 60 days
Bio-based Product Business	7 – 45 days
Petroleum Exploration and Production Business	30 days

Account Receivable Turnover and Collection Period

	2021	2020
Account Receivable Turnover (AR Turnover: times)	26.29	18.33
Collection Period (days)	14	20

1.3 Shareholding Structure



The date to list shareholders is 9 September 2021

Bangchak Corporation Plc.
Registered Capital and Paid-up Capital Baht 1,376,923,157



- Subsidiary Company
- Associated Company
- Other Company

As of December 2021



Refinery Business Group

The complex refinery of Bangchak operates with a nameplate capacity of 120,000 barrels per day (120 KBD). Most of the outputs are gasoline and diesel. The quality of its gasohol and diesel products meets the public sector's Euro 4 standard. It raises the efficiency of its refining processes with the implementation of its Rocket and 3E Projects with greenhouse gas emission reductions. Bangchak focuses on energy stability in its processes by using electricity and steam derived from its cogeneration power plant while replacing fuel oil.

● **BCP Trading Pte. Ltd. (BCPT)**

Incorporated in Singapore with a registered capital of USD30 million wholly owned, BCPT engages in commodity trading including crude oil, petroleum products, petrochemicals, other chemical products, and other downstream businesses.

● **Bangkok Fuel Pipeline and Logistics Co., Ltd. (BFPL)**

BFPL engages in the business of fuel transportation and logistics, which Bangchak holds 100%.

● **General Energy Manning Co., Ltd. (GEM)**

Incorporated with Baht 1 million in registered capital, in which Bangchak holds 49%, GEM engages in the business of recruitment and human resource management.

● **Bongkot Marine Service Co., Ltd. (BONGKOT)**

This joint-venture enterprise has a registered capital of Baht 240 million, in which Bangchak holds 30%. It engages in supplying and administration of floating storage units.

● **Fuel Pipeline Transportation Ltd. (FPT)**

Bangchak holds 4.78%, FPT operates underground pipeline fuel transport. The multiproduct pipeline is laid parallel to the railway route from Bangchak Refinery to Don Muang International Airport Oil Depot via Chong Nonsi Oil Depot and ends at Bangchak's oil depot in Bang Pa-in, Ayutthaya, and at FPT. A pipeline connection with the system of JP-One Asset Co., Ltd., made at the Makkasan area in Bangkok, supplies aviation fuels to Suvarnabhumi International Airport. FPT's oil transmission pipeline system expansion project from Amphoe Bang Pa-in to the Phichit Oil Depot and the construction of the pipeline to Lampang oil depot has been completed in 2020.



Marketing Business Group

The Marketing Business Group sells fuels and lubricants to consumers through Bangchak's network of 1,277 service stations nationwide, made up of 662 standard and 615 community service stations, as of December 2021. They also distribute products to industrial users and the transport, airlines, vessels, construction, and agriculture sectors, which provide convenience to customers. The stations offer supplementary (non-oil) businesses under the operation of Bangchak Retail Co., Ltd.

● **Bangchak Green Net Co., Ltd. (BGN)**

Incorporated with Baht 1 million in registered capital, in which Bangchak holds 49%, BGN engages in service station administration and sales management of consumer products at Baichak and Lemon Green outlets.

● **Bangchak Retail Co., Ltd. (BCR)**

This wholly owned subsidiary of Bangchak has Baht 1,500 million in registered capital. BCR engages in the food and drinks business to accommodate continuous growth in the retail business. BCR now has 817 Inthanin coffee shops (as of December 2021).

● **Oam Suk Social Enterprise Co., Ltd.**

With an initial registered capital of Baht 10 million, in which Bangchak holds 40%, the company engages in the purchase of agricultural produce and organic crops for processing, marketing, distribution, and R&D.



Green Power Business Group

Bangchak invests in the renewable-power business by holding 57.46% equity in BCPG Public Company Limited (BCPG), a SET-listed company. Its IPO took place on September 28, 2016. BCPG engages in investments in the power generation business from green energy sources (both domestic and overseas), such as solar, wind, and geothermal power projects.

● **BCPG Public Company Limited (BCPG)**

BCPG has Baht 16.508 billion in registered capital, formed to engage and invest in green power businesses in and outside Thailand. At year-end, it commanded 504.7 megawatts (MW) in total capacity. In the past year, BCPG had invested in convertible bonds on VRB Energy, which engages in manufacturing and distributing a Utility-Scale Energy Storage System known as Vanadium Redox Flow, which is worth up to USD 24 million, and has signed a power purchase agreement (PPA) with Vietnam Electricity, a 25-year contract with a capacity of 600 MW at the Laos-Vietnam border.



Bio-based products business

Recognizing the significance of renewable energy in reducing trade deficits from imported fuels, thus enhancing national energy security, supporting farmers and conserving the environment, Bangchak advocates the blending of ethanol with gasoline, and biodiesel with diesel to form assorted graded of gasohol and biodiesel. Bangchak invests in bio-based products through shareholding in BBGI Public Company Limited (BBGI).

● **BBGI Public Company Limited (BBGI)**

BBGI was incorporated through a merger between BBP Holdings Co., Ltd. (BBH), a subsidiary of Bangchak, and KSL GI Co., Ltd. (KSLGI), a subsidiary of Khon Kaen Sugar Industry Plc. with a registered capital of Baht 2.532 billion. In April 2018, it registered conversion into BBGI Plc., along with increasing its registered capital to Baht 3.615 billion by issuing 433.20 million recapitalization shares with a par value of Baht 2.50 per share for public offering. Bangchak currently holds 60% shares in BBGI, which manufactures and distributes ethanol, biodiesel, and by-products. BBGI's subsidiaries and associates have a total capacity of 1,600,000 liters per day (600,000 liters per day of ethanol and 1,000,000 liters per day of biodiesel) with the following subsidiaries and associates:

● **Bangchak Biofuel Co., Ltd. (BBF)**

Established with Baht 281.5 million in registered capital, in which BBGI holds 70%, BBF engages in the production of biodiesel from crude palm oil, a basic raw material, with the nameplate capacity raised to 1,000,000 liters a day. The company is located in Bang Pa-in, next to Bangchak's oil depot in Ayutthaya.

● **Bangchak Bioethanol (Chachoengsao) Co., Ltd. (BBE)**

BBE has a registered capital of Baht 500 million, in which BBGI holds 85%. Located in Amphoe Phanom Sarakham, Chachoengsao, it produces ethanol from fresh cassava, cassava chips, sugar, and molasses with a capacity of 150,000 liters a day.

● **KSL Green Innovation Public Company Limited (KGI)**

KGI is wholly owned by BBGI with a registered capital of Baht 610 million. It engages in the production and distribution of ethanol obtained from molasses, a by-product of the sugar production process. Currently, KGI has two ethanol manufacturers operating in Bo Phloi District, Kanchanaburi, with a capacity of 300,000 liters per day and Nam Phong District, Khon Kaen, with a capacity of 150,000 liters per day, which is currently being renovated to increase the capacity by 200,000 liters per day.

● **BBGI Utility and Power Co., Ltd.**

Wholly owned by BBGI Plc, BBGI Utility and Power Co., Ltd. has a registered capital of Baht 50 million. It was formed to engage in the production and sale of bio-based energy, power, and public utilities.

WIN Ingredients Co., Ltd.

WIN Ingredients Co., Ltd., has a registered capital of Baht 320 million, with BBGI Plc. holding 51%. It was formed to engage in the production, sale, import, and export of all bio-based products and chemicals.

The other invested company is Ubon Bio Ethanol Co., Ltd. (UBE). As of September 21–23, 2021, the company offered its shares to the public, therefore decreasing BBGI's equity from 21.28% to 12.39%.

Ubon Bio Ethanol Co., Ltd. (UBE)

UBE was incorporated with a registered capital of Baht 3,914.29 billion, in which BBGI holds 12.39%. Located in Amphoe Na Yia, Ubon Ratchathani, it engages in ethanol production using fresh cassava, cassava chips, and molasses as feedstock with a capacity of 400,000 liters a day. UBE's subsidiary also engages in processing cassava into flour and generating power from the biogas derived from wastewater treatment from the flour and ethanol processes.



Natural Resources and New Business Group

This business group, one of Bangchak's five core businesses, is in charge of the development of upstream petroleum businesses, the lithium mining business and LNG business. Bangchak founded BCPR Co., Ltd., in Thailand, and BCPR Pte. Ltd. in Singapore, to engage in the petroleum E&P business. BTSG Co., Ltd., in Thailand, to engage in liquefied natural gas business and founded BCP Innovation Pte. Ltd., in Singapore, to engage in the lithium mining business and startup.

BCP Innovation Pte. Ltd. (BCPI)

BCPI wholly owned by Bangchak, was incorporated in Singapore with a registered capital of USD 53.3 million to engage in the lithium mining business and other startup businesses. Currently, BCPI has the right to purchase lithium under the Lithium Purchase Agreement with Lithium Americas Corp. of up to 6,000 tons per year from the Cauchari-Olaroz project and has invested in many startup businesses.

BCPR Co., Ltd.

On July 12, 2018, Bangchak established a wholly owned BCPR Co., Ltd., in Thailand, which today has Baht 661 million in registered capital (6.61 million shares at Baht 100 per share). The objective is to engage in business operations by investing in natural resource businesses. BCPR has now invested in BCPR Pte. Ltd., founded in Singapore to invest jointly in OKEA ASA, which engages in petroleum development and production in Norway.

BCPR Pte. Ltd.

BCPR Pte. Ltd., was incorporated in Singapore on July 12, 2018, with a registered capital of USD 18.2 million and is wholly owned by BCPR Co., Ltd. The company engages in foreign energy, petrochemical, and natural resources businesses and currently invests in OKEA ASA, which engages in local petroleum exploration, development and production in Norway.

● **OKEA ASA**

OKEA ASA, a listed company on the Norwegian Stock Exchange, engages in Norway's petroleum exploration, development and production. BCPR Pte. Ltd., Bangchak's subsidiary, holds 45.71% shares in OKEA ASA. The company operates the Draugen, Gjoa, Ivar Aasen and Yme oil and gas fields (production commenced in Q4 2021) and holds or is developing the Grevling, Aurora, Falk oil and gas fields and several other fields in Norway. In addition, OKEA ASA is the operator of many fields and continues to strive for business opportunities to grow and expand through M&As.

● **BTSG Co., Ltd. (BTSG)**

BTSG has Baht 200 million in registered capital, in which Bangchak holds 51%, to engage in the supply and distribution of liquefied natural gas and related businesses.

● **Thai Special Gas Co., Ltd. (TSG)**

TSG has Baht 50,000,000 in registered capital, in which Bangchak holds 5% equity, and operates the business of supplying, bottling, and selling industrial gases. This also includes design, equipment, and system installation, selling of tools and equipment, and testing services of equipment such as industrial gas tanks.



Research and development and innovation business

To pursue the position of the leading Asian Greenovative group, Bangchak expands its investment in emerging energy innovation such as lithium, used in the manufacturing of batteries for electrical vehicles (EVs) and extending bio-based products to add value to its current biofuel products. Bangchak set up four more venture-capital companies to engage or jointly invest in 10 domestic startup businesses, promoted by the government.

● **BCV Bio based Co., Ltd. (BCVB)**

BCVB, wholly owned by Bangchak, was incorporated with a registered capital of Baht 20 million to engage in the venture capital business for funding domestic startup companies in bio-product innovation.

● **BCV Energy Co., Ltd. (BCVE)**

BCVE, wholly owned by Bangchak, was incorporated with a registered capital of Baht 20 million to engage in the venture capital business for funding domestic startups relating to energy innovation.

● **BCV Innovation Co., Ltd. (BCVI)**

BCVI, wholly owned by Bangchak, was incorporated with a registered capital of Baht 65.1 million to engage in the venture capital business for funding domestic startups relating to innovation.

● **Winnonie Company Limited (Winnonie)**

Winnonie has Baht 90.1 million in registered capital, BCVI holds 55.49%, to engage in electric motorcycles and battery replacement services, including related businesses that align with Bangchak's goal, leadership in green energy innovator.

*List of major shareholders as detail under 1.4 Registered Capital and Paid-up Capital

1.4 Registered Capital and Paid-up Capital

The Company's registered capital amounted to Baht 1,376,923,157 of which Baht 1,376,923,157 was paid up. An equal number of common shares were issued at a par value of one Baht each.

Shareholders

Top 10 Major Shareholders (as of September 9, 2021)	Number of Shares	Shareholding (%)
1. Social Security Office	198,307,697	14.40
2. Vayupak Fund 1, managed by Krung Thai Asset management PLC	136,586,300	9.92
3. Vayupak Fund 1, managed by MFC Asset management PLC	136,586,300	9.92
4. Thai NVDR Co., Ltd.	81,395,289	5.91
5. Ministry of Finance	65,543,767	4.76
6. Bualuang Long-Term Equity Fund	38,016,600	2.76
7. SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	37,079,598	2.69
8. Mrs. Somsong Lapananrat	26,733,700	1.94
9. Bangkok Life Assurance PLC	24,154,700	1.75
10. Bangchak Corporation Public Company Limited	19,238,000	1.40
Top 10 Total	763,641,951	55.45
Grand Total	1,376,923,157	100.00

Shareholders through Thai NVDR Co., Ltd. Who owns more than 0.50% of the paid-up BCP shares

Top 10 Major Shareholders (as of September 9, 2021)	Number of Shares	Shareholding (%)
1. STATE STREET BANK AND TRUST COMPANY	18,770,460	1.36
2. N.C.B.TRUST LIMITED-NORGES BANK 30	12,169,142	0.88
Total	30,939,602	2.24

Source: <http://www.set.or.th/set/companyholder.do?symbol=BCP-R>

Note: Investors can examine updated shareholders' information at Bangchak's website before the AGM

1.5 Issuance of other securities

Debentures

On October 27, 2021, Bangchak earned “A-” credit rating for the organization and unsubordinated and unsecured debentures and subordinated bond at BBB Level, Stable Outlook by TRIS Rating Co., Ltd.

In 2021, Bangchak has issued and offered for sale of unsecured and unsubordinated domestic debentures and there are debenture holders’ representatives totaling 7,000 million baht. As of November 5, 2021, Bangchak has total outstanding debentures of 40,500 million baht as detailed below

Debenture	Value (Baht million)	Interest rate (%/year)	Maturity (years)	Redemption Date
BCP224A	1,000	5.35	10	April 30, 2022
BCP225A	3,000	2.60	2	May 8, 2022
BCP238A	400	2.96	5	August 10, 2023
BCP23NA	2,000	1.45	2	November 5, 2023
BCP244A	3,500	5.18	10	April 11, 2024
BCP258A	600	3.42	7	August 10, 2025
BCP26NA	1,000	2.29	5	November 5, 2026
BCP273A	2,000	4.72	12	March 3, 2027
BCP275A	500	3.00	7	May 8, 2027
BCP28DA	7,000	4.04	10	December 20, 2028
BCP29NA	1,400	3.11	8	November 5, 2029
BCP303A	1,000	5.05	15	March 3, 2030
BCP305A	4,500	3.40	10	May 8, 2030
BCP31NA	2,600	3.43	10	November 5, 2031
BCP19PA	10,000	5.00	100	March 3, 2119

1.6 Dividend policy

- Bangchak Corporation Public Company Limited**

The Company has the policy to pay out dividend to the shareholders at the rate of not less than 30 percent of net profit after deduction of allocation of legal reserve. However, this is subject to the economic situation, the Company’s cash flow and investment plans of the Company and its subsidiaries according to the necessary, appropriation and other concerning as the Board of Directors’ consideration.

Dividend Payment History

Year	2015	2016	2017 (Restate)	2018 (Restate)	2019	2020	2021 (First Half)
Earnings per share (Baht/share)	3.01	3.47	4.07	1.79	1.18	(5.50)	1.21
Annual dividend (Baht/share)	2.00	1.80	2.15	1.35	0.80	0.40	1.00
Dividend payout ratio (%)	66	52	53	75	68	-	36

- **Subsidiaries' dividend policies (only dividend-paying ones)**

BCPG Public Company Limited

This company's dividend payment is no lower than 40% of its net profit according to separate financial statements after deduction of all reserved funds under its regulations and related laws. The Board of Directors' resolution on dividend payment will be raised for the approval of the shareholders at the AGM, except for interim dividend payment, which the Board authorized to approve and make a subsequent report to shareholders' meeting. Dividend payment is subject to each year's economic situation, the company's cash flow, and investment plans of Bangchak and affiliates. The Board, however, will also take into consideration other factors as seen appropriate.

BBGI Public Company Limited

This company has the policy to pay out dividend to the shareholders at the rate of not less than 40 percent of net profit after deduction of allocation of legal reserve. Note that the Board may decide to set different dividend payment periods and rates from this or not pay dividend at all, depending on performance outcomes, financial positions, cash flows, working capital, liabilities, terms and restrictions of loan agreements, terms governing the company's rights and responsibility as the bond issuer, the company Group's investment plans and business growth, as well as the state of the economy and the market, other needs, factors, and related considerations seen fit by the Board.

Once the Board has endorsed an annual dividend payment, it must seek the shareholders' approval at the AGM, except for interim dividend, which falls under the Board's authority. The Board is required, however, to report to the shareholders at their next meeting.

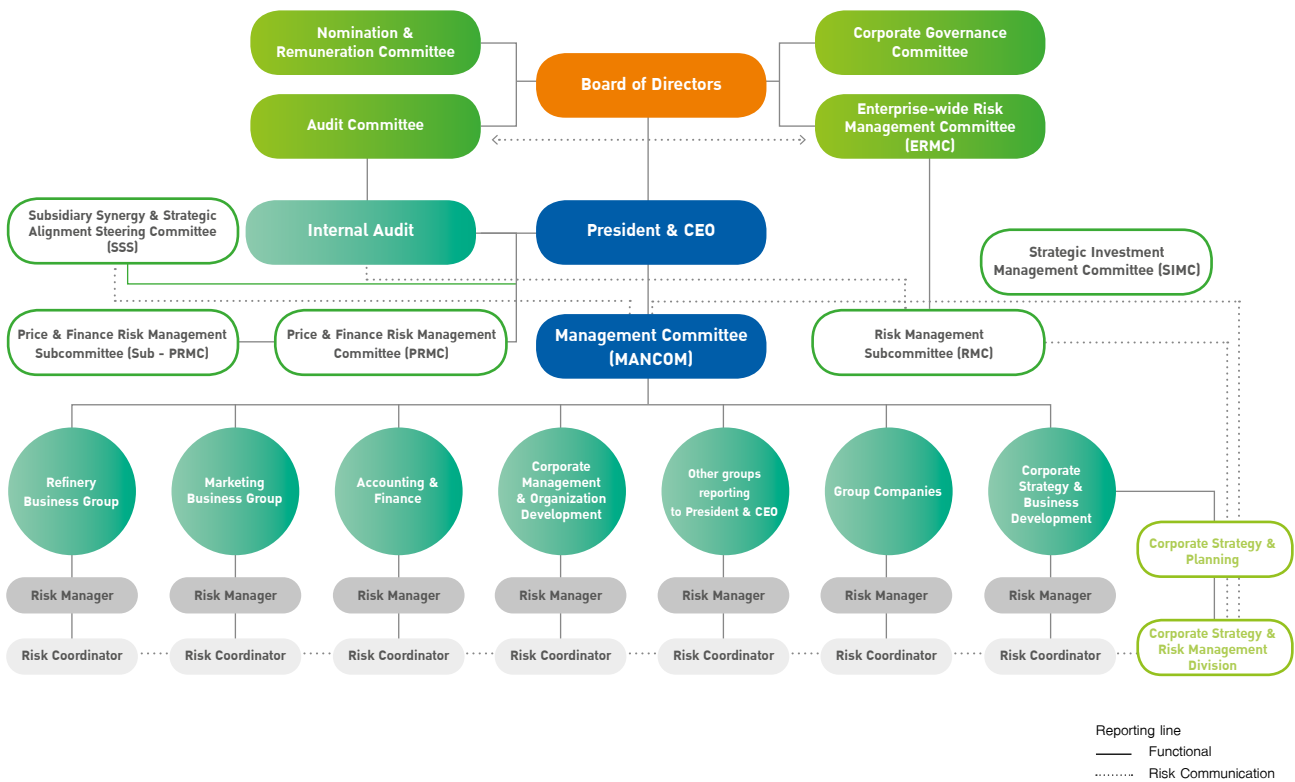
Bangchak Green Net Company Limited

For a given fiscal year, the holders of preferred shares are entitled to annual dividends equivalent to the average daily interest rates for one-year fix deposits announced by Krungthai Bank Plc plus 3%. Dividends are paid in proportion to each paid-up share value when the dividends are paid out as stated in the resolution of the annual general meeting of shareholders (AGM). For a given year, if the company's profit is less than the dividends calculated for holders of preferred shares, all dividends are to be paid from such profit to holders of preferred shares only, and none is to be paid to holders of common shares. Any outstanding dividends for holders of preferred shares will be carried forward or accumulated to the following year along with those for the holders of common shares. For a given year, if the company's profit exceeds the dividends calculated for holders of preferred shares, the AGM will approve dividends for holders of common shares, case by case.

2. Risk Management

2.1 Risk Management Policy and Plans

Bangchak has adopted an international integrated enterprise-wide risk management system based on COSO ERM and ISO 31000 for more than 18 years to define management directions and measures to prevent and minimize impacts from a variety of risks preventing it from achieving goals. The risk management system has provided not only the capability for Bangchak to operate all businesses successfully under a relentlessly changing environment but has also warranted confidence among all stakeholders. All executives and staff, as well as joint ventures, fully participate in this international risk management system aligned with the corporate strategy and planning, as well as the sustainability development policy involving environmental, social and governance (ESG), under the supervision and monitoring of an Enterprise-wide Risk Management Committee (ERMC), with reporting lines and organizational network illustrated below:



- Remark:
- Risk Manager – Vice President / Designated person
 - Risk Coordinator – assigned by Senior Executive Vice President / Executive Vice President
 - On January 1, 2022, the Board of Directors approved the Corporate Governance Committee to change its name to the Sustainability and Corporate Governance Committee.
 - On January 1, 2022, President and Chief Executive Officer change the position name to President and Group Chief Executive Officer

Risk Management Results

In 2021 almost every country worldwide, including Thailand, suffered economic contraction caused by the COVID-19 pandemic. Because of the Delta variance, governments in several countries had no choice but to enforce the lockdown measure, which affected economic activities and disrupted supply chains. Businesses shut down their factories and trading partner countries in supply chains halted production. Demand for goods and commodity prices increased especially crude oil prices. It affected the economy, inflation rate and the company's performance. However, Bangchak, including joint-venture companies, had prepared an enterprise-wide risk management plan to mitigate the impact on the business. It monitored and tracked the overall effect to keep risk levels acceptable and prepare for a volatile future business landscape. Bangchak developed a risk management plan in parallel with the operating strategy. It planned two scenarios in response to potential situations to ensure adaptability to changing circumstances.

In addition, for business continuity and sustainability, Bangchak reviewed trends and business factors that are expected to change and impact business (mega trends and global risks) to manage them in the medium term and long term, including competition in the business and industry, economic situation, consumers' behavior, the surroundings and climate change due to global warming, and technological and innovation growth, including energy storage, electric vehicle, biological technology, and policies of the public sector. These studies have been integrated with primary data of stakeholders' expectations and needs for further analyses of future impacts and directions of risk management in parallel with integrated corporate strategy to strive for mutual sustainability.



2.2 Risks to Bangchak's operations

Bangchak has grouped its risk management framework into 1) corporate risk management, 2) project investment risks, and 3) business continuity management. This framework helps formulate appropriate risk management system and assessment. Below is a progress report in these three areas.

1. Corporate Risk Management

Corporate risk management includes management of all internal and external risks incorporated with an assessment of future trends which could affect the organization in the short, medium, and long terms. The system incorporates risks in strategy, operation, finance, and reputation. The system is managed with specific key risk indicators (KRIs) to monitor and track the likelihoods and severity of all identified risks and provides treatment plans to mitigate and minimize the risks and drive operations to succeed as planned. In 2021, Bangchak assessed and managed corporate risks aligned with the corporate strategy and sustainability development involving the environment, society and governance as follows.

Strategies

Risks of the global economic downturn and lower demand

COVID-19 impacted the economy. Consumption of certain products declined because of lockdown announcements, the closure of some businesses, and the restriction of domestic and international travel. Therefore, Bangchak formulated mitigation plans as follows:

- In 2021 demand for jet fuel remained affected by the national lockdown measures due to the COVID-19 outbreak. Bangchak reduced its capacity and adjusted the processes. It switched from jet fuel production to diesel production to meet market demand.
- The Refinery Business Group modified Bangchak into a niche products refinery to present new, more diverse products to the market, going from a variety of fuels into production of UCO (unconverted oil) for feedstock of lube base oil and paraffin wax along with modifications for greater diversity. An instance is solvents, which are key industrial components, including paint, thinner, and resin. Bangchak still plans to sell more diverse array of products in the future.
- Marketing Business Group successfully maintained its status as the No. 2 market share leader (according to the Department of Energy Business) by achieving the goal of unique design for each station in combination with the Bangchak brand identity. Bangchak had 1,277 service stations (as of December 31, 2021) and remained focused on the continued expansion of non-oil businesses. The year 2021 marked Inthanin's 15th anniversary and the Company aimed to keep expanding branches inside and outside service stations. In addition, Bangchak added a small-store format to access communities. Due to continued branch expansion, Bangchak had 817 branches as of 2021. The online sales revenue also increased thanks to wider coverage in several areas. Furthermore, the Company partnered with more food delivery service providers, such as Robinhood. The Group has been developing new businesses to turn service stations into Your Greenovative Destination that fulfilled customers' needs and meet their changing lifestyles. It installed EV chargers at 70 Bangchak service stations in 37 provinces nationwide. Also, it developed a business model of "Bangchak Food Truck" by collaborating with many leading brands to offer lifestyle products under the Grab & Go concept in service stations.

Risks of energy innovation transformation

Transformation of energy innovation is an external factor shaping Bangchak's businesses. Bangchak has therefore developed risk assessment and converted advancement of energy innovation into business opportunities as follows:

- Established a green ecosystem to drive Bangchak Group's innovations with an emphasis on green energy and bio-based products through Bangchak Initiative and Innovation Center (BiiC)
- Carved investment opportunities in businesses related to electric vehicles (EVs) and batteries of the future with a springboard in the lithium purchase agreement of up to 6,000 tons a year under the Cauchari-Olaroz Project of Lithium Americas Corp.
- Expanded business to high value bioproducts through BBGI Public Company Limited invested in Manus Bio Inc., a world leader in the biotechnology business. It also invested in joint-venture WIN Ingredients and received a recipe registration certificate for the sweetener Neotame to be distributed in Thailand and ASEAN. Furthermore, it started selling dietary supplements under the B Nature Plus brand. The brand's first product was the ASTA-IMMU antioxidant food supplement for skincare derived from astaxanthin red algae and a pharmaceutical-grade hand sanitizer manufactured under the GMP-HACCP manufacturing standard.
- Promote the initiation of business opportunities from energy innovation through regular campaigns among staff and subsidiaries, through introduction of Design Thinking to help develop new products and services to cope with future changes. To this end, BiiC can act like a business incubator and eventually commercialize selected initiatives.
- Continued to expand the startup service "Winnonie". Bangchak introduced and rented out electric motor cycles to motorcycle taxi riders and riders who delivered food or parcels. They can swap batteries at swapping stations located in Bangchak service stations. This effort scaled up green energy innovation and improved the riders' quality of life.



- Launched the "Smart Digital Fuel Dispenser Project: Krathing". Bangchak, in collaboration with Micro Oil and Retail Co., Ltd. and DTAC TriNet Co., Ltd., installed and managed digital fuel dispensers. It also established a communication system for the installation of Krathing dispensers nationwide. As a result, Krathing, serving as a platform providing quality fuel, could reach small communities. This project aimed to promote their access to quality energy that met the required standard. In the future, Bangchak would scale up services other than oil services to improve local people's quality of life in all aspects.

Risks of managing human resources for future growth

To support additional investments for security and sustainability of income, Bangchak needs to satisfy higher demand for diversified and highly skilled human resources for each business and to maintain a proper generation gap within the organization to drive future businesses. Managing risks of human resources for future growth to align with business strategies is defined and treated with consistent programs and sessions of lessons learned and knowledge exchange among staff of Bangchak Group. These sessions hone skills, identify career advancement, and sustain business continuity as well as strengthening ties among staff workers and Bangchak. Activities in these sessions are organized and analyzed jointly by the management through the Subsidiary Synergy and Strategic Alignment Steering Committee.

Operations

Risks of managing feedstock and supply chain

Management of risks associated with supply chains and suppliers on delivery of feedstock, raw materials, machines, equipment and related services for the production and distribution is critical to uninterrupted operations, fostering confidence among all stakeholders and giving a competitive advantage for the organization. The risk management plan on feedstock and supply chains covers:

- Select crude oil from various sources at suitable periods with due regard for appropriate quality for processes that yield healthy refining margins to add business value.
- Develop long-term crude sales agreements with domestic and international suppliers to secure consistent supply for the refinery.
- Stock and procure feedstock for biofuel production from competitive sources with appropriate prices.
- Properly diversify supplier risks by classification and segmentation of suppliers, raw materials and feedstock, products, and services to ensure optimal value. Proper assessment of supplier risks affecting economic, societal, and environmental values to Bangchak is essential to ensure business continuity throughout the supply chain.
- This year Bangchak developed a plan to accommodate substitution merchandise to lower the risk of non-delivery of goods due to city lockdown measures in partner countries or other reasons.

Pandemic risk

The COVID-19 pandemic continued to spread across the world, including Thailand. It affected both the economy and daily lives, which had to be adjusted for the sake of transmission control. After assessing several aspects of the impact, Bangchak formulated preventive measures to mitigate risks. It rehearsed a response plan under the Business Continuity Management (BCM) plan. Bangchak takes most seriously the safety of its employees, customers and stakeholders by educating them on transmission prevention. Furthermore, it separated operations between M Tower and the refinery. During a severe outbreak, it also provided a safe house for DCS employees. Bangchak turned itself into a hybrid workplace, where employees can

work from homes and at the office to suit changing situations. Prioritizing employees' and customers' health and safety, the Group provided COVID-19 vaccines. That was why 99% of the employees were vaccinated in August 2021 and



a high percentage of employees received two shots. It also prepared to procure the third dose to boost immunity. Moreover, it sanitized offices with disinfectant spray regularly. Its antigen test mobile unit provided weekly COVID-19 testing for Bangchak's and Bangchak Group's employees, including employees of service stations and Inthanin Café, to ensure safety and foster confidence among customers. However, due to the pandemic and the volatility of global oil prices in 2021, Bangchak emphasized a lean, agile work process adjustable to different situations. Furthermore, Bangchak was ready to restructure the organization for sustainability, including managing its working capital to ensure a sufficient amount for planned business operations and investment plans.

Risks of digital technology transformation and cybersecurity

Risks of digital technology transformation and cybersecurity are external risks that have rapidly evolved, driven by strong business competition, reliance on competitive technologies, and connectivity of hardware and software through Internet technology to raise business efficiency and create good experience for customers, with due regard for the safety of the corporate IT system. Bangchak took action to cater to such technological development and change along with reviewing technological risk issues concerning current business disruption as follows:

- Establish a digital technology unit in charge of planning, monitoring, and procuring proper digital technologies for Bangchak to cope with changes in consumer behavior, work process improvement toward increasing competitive advantages, and adding value and efficiency to its services. The following additional technologies were applied in 2021.
 - The Digital Payment Project, in which digital payment is made in the Mobile EDC (electronic data capture) form to avoid physical contact at service stations by scanning the QR Code to pay through all banks' applications and PromptPay or simply touch and pay with contactless credit cards while accruing Bangchak membership points.
 - Develop personalized marketing by applying data analytics to examine individual consumer behavior to develop tailor-made service patterns specific to each consumer and hence increase customer satisfaction.
 - Promoted the digitalization of working processes to increase efficiency and reduce work time. Bangchak chose digital tools, including Robotic Process Automation (RPA), Power BI or Power App, in work improvement. Enhanced work processes included due diligence of business partners, service station maintenance planning, and issuance of product purchase documents.
- Set up a cybersecurity function, responsible for planning, monitoring, surveillance, testing, and procuring tools to prevent cyber threats, which tended to keep increasing each year. In 2021 the Enterprise-wide Risk Management Committee focused on surveillance and provided risk management in case cyber-attacks disrupted the business process support system. It provided tools to enhance the security of the computer center. Moreover, it design more secure information infrastructure systems and conducted vulnerability assessments to promptly close gaps. Bangchak kept monitoring key risk indicators through the Security System Alert System. Furthermore, it formulated an incident response plan, created awareness of cyber threats among employees, and regularly conducted testing. Finally, it implemented a secure work system that received ISO 27001 certification for data security management, ISO 27032 for cybersecurity management, and ISO 27018 for personal data security management.
- In addition, Bangchak develop a refinery cybersecurity system program to safeguard work systems from cyber-attacks or interruptions which might affect refining processes. Since 2020, Bangchak has won ISO/IEC 27001 certification (Information Security Management), covering the refinery's Distributed Control System, thus ensuring that its refining processes will continue uninterrupted despite cyber-attacks.

Risks to reputation from social media

With the transformation of the social media platform, where news and information of Bangchak's products and services are exchanged among consumers, moved to online, lightning response rates have become crucial. More importantly, online negative news and distortions could go viral, thus tarnishing Bangchak's reputation. Managing reputation risk therefore demands a dedicated team to relentlessly monitor movements of online social media. These tasks increase communication efficiency under normal circumstance and crises and reduce negative impacts. The system also calls for regular drills to ensure crisis preparedness.

Finance

Risks of volatile prices of oil and feedstock

The risks of volatile prices of oil and feedstock directly affect the revenue stream of Bangchak's core petroleum and petroleum-related businesses. With this in mind, Bangchak manages these risks with short-term and long-term plans as follows.

- Put in place a mechanism to track the movement of the crude oil price, spreads between crude and refined product prices, and regular development of new risk management tools for members of the subcommittee and risk management committee on prices and finance to consider and decide suitable options to manage, and report directly to the executive management committee.
- Administer crude oil and refined product stocks, lower capacity to appropriate levels in line with lower market demand, lowered operating costs by about 20%, and adjust turnaround maintenance (TAM) in line with economic situation and reduced demand.
- Diversify risks arising from price fluctuation of agricultural produce through investment in bio-based businesses operated by BBGI to upgrade business competitive edge in biofuels, biodiesel and ethanol, a steppingstone to high-value bio-based product development and value additions to the company.

Risks of volatility of exchange rates and interest rates

Throughout 2021 the highly volatile exchange rate moved in a wide band. Since April, the baht/US dollar has depreciated mainly because of the dollar appreciation following global economic recovery. As for interest rates in 2021, the Bank of Thailand maintained the policy interest rate at 0.5% throughout the year as exchange rate fluctuations led to Bangchak's revenue uncertainty, especially businesses related to petroleum and foreign joint ventures. However, Bangchak had a plan to manage foreign exchange and interest rate risks continuously as follows:

- Adopt natural hedges on transactions with international currencies on both income and expenses.
- Manage major costs of capital toward fixed and consistent interest rates.
- Closely monitor movement and trends of international monetary markets to execute proper hedging on exchange rates and interest rates decided by the Risk Management Committee on pricing and finance to ensure successful businesses as planned.

Regulations

Risks from enforcement of the Personal Data Protection Act B.E. 2562 (2019)

The Personal Data Protection Act B.E. 2562 was announced in the Government Gazette on May 27, 2019 and was postponed taking effect on June 1, 2022. In compliance with the “Personal Data Protection Act B.E. 2562”, Bangchak considered formulating measures to prevent personal data risks. It established a working group to manage personal information. The group, consisting of representatives from relevant departments, worked with leading consultancies to manage and control personal data. This included defining solution guidelines and preventing personal data leakage or misuse that might harm Bangchak.

Risks from the stabilization of domestic retail fuel prices

The average prices of petroleum products and biodiesel products (B100) increased. To mitigate the impact on consumers and spur economic recovery, the Ministry of Energy asked businesses for cooperation in monitoring oil marketing margins and stabilizing domestic fuel retail prices to avoid excessive volatility. As a result, Bangchak could not adjust retail prices at service stations in line with the rising costs of petroleum products under the global market situation, leading to the lower net marketing margins per unit. Yet, the Company had measures to reduce such impact. According to the Department of Energy Business, it could maintain its status as the 2nd market share leader (according to the Department of Energy Business) by achieving the goal of unique design for each station in combination with the Bangchak brand identity. To mitigate the impact on the oil business, the Company installed EV chargers at 70 Bangchak service stations in 37 provinces across the country to turn Bangchak service stations into a Greenovative Destination that fulfilled customers’ needs and meet their changing lifestyles. Moreover, it developed a business model of “Bangchak Food Truck” by collaborating with many leading brands to offer lifestyle products under the Grab & Go concept in service stations.

Societal and Environmental Risks

Risks of impacts on communities and society

Bangchak is fully committed to operating its businesses in a friendly way with communities, the public and the environment in a sustainable way. Work processes have therefore been continuously upgraded to ensure safety and zero impact on communities and the public under the following risk management plan.

- Constantly developed a system for occupational health and safety of international standard to upgrade health and safety in the workplace while systematizing work processes with due regard for risks, opportunities, and legal requirements. Bangchak was certified with ISO 45001, ISO 14001, and ISO 50001.
- Routinely conduct risk management with systems of Safety Integrity Level, Reliability-Centered Maintenance, and Risk-Based Inspection to ensure the efficiency of all equipment and work processes for accurate preventive maintenance programs.
- Perform hazard and operability study assessment and install the process safety management system at all procedural levels of refining processes in conjunction with leading engineering consulting firms to ensure international work standards and practices.
- Install an online air quality metering system with automatic display on all monitors in the refinery and its vicinity for the communities surrounding the facilities to get real-time air quality information, leading to higher public confidence in Bangchak’s operation.

- Consistently organize community educational activities for people living near the refinery facilities, schools, temples, and condominiums to understand, learn and be fully aware of safety. The programs include sharing of knowledge and practical drills on evacuation, firefighting, and first-aid medical treatment, as well as community safety alert and warning systems. Community members have actively participated in these programs.

In supervising businesses operated by joint ventures, Bangchak monitored and stayed vigilant over risks with impacts on individual communities to prevent them from hardship or impacts of production processes or operation, including vigilance over wastewater treatment and CSR Activities with Surrounding Communities. The ERMC is charged with year-round monitoring of work in this aspect.



Risks of climate change and environmental change leading to GHG reduction measure

Because business operations potentially cause global warming, Bangchak took action to focus on reducing energy consumption and GHG and carbon dioxide emissions as follows:

- Invested through BCPG Public Company Limited in VRB Energy, which researched, developed, produced, and distributed an energy storage system called Vanadium Redox Flow battery suitable for a utility scale, such as connection to the transmission system, decentralized generation support or a virtual power plant because of a large-scale, long-term power storage capacity. This is a future business guideline for renewable energy. Moreover, the Company had the rooftop solar power plant project implemented by Chiang Mai University under the CMU Smart City Project, Chiang Mai.
- Showed commitment to conducting a low-carbon business and leading energy transition. Bangchak has been increasing the proportion of green companies to lower carbon emissions. It also founded the Carbon Markets Club to promote carbon credit trading and set a carbon-neutral target by 2030 and a zero GHG emission target by 2050. By improving the efficiency of processes and using low-emission products, Bangchak would reduce emissions by 30% by 2030. Additionally, it applied other mechanisms, such as investing in green energy businesses and trading of the remaining carbon credits. Bangchak was one of 14 organizations receiving the Low Carbon and Sustainable Business Awards from Thailand Greenhouse Gas Management Organization (TGO). The evaluation was based on good governance, sustainability reports and business size based on economic, environmental and social indicators in line with the country's sustainable development goals.
- Replace fuel oil with natural gas to generate power and steam in the combined-cycle plant and deploy it as a primary energy source for the distillation units, resulting in higher energy efficiency and reduction of carbon dioxide emissions.
- Bangchak took part in easing pollution in the form of PM 2.5 particulates and smog by selling diesel containing five times less sulfur (lower than 10 ppm), as less sulfur can lower dust problems resulting from combustion along with sulfur dioxide. Such diesel was sold in Bangkok Metropolis during such critical periods.
- Remodel resource consumption with the 3Rs strategy of Reduce, Reuse and Recycle to achieve sustainable and environmentally friendly business success. This includes collection of plastic bottles from customers voluntarily to produce recycled products for society, collection of depleted plastic lubricant containers for recycling to produce polymers and eventually reproduce such containers. These programs are aimed to reduce public waste and

sustain the values of resources through reuse and recycling to optimize their values to the environment, society and communities in a sustainable way.

- Lowered plastics in non-oil activities as well as plastic containers by designing lids of cold beverages that eliminates straws, in addition to continually modifying plastic containers (Bio-cups).

Water Shortage Risks

Water shortage has been identified as an imminent global crisis. Global warming and a booming population are the main causes of uncertainty on available water for consumption. Bangchak has paid its full attention to water management to conserve water in production processes as follows.

- Monitored risks from climate change, such as drought, by monitoring and staying vigilant over daily water situations of the Metropolitan Waterworks Authority to assess the water shortage risk affecting refining processes, to ensure emergency water source availability, and to define proactive measures in case of risk arising from lower Chao Phraya River water levels, which may affect navigation, while ensuring minimal effects on stakeholders. Monitored flood situations and took proactive steps, for example, monitoring the levels of water in the major rivers during the rainy season, inspecting the readiness of flood prevention equipment by establishing a risk management plan in response to flood possibility and severity in order to ensure continuous business operation.
- In 2021 it reduced water consumption by improving tap water quality with a micro-filtration system and a reverse osmosis system. It also reused 1,289,121 cubic meters of condensate water and stripped water in processes. Furthermore, Bangchak recycled 181,407 cubic meters of treated water by improving its quality with the reverse osmosis system. Following the 3Rs measure, it saved water equivalent to the total water consumption of 3,874 households.
- In 2021 Bangchak conducted water stress assessment through the AQUEDUCT program to find that the location of Bangchak Refinery was a medium-high (20-40%) risk area, which by definition is not a significant area for water stress.
- Promote the reduction of water consumption in all production processes with all affiliates and business units, led by the water recycling program by the Bio-based Product Business Group. Moreover, a project of drilling for ground water was initiated for water storage and supply for the facilities.

Cultural promotion

Social development is part of Bangchak's business management. Therefore, participation in social development for sustainability was defined in the corporate and employee cultures.

- Bangchak valued environmental and social care as the corporate culture. It also defined a business responsibility policy on respect for human rights as guidelines for Bangchak Group's Board of Directors, executives, and employees. It adhered to the UN Global Compact, international guidelines on social responsibility (ISO 26000), the Universal Declaration of Human Rights (UDHR), the United Nations Guiding Principles on Business and Human Rights (UNGPs), and Women's Empowerment Principles (WEPs). Bangchak incorporated these into the model for continued growth and promoted engagement to ensure equality and inclusion.



- Bangchak organized a project called “Solving Children’s Illiteracy Is Easy”, recognizing children’s illiteracy issue, the nation’s primary problem that must be solved continuously. The project is a collaboration among Bangchak, Happiness Sharing Foundation, Asst. Prof. Siwakan Patummasoot and Ajarn Naiduangta Patummasoot, poets and academic experts at the Thung Sak Ashram Learning Center. It offered a curriculum to solve students’ illiteracy problems systematically and effectively and had a concrete follow-up method. Since its inception, the project has trained approximately 600 teachers and covered 9,000 students from 139 schools in 51 provinces. For the project results, the literacy rate of participating children increased to 66% in 2020 from 48% in 2014. The project therefore helped solve the country’s illiteracy problem and achieved the United Nations Sustainable Development Goals 4 on equitable quality education.
- The “Pun Gun Im” Project supported the mission of the Department of Social Development and Welfare, Ministry of Social Development, by providing food boxes to 57 communities in nine districts of Bangkok. The effort aimed to offer relief to the disadvantaged and economically impacted people. At the same time, the project supported small restaurant operators and partner shops in Bangchak service stations by buying their food to help communities. The project also took place in the Phra Khanong – Bangna area, giving food to construction workers at their camps. Around Bangchak Refinery, the project supported business owners and offered relief to those affected by COVID-19. In total, the project delivered more than 50,000 food boxes.



- “Kaew Phaw Kla” activity invited Bangchak Group’s employees and Inthanin customers nationwide to return Inthanin bioplastic cups. Bangchak then gave these cups to the Forest Department to cultivate saplings in place of black plastic plant bags to reduce waste and increase green space.



- “Bangchak Engages Thais in COVID-19 Battle: the Series” campaign eased the economic impact of the new wave of COVID-19 and strengthen the community economy. The project consisted of EP. 1: “#Save Samut Sakhon” with the “One Baht from Each Car” activity. Every time customers filled their tanks with Bangchak fuels or bought beverages from Inthanin Café, Bangchak would donate one baht to the fund called “People of Samut Sakhon Fight COVID-19”. EP. 2: “Save Naklua Girl” gave a bag of sea salt flowers to each Inthanin Café patron. EP. 3: “Egg Sharing” (Khai Punsuk) gave a chicken egg to cars that visited Bangchak service stations.

2. Project Investment Risks

In addition to strategic directions and returns on investment, project investment risk management is another crucial component of business success. All investment projects must therefore be reviewed for risk management with risk treatment at various stages as follows:



For all investment projects significant to the Company's operations, the Enterprise-wide Risk Management Committee must approve their risk management plans to ensure that the business managed risks properly, impacted neither the community nor the environment, and could achieve Bangchak's goals. In 2021 the committee approved and monitored the progress of the risk management plan of the project that invested in Winnonie Co., Ltd., the LNG business development project in response to future business expansion of BTSG Co., Ltd. (BTSG), and BCPG Plc.'s project that invested in capacity expansion of VRB Energy, a battery manufacturer for large-scale energy storage systems.

3. Business Continuity Management (BCM)

To ensure the ability to continue its businesses even during crises, Bangchak has developed and installed a Business Continuity Management (BCM) system. Bangchak won the ISO 22301: 2012 BCM award covering Headquarters, Bangchak refinery and Bangchak Oil Distribution Center, Central Region Business Office and Bang Pa-in Oil Distribution Center for the eighth consecutive year since 2013. The award is a guarantee of its preparedness to continue its businesses with maximum efficiency under international standards even during crises, and high confidence for all stakeholders on the ability of Bangchak to fully operate during crises and constantly deliver products to its clients.

In 2021 the world faced many challenges, especially the economic downturn that still took some time to recover, high uncertainty due to the new COVID-19 variants and the transforming economic context after the COVID-19 pandemic. These factors could affect some sectors' operational ability and competitiveness and require adjustment. Bangchak has prepared itself for the outbreak and practiced emergency plans for various potential situations that might arise. Additionally, it improved the crisis management plan and business continuity management plan in line with the current situation. Bangchak also deployed transmission control measures. Moreover, it assessed the situation and prepared operational guidelines in several areas as follows:

Safety

Bangchak advocated compliance with the business continuity management (BCM), which covered the epidemic crisis of COVID-19, based on the response plan indicated under (1) above. On November 24, 2021, Bangchak staged an emergency drill in case of a fire at the refinery to ensure that the employees could indeed operate under emergencies.

Marketing

Bangchak modified its marketing plans in view of shifting demand, notably that for diesel and aviation fuels, directly affected by the national lockdown to check the spread. Bangchak came up with sales promotional measures through assorted loyalty programs as well as cooperation with business partners to handle the pandemic, which could cut the number of Inthanin Coffee customers, by focusing on more sales through delivery channels. To meet consumers' changing lifestyles, Bangchak developed a new business model, "Bangchak Food Truck". It joined forces with a variety of leading brands to sell lifestyle products at services stations under the concept of Grab & Go. Furthermore, Inthanin expanded the beverage business line to offer new products. It purchased the right to the DAKASI bubble tea and opened shops in Bangchak service stations nationwide.

Finance

Bangchak stayed prepared for this situation by lowering expenses and investment by about 20%. In November 2021 it issued and offered bonds worth Baht 7 billion. As a result, it was ready and able to better cope with COVID-19 to enhance liquidity and support new investments as planned and targeted.

3. Driving a Sustainable Business

3.1 Sustainability Policy and Targets

Sustainability Policy and Guidelines

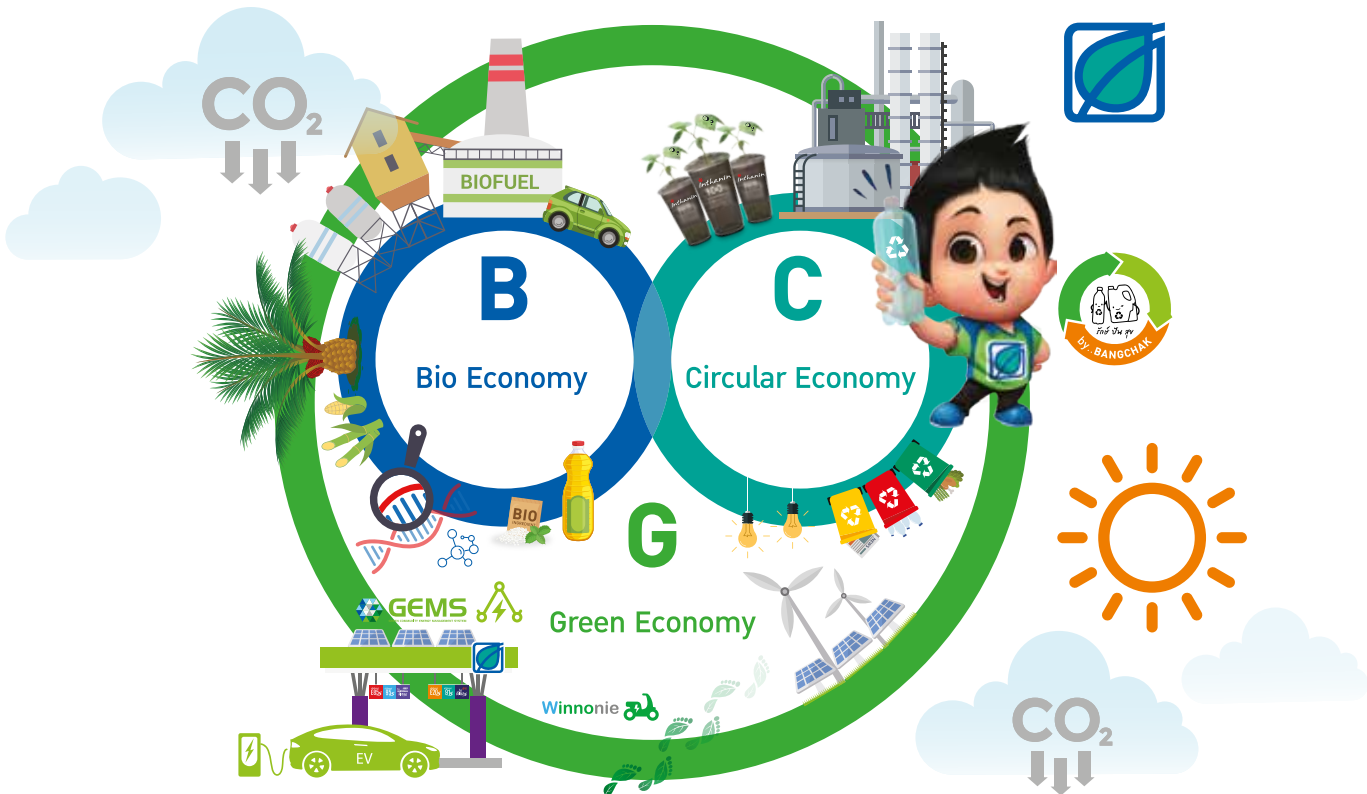
Bangchak’s Sustainability Policy was developed by integrating international sustainability guidelines, criteria, and standards such as United Nation Global Compact (UNGC), Dow Jones Sustainability Indices: DJSI, International Organization for Standardization (ISO) as well as stakeholders’ expectation to Company’s vision, direction, and business strategy. The policy serves as a framework that demonstrates Bangchak’s sustainability commitments along the business value chain. The Company discloses its performance through the annual Integrated Sustainability Report. To demonstrate transparency, completeness, and accuracy of information, the report is verified in accordance with GRI standards through a third-party entity with expertise on oil and energy business.



Sustainability Policy and Integrated Sustainability Report can be found on <https://www.bangchak.co.th>



Independent Assurance





In addition, Bangchak has “**4 Green Sustainability Strategy**” that align with Sustainability Policy and support the Sustainable Development Goals (SDGs).

- **Green Business** : focus on responsible and sustainable investment and value added to business by bringing green technology and innovation to existing and new business operation to help grow the company with the aim to be a leading green innovation technology company in Asia.
- **Green Production** : enhance Environmental Management and Process Safety especially for energy and water efficiency through ISO 14001, ISO 50001, ISO 45001 and Process Safety Management (PSM).
- **Your Greenovative Destination** : create innovative, sustainable, and green experiences in response to the new normal where everyone is able to take part in protecting the environment through the use of Bangchak’s service stations, products, and services.
- **Green Society** : develop social and environment responsible business activities to improve quality of life by focusing on helping small and medium enterprises (SMEs) and farmers through multi-faceted projects.

Bangchak has developed Key Performance Indicators (KPIs) to support the 4 Green Sustainability Strategy, Sustainable Development Business Plan, Corporate’s Vision of “Evolving Greenovation” as well as stakeholders’ expectation. The Company conducts activities to support and help stakeholders as needs arise based on current situations. During the third wave of COVID-19 pandemic Bangchak secured vaccines for our employees resulting in a high percentage of our employees who have already received 2 doses. The Company is working on arranging booster shots for our employees and continue to disinfect workspaces as well as provide antigen test mobile unit for certain groups of employees to be tested weekly including employees at the service stations and Inthanin Coffee to ensure safe environment and build trust for our customers who come in to use our services. In addition, Bangchak has implemented hybrid workplace arrangement to allow employees to work from home or from the office as condition changes. In addition, the Company remains agile and ready to adjust management of the situations and environment to build a sustainable organization including sound management of working capital to ensure sufficient funds



for operations and investment plans. In November 2021, Bangchak issued share value at 7 billion baht which ensures that the Company will be ready and able to better handle COVID-19 situations.

On the environmental dimension, Bangchak is committed to contributing to the climate change mitigation efforts. To that end, the Company has target to become carbon neutral by 2030 and to achieve net zero by 2050. Bangchak plans to continue increasing share of green business, expand business to support Thailand emerging electric vehicle industry, study new technology such as hydrogen, carbon capture utilization and strong, and build a network to develop carbon market through the Carbon Markets Club that support the purchase of carbon credits which is an important mechanism for energy transition by reallocating resources to help expand green businesses. In addition, Bangchak is part of the founding member of the Synthetic Biology Consortium, which is Thailand first network to support synthetic biology industry in the country.

Bangchak has always placed importance on sustainability performance through management of environmental, social,

and good governance and economic performance. The Company participates in the Stock Exchange of Thailand's (SET) Thailand Sustainability Investment (THSI) index and the DJSI Corporate Sustainability Assessment (DJSI/CSA 2021) – assessed by S&P Global – to bolster confidence in the Company's sustainability management. In addition, Bangchak was assessed by Morgan Stanley Capital International (MSCI) ESG research for the ESG Ratings which measures a company's resilience to long-term, industry material environmental, social and governance (ESG) risks. Results from ESG assessments are as follow:

- Stock Exchange of Thailand's Assessment
 - Bangchak was selected to be included in the Thailand Sustainability Investment (THSI) for the 7th year in a row (2015 – present)
- International ESG Assessments
 - Ranked in the Top 3 of S&P Global DJSI Corporate Sustainability Assessment (DJSI/CSA 2021) 85 scores in the category for Oil and Gas Refining and Marketing
 - Received AA Rating from MSCI ESG Ratings for the third consecutive year (2019 – present)

3.2 Stakeholder Impact Management Throughout the Value Chain

3.2.1 Business Value Chain

In alignment with the “Evolution Greenovation” vision, Bangchak place high emphasis on stakeholder engagement and sustainable value chain management from upstream such as crude oil and raw material supply, crude oil and raw material transportation in production process to downstream processes such as refinery, product development, procurement, transportation and product distribution and services. The objectives are to response stakeholders’ needs and expectations, to create a balance between business value and build trust from all stakeholders.

3.2.2 Stakeholders Analysis

Bangchak categorizes stakeholders based on sustainability impacts and business impacts. There are 10 stakeholder groups as follows: creditors/financial institutions, customers, employees, suppliers/contractors, business partners (dealer, BGN, agricultural cooperative), communities, government, shareholders, media and business competitors.

In 2021, Bangchak engaged with all stakeholder groups to survey stakeholders’ needs and expectations. Engagement sessions were conducted through various methods and frequencies as appropriate to each stakeholder group. Results are assessed against business plan/strategy that was considered from global sustainability trends, SDGs and internal business factors to develop the Company’s materiality topics, sustainability strategy, and plans.

There are 3 main issues for each dimension of ESG that Bangchak focused upon. During 2020–2021, the Company reviewed and assessment impacts from COVID–19 pandemic which included:

Governance and Economic Dimension	Environmental Dimension	Social Dimension
<ul style="list-style-type: none"> 1. Green innovation business investment 2. Product & service quality 3. Digitalization 	<ul style="list-style-type: none"> 4. Climate change mitigation and adaption 5. Waste management 6. Air pollution management 	<ul style="list-style-type: none"> 7. Occupational health and safety 8. Job security & employee development 9. Community relations

3.3 Environment Management



3.3.1 Environmental Guideline and Policy

Although the COVID-19 pandemic was still impacting business operation in 2021, Bangchak recognizes that climate change is a major issue concerning the international communities and impacts from climate change continues to intensity with each passing year. Bangchak determines to do its part to support the Paris Agreement to limit global temperature rise to below 2 degrees Celsius as well as to support the Sustainable Development Goals (SDGs). The Company has implemented Safety, Security, Occupational Health, Environment and Energy Policy (SHEE Policy) to ensure safe operations and strongly adhere to domestic and international environmental standards while proactively manage environmental performance as follows:

Proactive Environmental Management

Bangchak remains committed to reducing environmental impacts. The Company operates in accordance with ISO

14001:2015 as a minimum standard along side Global Reporting Initiative (GRI). The Company emphasizes proactive environmental management, reducing emissions at the source, and optimizing resource usage in line with circular economy framework in order to reduce direct and indirect environmental impacts.

Oil and Chemical Spills Prevention and Management

In 2021, Bangchak maintains focus on reducing the impacts of business operations to the surrounding environment and communities including from crude oil transportation both on land and sea as well as product transportation to customers. The Company also aims to prevent incident and has set zero significant oil and chemical spills target (defined as more than 100 Barrels/Incident).

Air Pollution Management

Bangchak's operations ensure that the level of air pollution both within the refinery and surrounding communities are well within the requirements set by regulations. In addition, the company has set a target on complaints related to air pollution by the community as zero. Volatile organic compounds (VOCs) for oil depot are strictly controlled as well as emissions from all refinery operations. Furthermore, the refinery has a policy to use cleaner fuel to reduce pollution from production process.

Waste and Unused Material Management

Bangchak places importance on using the most of out resources. The 3Rs (Reuse, Reduce, Recycle) principle is applied for operations both in the refinery as well as in the office and the scope of applications continue to expand. The Company has set zero waste to landfill target alongside no waste disposal without energy recovery target of zero ton as well as waste generation intensity target of 3% by 2025.

In addition to waste management targets, Bangchak has set the Big Green Turnaround Management policy to present and reduce impacts to the environment that occur due to the maintenance of machinery and equipment.



Sustainable Management of the Environment

Bangchak's Sustainability Policy set expectations on sustainable management of environmental dimension including climate, water, and energy to reduce impacts from the Company's operations and to support the Sustainable Development Goals (SDGs), specifically SDG 6 and SDG 13. In addition, the Company has implemented eco-efficiency index alongside sustainable development.

Climate Change

Greenhouse gas management is essential in tackling climate change, as such it is a major issue for the refinery operation. Therefore, Bangchak places great important in the management of greenhouse gas along side reducing our scope 1 and scope 2 emission.

In 2021, Bangchak received certification from the Carbon Footprint for Organization (CFO) for the refinery from the Thailand Greenhouse Gas Organization (TGO). The certification enables Bangchak to assess greenhouse gas emission from refinery activities, classify the causes of major emissions, and determine measures to reduce future emissions to achieve carbon neutrality target by 2030 and net-zero target by 2050.

Energy Consumption

Climate change impacts have accelerated Bangchak's efforts to reduce energy consumption especially in the refinery where energy consumption is high. Bangchak operates under ISO 50001 and has set a policy to reduce greenhouse gas emission from energy consumption including from heat, electricity, and steam consumption. In addition, the Company has set target to reduce Energy Intensity Index (EII) to 98.6 in 2021 and long term EII target to be 88 by 2030.

Water Management

Water resource is another important issue for Bangchak as well as to support Sustainable Development Goal 6 of Clean Water and Sanitation. As water is an important input for the refinery operation, Bangchak uses 3Rs principles to manage water and to ensure sufficient water quantity and quality for operation. Water discharge quality is within the limits as to not create negative impact to the environment and surrounding communities and in accordance with GRI Sustainability Reporting Standards. Bangchak has set water reuse target at 30% compared to 2013 baseline year by 2030.



3.3.2 Environmental Performance

Bangchak's environmental performance data was verified by third party – Lloyd's Register International (Thailand) Company Limited. Verification process is aligned with GRI Sustainability Reporting Standards (GRI Standards) and Oil & Gas Sector Supplement (OGSS). Performance is disclosed in the Company's annual Sustainability Report (2021). In addition, in 2021, Bangchak refinery was certified as Green Industry level 5 for environmental management by the Department of Industrial Works.

Oil and Chemical Spills Prevention and Management

Performance

- No significant incidents of oil or chemical spills to the environment

Operation

Bangchak has put in place measures to prevent and prepare personnel regularly to ensure effective and efficient management in case of oil and chemical spills, especially in the Chao Phraya Basin, to instill trust and confidence in Bangchak's management of the environment during emergency by surrounding communities. In the event of a spill, a ship which has been equipped with side collecting boom and belt skimmer systems called "Sri Tahrarak 8" will be used for cleanup. In 2021, there was no significant oil and chemical spills (more than 100 barrel per incident).

In addition, Bangchak supports government entities, the Oil Industry Environment Safety Group Association (IESG), and other requests for cleanup as well as other incidents.

Management of Air Pollution

Performance

- No air pollution complaint filed against the Company
- Third-party measurements of air quality were 100% within standard

Operations

Bangchak's clean fuel policy helps respond to proactive environmental management policies by reducing pollution and controlling emissions from the source in accordance with the guidelines of the international standard ISO 14001:2015 including air quality monitoring by continuous measurements with the on-line flue air quality monitoring device, work area and the atmosphere around the refinery. In addition, third party measurement of air quality is used in parallel with company's own measurements for both within the refinery and surrounding community. Air quality was 100% within standards, resulting in the year 2021 the company has no complaints about air pollution.

In addition, the Company replaced oil storage tank sealant to reduce volatile organic compounds (VOCs) leakage.

Climate Change

Bangchak continuously monitors and manages corporate greenhouse gas emissions. In 2021, Bangchak refinery received certification from the Carbon Footprint for Organization (CFO) from the Thailand Greenhouse Gas Organization (TGO). The Company uses product life cycle assessment (LCA) and Intergovernmental Panel on Climate Change (IPCC) 2006 guidelines to prepare greenhouse gas emission data. The data is verified using a third party – Lloyd's Register International (Thailand) Company Limited for Scope 1 and Scope 2 emission disclosure in the 2021 Sustainability Report.

Bangchak sets GHGs emission reduction target for scope 1 at below 850,095 tons of carbon dioxide equivalent and scope 2 at below 4,694 tons of carbon dioxide equivalent for our refinery business to support SDG 13 – Climate Action. The Company has set long term target to become carbon neutrality by 2030 through GHG emission reduction and using carbon offsets.

Bangchak Refinery Greenhouse Gas Emission (2019 – 2021)

Greenhouse Gas Emission	2019	2020	2021
Scope 1 (ton CO ₂ e)	899,697	883,878	819,696
Scope 2 (ton CO ₂ e)	8,264	4,554	5,487
Scope 3 (ton CO ₂ e)	-	279,038	422,077
Total (ton CO₂e)	907,961	1,167,470	1,247,260

Energy Consumption

Performance

- Refinery's Energy Intensity Index (EII) was 98.6 against target of 97.7

Operations

Bangchak is in compliance with ISO 50001 for energy management system and continues to improve energy management and develop human capability within the organization. In 2021, the Company implements projects to improve energy efficiency and continues to follow-up on projects implemented since 2019, resulting in improved energy efficiency. Projects included:

- Catalysts replacement at the naphtha quality improvement unit 2 and 3 project
- Installation of coating material at the crude oil distillation unit 3 to reduce heat loss at the furnace wall project
- Project to stop using gas compressors in the crude oil distillation unit 3
- Project to stop using sulfur removable in fuel gas unit 3

- Heat exchanger improvement to reuse waste heat in crude oil distillation unit 2 project
- Project to reduce the use of high-pressure steam at the light naphtha oil refinery tower
- Project to reduce the use of medium-pressure steam at the product separation tower of the molecular splitting unit
- Project to reduce outlet temperature for the molecular splitting unit furnace



Bangchak Refinery Fuel Consumption (2019 – 2021)

	2019	2020	2021
Fuel gas (liter)	136,607,978.0	131,578,519.0	101,670,730.0
Natural gas (kilogram)	84,916,177.0	66,868,625.0	91,834,880.7
Crude oil (barrel)	41,113,626.2	35,598,490.6	36,168,982.37

Bangchak Refinery Electricity Consumption (2019 – 2021)

	2019	2020	2021
Electricity purchased (kWh)	16,528,000	9,257,000	11,153,000

As a result, in 2021 Bangchak's EII was 98.6 which was higher than 97.7 target due to throughput reduction from economic considerations and COVID-19 situation.

Water Management

Performance

- Water consumption per production capacity was 63 million cubic meter/thousand barrel of crude oil equivalent which was better than target of 65 million cubic meter/thousand barrel of crude oil equivalent
- Reduced water consumption by 1.47 million cubic meter equivalent to 41.13% of 3.58 million cubic meter required for production
- Reuse/recycle water for refinery operation 1.47 million cubic meter

Operations

Bangchak has water management in the implementation of the policy to reduce the amount of water used in the production process within the refinery in accordance with the 3Rs (Reuse, Reduce & Recycle), including monitoring and monitoring the situation of drought, floods and changes in the water level in the Chao Phraya River including water risk analysis and water stress. In addition, the refinery has also implemented projects to improve water efficiency from the refinery development project in 2021 and monitoring of the original project implemented since 2020 to reduce tap water consumption. Examples of projects include:

- Efficiency improvement of the cooling water system unit 2
- Reduction of steam usage inside the distillation units
- Reduction on the use of backwashing water and carbon filter at the water purification unit
- Steam condensation loss reduction program at the steam turbine generator unit 3

From the project to increase water production capacity at the RO Recycle unit from the treated wastewater and policy to reduce the use of tap water; in 2021 Bangchak was able to recycle 30.8% of water compared to 2015 baseline meeting the long-term target of 30% reduction in water consumption by 2030.



Bangchak Refinery Water Consumption (2019 – 2021)

	2019	2020	2021
Water consumption (million cubic meter)	2.49	2.04	2.10

Waste and Unused Material Management

Performance

- Zero waste to landfill
- Waste managed using 3Rs principle – 99.78%

Operations

The Company adheres to the 3Rs waste management principles which are reduce, reuse, and recycle to ensure highest resource efficiency under zero waste to landfill policy. In 2021, Bangchak was still able to achieve this target. The Company complies with law and regulations related to refinery waste management and was able to use 3Rs principle on 99.78% of all waste generated.

3.4 Sustainability Management - Social Dimensions

3.4.1 Policies and Guidelines

Bangchak strives to comply with the laws, regulations, and regulations relating to social management and respect for human rights in formulating policies and guidelines for social management in the business process. In addition, the Company adopts the principles of sufficiency economy and international sustainability standards such as the UN Global Compact and the World Sustainable Development Goals (SDGs) and the Dow Jones Sustainability Indexes (DJSI). Sustainable with the environment and society in its operations. Bangchak has also formulated policies related to social management in all aspects, including reducing impacts and helping to take care of the environment and society at the same time including Human Rights Policy, Safety, Security, Occupational Health, Environment and Energy Policy, Good Corporate Governance Policy, Prevention and Anti-corruption, Caring for employees, customers and partners and contractors. In addition, the Company conducts surveys of stakeholders' opinions and expectations to develop work and activities that meet the expectations of stakeholders. Bangchak's policies and guidelines are continually improved through various assessments such as the Stock Exchange of Thailand's THIS, DJSI/Corporate Sustainability Assessment by S&P Global and MSCI. Sustainability Policy and Human Rights Policy can be downloaded from:



Sustainability Policy

<https://www.bangchak.co.th/storage/document/sustainability/2019/sustainability-policy-th.pdf>



Human Rights Policy

<https://www.bangchak.co.th/storage/document/sustainability/2020/human-rights-cpk-th.pdf>

Human Rights

In 2021, Bangchak revised its business responsibility policy for respecting human rights. It adheres to the UN Global Compact, the Universal Declaration of Human Rights (UDHR), the United Nations Guiding Principles on Business and Human Rights (UNGPR) as guidelines and set framework for operations that respects gender equality employment for men, women, LGBTQ, and people with disabilities, promote employee committee to represent employees in consultation with senior management in order to prevent possible impacts from business operations. The Company has conducted a comprehensive Human Rights Impact Assessment in accordance with the Human Rights Due Diligence process (HRDD) covering risk groups which include employees, contractors, communities, and societies surrounding the operations. Customers and partners, suppliers and temporary workers including vulnerable groups (women, children, indigenous people and people with disabilities) involved within the organization covering refining and oil trading businesses, marketing business, and business partners.

Taking Care of Our Employees

Bangchak laid down the concept of employee care according to The Best Employer: Bangchak 100x (Living Well, Happy) with the goal of developing employees at all levels to drive the organization according to the I AM BCP values to support the rapid changes in the economy, environment, and society including changes in technology and innovation that affect business operations along with the key points from the Employee Engagement Survey, which is conducted annually to develop a plan to take care of employees.

Safety and Occupational Health

Occupational safety and health are important responsibilities of the Company. Bangchak requires executives, employees, business partners and contractors to be responsible for their own safety as well as their colleagues, communities according to the Occupational Safety and Health Policy.

The Company operates in accordance with ISO 45001 safety standards and process safety management (PSM) at all times. In addition, the company provides risk assessments and measures to reduce the risks to health of workers to ensure that everyone goes home safely everyday.

Responsibility to our Customers and Service Station Operators

Bangchak's customers are categorized into 3 main groups: Service station customers (End User), industrial customers, and wholesale customers which include service station operators and agricultural co-ops. Bangchak manage relationships both proactively and reactively with various groups of customers according to the strategy of developing a marketing business that focuses on responding to the needs of customers (Customer Centric). For the service stations which is an important segment, Bangchak conducts survey of the net worth indexes of customers who will recommend the organization to those around them (Net Promoter Score: NPS) to measure service results and to continuously develop customer care plans.

Community and Society Development

Bangchak aims to do our part in improving the quality of life and strengthening the society. Focusing on the implementation of the 4 Green strategy and the corporate vision "Evolving Greenovation" by applying innovation, technology, and the concept of BCG economy model (Bio Economy, Circular Economy and Green Economy) that focus on the efficient use of resources to develop projects that are beneficial to the wider society and create value for all stakeholders while supporting the Sustainable Development Goals (SDGs) SDG 13: Climate action, SDG 12: Responsible consumption and production, SDG 7: Affordable, clean and modern energy, SDG 9: Industry, Innovation and Infrastructure (by fostering innovation through promoting startups or social enterprises) and SDG 8 Decent work and economic growth.

2021 Targets and Strategies on Social Dimension

Target	Strategy
Taking Care of our Employees <ul style="list-style-type: none"> Employee Engagement = 60% 	<ul style="list-style-type: none"> Talent management, career advancement, performance review, compensation, and benefits Communicating and strengthening relationships between management and employees through communication and activities
Safety and Occupational Health <ul style="list-style-type: none"> Sickness due to occupational disease for all personnel = 0 No significant oil and chemical spill to the environment 	<ul style="list-style-type: none"> Process Safety Management (PSM) Encourage participation and communication with operators
Responsibility to our Customers <ul style="list-style-type: none"> Maintain 1st position on Net Promoter Score (NPS Score) 	<ul style="list-style-type: none"> Your Greenovative Destination
Community and Society Development	
Communities around the refinery <ul style="list-style-type: none"> Community Engagement Assessment > 85% No widely complaints from the community 	<ul style="list-style-type: none"> Develop activities that provide benefits to the community thoroughly Communicate closely with the community

3.4.2 Social Dimension Performance

Human Rights In 2021, key human rights activities include:

1. Improving the Business Responsibility Policy for Respecting Human Rights

by integrating Women's Empowerment Principles (WEPs) into the policy development.

Bangchak Human Rights Policy can be downloaded from:

<https://www.bangchak.co.th/storage/document/sustainability/2020/human-rights-cpk-en.pdf>



2. Human Rights Due Diligence (HRDD)

– Bangchak conducted Human Rights Due Diligence in accordance with the National Human Rights Commission of Thailand's guideline covering 8 main risk areas including construction and expansion of business operations, employees, and contractors, surrounding communities, customers and consumers, business partners, foreign labors, and temporary workers.

For contractors and suppliers, the Company uses a Supplier Code of Conduct (SCOC) assessment tool for labor and human rights, safety, occupational health, and environment.

From a comprehensive examination of human rights issues, it was found that there were no business administration risks that could lead to human rights violations. However, the company continues to monitor and develop measures to support and mitigate impacts.

3. Operations to prevent and mitigate impacts that may occur from business operations, which which the Company attaches importance to the following issues:

- Regarding the protection of personal information, Bangchak realizes the importance of protecting personal information. In 2018, Bangchak established the cybersecurity division to be responsible for cybersecurity management based on the International Standards for Cybersecurity Management ISO /

IES 27001: 2013, ISO / IES 27032: 2012 and NIST Cyber Security Framework. When the Personal Data Protection Act of 2562 became law, the Company conducted a workshop with a consulting company, to analyze important operational processes that involve collecting, using, or disclosing personal information. Bangchak has established Data Protection Policy as a guideline for managing personal information that the company has collected, used or disclosed to be protected as required by law. The Company has created a privacy notice to inform the owner of the personal information about the purposes for which the company collects, uses and discloses personal information as well rights and channels for requesting to exercise the rights of the personal data owner. In addition, Bangchak conducted trainings to provide knowledge and create awareness among employees regarding the adherence to the law. Work processes have also been improved to take into account control points and control measures to reduce risks including the development of information technology systems used in operations for better internal control.

- Occupational Health: Bangchak has taken action on human rights management to now cover emerging epidemics, especially in the case of the COVID-19 crisis that continues to spread for the second year. The Company provides necessary protective equipment, such as masks, alcohol gel, adjusting working hours accordingly, and continuing to allow employees to work from home. In addition, Bangchak has procured vaccines and ATK testing for employees and contractors.
- Safety: The Company operates according to the ISO 45001 standard by complying with the safety, occupational health and working environment laws. Providing knowledge and training in accordance with the operating safety regulations and provide the use of protective equipment as well as employing technology to reduce risk including providing annual health check-up according to risk factors and preliminary screening through temperature measurement before entering the work area, providing alcohol gel service at various points all

over the office, campaigning for employees to take care of themselves by wearing masks and washing their hands regularly.

Collective Bargaining

Bangchak ensures open communication between management and employees in regards to negotiation of employees' benefits through Bangchak's Labor Union where meeting are held quarterly in accordance with regulations. Currently over half of Bangchak's employees are members of the Union. The Union has 13 committee members who act as employees' representatives to work with management to improve employees benefits and response to employees' expectations. The Union meets on a quarterly basis as required by law. In 2021, outcome from Union meetings include: amendments to the welfare of parents' medical expenses to be able to reimburse the cost of treatment in the case of treatment at a private clinic, adjusting the rules for medical expenses for employees' children in the event that the employees are married by allowing the distribution of rights bindings from two children had to be tied to only one person now parents can share rights.

Disputes and Complaints

In 2021, due to regular exchange meetings between the management and the employee committee, representing employees, the Company had no significant labor disputes. No human rights complaints including no significant violations of laws or social regulations and there have been no instances of being accused of causing a negative impact on social issues in the past 3 years.

Taking Care of Our Employees

Performance

- Corporate engagement score increased to 70, higher than in 2020, which was 63.

Key Operations

Bangchak sets strategic plan on employee stewardship and followed up the employee issues on a regular basis through the Management Development Sub Committee (Sub MDC) of each business group. The Company gathers employee feedback from the Employee Engagement Survey and screen issues for discussions before passing them to the

Management Development Committee (MDC) for consideration and approval for further improvement and development. The monitoring process also helps Bangchak to handle employee stewardship in each business group and working group more closely and effectively on issues such as manpower planning to serve business growth plan, learning and development, job rotation for development, and the promotion of learning for business development.

Bangchak's employee management consists of four areas as follows:

- **Planning and Recruitment**

The internal job transfer rate in 2021 was 19.91% higher than 2020 rate of 10.11%. Retention rate of employees with fewer than 2-year tenure is 99% for the 4th consecutive year due to the adjustment in employee benefits and working style to better match employees in each age range. There were 50 new hires, 12 people with disabilities were hired. Recruitment was conducted through Facebook Page, Youtube and Spotify channels, including Bangchak Career Podcast. And there is a Bangchak Virtual Career Roadshow that replaces going to Job Fair and Career Fair during the COVID-19 as video on Bangchak Career Youtube channel. In 2021, Bangchak was voted "Dream Company" by JobTopGun as company that can take care of employees in 4 aspects: good life, good job, good pay, and good community with score of 3, above the median score.

- **Employee Development**

Bangchak continually develops learning courses and employees according to the employee development plan in accordance with the career path of employees to create professionals who have knowledge and understanding of management including various skills and abilities needed to improve and be ready for change. The Company also attach importance with the development of potential, aptitude and individual interests of employees including creating an understanding of communication in order to develop employees to understand and be able to reach their potential through testing, assessments and various

additional courses that help to analyzing and developing employees' potential.

In 2021, which is a period of adjustment to the New Normal due to the COVID-19 pandemic, the Company has a policy encouraging employees to cooperate, collaborate, think, and act in order to change their working methods to be more efficient. This include the creation of new business and innovation in the organization according to the Core value: I AM BCP. As a result, there were training to develop skills and competence in business management to accommodate the change by organizing important training courses and knowledge management systems within the organization as follows:

- **Reskill & Upskill**

A project for employees such as engineers, analysts, and planners to have more responsibility for sales tasks, in order to have knowledge and skills in sales, business and finance that are in line with the company's policy direction in order to adapt to the New Normal.

- **Preparing the organization in a disruptive world**

It is an ongoing course developed to promote innovative ideas in the organization. The concept of Agile and Design Thinking is applied to employee development. The program is available to employees at all levels including new employees, employees who are set for promotion, and employees in the Talent & Successor groups. Training and coaching for pitching projects are provided before being students are required to present at management meetings.



- **e-Learning**

Bangchak recognizes the importance of employees' flexible learning experience, and the broad choices of contents to match each person's interest. To suit the needs of the changing trends of learning method, the Company has adopted the e-Learning systems, provided by Conicle to enhance the capability of the employees.

- **BCP Knowledge Management System (BCP-KMS)**

In 2021, Bangchak improved its internal knowledge management system (BCP-KMS) as a space for employees to exchange and share knowledge of work experience, lessons learned, and tips and tricks to support organization's retention of critical knowledge in line with long-term strategies and the necessity of current business needs.

In 2021, 98% of employees have received training through e-Learning and BCP-KMS systems.

- **Performance Review and Compensation**

Bangchak attaches great importance to employee retention because employees are the main drivers for achieving business goals.

- **Performance review**

There are 2 levels of assessment, employees are evaluated against their KPIs and on their behaviors. For managers and above, evaluations are conducted against 3 aspects: performance evaluation (KPIs), behavior and a 360-degree assessment from those who work with them. The Company started experimenting with a new performance appraisal system in conjunction with the old appraisal model for managers and above before considering adopting the whole organization next year. This evaluation model will be able to measure the results more clearly. In addition, Bangchak has also begun to adjust the setting of employee KPIs to be more in line with the goals of the organization so that everyone can see the importance of their own work that is involved in driving the organization's goals. There is a plan that will be used to measure the results of all

departments and levels in the next year. This is an important part that will lead the organization to a High-Performance Organization (HPO).

- **Promotion**

There is a system for High Potential employees, with a Fast Track that considers past performance along with growth potential. Employees are put into the fast track based on their strategic ability, leadership, and completion of mandatory courses at the required level. They will be considered for promotion according to special criteria (High Potential & Fast Track).

- **Compensation Management**

Proper management of employee compensation at each level is another important aspect of engagement and of High-Performance Culture. Benchmarking of compensation and benefits between the petroleum industry and neighboring industries were conducted including the external environment to review and improve the remuneration criteria. Bangchak continues to review and develop compensation schemes be able to manage the compensation in accordance with the trend of the new generation of employees. There is no gender difference in the compensation and promotion of employees, the Company considers compensation based on knowledge and abilities according to the expectations of each job level.

Compensation for employees at all levels are considered based on the same criteria for both men and women. However, the difference in the compensation ratio comes from the number of male/female employees, age of employment, and performance. In 2021, Bangchak has arranged to verify the disclosure of employee compensation ratios between female and male in accordance with the Global Reporting Initiative's Sustainability Reporting Standard: GRI 405-2 (Ratio of basic salary and remuneration of women to men) by Third Party that specializes in independent certification and assurance to ensure that the disclosure is accurate and complete according to international standards.

• Employee Engagement

2021 was still the year of the pandemic. Bangchak has adjusted the strategy to maintain and build employee engagement by focusing on taking care of employees in terms of valuing employees (People Value) together with the Business Unit / Business Group to jointly formulate plans to increase employee engagement with the organization in accordance with the company's policy direction under the strategy 100Xhappiness, well-being, approved by the Management Development Sub-Committee (Sub MDC) of each business group. Key operations include:

– Caring for employees during COVID-19

In 2021, Bangchak implemented measures and guidelines to take care and protect employees as follows:

1. Arrange preliminary screening through temperature measurement before entering the work area. Providing alcohol gel service at various locations around the office and conducted campaigns to remind employees to wear masks and wash their hands regularly
2. Instituted work from home and hybrid workplace policies to reduce infection risks
3. Ensure timely communication of current situations to employees through public relations so that employees are informed of the latest news and awareness of health care in all channels along with surveys of employees traveling to risk areas to strictly prevent the spread of the virus in the office
4. Provided safe house for critical personnel to reduce risk of infection to employees who must work in the refinery area
5. Procured 1st, 2nd, and 3rd shots of vaccine for employees and their family and set policy that employees do not have to use their leave to go get vaccinated
6. Find hospital for infected employees and their families
7. Procured alcohol gel and masks and send them to employees at home

8. Provide access to mental health support during Work from Home
9. Provided waiting center including basic self-care equipment such as oximeter, thermometer, and basic medicine kit. As well as provide telemedicine access during quarantine and for screening for high-risk employees free of charge.
10. Conduct weekly testing using Antigen Test Kit (ATK)

– Actions to respond to the results of the organizational engagement survey

Results from the 2020 employee engagement survey showed compensation, benefits, performance review, and career opportunities and development are still areas in which employees are interested in. Bangchak continues to make adjustments and improvements on compensation and benefits as reported in the Compensation Management section. As for career opportunities and development, Bangchak supports employees through job rotations. In 2021, job rotation rate was 19.91%.

– Employee Communication

Bangchak had to adjust its communications to employees during work from home period to ensure social distancing. Communication becomes even more important to maintain employee engagement and inform employees of business directions. Various communication channels include:

- o Communication activities from PS & CEO and senior management with employees through the BCP Town Hall which were held 3 times in 2021.



In addition, there were Town Hall activities under various departments and business groups which were broadcast live via live streaming as official communication to communication business operations movement in the organization and news to employees directly from President and Chief Executive Officer (PS & CEO) and Senior Executive Vice President. This was supplemented with Live Facebook activities, Teatime online, “Short with PS” articles via email within the organization, as well as opening a channel for hearing comments or have employee feedback via CEO Box.

- o Added new communication channels to increase engagement between employees and the organization as well as to ensure that employees received news in a timely manner through Facebook Group: Proud to be BCP#2, Line Official: I AM BCP Everywhere with you, encouragement cards from high level executive (EVP up), and other activities to employees working both from home and at the office.
- o Build recognition through various activities to promote expressing gratitude from both employees and management such as Congrats Day where high level management congratulate employees who are promoted and give direction and expectations to employees to motivate the employees in their new role.
- o Building relationships between senior management and employees through employee club activities and activities such as planting paniculata trees in the refinery, sending care boxes, care kit boxes with medicine and COVID-19 prevention equipment, lunch boxes, special food in various activities directly to employees homes and at the desk during COVID-19 outbreaks.

Occupational Health and Safety

Performance

- Sickness due to occupational disease for all personnel = 0
- 5,000,000 safe working hours with no employee loss time from injury

The Occupational Safety and Health and Working

Environment Committee is comprised of representatives from staff at the operational level not less than 50% of the total committee. The representatives of the operational level employees are elected by job divisions to ensure that there are representatives of employees from every line of work which requires meetings to be held at least once a month. The Committee provides a platform to receive information from employees in each line of work through representatives and inform and follow up on the progress of the operation. In 2021, the Committee pushed for the implementation of COVID-19 prevention measures that are appropriate and compliant with the Occupational Safety and Health Administration (OSHA 3990-03 2020).

• **Compliance with measures to prevent the spread of COVID-19**

Due to the worsening outbreaks for COVID-19 in 2021, Bangchak has increased protection measures to prevent the spread in the workplace such as rigorous screening of employees and contractors who come to work in the area including body temperature check, health and travel history questionnaire for COVID-19 screening, and rapid test screening for shift workers and other employees who are deemed to be at risk. The work area was cleaned with disinfectant and UV light. The Company also established a waiting center for employees in high-risk groups who want to quarantine with air-conditioned rooms. The waiting center was also equipped with thermometer for daily assessment of symptoms. Employees are provided full three meals. and generic home remedies and doctors were available to give advice in case of symptoms. In addition, the Company also encourages at-risk employees to undergo RT-PCR testing at the hospital and coordinate to find a hospital for treatment in case of infection.

Bangchak provided protective masks for all employees. There are alcohol gels available throughout the office and operation area.

The Company also arranged for transportation to reduce the risk of traveling by public transportation for shift workers and employees who need to work at the refinery. In addition, Bangchak supports the provision of vaccines for employees and contractors. Guidelines for prevention of infection have been established, including always wearing a protective mask when working and meeting with others, maintain social distancing, regular hand washing, as well as publicize, educate, and advise on preventing the spread of the virus regularly.

- **Sickness due to occupational disease for all personnel = 0**

In addition to taking care of employees and contractors during the COVID-19 outbreaks, in normal operations, Bangchak uses proactive occupational health processes to provide a Health Risk Assessment covering all areas of the refinery leading to the formulation of appropriate control and risk reduction measures. In addition, regularly monitoring and measuring the working environment, such as light, sound, heat and chemicals in the work area are used to assess control measures. Conditions that may affect the health of workers are assessed by comparing the results obtained from the measurements with the specified standard values; in the event that the results of the measurement exceed safety standard, the Company constantly designs and improves the work area to ensure safe working condition. In addition, safety officers and occupational health specialists are assigned to the work area to manage and provide advice to employees and contractors on issues related to occupational health at all times. Occupational health measures are as follows:

- Providing health check for employees at the start of employment, during employment and at termination of employment
- Provide annual health check-up, which include general health checkup and checkup based on occupational risk factors. Occupational health experts are hired to determine check-up

with special focus on risk factors. The team analyzes the test results based on internal and external factors in the workplace. If employees are found to be ill, they are advised to visit a doctor and receive ongoing health care. The company will also provide additional health checks recommended according to age. Some of these are prostate, pancreatic, and gastrointestinal cancer examination as part of the employee health program

- Monitor operational procedures in line with international standards and set clear criteria of people at occupational risk within 3 levels – low, medium and high
- Provide contractor occupational health measures, such as preparing work areas, procedures, prevention equipment, and knowledge
- Conduct medical emergency drills between Bangchak and hospitals' support teams. The contracted hospitals have participated in the drills to ensure that their staff are familiar with the process which increase communication and response effectiveness
- Employ occupational health experts to assess and improve employee general and occupational risk-based health check programs

Bangchak requires all contractors to undergo risk-based health check. This includes health examination, analysis, follow-up, and consultation. Those whose results are found to be abnormal are required to have regular consultations with doctors. Reports of all health checkups are submitted to Bangchak supervisor and safety representative.

- **5,000,000 safe working hours with no employee loss time from injury**

In 2021, the employee accident rate was zero, enabling Bangchak to achieve the goal of 5,000,000 safe hour-person with no loss time from injury. The Company has monitors and measures results through indicators such as Injury Frequency Rate (IFR), Injury Severity Rate (ISR), Total Recordable Injury Rate (TRIR) and High-consequence work-related injuries rate of employees in the year.

Incident Rate	2019		2020		2021	
	Male	Female	Male	Female	Male	Female
Loss-Time Injury Frequency Rate (LTIFR) – employees	0	0	0	0	0	0
Injury Severity Rate (ISR) – employees	0	0	0	0	0	0
Total Recordable Injury Rate (TRIR) – employees	0	0	0.60	0	0	0
High-consequence work-related injuries rate* – employees	0	0	0	0	0	0

*High-consequence work-related injuries rate because of work accidents and not be allowed to go back to work for 6 months.

Responsibility towards customers and service station operators

Bangchak aims to be the First brand of choice (The Most Admired Brand) by 2024 as a way of thanking our customers for their loyalty. Our Customer Feedback Process brings input of customer expectations, which will be used for our planning of innovation as well as technology for products and servicing at service stations, complying with a concept of social and environmentally friendly. To gain more market insights on the “Your Greenovative Destination”, the Company has used the international standard survey called Net Promoter Score (NPS). It is an index of measuring engagement through word of mouth and Customer Satisfaction. The Company continually use the information, needs and expectations of consumers to shape its strategy.

2021 Performance

- Maintain number 1 position on Net Promoter Score (NPS) from 2017 – 2021
- Maintain number 2 market share for E20 and E85 at 18.2% and 35.4% share, respectively. As of November 2021, Bangchak is the top seller of E85 fuel by volume

Key Operations

1. Care during the 2nd year of COVID-19

In the second year of COVID-19 pandemic, Bangchak has changed its marketing strategy in respond to the situation as follow:

- Develop Call Center system to support all communication channels from consumers. Operators can handle calls from consumers, service station operators (for ordering fuel shipment) as well as Inthanin Coffee shop customers. Call Center employees were able to work from home and customers can provide satisfaction rating through the system.
- System development to response to the new normal including upgrade where members can provide telephone number to collect points, QR Code payment and use of wireless credit card machines and ordering fuel refilling without having to lower car windows
- Modify promotions and special privileges including
 - Redeem points from membership card for COVID insurance policy, COVID vaccine allergy protection policy, and exchange points for discount
 - Facebook and Line Official games
 - Promotional products to help farmers such as giving away longans, mangosteens, and chicken eggs
 - Customers can order Inthanin Coffee through various platforms such as Grab, Lineman, and Foodpanda to reduce risks as well as enjoy special discounts
 - Sale alcohol gel (5-liter size)
 - Collaboration with 11 well-known brands to offer food, beverages and other products at Bangchak Food Truck 9 branches

2. Care of customer and service station operators/Inthanin stores

In line with the goal to be the number one gas station brand in the minds of consumers, Bangchak has given importance to listening to the needs and expectations of customers at the service stations, industrial customers, wholesale customers and service station operators, which are the connection points between Bangchak and customers who come to use the service at the service station by developing and delivering products that exceed customer expectations. In addition, Bangchak continually develops environmentally friendly products and services by employing various technologies and innovations to develop service stations environment in service stations and non-oil business (Innovative Service Stations). The Company also continues to develop and maintain good relationships with customers focusing on 3 areas of operation which are:

1. Developing a two-way communication between the customer and Bangchak

Service Station Customers	Industrial and Wholesale Customers	Service Station and Inthanin Coffee Operators
<ul style="list-style-type: none"> Continuously develop for 4th year on customer contact channels both by phone and online media: <ul style="list-style-type: none"> Call Center 1651 Line Official Facebook Line@ Website Live Chat Email Call back service during high volume and long wait time System to search for information when customers mention Bangchak on social media such as Pantip and Facebook 	<ul style="list-style-type: none"> Use of online communication channels Conduct after service online survey such as after technical services and delivery service 	<ul style="list-style-type: none"> Developed fuel ordering system through call center for service station operators to be able to place order at any hour through web ordering, mobile application, IVR system, and Line Call back system Feedback system after call Line Group for service station operators

2. Development of systems and technologies to support customer relationships

Service Station Customers	Industrial and Wholesale Customers	Service Station and Inthanin Coffee Operators
<ul style="list-style-type: none"> Develop a new system that can support CRM for customers so that they can receive special privileges from refueling at Bangchak service stations <ul style="list-style-type: none"> Customer segmentation such as truck drivers and food delivery Promote repeat visits such as Re-Active, Re-Churn, Return Volume Ability to donate points through mobile application Compliance with PDPA 	<ul style="list-style-type: none"> E-Tax invoice system Increase number of oil depot to provide better coverage and faster delivery Improve lubricants database so customers can select appropriate lubricant products through www.bangchaklubricants.com 	<ul style="list-style-type: none"> E-Report system to analyze the operational data of service stations through various E-Report systems accurately and quickly to cooperate in work improvement Point-of-sale system for raw material used in Inthanin Coffee to be sent directly to distribution center Expand the reach of E-Training for partners and employees so that they can access training and development material anywhere at any time

3. Relationship management to retain existing customers and add new customers

Service Station Customers	Industrial and Wholesale Customers	Service Station and Inthanin Coffee Operators
<p>Customer privileges such as:</p> <ul style="list-style-type: none"> • New Bangchak card members receive 100 extra points from membership card registration • Benefits – matching the price increase with equal amount of points on the days where fuel price increase • Double points for all diesel purchases for Bangchak card members • Birthday privileges – earn 50 extra points to redeem for special discounts at Inthanin Coffee or Furio Care car service center 	<ul style="list-style-type: none"> • Provide knowledge on various topics such as products/emergency planning training/after-sales service/support equipment/check equipment range and engine maintenance • Provide total solution service in addition to selling products including equipment maintenance and quality assurance • Meet with major customers monthly to jointly build a sales support tool and expand the sale network. 	<ul style="list-style-type: none"> • Deliver high quality products such as Hi Premium Diesel S and E20S EVO as well as PM 2.5 reduction diesel fuel • Develop a point redemption system to expand the customer base, for example, with AIS, exchanging points “The more you transfer, the more you get”, and with Krungsri Ayudhya Card Company Limited under the project “Transferable, easier to exchange” • Develop “Program Bonding” to support investment in service station development to provide complete and value-added services as well as add products and improvements to service station • Expand the numbers of service stations that accept digital payment • Expand partners in the online market to increase sales for Inthanin coffee shop operators with True Food, Shopee Food, and Air Asia Food and organizing promotional activities through food delivery partners • Develop TO GO products • Develop new beverages and bakery menus to better serve customers • Provide delivery services through Kerry Express in Inthanin Coffee stores • Joined the government’s COVID-19 economic stimulus program “Ying Chai Ying Dai” for Inthanin Coffee • Inthanin shop began to experiment with digital currency for payment of goods and services • Develop Inthanin Mobile Application for customers to choose to pick up products at branches and buy monthly packages (Subscription)

Development of Communities and Society

1. Taking Care of Bangchak's Neighbors

Performance

- In 2021, community engagement survey score increases to 86% from 84.40% in 2020

Operations

Bangchak participates in social care at the local level around the Company's establishment and refinery, which is an important operating area of the Company. The community relations operation classifies the target groups of residents around the area into 4 sub-groups in order to respond appropriately to the needs/expectations of each group. Most of the expectations are 1) safe business operations 2) communicating in advance in the implementation of the plan 3) communicating quickly in case of emergency 4) continually organizing activities 5) including the communities in activities that are beneficial to the community and society (6) helping to alleviate problems during the COVID-19 pandemic.

As a result, Bangchak formulated a strategy for community relations and organized community relations activities that covers 8 areas: safety, education, quality of life, environmental, strengthening relationships and preserving culture and traditions, economy, and public benefit. In 2021, Bangchak organized more than 216 activities benefiting more than 108,196 people. In 2021, the Company employed outside companies to conduct community engagement survey where score increase to 86% from 84.40% in 2020.

Key operations in 2021 include:

- **Safety:** Emergency Drills

Every year Bangchak organized emergency evacuation drill in the event of an accident as well as providing training to provide knowledge in the use of basic fire extinguishing equipment for teachers, students and personnel in the school and residents of condos around the refinery. In 2021, Bangchak organized an emergency evacuation drill and provide training to provide knowledge in the use of basic firefighting equipment to 4 schools and 22 condos around the refinery in the Phra Khanong-Bangna area to ensure that teachers, students, and

staff in schools as well as condo residents have knowledge and understanding and are ready to deal with various emergencies that may occur.

- **Communication**

There are various communication channels available for communities around the refinery including:

- Direct communication with community relations personnel who visit the communities or via telephone conversations
- Regularly conduct community activities
- LINE group for community committee, condominium residents, and teachers in schools in the communities around the refinery
- Public announcement boards in the communities and condominiums
- Facebook group: Bangchak Family Group

Organization of activities that are beneficial to the community and society which can be divided into:

- **Economic**

"Meal Box Punsuk" Project

It is a project that has changed the operation model from the Punsuk Market project, which has been on-going since 2012 to generate income for shop operators in communities around the refinery by allocating space to sell food and products on various occasions without cost, such as selling food at the annual turnarounds and during various special projects. Due to the COVID-19 pandemic the Company has adjusted the format to keep distance between community shops and contractors by delivery as food boxes to replace the sale of merchandise during 2021 major turnaround. It also encourages community shop operators to take part in environmental stewardship by supporting eco-friendly food boxes. The company has continuously encouraged community shops and contractors to use green containers since 2016.

In 2021, "Meal Box Punsuk" Project generated over 430,230 baht of income for 13 sellers.

“Bangchak Dee Tor Jai” Project to support locally owned shops in communities

Supported locally owned shops in communities surrounding the refinery during the COVID-19 outbreaks by ordering food and snacks as well as supporting products and handicrafts from the community to be used in the Company’s various activities.

Project to support and establish beekeeping of the large agricultural group at Tam Bon Bang Nam Phueng

Support farmers to increase agricultural yield in a natural way through the use of stingless bees for pollination. Participant farmers earn income from the sale of honey and bee propolis. With these products, consumers can eat healthy products made with natural processes without chemicals and good for health. In addition, the project can integrate the development of eco-tourism in the future

• **Environment: Project “Bangchak Cares for the Community” project to reduce dust**

Bangchak partnered with Phra Khanong District Office to help alleviate PM2.5 health problems in the community. Bangchak’s management and employees together with District Office personnel gave away 20,000 N95 masks to residents in the communities, schools and government agencies surrounding the refinery

• **Education : Eco-School Project**

The project is a partnership between Bangchak, Department of Environmental Quality, Phra Khanong District Office, and Bang Na District Office. The project aims to encourage school administrator and science teachers in 11 schools around the refineries to learn how to develop curriculums that include environmental issues in an integrated manner. In 2020, Bangchak adjusted the operations to a new normal by providing lessons through online channel and by uploading videos onto YouTube so students can access contents at any time.

• **Quality of Life: Project “Bangchak Cares –Fight COVID-19”**

Due to the COVID-19 pandemic, essential items such as surgical mask and alcohol disinfectant were in short supply. In addition, many in the communities were financially impacted by the economic crisis. To lend a helping hand, Bangchak initiated project and activities during COVID-19 as follow:

- **Bangchak COVID-19 Care Bags** – Provided 32,000 care bags which contained cloth masks, sanitizing alcohol gel, vitamin C, and a sticker with emergency contact number to communities residents, condominiums, and students in schools in the communities surrounding the refinery
- **Provide alcohol gel for hand washing during shortage** – to residents in the communities and condominiums, as well as student and health centers around the refinery
- **Employing community residents to sew cloth masks to fight COVID-19** – members of the communities (mostly stay-at-home mothers and young adults) were able to generate additional incomes for their families. The masks sewn were given to Service Station personnel and contractors in the refinery.
- **Volunteer event to sew cloth masks for the elderly** – Bangchak helped organized an activity where community volunteers sew masks for donation. Bangchak supported by provided sewing kits and fabrics, as well as taught volunteers to sew cloth masks. The volunteers were able to donate 300 masks to the elderly in the community.
- **Grow and Share project** – Bangchak provided vegetable seeds to 200 families so that they can grow their own food, reduce trips to buy food, reduce costs and create family activities during Work from Home.
- **“Tung Pun Suk” project** – set up collection box in our Service Stations, schools, and temples around the area to ease the hardship of community members during the crisis. Food and necessity items to people in needs were provided to people in needs.

Bangchak Group

Joins the Fight Against COVID-19

2021



Customers/The Public

- Distributes Biohazard Sample Collection Mobile Units
- Implement Seven Safes measures for customer safety
- Proactive ATK screening for service personnel
- “Bangchak X FAH FIRST AID” Campaign
- Discounts for Inthanin beverages for COVID-19 vaccinations
- Provide essential items to various communities
- Support the operations of COVID-19 vaccinations centers, proactive testing units, and community isolation centers
- “Bangchak Invites Thais to Fight COVID-19 The Series” campaign
- “Bangchak Pun Gun Im” and “Bangchak Group Pun Gun Im” campaign
- Oxygen Tank campaign
- “Food Barrel” Campaign



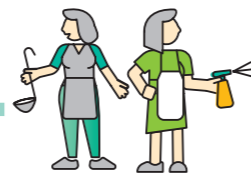
Medical Personnel

- Provide alcohol sanitizer, water, fuel cash cards, Inthanin beverages etc. to various hospitals and governmental agencies
- Provide space for a vaccination center and support the operations of vaccination center, proactive testing units, and community isolation centers.
- Support the operations of various hospitals such as by improving COVID-19 treatment facilities, providing medical equipment (ie. high flow oxygen tanks)



Employees

- Adopting Work from Home measures
- Proactive ATK screening before entering premises
- Ongoing employee care – providing masks, essential items care kit
- Procuring vaccines for employees and their families
- Securing treatment facilities if infected
- Providing a safe house for critical persons
- Hybrid Workplace (Bangchak Sandbox)
- Consistent communication
- Prioritizing safety management
- Issuing “Fit to Travel” documentation



Business Partners

- Special areas in service stations allocated restaurants affected by lockdown measures in commercial buildings
- Provide alcohol sanitizers to the media and various schools



Farmers

- Campaigns for salt and egg producers
- Buying mangosteen, longan, pineapple affected oversupply, presented to various agencies



Volunteers

- Provide fuel cash cards and Inthanin beverages
- Fuel for Care Campaign



Shareholders

- Organize meetings that socially-distanced, with a reduced number of participants
- Provide masks and sanitation alcohol



Neighboring Communities

- “Pun Gun Im” campaign for Phra Khanong–Bang Na area
- “Bangchak Dee Tor Jai” campaign for small business around the refinery
- Lunch Box Campaign
- Bangchak COVID-19 Survival Bag Campaign
- Employing members of the community and volunteers to sew cloth masks for the elderly
- Provide alcohol sanitizer, water, Andrographis paniculata, mask etc. to local communities
- Provide commuter transportation for monks and novices from Wat Dhammamongkol to and from the Chulabhorn Royal Academy vaccination center



2. Taking Care of the Society

Bangchak supports the Global Sustainable Development Goals (SDGs) by developing activities under the Bangchak WOW concept, promoting activities in 3 areas: Well Being Improvement, Oxygen Enhancement, and Water Management as follows:

- Bangchak invites Thais to fight COVID-19 – The Series

Last year, Bangchak adjusted its Corporate Social Responsibility to respond to the COVID-19 pandemic through a variety of activities to respond to different stakeholders, such activities that required cooperation from employees. By being open to listening to opinions and perspectives from employees to share ideas, submit information, and participate in projects that are beneficial to the wider society. Bangchak was able to hear about challenges and suffering of the Thai people from all channels. The Company then enacted plans to provide relieves in a timely manner under the name “Bangchak invites Thais to fight COVID-19 The Series” with project/activity forms and results as detailed below:

Projects	Activities	Outcome
1. Strengthening public health and proactive prevention in the community	1.1 Supported Biosafety Mobile Unit for proactive COVID-19 testing	1.1 Provided a biosafety sample collection vehicle – by KMITL GO FIGHT COVID-19 Innovation Center, KMITL Research and Design Center, in collaboration with Doctor Lab Panda – was the latest innovation and the first vehicle in Thailand that can test 3 cases at a time
	1.2 Provided equipment and supplies including drinking water, medical equipment, alcohol gel for field hospitals, waiting centers in communities in Khlong Toei, Phra Khanong, and Bangna	1.2 Provided medical equipment, alcohol gel for field hospitals, waiting centers, and more than 30 government agencies, worth more than 3 million baht
	1.3 Provided Bangchak Petrol Card to hospitals, field hospitals, waiting centers, temples, foundations, volunteer teams, etc.	1.3 Delivered to more than 100 agencies with a total value of more than 3,200,000 baht
	1.4 Supported the work of the Department of Thai Traditional and Alternative Medicine by utilizing 6 Bangchak gas stations as delivery points for andrographis paniculata extracts to COVID-19 patients in areas with a lot of non-severe cases and patients receiving treatment at home	1.4 Reduced delivery time of andrographis paniculata extracts from 3 days to 2 day for more than 600 patients in Khlong Toei, Bang Na, Phra Khanong, Rat Burana, Rama 2, Rama 3, Sathorn, Yannawa and Mueang Samut Prakan districts

Projects	Activities	Outcome
2. Stimulating the economy	<p>2.1 Pun Kan Im Project- Support small restaurant operators by purchasing food to support medical personnel, staff, volunteers, patients, including people in communities who were affected, the disabled, the socially disadvantaged and 27 construction workers camps</p> <p>2.2 Distributed and sold fleur de sel in Inthanin Coffee shops to help salt farmers in Samut Sakorn province who were impacted by factory closures and COVID-19 outbreaks which reduced the number of tourists resulting in oversupply and price drop</p> <p>2.3 Punsuk eggs – due to the oversupply of chicken eggs in the market Bangchak organized the campaign “Punsuk Eggs” to distribute at “4 corner” Bangchak service stations at a lower price than the cost to help with people’s daily expenses</p> <p>2.4 Pineapple Punsuk Supported by purchasing Phu Lae pineapples from farmers in Chiang Rai province who faced the problem of not be able to export their produce to provide COVID-19 patient with good source of vitamin C. The fruits were delivered to patients in hospitals, field hospitals, and in communities through the provincial public health office including inmates in prisons in 14 provinces in both the northern and central regions through 27 departments</p>	<p>2.1 Provided over 50,000 meals to more than 40 organizations and communities and generated over 2 million baht in income for over 200 small restaurants</p> <p>2.2 Distributed and sold over 100,000 packages of fleur de sel (over 5 ton), woth over 0.3 million baht thus, helping almost 100 family of salt farmers from 2 cooperatives</p> <p>2.3 Bought 8,000 cartons of eggs from farmers in Nakorn Pathom province to be sold at below cost to over 3,000 families in the Bangkok metropolitan area</p> <p>2.4 Donated 50 tons of Phu Lae pineapple worth 0.5 million baht to COVID-19 patients</p>

Projects	Activities	Outcome
<p>3 Helping society/alleviating suffering during quarantine</p>	<p>3.1 Delivered rice from the networked agricultural cooperatives to construction worker camps</p> <p>3.2 Delivered ready-to-eat meals to medical personnel, volunteers, patients, and people in communities that were impacted by the outbreaks including vulnerable groups such as disabled people and construction workers</p> <p>3.3 Delivered drinking water to field hospitals and hospitals in critical areas</p>	<p>3.1 Donated rice to 10 communities and construction workers camps over 10 places value more than 0.2 million baht</p> <p>3.2 Delivered over 50,000 meals, worth more than 2 million baht, to more than 40 agencies and communities and 27 construction worker camps throughout Bangkok metropolitan area and provinces with high cases</p> <p>3.3 Delivered over 152,000 bottled water worth over 0.46 million baht</p>
<p>4. Raising funds to support agencies/ temples/foundations/volunteer groups during crisis</p>	<p>4.1 Fuel Sharing Project X2 which raises funds from the public and the company will match the amount to support refueling cards for volunteer groups and various agencies to use in missions to pick-up and send COVID-19 patients to receive treatment or to return home. The project also included funds raised from Bangchak's executives</p>	<p>4.1 Raising funds from the public, employees and management to deliver fuel valued over 1.8 million baht to a network of over 60 volunteer organizations</p>



Support of the Sustainable Development Goals (SDGs)

In addition to mobilizing assistance to stakeholders in various forms, taking into account the maximum benefit that will occur, Bangchak also carries out its main mission to continuously respond to the goals and sustainability policies of the organization. The activities carried out in response to the SDGs are as follows:

SDG 13: Climate Action

In 2021, in addition to dealing with the COVID-19 outbreak, Bangchak also placed high emphasis on climate change (Climate Action) which is an increasingly important global environmental issue. Bangchak's actions to support climate change efforts are:

- **“Your Tree”** Project a mobile application that encourage consumers to use cleaner fuel to reduce emission from combustion process which is like planting a tree to capture carbon.
- **“Nam Man Rod Phoon”** (dust reduction fuel) project – during PM2.5 crisis, Bangchak produced low sulfur (10 ppm) diesel fuel to be sold in greater Bangkok Area to help reduce PM2.5. As emission from vehicle contribute to 51% of the PM2.5 in Bangkok, it is important that Bangchak act to be part of the solutions to this health crisis. Even though low sulfur diesel cost higher, Bangchak did not pass these costs on to the customers.
- **Environmental Seminar titled “Exponential Path to Net Zero”** under the Bangchak 100x approach: 100 ideas for a sustainable world. The seminar was held as Hybrid Conference, inviting interested parties to find answers and solutions on how we can reach net zero goal. Participants can update global trends and advanced technology from foreign experts who provide reflection of the preparations of countries, organizations and individuals following the 2021 United Nations Climate Change Conference (COP 26) of the United Nations in Scotland.
- **Project to develop Wet Forest area in Phu Long forest– the last remaining forest in Lamphao, Chaiyaphum province.** Although the project has been on-going for 16 years, dry conditions led to wildfires that damaged over 3,000 rai of the forest.

Bangchak's proposed solution is to grow 10 rai of wet forest to capture water based on Koh Nong Na model. Over 2,000 trees were planted and the area is monitor every 3 months. In 2021, due to the COVID-19 crisis monitoring efforts for the project was disrupted. However, survival rate for trees in the project is expected to be high because of water management system that uses banana trees for shade. In addition, there were no wildfires and the area experienced heavy rainfall.



SDG 12: Responsible Consumption and Production Bangchak continues to work to reduce the plastic waste in its business operations and to support SDG 12.4 that encourage businesses to manage and reduce waste into the environment and waterways. In order to reduce the impact on health and environmental problems, the company has adopted the innovation of bioplastic production and the circular economy approach to reduce the use of single-use plastic packaging and switch to packaging made from bioplastic. Key operations include:

- **“Reduce Waste with Bangchak”** Project – the Company has switched beverage cups and lids to bioplastics. In 2021, over 100 million plastic cups have been replaced by bioplastic.
- **“Kaew Phaw Kla” Project** – In 2021, Bangchak donated 500,000 Inthanin’s bio-cup glass to the Royal Forest Department to use for growing seedlings instead of plastic nursery bags
- **“Rak Pun Suk” project** – through our service stations Bangchak collected PET bottles to be recycled into fibers which can be used to produce products from recycled plastics. The project continues to send plastic bottles to the foundation throughout the year.

SDG 8: Decent Work and Economic Growth Helping to improve the well-being of Thai society is one of Bangchak’s core believes. Since the foundation of the company, Bangchak grew our business in tandem with society’s growth, the Company focuses on building economic strength to the communities and Thai farmers. Projects to support SDG 8 are:

- **Community Service Stations (COOP Service Station) Project** – The project is supported by Cooperative Promotion Department and agricultural cooperatives across the country. Agricultural cooperatives with their own service stations can help reduce the cost of fuel for COOP’s members. In addition, members also receive profit sharing in the form of dividends as well as member privileges. The project has improved the livelihood of over 1 million farmer families. Bangchak sets a target to add 10 COOP service stations annually. Bangchak also help COOP partners on the marketing and internal management tools to increase sale and operational effectiveness as well as improve the image of the service station. The COOP Turnpro project was established to improve business acumen of COOP management and agricultural cooperation.
- **Partnership School Project** – Bangchak, Agricultural Cooperative Project, and the Mechai Viravaidya Foundation have partnered with 5 schools in Khon Kaen, Lampang and Surin provinces to establish “Agricultural business in school”. The project teaches students to learn about agriculture management, saving and budgeting under the guidance of teachers. The project also lends money to families who wish to develop their own business. To date, 19 loans have been given and the fund has increase to over 850,000 baht from the 440,000 baht in the previous year.

SDG 4: Quality Education

- **“Pun Dek Jew Pen Dek Jaew”** (turn small children into exceptional children) Project promotes reading comprehension and writing through Happiness Sharing Foundation. There are 58 participating schools from 35 provinces with over 1,000 first grade students. In addition, the project has expanded to schools that have participated in past years. The project published 2 editions of textbooks to pilot the test material to over 800 first grade students. In addition, the project also develop an environmental project called “Rak Pun Sook Junior” to create awareness on waste management in accordance with circular economy principles. Additional information can be found in the 2021 Sustainability Report.



<https://www.bangchak.co.th/th/document/sustainability-report>

4. Management Discussion and Analysis: MD&A

Executive Summary

Summary of the company and its subsidiaries' operating for the 4th quarter and for the year 2021

Unit: THB Million	Q4/2021	Q3/2021	QoQ	Q4/2020	YoY	2021	2020	YoY
Total Revenue	66,762	47,649	40%	33,134	101%	199,417	136,450	46%
Accounting EBITDA	9,281	7,531	23%	2,750	237%	25,818	4,104	529%
<i>Refinery and Trading Business</i> ^{1/}	3,084	1,891	63%	600	414%	9,363	(2,169)	N/A
<i>Marketing Business</i> ^{2/}	255	562	-55%	602	-58%	2,614	2,174	20%
<i>Power Plant Business</i> ^{3/}	1,038	1,179	-12%	868	20%	4,193	3,640	15%
<i>Bio-Based Products Business</i> ^{4/}	255	890	-71%	590	-57%	1,863	1,828	2%
<i>Natural Resources Business</i> ^{5/}	4,832	3,112	55%	221	>1,000%	8,251	(1,004)	N/A
<i>Others</i>	(184)	(102)	-80%	(131)	-40%	(466)	(365)	-28%
Profit attributable to owners of the company	1,756	1,820	-4%	251	598%	7,624	(6,967)	N/A
Earnings (Loss) per share (Baht)	1.20	1.25		0.09		5.25	(5.50)	

Note: 1/ EBITDA from Refinery Business of the company, BCP Trading Pte. Ltd. and share of profit from associated companies

2/ EBITDA from Marketing Business of the company, Bangchak Green Net Co.,Ltd., Bangchak Retail Co., Ltd., and share of profit from associated companies

3/ EBITDA from Power Plant Business of BCPG Plc., its subsidiaries, and share of profit from associated companies

4/ EBITDA from Bio-Based Products Business of BBGI Plc., its subsidiaries, and share of profit from associated companies

5/ EBITDA from Natural Resources Business of OKEA ASA, BCP Innovation Pte. Ltd., and NIDO Petroleum Pty. Ltd.

Performance in 2021, amid the COVID-19 pandemic which exacerbated and prolonged throughout the year, Bangchak Corporation Plc. ("the company") and its subsidiaries were able to generate a record-breaking performance, with revenue from sales and rendering of service in the amount of THB 199,417 million (+46% YoY), with EBITDA of THB 25,818 million (+529% YoY), and **net profit attributable to owners of the parent at THB 7,624 million** (THB +14,591 million YoY) or **earning per share of THB 5.25**. The company group's performance was supported by significant rises in crude oil and refined products prices in the global market as a result of economic recovery and growth in oil demand following the progress of COVID-19 vaccination around the world which improved COVID-19 situations in many countries. In addition, tighter oil supply amid energy crisis, which pushed up natural gas and coal prices to an elevated level, have made many industrial and power plants switched fuel from natural gas or coal to oil. In 2021, average Dubai crude oil price was 69.39 \$/BBL, an increase of 27.11 \$/BBL compared to the previous year. The company group recorded inventory gain approximately of THB 6,700 million in this year. Although domestic oil demand has declined, Bangchak refinery continuously increase crude run to support the expansion of unconverted oil (UCO) for export market where production volume of UCO increased to 2 times compared to the previous year. In addition, crack spreads for most finished products increased resulting in higher Operating GRM. Moreover, the Natural Resources Business was positively impacted by the sharp increase in energy prices, especially natural gas price. Resulting in OKEA recording the highest revenue from oil and gas sales, where revenue in Q4/2021 was similar to the full year revenues for 2020. However, the company group changed its recording method of investment in OKEA from share of profit (loss) to consolidated method from 1st July 2021 onward which resulted in OKEA's EBITDA in consolidated financial statement approximately of THB 7,800 million. In addition to market-related factors that contributed

to improved performance from the previous year, the company group has also undertaken Business Process Redesign (BPR) to improve work processes to increase efficiency and reduce costs. There are ongoing projects and new development projects this year which increased EBITDA for the company group by more than THB 1,600 million.

The COVID-19 pandemic situation deteriorated due to the spread of the Delta variant which affected total sales volume of the Marketing Business to decline compare to the previous year. However, after the improvement in COVID-19 outbreak during Q4/2021, economic activities and domestic travel recovered. This led to sales through the retail market in December 2021 to reach an all-time high at 432 million liter per month, making it the first year where sales exceeded Bangchak's refining capacity. In addition, the Marketing Business continues to increase sales of lubricants, resulting in an increase in market share of domestic lubricant market to 9.9% from 9.4% in the previous year. Furthermore, Inthanin coffee business also recorded new high for the number of cups sold per day in December.

As for performance in Q4/2021, the company and its subsidiaries recorded revenue from sales and rendering of service in the amount of THB 66,762 million (+40% QoQ), with EBITDA of THB 9,281 million (+23% QoQ). This quarter the Refinery and Trading Business Group's performance increased from the increase in crack spreads of most finished products in line with global markets. As a result, Operating GRM for Q4/2021 was 6.79 \$/BBL, an increase of 3.72 \$/BBL from the previous quarter. In addition, the Natural Resources Business has a better performance from OKEA's increase in revenue due to higher crude oil and gas prices compare to last quarter. However, revenue from the Marketing Business declined from Q3/2021 due to the government's price control measures of retail domestic diesel to below 30 baht per liter, even though sales volume increased after the easing of COVID-19 outbreaks. For Bio-Based Product Business, excluding the effect of recording a gain from fair value adjustments of investments in Q3/2021, the performance remained close to the previous quarter. This quarter, the company group recorded **net profit attributable to owners of the parent THB 1,756 million** (-4% QoQ) or **earning per share of THB 1.20**. The company group's performance of each business group in 2021 are as follow:

The Refinery and Oil Trading Business performance increase THB 11,532 million from 2020, mainly from an Inventory Gain of THB 5,966 million in 2021 while there was an Inventory Loss in 2020. In addition, Operating GRM rose to 4.52 \$/BBL, mainly due to higher crack spreads of most finished products and crude premium declined. In 2021, Bangchak refinery continue to increase production capacity to support the expansion of UCO export which help to support GRM and reduce impacts from lower domestic demand. Due to the scheduled refinery maintenance in Q1/2021, the refinery average crude run was 99.0 KBD or 83% utilization rate where production of UCO increase to 2 times compared to the previous year. For the Oil Trading Business, BCPT recorded an increase in gross profit, mainly from transactions of low sulfur fuel oil and diesel products group due to increase in demand from global economic recovery and the easing of lockdown restrictions in many countries. In addition, the company group has expanded into fuel pipeline transportation and logistics businesses through Bangkok Fuel Pipeline and Logistics Company Limited ("BFPL"), a wholly-owned subsidiary of the company. BFPL granted the right to manage the fuel pipeline systems (Bangkok - Bang Pa-in) from Fuel Pipeline Transportation Limited ("FPT"), and will start an operation in 2022. The expansion into logistics business will create many opportunities with potential to not only reduce costs and losses from oil transportation

but also increase revenue as well as reduce carbon emissions from vehicular transport and road accidents, supporting Bangchak's sustainable growth in harmony with the environment and society.

The Marketing Business performance increase 20% from 2020, mainly due to Inventory Gain in 2021 as a result of oil price increase. While total sales volume declined 6% YoY from the impacts of worsening and prolonged COVID-19 outbreak compared to the previous year. In addition, tourism and airline industries have not recovered yet resulting in the continue decline in jet fuel sales. Moreover, net marketing margin per unit decreased 14% YoY due the increase in the cost of finished product, biodiesel (B100), and ethanol. In addition, during Q4/2021 the government implemented price control measures on retail diesel. As a result, the company was unable to adjust retail price in line with cost of finished products. The company's cumulative retail market share in 2021 was 16.2%, maintaining the 2nd place position in market share (data from the Department of Energy Business). At the end of 2021, Bangchak has 1,277 service stations. The company plans to develop service stations into "Your Greenovative Destination" that can fulfill customers' desires but still respond to changing lifestyles. The company developed "Bangchak Food Truck" business which is currently in its 9 service stations. In addition, Bangchak currently offers EV charging service in 70 service stations, covering 37 provinces across the country. The Marketing Business continues to focus on expanding non-oil business. There were 817 Inthanin Coffee branches and 15 DAKASI bubble tea branches at the end 2021. Due to the COVID-19 situation, Bangchak Retail Co.,Ltd ("BCR") continually promote inthanin's sales through online platforms which include 7 major online delivery players to be in line with changing consumer behavior. As a result, in 2021, BCR's revenue from Inthanin coffee shop increase 18% YoY, in line with the increase in number of cups sold per day of 20% YoY. While online sales increased to 3 times compared to the previous year. In addition, Inthanin Coffee received the Superbrands Award for the first time in 2021.

Power Plant Business performance increase 15% from 2020, due to the share of profit from the Geothermal Power Plant business in Indonesia of THB 577 million, an increase of THB 344 million, due to increased tariff rate and lower financial costs. In addition, performance from Solar Power Plant Projects in Japan increased due to the commencement of commercial operation of Chiba 1 Solar Power Plant (PPA 20 MW) in Q4/2021. Hydro Power Plant in Lao PDR recorded increased performance from higher rainfalls. While performance from Solar Power Plants in Thailand increased due to the recognition of full year performance from the 4 new Solar Power Plant projects (PPA 20 MW) and efficiency improvements of electricity generation. As a result, the Power Plant Business total electricity sales in 2021 increased 13% YoY. In 2021, BCPG expanded investment into utility-scale energy storage system or vanadium redox flow battery through the purchase of convertible bonds of VRB Energy Inc. The investment is in line with BCPG's strategy to become a leader in the renewable energy and large-scale energy storage business as well as to mitigate limitations from the fluctuation of electricity generation by renewables. Moreover, Impact Energy Asia Development Limited ("IEAD"), an associate company of BCPG, has signed a power purchase agreement with Vietnam Electricity with a contracted capacity of 600 MW at the Lao PDR-Vietnam border with a contract term of 25 years. In addition,

BCPG has successfully issued green bonds worth THB 12,000 million, which is the first financing through the bond market.

Bio-Based Product Business In 2021, the Business was impacted from COVID-19 outbreak with was worse and longer than the previous year. The **Biodiesel Business** recorded a decline in gross profit of 17% YoY even though average sale price for B100 product increased throughout the year but sales volume decreased due to COVID-19 outbreaks and lower blending mandate for B100 to control domestic retail diesel price. In addition, competition in the market was high. However, revenue from sales of refined glycerin increased which helped to lessen the aforementioned impacts. The **Ethanol Business** saw increased in average sale price of ethanol products in line with the price of main raw material; however, demand for ethanol declined. As a result, the Ethanol Business's gross profit declined 78% YoY. However, the Bio-Based Product Business recognized gains from fair value adjustment of investments in 2021, resulting in comparable performance from the previous year. The **High Value Products (HVP) Business**, BBGI has a strategic plan to integrally invest in the entire value chain from upstream to downstream. Currently, BBGI has a Memorandum of Understanding (MOU) with Bio-Om Co., Ltd, a biotechnology research and development company, to jointly develop high value bio-based enzyme and to co-develop the technology to commercial scale. In addition, BBGI has begun selling products under the "B Nature Plus" brand including ASTA-IMMU dietary supplement, ASTA-VIS dietary supplement, and pharmaceutical grade hand sanitizer. BBGI is preparing to raise funds through an initial public offering (IPO) totaling no more than 433.20 million shares at par value of 2.50 baht per share, representing no more than 30% of the number of all issued and sold ordinary shares. In late January 2022, the Securities and Exchange Commission (SEC) has started counting 1 on the application for an offer for sale of securities and a registration statement for the offer for sale of securities.

The Natural Resources Business saw its performance increase THB 9,254 million from 2020, mainly from the change recording of investment status in OKEA from investment in an associated company to subsidiary which resulted in the change in recording method of investment from share of profit (loss) to consolidated method from 1st July 2021 onward which resulted in a significant increase in Natural Resources Business Group's EBITDA. OKEA's operating results showed 241% YoY with record crude oil and gas sales revenues of THB 14,201 million, an increase of 158% YoY. The improved performance was mainly attributed to the significant increase in average selling price of crude oil and natural gas due to economic recovery in many countries around the world which pushed up demand for energy coupled with record high prices of coal and natural gas which caused the industrial sector and power plants to switch to using oil as fuel instead. The Yme field started production in October 2021 and it is expected that OKEA will have production capacity of 18,500 - 20,000 barrels per day in 2022. In addition, in January 2022, OKEA awarded 4 petroleum production licenses, three of which as operator. The awards strengthen OKEA's portfolio of near-field exploration opportunities around its Draugen and Gjøa production sites. In addition, the company saw an opportunity to enter the Liquefied Natural Gas (LNG) business by co-investing with Thai Special Gas Company Limited ("TSG"), a gas distributor for international standard industries and provider of a full range of gas equipment services, to establish

a joint venture company under the name BTSG Company Limited (“BTSG”) to engage in LNG procurement and distribution business.

The world has coped with COVID-19 pandemic for over 2 years with no sign of the crisis ending. As can be seen from new waves of outbreaks and new variant for each cycle. Toward the tail end of 2021, the Omicron variant unleashed another wave of outbreak which impacted global and Thai economy as well as daily lives that have to continue adjusting to the new normal to stay safe from infection. To bolster stakeholders’ confidence in the company ability to operate business amidst the pandemic, the company has prepared a risk management plan and conducted drills according to the Business Continuity Management (BCM) plan, as well as managed working capital to ensure sufficient capital for business operations and investment according to plan. In addition, the company group has given great importance to the safety and health of employees and their families as well as our customers and partners. As a result of the company group's effort in procuring COVID-19 vaccines, over 90% of employees have received 2 doses. The company aims to have high percentage of employees who have received 3rd dose rapidly. The company has also changed the working arrangement to be a hybrid workplace, where employees can work at home and in the office according to changing situations. At the office, the company established measures to control office density and spraying disinfectants at the office regularly. In addition, COVID-19 screening via Antigen Test Kit (ATK) check point is set up for Bangchak Group's employees on a weekly basis. Moreover, ATKs are provided for employees who work at Bangchak service stations and Inthanin coffee shops. This enable employees to regularly test for COVID-19 themselves to ensure safety and build confidence for customers who come to use our services

Statement of Income

Consolidated Statement of Income (THB Million)	Q4/2021	Q3/2021	QoQ	Q4/2020	YoY	2021	2020	YoY
Revenue from sale of goods and rendering of services	66,762	47,649	40%	33,134	101%	199,417	136,450	46%
Cost of sale of goods and rendering of services	(57,473)	(41,613)	38%	(30,741)	87%	(175,744)	(132,122)	33%
Gross Profit	9,289	6,036	54%	2,393	288%	23,673	4,328	447%
Other income	228	777	-71%	120	89%	1,279	533	140%
Selling and administrative expenses	(2,465)	(1,652)	49%	(2,180)	13%	(7,153)	(7,141)	0.2%
Exploration and Evaluation expenses	(344)	(133)	159%	-	N/A	(516)	-	N/A
Gain (Loss) from derivatives	133	(777)	N/A	165	N/A	(1,274)	17	N/A
Gain (Loss) on foreign exchange	(75)	103	N/A	140	N/A	251	732	N/A
Gain (loss) from fair value adjustment of investment	(4)	575	N/A	-	N/A	614	-	N/A
Gain (Loss) from sale of investment	(2)	122	N/A	-	N/A	120	-	N/A
Reversal of (loss) from impairment of assets	(1,757)	(13)	N/A	115	N/A	(1,358)	(2,375)	N/A
Profit (loss) from operating activities	5,003	5,037	-1%	752	565%	15,635	(3,907)	N/A
Finance costs	(809)	(748)	8%	(484)	67%	(2,540)	(1,969)	29%
Impairment gain and reversal of impairment loss (impairment loss) determined in accordance with TFRS 9	(29)	0.3	N/A	23	N/A	(30)	(891)	N/A
Share of profit (loss) of associates and joint ventures accounted for using equity method	159	177	N/A	264	N/A	1,042	(592)	N/A
Profit (loss) before tax	4,323	4,466	-3%	555	679%	14,108	(7,359)	N/A
Tax income (expense)	(1,756)	(1,904)	N/A	46	N/A	(4,263)	1,589	N/A
Profit (loss) for the period	2,567	2,562	0.2%	601	327%	9,845	(5,770)	N/A
Owners of parent	1,756	1,820	-4%	251	595%	7,624	(6,967)	N/A
Non-controlling interests	811	742		349		2,221	1,197	
Basic earnings (loss) per share (Baht)	1.20	1.25		0.09		5.25	(5.50)	

Performance in 2021, the company and its subsidiaries recorded a profit for the period THB 9,845 million, an increase of THB 15,615 million when compared with 2020, of which the net profit attributable to the owners of the parent was THB 7,624 million, or basic earning per shares of THB 5.25 mainly due to the following reasons:

- 1) The company group has changed the record of OKEA performance from share of profit (loss) to consolidated financial statement method since 1st July 2021. The difference of items in consolidated statement of income was significantly affected by the change as below.

Items in consolidated statement of income (THB Million)	Difference of consolidated statement of income (A)	OKEA's contribution (B)	% (B) / (A)
Revenue from sale of goods and rendering of services	62,967	10,068	16%
Cost of sale of goods and rendering of services	43,622	3,031	7%
Gross Profit	19,344	7,037	36%
Other income	746	203	27%
Selling and administrative expenses	12	308	>1,000%
Exploration and Evaluation expenses	516	477	92%
Impairment of assets	-1,017	1,402	138%
Finance costs	570	308	54%
Tax expense	5,852	3,171	54%

- 2) Revenue from sales and rendering services was THB 199,417 million, an increase of 46% YoY. OKEA's contribution to revenue increase was 16%. Excluding OKEA's revenue, the company group's revenue increased from petroleum related business. The company's revenue increased 32% YoY, from the rise in average selling price due to the increase in crude oil price in line with economic recovery and expansion of oil demand as COVID-19 vaccination progress globally. In addition, total sales volume for oil products increased 4% YoY, mainly attributed to export of low-sulfur fuel oil and UCO. Moreover, BCPT realized an increase in sales revenue with main factors being the rise in average selling price per unit and increase in sales volume of external customers outside the company group.
- 3) Gross profit was recorded at THB 23,673 million, an increase of 447% YoY, where an increase of 36% was contributed by OKEA. Excluding OKEA, the company group's gross profit increased from petroleum related business, mainly from the company group recorded Inventory Gain of THB 6,700 million in 2021 compared to Inventory Loss of THB 4,748 million in 2020. In addition, Operating GRM of Refinery Business was 4.52 \$/BBL, an increase of 1.31 \$/BBL from the previous year, due to the rise in crack spreads for most finished products as well as the decline in crude premium. While the Marketing Business saw its net marketing margin declined 14% YoY, due to the increase in finished product, biodiesel, and ethanol prices. In addition, the government issued price control measure for retail diesel as a result the company was unable to adjust retail prices in line with cost of finished products. This led net marketing margin per unit declined when compared to the previous year.
- 4) Other income was recorded at THB 1,279 million, an increase of 140% YoY. OKEA's contribution to the increase was 27%. The remaining amount mainly came from construction delay claim which received from contractor.
- 5) Selling and administrative expenses was recorded at THB 7,153 million, attributed to OKEA was THB 308 million. The rest of the company's group (excluding OKEA) decreased due to the Marketing Business Group changing of its convenience store business model. As a result, expenses are comparable to the previous year.
- 6) Exploration and Evaluation expenses was recorded at THB 516 million entirely from OKEA, while in 2020 was from NIDO.
- 7) Loss from derivatives was recorded at THB 1,274 million, mostly from recognized loss from crude and product oil price hedging contract as well as forward foreign exchange contract.
- 8) Gain from fair value adjustment of investment was recorded at THB 614 million, result from recognized profit from changing investment status from investment in associate to other investment.
- 9) Gain from sale of investment was recorded at THB 120 million from disposal of investment in BCPE.
- 10) Impairment of assets was recorded at THB 1,358 million, mainly from OKEA's asset impairment result from the transfer of ownership of Yme field's asset.

- 11) Finance costs was recorded at THB 2,540 million, an increase of 29% YoY, an increase attributed to OKEA of 54%. Where the rest was mainly attributed to the company's construction of the Efficiency, Energy, and Environment Enhancement Project (3E) which was completed this year. As a result, the transfer of finance costs to project costs were reduced. In addition, BCPG has expenses related to refinance.
- 12) Share of profit (loss) of associates and joint ventures accounted for using equity method was recorded at THB 1,042 million mainly from Star Energy Group Holdings Pte.Ltd. in amount of THB 577 million and OKEA in amount of THB 371 million (before change status to investment in subsidiaries)
- 13) Tax expense was recorded at THB 4,263 million, consist of current tax expense in amount of THB 2,807 million and deferred tax expense in amount of THB 1,456 million. An increase in effective tax rate from the prior year mostly came from OKEA's tax which has total tax rate 78%, with 22% corporate income tax and 56% petroleum tax.

Performance by Business Group

1) Refinery and Oil Trading Business Group

Crude Oil Price Situation

Crude Oil Price (\$/BBL)	Q4/2021			Q3/2021	QoQ	Q4/2020	YoY	2021	2020	YoY
	MAX	MIN	AVG	AVG	+/-	AVG	+/-			
Dubai (DB)	84.34	69.11	78.27	71.68	6.59	44.64	33.63	69.39	42.27	27.11
Dated Brent (DTD)	86.12	69.03	79.76	73.51	6.25	44.16	35.60	70.91	41.84	29.07
DTD - DB	1.77	(0.08)	1.49	1.83	-0.34	(0.48)	1.97	1.53	(0.44)	1.96

In Q4/2021, average Dubai crude price increased compared to Q3/2021 due to economic recovery and increase in global demand for oil following the progress of global COVID-19 vaccinations while supply increase from OPEC+ was limited after reaching the agreement to gradual increase and high oil demand during winter season at the end of the year. Moreover, the global energy shortage, especially in Europe and China have led to the increase in oil demand as power industry and heavy industries switched from high prices natural gas and coal to oil. In 2021, average Dubai crude price increased significantly compared to 2020. Price increase was driven by economic recovery and expansion in oil demand after progress of global COVID-19 vaccination leading to declining trends in number of new cases and loosening of lockdown measures in many countries around the world. While supply increase was limited from OPEC+ decision to slowly increase supply and production delay from producers as investments in transition to clean energy were disrupted. In addition, global energy shortage led to increase oil demand from fuel switching to oil for replacing natural gas and coal.

Average Dated Brent and Dubai spread (DTD - DB) in Q4/2021 declined when compared to Q3/2021, from the slowdown of European demand for Light crude due to the new wave of COVID-19 and resume lockdown measures in various countries. While Asian demand for Dubai crude was still strong. For the Dated Brent and Dubai spread (DTD - DB) average in 2021 increased when compared to 2020, from the recovery of Light crude demand after the easing of lockdown measures. Also, the improved COVID-19 situation, especially in the US and Europe after vaccines rollout which led to lower new cases, resulting in driving activity begin to return to normal.

Crack Spreads Situation

Crack Spreads (\$/BBL)	Q4/2021			Q3/2021	QoQ	Q4/2020	YoY	2021	2020	YoY
	MAX	MIN	AVG	AVG	+/-	AVG	+/-			
UNL95 - DB	23.25	9.68	15.44	11.76	3.68	4.11	11.33	11.11	4.43	6.68
IK - DB	12.32	5.59	10.21	5.40	4.80	2.42	7.79	5.86	2.54	3.32
GO - DB	13.20	7.71	11.45	5.44	6.01	3.69	7.76	6.73	6.14	0.59
FO - DB	1.00	(10.74)	(6.89)	(3.33)	-3.56	(0.57)	-6.32	(4.88)	(2.98)	-1.90

Gasoline and Dubai crack spread (UNL95 - DB) average in Q4/2021 increased when compared to Q3/2021. The increase was supported by strong rebound in demand for Asia after the easing of lockdowns amid tight supply due to lower export volumes from oil refineries in North Asia and China. For the gasoline and Dubai crack spread (UNL95 - DB) average in 2021 increased when compared to 2020 due to global demand recovery from loosening of

lockdowns after continuing decline in trends of COVID-19 new cases which led to recovery in driving activities. As for **Jet (Kerosene) - Dubai crack spread (IK - DB)** average in Q4/2021 increased when compared to Q3/2021 as result of high demand for kerosene for heating during the winter season in North Asia and Europe as well as global energy crisis which push up demand for oil as substitute for natural gas and coal. For the Jet (Kerosene) - Dubai crack spread (IK - DB) average in 2021 increased when compared to 2020 due to the recovery of jet fuel demand from resume commercial flights as COVID-19 situations improved. As for **Diesel and Dubai crack spread (GO - DB)** average in Q4/2021 was higher than Q3/2021 from the continued recovery of Asian demand due to loosening of travel restrictions. While regional supply remained tight due to lower export volume from China. Diesel and Dubai crack spread (GO - DB) average in 2021 increased when compared to 2020 as a result of soften lockdown measures and economic recovery. As for **Fuel oil and Dubai crack spread (FO - DB)** average in Q4/2021 declined when compared to Q3/2021, due to the decrease in demand for high sulfur fuel oil for power generation in the Middle East and South Asia after end of summer season in Q3/2021. Meanwhile, supply from refineries have increased due to the increase in demand for refined products to serve the market. In addition, sulfur removal unit of a Kuwait refinery experienced unplanned shutdown which increase the supply of high sulfur fuel oil in the export market. Fuel oil and Dubai crack spread (FO - DB) average in 2021 declined compared to 2020 due to the increase in heavy crude supply from OPEC after global demand recovery; thus, increasing the supply of fuel oil.

Refinery and Oil Trading Business Group Performance

	Q4/2021	Q3/2021	QoQ	Q2/2020	YoY	2021	2020	YoY
EBITDA (THB Million)	3,084	1,891	63%	600	414%	9,363	(2,169)	N/A
Average Crude Run (KBD)	112.2	111.4	1%	100.0	12%	99.0	97.2	2%
Utilization Rate (%)	94%	93%		83%		83%	81%	
Average FX (THB/USD)	33.55	33.09		30.78		32.16	31.46	
<i>(Unit: \$/BBL)</i>								
Operating GRM	6.79	3.07	3.72	3.74	3.05	4.52	3.20	1.31
Oil Hedging	(0.72)	(1.24)	0.52	(0.39)	-0.34	(0.69)	0.03	-0.72
Inventory Gain/ (Loss) ^{1/}	3.91	3.72	0.19	(0.03)	3.94	5.13	(3.91)	9.04
Total GRM	9.97	5.54	4.43	3.32	6.65	8.96	(0.68)	9.64
Total Sales Volume in each market category of the company ^{2/} (Million Liters)								
Marketing Business	1,379	1,052	31%	1,284	7%	4,854	5,140	-6%
Petroleum traders in accordance with section 7	211	212	-1%	161	31%	738	670	10%
Export	510	462	10%	206	147%	1,494	990	51%
Total Sales Volume	2,101	1,726	22%	1,651	27%	7,086	6,800	4%

Note: 1/ Inventory Gain/(Loss) in the table included (Reversal of) losses on inventories devaluation (NRV)

2/ Sales volume does not include oil swaps between major oil companies (petroleum traders in accordance with section 7) and sales of crude oil

Performance for Q4/2021, the Refinery and Oil Trading Business Group recorded EBITDA of THB 3,084 million, an increase of THB 1,193 million when compared to Q3/2021, with the following factors affecting performance as follow:

1. The Bangchak refinery's average production in Q4/2021 was 112.2 KBD or 94% utilization rate, which is slightly higher than the previous quarter, due to the recovery in domestic demand after improvements in COVID-19 situation led to the loosening of restrictions. This led to recovery of economy and increase in consumers' travels.

2. During this quarter, the refinery's Total Gross Refinery Margin (Total GRM) was recorded 9.97 \$/BBL, an increase of 4.43 \$/BBL when compared to the previous quarter, due to the following reasons:

- Operating GRM was recorded at 6.79 \$/BBL, an increase of 3.72 \$/BBL, due to the increase in crack spread of most products in line with global markets where demand was supported by the continued economic recovery in Asia after easing the lockdown measures. Especially, Diesel and Dubai crack spread (GO - DB) increased significantly which is the largest product yield of the Bangchak refinery.
- During this quarter, the refinery business recorded loss from crude and product oil price forward contract 0.72 \$/BBL. Whereas, the previous quarter recorded a loss of 1.24 \$/BBL
- This quarter the refinery business recorded Inventory gain of 3.91 \$/BBL or THB 1,355 million, an increase from Q3/2021 where inventory gain was 3.72 \$/BBL or THB 1,261 million. The gain is attributed to the continue increase in global crude oil price as a result of rise in demand after the increase coverage of COVID-19 vaccinations in many countries. Also, the global energy was shortage from switching fuel to oil for replacing natural gas and coal which pushed up the prices. Especially, in October where the price of Dubai crude reached the maximum of 84.34 \$/BBL, resulting in average Dubai crude price in October was 81.59 \$/BBL.

3. BCPT recorded total trade transactions of crude oil and finished product of 7.99 million barrels, an increase of 1.03 million barrels (+15%) compared to the previous quarter. Gain was mainly attributed to the increase in transactions of naphtha and low sulfur fuel oil products group. In addition, gross profit increased from the previous quarter, mainly from crude oil transactions. This was due to oil demand recovery in many countries as well as benefited from continued power industry and industrial fuel switching from high prices of natural gas and coal to oil. BCPT was able to expand its customer base to new countries such as the Oman and Gabon in accordance with BCPT strategic direction.

Performance for 2021, the Refinery and Oil Trading Business Group recorded EBITDA of THB 9,363 million, an increase of THB 11,532 million when compared to 2020, with the following factors affecting performance:

1. In 2021, Bangchak refinery's production rate continually increased to support the expansion of UCO export which helps to offset the decline in domestic oil consumption due to COVID-19 outbreaks. However, the refinery underwent annual turnaround maintenance during Q1/2021. These resulted Bangchak refinery's average production rate was 99.0 KBD or 83% utilization rate in 2021. However, average production rate increased 2% YoY.

2. Total Gross Refinery Margin was 8.96 \$/BBL increased 9.64 \$/BBL when compared to 2020, mainly due to the following reasons:

- Operating GRM was 4.52 \$/BBL, an increase of 1.31 \$/BBL, due to the increase in crack spread of most products, decline in crude premium, and the production yield of UCO increased to 2 times compared to 2020 for supporting refining margins.

- In 2021, the refinery recorded loss from crude and product oil price hedging contract 0.69 \$/BBL, whereas 2020 realized a gain of 0.03 \$/BBL
- The refinery business recorded an inventory gain of 5.13 \$/BBL or THB 5,966 million due to crude oil price increase throughout 2021 as a result of recovery in global demand after the progress of COVID-19 vaccination in many countries, while supply increase was limited. In 2020, the refinery business recorded an inventory loss of 3.91 \$/BBL or THB 4,379 million due to the crash in crude oil price from the first wave of COVID-19 and oil price war after the OPEC+ meeting in March 2020.

3. BCPT recorded a decline in trade transactions of crude oil and finished product by 2.41 million barrels (-8%) when compared to 2020, mainly from the decrease in crude oil transaction. This was due to Bangchak refinery's annual turnaround maintenance in Q1/2021 and the need to manage inventory's Bangchak to maintain at appropriate level. However, BCPT was able to increase gross profit, mainly from transactions of low sulfur fuel oil and diesel products group due to increase in demand from global economic recovery and the easing of lockdown restrictions in many countries. In addition, BCPT recognized other income from its trade collaboration with partners in Q4/2021. This year, BCPT continues to expand its trade transactions with partners to new countries such as the United Arab Emirates, Oman and Gabon, in accordance with BCPT strategic plan.

2) Marketing Business Group

Marketing Business Performance	Q4/2021	Q3/2021	QoQ	Q4/2020	YoY	2021	2020	YoY
EBITDA (THB Million)	255	562	-55%	602	-58%	2,614	2,174	20%
Net Marketing Margin (Baht / Liter)	0.54	0.73	-26%	0.77	-30%	0.72	0.84	-14%
Sales Volume (Million Liters)								
Retail	1,142	900	27%	1,101	4%	4,091	4,197	-3%
Industrial	237	153	55%	183	29%	762	943	-19%
Total	1,379	1,052	31%	1,284	7%	4,854	5,140	-6%
Sales volume in each product category (Million Liters)								
LPG	28	26	8%	35	-21%	97	138	-30%
Gasoline	4	3	59%	11	-60%	23	47	-52%
Gasohol	412	326	26%	415	-1%	1,474	1,603	-8%
Jet Fuel	60	33	85%	30	103%	163	266	-39%
Diesel	829	627	32%	746	11%	2,917	2,900	1%
Fuel Oil and Others	46	37	22%	47	-3%	180	186	-3%
Total	1,379	1,052	31%	1,284	7%	4,854	5,140	-6%

Note: Net Marketing Margin of Bangchak only (excluding Inventory Gain/(Loss) and NRV)

Performance for Q4/2021, the Marketing Business Group recorded EBITDA of THB 255 million, a decrease of THB 307 million compared to Q3/2021, with the following factors affecting performance:

1. Total sale volume of the Marketing Business Group increased 31% QoQ, attributed to the sold through retail channel and industrial channel increasing by 27% and 55% QoQ, respectively. This was due to improved COVID-19 outbreak situation after decline in number of COVID-19 cases compared to the previous quarter. As a result, the government announced the soften restrictions on control measures. Also, the government economic stimulus, the harvest crops and travel season helped to boost economic and consumers activities. Also, the continuous sales promotions have resulted in a record new high of retail sales in December 2021 of 432 million liters per month.

2. Net marketing margin per unit declined by 26% QoQ, due to the increase in the cost of finished product and biodiesel (B100) which rose in line with global energy demand. In addition, the government controlled the retail diesel price by limit the price to below 30 baht per liter and the marketing margin of diesel in order to alleviate cost of living for consumers. As a result, the company was unable to adjust retail price in line with cost of finished products that increase based on the global market, resulting in lower net marketing margin per unit, especially during October where marketing margin dropped significantly. However, due to the continual rise in oil prices, inventory gain for this quarter increased from previous quarter.

3. Bangchak's cumulative retail sales volume market share in 2021 was 16.2% (data from the Department of Energy Business). The company continues to expand the number of service stations to expand its geographic reach to customers and push up sales through service stations. This quarter, Bangchak opens 27 new service stations. At the end of Q4/2021, Bangchak has a total of 1,277 service stations. In addition, the company played its part to alleviate the PM2.5 problem by producing low Sulphur Euro 5 standard diesel to be sold in Bangchak service stations in Bangkok between 15th November 2021 to 28th February 2022. Moreover, Bangchak partners public and private sectors signed a memorandum of understanding for the operations of the digital fuel dispenser under the name "Krating" which is a platform to provide quality fuel to small communities, and access to other services in addition to fuel in the future, lifting the quality of life for local communities in all aspects.

4. Marketing Business Group continues to develop and expand its non-oil business, during the quarter 87 new Inthanin coffee shops were opened. As of the end of Q4/2021, the total number of Inthanin coffee shops was 817 branches. Also, there was 15 branches of DAKASI pearl milk tea operating in Bangchak service stations. The number of cups sold per day increased 10% QoQ as COVID-19 situation improved and many Inthanin coffee branches returned to normal operations. In addition, never stops creating new experiences to customers, Inthanin collaborated with Cha Tra Mue (Inthanin X Cha Tra Mue) to create new beverage menus in this quarter such as Dalgona Cocoa Rose Tea and Dalgona Rose Matcha. Inthanin coffee continually create storefront and online delivery platforms promotions to increase sales. The company also cooperated with other non-oil business partnerships to improve service stations for responding to consumers' demand as well as increase returns for business such as restaurant business, car care business and EV chargers.

5. Normally, during this quarter there is an increase in selling and administrative expenses from employee expense, service station maintenance costs, and marketing promotion, resulting in a decline in EBITDA compared to the previous quarter.

Performance for 2021, the Marketing Business Group recorded EBITDA of THB 2,614 million, an increase of THB 440 million compared to 2020, with factors affecting operations as follow:

1. Total sale volume of the Marketing Business Group decreased by 6% YoY where retail and industrial sales declined 3% and 19% YoY, respectively. Reduction in sale volume was a result of COVID-19 outbreak which started in April resulting in lower oil demand. Especially, during Q3/2021 where COVID-19 outbreaks situation deteriorate due to the spread of Delta variant which resulted in the government declaring highest lockdown measures for the maximum and strict controlled areas as well as asking for cooperation from both public and private sector to implement work from home; thus, reducing consumer travel and out-of-home activities. In addition, the aviation industry has not fully recovered due to COVID-19 outbreaks throughout the year which resulted in lower jet fuel sales compared to 2020.

2. Net marketing margin per unit declined 14% YoY, due the increase in the cost of finished product as global energy demand recovered. The prices of ethanol and biodiesel also rose. In addition, the government issued price control measure for retail diesel which experienced high impact during Q4/2021 as a result the company was unable to adjust retail price in line with cost of finished products. This led net marketing margin per unit declined when compared to the previous year. However, due to increase in oil price, resulted in recording inventory gain in this year while the company recorded inventory loss in 2020.

3. The company continues to implement its strategy to expand customer base and strive for increase sale per service station by expanding the number of service stations in high potential locations as well as plans to open more Unique Design Service Stations. There were 57 new service stations. At the end of 2021, Bangchak has 1,277 service station. The cumulative retail sales volume market share in 2021 was 16.2% whereas in 2020 was 15.6% (data from the Department of Energy Business). Under the concept of Greenovative Destination strategy, the company plans to develop service stations into destinations that can fulfill customers' desires but still respond to changing lifestyles. The company partnered with leading brands to develop "Bangchak Food Truck" business. In addition, lifestyle products have been introduced at service station in Grab & Go format. At the end of Q4/2021, the company opened food trucks in 9 service stations. In addition, there were 70 service stations with EV charging service in 37 provinces across the country. In 2021, Bangchak received the Superbrands Award for the 4th consecutive year for being the top 25 brands in Thailand, organized by Superbrands Thailand.

4. For non-oil business, in 2021 there were 170 new Inthanin coffee shops. As of the end of 2021, the total number of Inthanin coffee shop was 817 branches with 44 branches being the unique design. In addition, Bangchak Retail Company Limited ("BCR") continues to look for opportunities to diversity its beverage business line and create new partnerships to make Inthanin becomes more than coffee shop. The company acquired license for DAKASI bubble tea to expand DAKASI shops in service stations across the country. In 2021, there were 15 DAKASI branches. In addition, BCR partners with Thai Airways International Plc. to sell Puff & Pie products in Inthanin coffee shops. As a result, in 2021, BCR's revenue from Inthanin coffee shops increased 18% YoY, in line with the increase in number of

cups sold per day of 20% YoY. Additionally, Inthanin had record new high for the number of cups sold per day in December. Due to the COVID-19 situation, Inthanin Coffee Shop has continuously pushed sales through online platforms which include 7 major online delivery players to be in line with changing consumer behavior. As a result, online sales revenue increased to 3 times when compared to the previous year. Furthermore, Inthanin received the Superbrands Award for the first time in 2021.

3) Power Plant Business Group

Power Plant Business Performance (THB Million)	Q4/2021	Q3/2021	QoQ	Q4/2020	YoY	2021	2020	YoY
EBITDA	1,038	1,179	-12%	868	20%	4,193	3,640	15%
Revenue from sale and rendering of services	1,232	1,302	-5%	1,137	8%	4,669	4,231	10%
Share of profit (loss) from associated companies	152	150	1%	(25)	N/A	600	270	122%
Wind Power Plant	5	(5)	N/A	50	-89%	23	37	-38%
Geothermal Power Plant	147	156	-6%	(74)	N/A	577	233	148%
Electricity Sales (Million KWh)								
Solar Power Business - Thailand (171.8 MW)	80.09	75.30	6%	73.49	9%	317.03	290.46	9%
Wind Power Business - Thailand (9.0 MW)	3.31	3.95	-16%	3.41	-3%	13.39	11.66	15%
Solar Power Business - Japan (34.7 MW)	8.63	5.02	72%	4.22	104%	22.21	17.20	29%
Hydropower Business - Lao PDR (114.0 MW)	142.19	210.24	-32%	157.12	-10%	522.57	453.32	15%
Total Electricity Sales	234.22	294.52	-20%	238.25	-2%	875.21	772.64	13%

Performance for Q4/2021, the Power Plant Business Group recorded EBITDA of THB 1,038 million, a decrease of THB 140 million compared to Q3/2021, with the following factors affecting operations:

- Solar Power Plant projects in Thailand recorded an increase in total electricity sales by 6% QoQ, mainly due to seasonal factor as quarter 3 is low season for solar power plants in Thailand.
- Wind Power Plant project in Thailand, "Lom Ligor", recorded a decrease in total electricity sales by 16% QoQ, due to seasonal factors of wind power plants.
- Solar Power Plant projects in Japan recorded an increase in total electricity sales by 72% QoQ, due to the commencement of commercial operation of Chiba 1 Solar Power Plant (PPA 20 MW) in November 2021.
- Hydro Power Plant project in Lao PDR recorded a decrease in total electricity sales by 32% QoQ, due to seasonal factor as quarter 3 was high season for hydro power plant.
- Recorded shares of profit from investments in associated companies THB 152 million in line with last quarter, with details as follow:
 - Share of profit from the Wind Power Plant business in the Philippines was recorded at THB 5 million, an increase from the previous quarter by THB 11 million, due to high season of wind power plant in the Philippines.

- Share of profit from the Geothermal Power Plant business in Indonesia was recorded at THB 147 million, a decrease from the previous quarter of THB 9 million, due to higher operational expenses included depreciation expenses from the open of new production well in Q4/2021. Although, the electricity sales volumes increased compared to the previous quarter due to lower shutdown days.

Performance for 2021, the Power Plant Business Group recorded EBITDA of THB 4,193 million, an increase of THB 553 million compared to 2020, with the following factor affecting operations:

1. Solar Power Plant projects in Thailand recorded an increase in total electricity sales by 9% YoY, due to recorded full year revenue from the investment in the 4 new Solar Power Plant projects (PPA 20 MW) in August 2020 and the efficiency improvement program of solar power plants.

2. Wind Power Plant project in Thailand, the “Lom Ligor”, recorded an increase in total electricity sales by 15% YoY, mainly from increase in wind speeds at the projects compared to previous year.

3. Solar Power Plant projects in Japan recorded an increase in total electricity sales by 29% YoY, mainly from the commencement of commercial operation of Chiba 1 solar power plant project.

4. Hydro Power Plant projects in Lao PDR recorded an increase in total electricity sales by 15% YoY, due to the full year contribution of “Nam San 3B”, which has acquired since February 2020 and higher rainfall compared to previous year.

5. Recorded shares of profit from investments in associated companies THB 600 million, an increase of THB 330 million compared to last year, with details as follow:

- Share of profit from the Wind Power Plant business in the Philippines decreased by THB 14 million, due to the 5-years retroactive payment recorded in 2020 which resulted in higher profit sharing compared to this year. Although, in 2021 the electricity generation improved from the better wind speed at the project.
- Share of profit from the Geothermal Power Plant business in Indonesia increased by THB 344 million, due to the project received an increase in the tariff rate and lower financial costs.

4) Bio-Based Product Business Group

As for the performance of the Bio-Based Product Business Group in Q4/2021, EBITDA was recorded at THB 255 million, and for the entirety of 2021 recorded EBITDA of THB 1,863 million. Performance of each business unit are as follow:

Biodiesel Business

Biodiesel Business Performance	Q4/2021	Q3/2021	QoQ	Q4/2020	YoY	2021	2020	YoY
Revenue (THB Million)	2,701	1,999	35%	2,604	4%	9,482	8,143	16%
Gross Profit (THB Million)	298	178	68%	484	-38%	910	1,089	-17%
B100 Production Volume (Million Liters)	56.98	55.69	2%	71.74	-21%	238.60	258.02	-8%
B100 Sales Volume (Million Liters)	58.04	53.51	8%	73.74	-21%	239.14	268.08	-11%

Performance comparison between Q4/2021 and Q3/2021 are as follow:

1. Production of B100 was 56.98 million liters and sales of B100 was 58.04 million liters up 2% and 8% QoQ, respectively. This was due to the loosening of COVID-19 restrictions by the government as outbreak situations subsided as well as the measures to stimulate domestic travels, resulting in demand for biodiesel increase. Although, the Committee of Energy Policy Administration (CEPA) issued a resolution to reduce biodiesel blending mandates from 20% (B20), 10% (B10), and 7% (B7) to 6% (B6) during 11st - 31st October 2021 and adjusted the blending mandate to 7% (B7) during 1st December 2021 - 4th February 2022 to alleviate the impacts of global oil and B100 price increase on domestic diesel prices.

2. Sales revenue was THB 2,701 million, an increase of 35% QoQ. Growth mainly came from the increase in B100 average selling price compared to last quarter. This was in line with the increase in crude palm oil (CPO) price due to the reduced production level from Indonesia and Malaysia, the major producers of palm oil, which experienced labor shortages because of COVID-19. In addition, costs of palm oil production increase in tandem with the price of fertilizer, the main input. On the demand side, the economic recovery has increased demand for CPO and deplete domestic CPO stock. However, due to costs management during high CPO prices and the increase in B100 sales volume as well as increase in refined glycerin sales compared to last quarter, these have caused Biodiesel Business realized gross profit of THB 298 million, an increase of 68% QoQ.

Performance comparison between 2021 and 2020 are as follow:

1. Production of B100 was 238.60 million liters and sales of B100 was 239.14 million liters down 8% and 11% YoY, respectively. The COVID-19 pandemic from the Delta variant during 2021 which was more severed and prolonged than the previous year result in the highest cases and deaths. The government imposed the strict controlled to curb the outbreak, consumers' reduction in travel and outside activities to limit outbreaks and government's measure to control domestic retail diesel prices through the lowering of blending mandates have suppressed biodiesel demand compared to last year.

2. Sale revenue was THB 9,482 million, increasing 16% YoY mainly from the increase in average selling price of B100 compared to the previous year. In 2021, the average price for B100 (according to announcement made by the Department of Energy Business) 41.09 baht/liter, an increase of 29% YoY. This was due to the reduced production level from Malaysia and Indonesia, which are the major palm oil producers and labor shortages during COVID-19 outbreaks resulting in selling price of CPO increase compared to the previous year. Thus, Thailand's export of CPO increased result in domestic selling price of CPO increase. Although the sale volume of B100 was declined from the previous year together with higher competition; however, due to increase in sale of refined glycerin in 2021, resulting in gross profit of THB 910 million, a decline of 17% YoY.

Ethanol Business

Ethanol Business Performance	Q4/2021	Q3/2021	QoQ	Q4/2020	YoY	2021	2020	YoY
Revenue (THB Million)	1,299	1,158	12%	1,171	11%	4,611	4,428	4%
Gross Profit (Loss) (THB Million)	(67)	31	-314%	93	-172%	140	634	-78%
Ethanol Production Volume (Million Liters)	32.16	44.54	-28%	31.95	1%	174.54	178.85	-2%
Ethanol Sales Volume (Million Liters)	51.71	44.56	16%	49.22	5%	179.93	185.28	-3%

Performance comparison between Q4/2021 and Q3/2021 are as follow:

1. Production volume of Ethanol products was at 32.16 million liters, a decrease of 28% QoQ, due to the annual maintenance activities at KSL Green Innovation Public Company Limited ("KGI") in Amphoe Boploy, Kanchanaburi province and Amphoe Namphong, Khon Kaen province which continued from last quarter. Whereas, sales volume of Ethanol products was at 51.71 million liters, an increase of 16% QoQ, due to the improved prospects of COVID-19 outbreaks which lead to the loosening of government's restrictions and higher consumers activities including vehicles usage resulting in higher demand for ethanol in the production of gasohol.

2. Sales revenue was recorded at THB 1,299 million, an increase of 12% QoQ, mainly from higher sale volume compared to last quarter while sale price for ethanol decreased due to more intense competition in the industry. In addition, in Q4/2021 KGI incurred cost associated with planned annual maintenance which resulted in gross loss of THB 67 million, a decrease of 314% QoQ.

Performance comparison between 2021 and 2020 are as follow:

1. Production volume of Ethanol products was at 174.54 million liters, a decrease of 2% YoY, as the KGI plant in Amphoe Namphong underwent annual maintenance for a longer duration than the previous year. Sales volume of ethanol products was at 179.93 million liters, a decline of 3% YoY, mainly from the more severed and prolonged of COVID-19 pandemic from the Delta variant. The government imposed the strict controlled and the population cut down on travel and outside activities. Additionally, the industrial grade Ethanol, which to be used in the production of alcohol gel and disinfectant products, declined in sales volume. Due to the sales efforts, the sales volume of fuel grade Ethanol declined slightly.

2. Sales revenue was THB 4,611 million, an increase of 4% YoY, mainly from the increase in average selling price of ethanol products increasing in tandem with higher raw material cost. This was due to low production of sugar

cane because of drought in 2020. In addition, domestic cassava price also increased due to growth in export volume compared to last year. However, the decline in ethanol demand resulted in Ethanol Business to record a gross profit of THB 140 million, a decline of 78% YoY.

However, the Bio-Based Product Business Group's EBITDA in 2021 is on par with the previous year due to the recognized gains from fair value adjustment of investments.

Progress of High Value Product (HVP) Business in 2021

In 2021, BBGI began expanding the business from biofuel products to health-related high value bio-products with a strategic plan to invest in an integrated value chain from upstream to downstream. Currently, BBGI has a Memorandum of Understanding (MOU) with Bio-Om Co., Ltd., a biotechnology research and development company headed by researchers from Chulalongkorn University who have gone through incubation from CU Innovation Hub and the National Science and Technology Development Agency (NSTDA) to jointly develop high value bio-based enzyme that has the ability to destroy the chemical structure of pesticide residues in fruits and vegetables (insecticide detoxification) and develop the technology to commercial scale.

In addition, Win Ingredient Company Limited ("WIN"), a joint venture company between BBGI and Manus Bio Inc., has already selected distributors of sugar substitute sweeteners in 5 countries: Thailand, Malaysia, Vietnam, Indonesia, and the Philippines. BBGI has also begun commercial distributions in two formats. The distribution of Astaxanthin, a high valued bio-based product that contains high antioxidant and is found to have anti-aging and skin care properties on a Business-to-Business (B2B) format. The distribution on a Business-to-Customers (B2C) format under the brand "B Nature Plus", which include food supplement ASTA-IMMU - an antioxidant, skin care extracted from red algae (Astaxanthin), ASTA-VIS dietary supplement - a product that helps to nourish eyes extracted from red algae (Astaxanthin), Bilberry, Lutein and Fish Oil and GMP HACCP-certified pharmaceutical-grade hand sanitizer that is safe and fragrance-free. These products are distributed through Facebook: BNaturePlus, Line official: @BNaturePlus, Shopee: BBGI Official Store, and Lazada: BBGI Flagship Store.

5) Nature Resources Business Group

Natural Resources Business Group Performance	Q4/2021	Q3/2021	QoQ	Q4/2020	YoY	2021	2020	YoY
EBITDA (THB Million) ^{1/}	4,832	3,112	55%	221	>1000%	8,251	(1,004)	N/A
Share of profit (loss) OKEA (THB Million) ^{2/}	N/A	N/A	N/A	275	N/A	371	(914)	N/A
OKEA Performance								
EBITDA (THB Million)	4,827	3,005	61%	775	522%	9,850	2,890	241%
Revenue from crude oil and gas sales (THB Million)	6,247	3,822	63%	1,959	219%	14,201	5,511	158%
Production volume - Net to OKEA (KBD)	16.04	16.32	-2%	16.17	-1%	15.53	16.15	-4%
Sales volume - Net to OKEA (KBD)	18.10	16.98	7%	18.79	-4%	15.84	15.87	-0.2%
Realized liquids price (USD/BBL)	78.00	67.40	16%	39.00	100%	65.30	36.30	80%
Realized gas price (USD/MMBTU)	31.44	16.15	95%	5.38	484%	17.56	3.12	464%

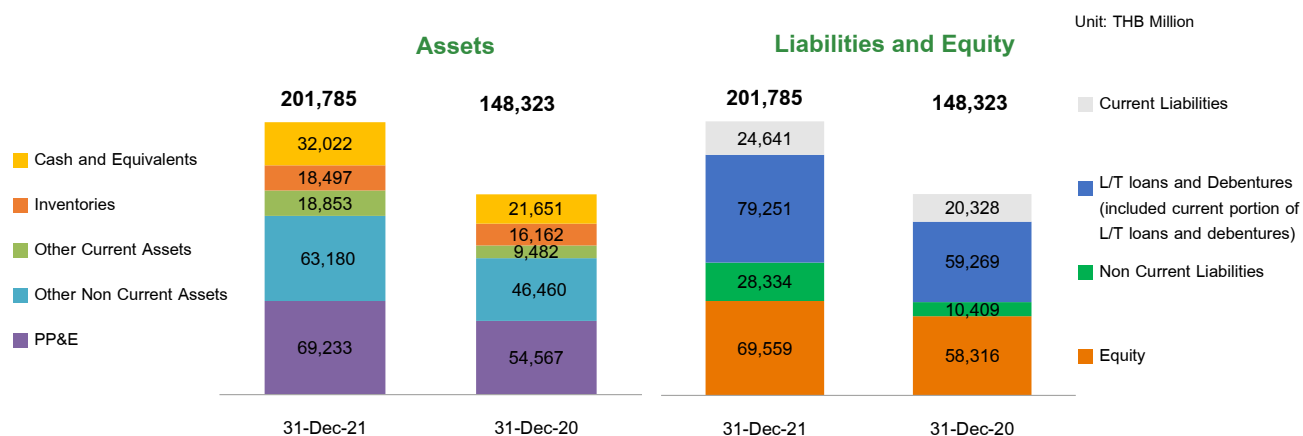
Note: 1/ Natural Resources Business Group changed the recording of OKEA's performance from share of profit (loss) to consolidated method since Q3/2021.

2/ Share of Profit from OKEA in 2021 recorded from share of profit between 1st January - 30th June 2021 (before changing the status of investment).

In Q4/2021, the Natural Resource Business Group recorded EBITDA of THB 4,832 million, an increase of THB 1,720 million compared to Q3/2021. This quarter OKEA's performance improved mainly due to the increase in average oil and natural gas prices from the continual increase in oil demand from global economic recovery after COVID-19 vaccination efforts in many countries have progressed well. Revenue from sales of crude oil and gas sales was THB 6,247 million, increase of 63% QoQ, where this quarter's revenue was the highest recorded and on par with the full year revenue in 2020. In addition, sales volume increased 7% QoQ mainly from the distribution of Ivar Aasen field and Yme field. Of which Yme field began production in October 2021.

In 2021, the Natural Resources Business Group recorded EBITDA of THB 8,251 million, an increase of THB 9,254 million when compared to 2020, mainly from the company group changed recording of investment status in OKEA from associated company to subsidiary which resulted in the change in recording of performance from share of profit (loss) to consolidated method since 1st July 2021. In addition, during Q3/2021 the company recorded gain from sales of investment in BCPE (net of exchange rate) of THB 120 million. As a result, the Natural Resources Business Group realized a significant increase in EBITDA. If consider the OKEA's full year performance, EBITDA increase 241% YoY, mainly from the significant rise in average price of oil and natural gas. Especially, natural gas price increased 464% YoY, due to high demand during the winter season in Europe and easing of lockdown measures in many countries. Whereas, Europe's gas reserve was low level.

Statement of Financial Position



The company group has changed record of OKEA performance from share of profit (loss) basis to consolidated financial statement basis since 1st July 2021. OKEA's financial statement has caused differences in consolidated financial statement of financial position as shown below.

Items in consolidated statement of financial position (THB Million)	Difference of consolidated statement of financial position as of 31 st December 2021 compared to 31 st December 2020		
	Total difference	OKEA's financial statement	The company group (Excluding OKEA)
Cash and Cash Equivalents	10,371	7,680	2,690
Inventories	2,335	954	1,380
Other Current Assets	9,371	5,073	4,298
Other Non-Current Assets	16,720	15,214	1,506
PP&E	14,666	17,690	(3,024)
Assets	53,463	46,611	6,851
Current Liabilities	4,313	6,591	(2,277)
L/T loans and Debentures (included current portion of L/T loans and debentures)	19,982	10,504	9,478
Non-Current Liabilities	17,925	23,079	(5,155)
Equity	11,243	6,437	4,806
Liabilities and Equity	53,463	46,611	6,851

Assets

As of the 31st December 2021, the company and its subsidiaries had Total Assets in the amount of THB 201,785 million, an increase of THB 53,463 million when compared to the 31st December 2020, changes in assets are as follow:

1. Cash and cash equivalents increased by THB 10,371 million, increased from OKEA's contribution was THB 7,680 million and the company group (excluding OKEA) by THB 2,690 million. Details are stated in Analysis of the Cash Flow Statement.

2. Inventories increased by THB 2,335 million, mainly from increased in the company group (excluding OKEA) was THB 1,380 million, which came from the increase in cost of oil inventory per unit in line with global oil prices. The rest of inventories rose of THB 954 million was contributed by OKEA.
3. Other current assets increased THB 9,371 million, increased from OKEA's contribution was THB 5,073 million which mainly from other current receivables. The rest of the increase in amount of THB 4,298 million mostly came from the company's trade account receivables due to the increase in export sales volume and average selling price of finished products, and BCPG's trade account receivable due to the longer duration of electricity payment period from The Electricite du Laos ("EDL"). However, BCPG closely monitored EDL debt collection and continues to receive payment.
4. Other non-current assets main items consist of investments, right of use assets, intangible assets and indemnification assets. Other non-current assets increased by THB 16,720 million, increased from OKEA's contribution was THB 15,214 million, which mainly from indemnification assets. These expenses related to close-down and removal of oil equipment for Draugen and Gjøa field, which could be collected from the seller. The rest of the increase was THB 1,506 million, mainly from
 - Other non-current financial assets rose by THB 2,851 million from increase in other investment (1) BBGI changing investment status from associate company to other investment in amount of THB 1,164 million. (2) BCPG's investment in VRB Energy Inc in amount of THB 775 million and (3) the company invested in FPT and BAFS in amount of THB 583 million.
 - Right-of-use assets increased by THB 1,656 million, mainly occur from BFPL granted the Right to Manage the Fuel Pipeline Systems (Bangkok - Bang Pa-in) from FPT.
 - Goodwill decreased by THB 1,004 million, result from the purchase price allocation (PPA) on the investment in OKEA due to the change of OKEA's investment status to subsidiary.
 - Deferred tax assets decreased by THB 855 million, majority from reversal of impairment in assets and investments.
 - Long term loan decreased by THB 855 million, from Lithium Americas Corp. ("LAC") repaying the long-term loan to BCPI.
5. Property, plant and equipment net increased by THB 14,666 million which rose from OKEA's contribution (including depreciation) in amount of THB 17,690 million and the rest of contribution decreased in amount of THB 3,024 million, mostly from the PPA on the investment in OKEA by THB 6,280 million. In addition, the depreciation of the company group for the period (excluding OKEA) was THB 4,474 million. While the company group invested in amount of THB 7,366 million which consist of (1) the company invested by THB 3,063 million, mainly from major turnaround and Efficiency, Energy, and Environment Enhancement Project (3E) (2) Power Plant Business invested in solar power business in Japan by THB 3,565 million and

(3) Bio-Based Product Business enhance the production capacity of the Ethanol plant and construct the power and steam generator plant by THB 574 million.

Liabilities

As of the 31st December 2021, the company and its subsidiaries had Total Liabilities THB 132,226 million, an increase of THB 42,220 million, changes in liabilities are as follow:

1. Current liabilities (exclude current portion of long-term loans and debentures) increased by THB 4,313 million. The increase was from OKEA's contribution by THB 6,591 million which mainly from trade and other current payables and current income tax payable. While the company group (excluding OKEA) decreased THB 2,277 million mainly from decreased in short-term loan from financial institutions of BCPG and BBGI.
2. Long-term loans and debentures (included current portion of long-term loans and debentures) increased by THB 19,982 million. OKEA's contribution to debentures increase was THB 10,504 million. The rest was from (1) issuance of debentures by THB 20,300 million which were the company by THB 7,000 million, BCPG by THB 12,000 million and BBGI by THB 1,300 million (2) loan drawdown increased by THB 3,352 million which mainly from BCPG. While there were loan repayment by THB 13,055 million and debenture repayment of the company by THB 2,500 million. Besides, the company group had the effects of foreign exchange rate led to the increase in liabilities value of THB 1,333 million.
3. Other non-current liabilities increased by THB 17,925 million. OKEA's contribution to the increase was THB 23,079 million, which was mainly from the provision for decommissioning cost. The rest decreased by THB 5,155 million from the PPA on the investment in OKEA, resulting in deferred tax liabilities decline of THB 4,887 million.

Equity

As of 31st December 2021, the company and its subsidiaries had Total Equity in the amount of THB 69,559 million, an increase of THB 11,243 million. Mainly from (1) the net profit for the period of THB 9,845 million (2) changes in ownership interests in subsidiary of THB 760 million (3) increased in other comprehensive income by THB 2,311 million, which mostly occurred from exchange rate differences on translating financial statements by THB 1,984 million due to the depreciation of THB against USD (4) share-based payment transactions by THB 1,476 million (5) dividend paid by THB 2,672 million and (6) coupon payment on perpetual subordinated debentures by THB 500 million. There was total equity attributable to owners of the parent was THB 53,467 million, and book value per share (exclude perpetual subordinated debentures) was THB 32.06.

As of 31st December 2021, the company and its subsidiaries had Cash and cash equivalents in the amount of THB 32,022 million, details are as follow:

Cash Flows (THB Million)	2021	2020
Net cash received from operating activities	16,980	6,340
Net cash used in investing activities	(5,840)	(6,353)
Net cash received (used in) financing activities	(1,019)	14,567
Effect of exchange rate changes on cash and cash equivalents	249	(178)
Net increase in cash and cash equivalents	10,371	14,375
Cash and cash equivalents as of 1 st January	21,651	7,276
Cash and cash equivalents as of 31st December	32,022	21,651

Details of each activity are as follows:

Net cash received from operating activities in the amount of THB 16,980 million which was derived from (1) profit for the period by THB 9,845 million (2) adjustments the gain transactions by THB 15,497, in which the main activities that affected an increase in cash flow were depreciation and amortization by THB 8,074 million, tax expense by THB 4,263 million, finance costs by THB 2,540 million, impairment loss on assets by THB 1,358 million and unrealized loss on foreign exchange by THB 640 million. Whereas, the main items that affected a decrease in cash flow were share of profit of associates and joint ventures by THB 1,042 million and gain from fair value adjustment of investment by THB 614 million (3) change in net operating assets and operating liabilities resulted in cash flow declining by THB 8,097 million, and (4) taxes paid by THB 265 million.

Net Cash used in investing activities of THB 5,840 million, mainly from cash paid for (1) property, plant and equipment in the amount of THB 7,972 million which details are aforementioned in assets section of financial position statement. (2) right-of-use assets of THB 2,198 million and (3) other investment of THB 1,708 million. Whereas, cash received from (1) acquisition of OKEA in amount of THB 5,011 million and (2) loans repayment of THB 1,024 million.

Net Cash used in financing activities of THB 1,019 million, mostly from cash paid for (1) repayment of long-term loans from financial institutions by THB 13,055 million (2) redemption of debentures by THB 3,323 million (3) short-term loans from financial institutions by THB 2,720 million (4) dividends by THB 2,672 million and (5) finance costs by THB 2,392 million. Whereas, cash received from (1) issuance of debentures by THB 20,284 million and (2) long-term loans by THB 3,352 million.

Financial Ratios

	Q4/2021	Q3/2021	Q4/2020	2021	2020
Profitability Ratios (%)					
Gross Profit Margin	13.91%	12.67%	7.22%	11.87%	3.17%
EBITDA Margin	13.90%	15.80%	8.30%	12.95%	3.01%
Net Profit Margin	3.84%	5.38%	1.81%	4.94%	-4.23%
Return on Equity ^{1/} (ROE)	15.27%	12.37%	-14.22%	15.27%	-14.22%
Efficiency Ratio (%)					
Return on Assets (ROA)	9.51%	7.43%	-3.90%	9.51%	-3.90%

1/ Profit and Total equity attributable to owners of the parent

	2021	2020
Liquidity Ratios (Times)		
Current Ratio	2.03	1.85
Quick Ratio	1.40	1.10
AR Turnover	26.29	18.33
Collection Period (Days)	14	20
AP Turnover	18.61	13.44
Payment Period (Days)	20	27
Leverage Ratios (Times)		
Debt to Equity	1.90	1.54
Interest bearing Debt to Equity	1.28	1.22
Net Interest-bearing Debt to Equity	0.81	0.85
Release of Debenture Ratio (Times)		
Net Debt to Equity	0.70	0.66

Financial Ratios Calculation

Profitability Ratios

- Gross Profit Margin (%) = $\frac{\text{Gross Profit}}{\text{Revenue from sale of goods and rendering of services}}$
- EBITDA Margin (%) = $\frac{\text{EBITDA}}{\text{Revenue from sale of goods and rendering of services}}$
- Net Profit Margin (%) = $\frac{\text{Profit attributable to owners of the parent}}{\text{Revenue from sale of goods and rendering of services}}$
- Return on Equity (%) = $\frac{\text{Profit attributable to owners of the parent (Yearly)}}{\text{Total Equity attributable to owners of the parent (Average)}}$

Efficiency Ratio (%)

- Return on Assets (%) = $\frac{\text{EBIT (Yearly)}}{\text{Total Asset (Average)}}$

Liquidity Ratios (Times)

- Current Ratio (Times) = $\frac{\text{Current Asset}}{\text{Current Liabilities}}$
- Quick Ratio (Times) = $\frac{(\text{Cash \& Equivalents} + \text{Short-term investments} + \text{Trade and other Account Receivable})}{\text{Current Liabilities}}$

- Accounts Receivable Turnover (Times) = $\frac{\text{Revenue from sale of goods and rendering of services}}{\text{Accounts receivable before doubtful debt (Average)}}$
- Collection Period (Days) = $365 / \text{Account Receivable Turnover}$
- Accounts Payable Turnover (Times) = $\frac{\text{Cost of sale of goods and rendering of services}}{\text{Accounts Payable (Average)}}$
- Payment Period (Days) = $365 / \text{Account Payable Turnover}$

Leverage Ratios (Times)

- Debt to Equity (Times) = $\frac{\text{Total Debt}}{\text{Equity}}$
- Interest Bearing Debt to Equity (Times) = $\frac{\text{Interest bearing Debt}}{\text{Total equity}}$
- Net Interest Bearing Debt to Equity (Times) = $\frac{(\text{Interest bearing Debt} - \text{Cash and cash equivalents} - \text{Short-term investments})}{\text{Total equity}}$

Issuance of Debenture Ratio (Times)

- Net Debt to Equity (Times) = $\frac{(\text{Interest bearing Debt} - \text{Cash and cash equivalents} - \text{Short-term investments})}{(\text{Total equity} - \text{Unrealized gain/loss from derivatives} - \text{Unrealized gain/loss on foreign exchange} - \text{Inventory gain/loss})}$

Note:

1/ Average Total Equity attributable to owners of the parent

- Yearly = $\frac{(\text{Total Equity attributable to owners of the parent of the year before} + \text{Total Equity attributable to owners of the company of this year})}{2}$
- Quarterly = $\frac{(\text{Total Equity attributable to owners of the parent of the quarter of the year before} + \text{Total Equity attributable to owners of the parent of the quarter this year})}{2}$

2/ Average Total Assets

- Yearly = $\frac{(\text{Total Assets of the year before} + \text{Total Assets of the company of this year})}{2}$
- Quarterly = $\frac{(\text{Total Assets of the quarter of the year before} + \text{Total Assets of the quarter this year})}{2}$

3/ The numerator of ROE is defined as the Profit attributable to owners of the parent and have to be annualized.

4/ The numerator of ROA is defined as EBIT and have to be annualized.

5/ Average Accounts Receivable before doubtful debt

- Yearly = $\frac{(\text{Accounts Receivable before doubtful debt of the year before} + \text{Accounts Receivable before doubtful debt of the company of this year})}{2}$
- Quarterly = $\frac{(\text{Accounts Receivable before doubtful debt of the quarter of the year before} + \text{Accounts Receivable before doubtful debt of the quarter this year})}{2}$

6/ Average Accounts payable

- Yearly = $\frac{(\text{Accounts payable of the year before} + \text{Accounts payable of the company of this year})}{2}$
- Quarterly = $\frac{(\text{Accounts payable of the quarter of the year before} + \text{Accounts payable of the quarter this year})}{2}$

7/ Interest Bearing Debt defined as Short-term loans + Long-term loans (including current portion of long-term loans) + Debentures (including current portion of long-term debentures) + Lease liabilities (including current portion of lease liabilities)

Sustainability Performance in 2021

The company has always placed importance on sustainability performance through management of environmental, social, and good governance and economic performance. To bolster confidence in the company's sustainability management, the company participates in the Stock Exchange of Thailand's (SET) Thailand Sustainability Investment (THSI) and the DJSI Corporate Sustainability Assessment (DJSI/CSA 2021) which assessed by S&P Global. In addition, the company was assessed by Morgan Stanley Capital International (MSCI) ESG Research Rating, an organization with expertise and credibility in ESG indices internationally. The assessment process is to measure a company's resilience to environmental, social and governance risk (ESG risk) relevant to their respective industries. Results from ESG assessments are as follow:

- **Stock Exchange of Thailand's Assessment**

- The company was selected to be included in the Thailand Sustainability Investment (THSI) for the 7th year in a row (2015 - 2021).

- **International ESG Assessments**

- Ranked in the Top 3 of S&P Global DJSI Corporate Sustainability Assessment (DJSI/CSA 2021), 85 Scores, in the category for Oil and Gas Refining and Marketing.
- Received AA Rating from MSCI ESG Ratings for the third consecutive year (2019 - 2021).

Three areas of focus for the company's ESG management are:

1) **Pandemic risk**

As the COVID-19 pandemic upend economic activities and livelihoods globally, new normal activities have emerged to control the spread of the virus. The company has assessed the impacts of the pandemic through multiple channels and have instituted measure to reduce risks as well as conducted Business Continuity Management (BCM). The company emphasizes on the health and safety of our employees, customers, and stakeholders. The company has conducted COVID-19 awareness activities, implemented social distancing measure between the refinery and head office at M Tower, established a safe house for essential employees during the peaks of the pandemic, and have implemented hybrid workplace to allow employees to work from home or from the office as condition changes. The company group's effort in procuring COVID-19 vaccines, over 90% of employees have received 2 doses. The company aims to have high percentage of employees who have received 3rd dose rapidly and continue to disinfect workspaces. In addition, COVID-19 screening via Antigen Test Kit (ATK) check point is set up for Bangchak Group's employees on a weekly basis. Moreover, ATKs are provided for employees who work at Bangchak service stations and Inthanin coffee shops. This enable employees to regularly test for COVID-19 themselves to ensure safety and build confidence for customers who come to use our services. Furthermore, the company places importance on being agile and adaptive to respond well to changing situation. In addition, the company has restructured its organization for sustainability and has managed the working capital to ensure sufficient funds for operations and investment plans.

2) **Implementation of the Personal Data Protection Act B.E. 2562 (2019)**

In accordance with the Personal Data Protection Act B.E. 2562 (2019) which was announced in the Government Gazette on 27th May 2019 and is currently postponed to take effect on 1st June 2022. To comply with the Act, the company has assessed measures to secure and protect personal data and has set up a committee to oversee and manage personal data. The committee is represented by members from relevant functions and work with leading consultancy to develop guidelines for protection and corrective actions in the events of data breach and misuse of personal information that can negatively impact the company.

3) Climate Change and the Environment

Climate change issues have always been top of mind for the company, the company strives to be part of the solutions to reduce energy consumption which is the main contributor of greenhouse gas emissions as follows:

3.1 Greenhouse Gas Accounting Management: the company joined “The Carbon Footprint for Organization” project and “Development of Economic Mechanisms for Carbon Price Determination and Investments to Reduce Greenhouse Gas Emissions” program organized by Thailand Greenhouse Gas Management Organization (“TGO”).

3.2 Greenhouse Gas Emission Reduction Targets: the company has set targets for Bangchak Group to become carbon neutral by 2030 and to become net zero greenhouse gas emissions by 2050

3.3 Plans to Achieve Targets: the company has developed business plan to ensure growth while reducing greenhouse gas emissions as follows:

- 3.3.1 Increase share of green business by continuing to increase share of investment in green businesses and promote carbon credit market. The company spearheaded Thailand’s network for carbon credit market through the establishment of Carbon Markets Club which Bangchak co-founded. In addition, the company has signed a memorandum of understanding (MOU) in the Thailand Synthetic Biology Consortium, which is the first network to promote and drive innovation and develop synthetic biology industry in Thailand.
- 3.3.2 Increase efficiency of the production process through the use of cleaner energy by using natural gas cogeneration power plant as the main source of energy in the refining process instead of fuel oil. The plant has increased refinery energy efficiency and decrease carbon emissions.
- 3.3.3 Produce high quality clean fuel to reduce pollution and PM 2.5 by developing diesel fuel that contain sulfur lower than 10 PPM, a five times lower Sulphur content. Reducing sulfur in fuel not only help to lower combustion particulate but also help to reduce sulfur dioxide. The low sulfur diesel fuel is sold in the Bangkok metropolitan area during high PM 2.5 season. The company also produced a high value niche product with low energy consumption.
- 3.3.4 Improve resources use through 3R strategy - Reduce, Reuse, and Recycle - and focusing on conducting environmentally-friendly and sustainable business such as setting up plastic bottles collection points in the service stations where collected plastic bottles are used to make social products and project to recycle engine oil containers to make recycled pellets to be use in the production of new engine oil containers in order to preserve value of resources, reduce waste generation, and promote the circular use to resources to generate the highest benefits to the environment, society, and communities.
- 3.3.5 Reduce plastic use in non-oil business such as using plastic sip cap to reduce the use of straws and switching to bio-degradable cups

Management Outlook towards the Business in 2022

Due to the new wave of COVID-19 which dragged on into 2022, and volatile global oil prices which are expected to affect the performance of some businesses within Bangchak Group, but overall performance is expected to improve compare to the previous year. Oil demand in Asia is expected to recover from COVID-19 vaccination and adjustment to the new normal which will drive economic growth. However, Bangchak Group has readied itself for the situations and has placed importance on having effective, agile, and adaptable work processes. **The Refinery and Oil Trading Business Group** plans to improve the Hydro Cracking Unit to increase the production capacity of unconverted oil (UCO) for use as a reactant in the production of lube base oil and to adjust the production process to obtain low aromatic solvent which is safer to users and more environmental-friendly. The improvements are part of Bangchak's transition toward becoming a Niche Product Refinery. In 2022, Bangchak plans to maintain crude run at 120 KBD supported by the capacity increase of Continuous Catalyst Regeneration Unit (CCR) and Hydro Cracking Unit after the project to increase Energy Efficiency and Environment (3E) completed in 2021. Bangkok Fuel Pipeline and Logistics Co., Ltd. ("BFPL") targets and plans to expand businesses to cover all aspects of transportation, not just transportation via pipelines, but include other mode of transportations to create synergy in all activities related to logistics operations which will increase effectiveness and improve flexibility to compete in fast-pace and dynamic situations. In addition, the company strives to improve its international oil trading business with BCP Trading Pte. Ltd. ("BCPT") strategic focus on expanding proportion of out-out trading (oil procurement and trading with entities outside of Bangchak Group) and continues to expand trading with new partners including new countries. **The Marketing Business Group's** goal is to maintain 2nd place in market share of oil distribution through service stations by creating the highest satisfaction for customers through continual improvement of service stations, service standards, and non-oil businesses that meet customers' needs; thus, making Bangchak service stations to be "Your Greenovative Destination" for customers. The Marketing Business Group also continues to expand non-oil and lubricants businesses. In addition, the company implemented digitalization of processes to improve customer experiences and increase operational efficiency. In 2022, the Marketing Business Group plans to add around 100 new service stations as well as develop the Inthanin coffee shop business under the concept of "every cup of yours for our world" and to develop non-beverage products with leading partners. Inthanin plans to have 1,000 branches in 2022. **The Power Plant Business Group** under BCPG Plc. ("BCPG") aims to become leader in the power production in the ASEAN with plans to expand business domestically and internationally. In 2021, the company issued THB 12,000 million of green bonds to support business expansion plans. **The Bio-Based Product Business Group** under BBGI Plc. ("BBGI") has expanded into the high value bio-based product business and began selling products under "B Nature Plus" brand including ASTA-IMMU dietary supplement, ASTA-VIS dietary supplement, and pharmacist-grade alcohol hand sanitizer. In addition, in late January 2022, the Securities and Exchange Commission (SEC) has started counting 1 on the application for an offer for sale of securities and a registration statement for the offer for sale of securities. Raising Funds from the initial public offering (IPO) will be used for business expansion as well as investment in future projects. In addition, BBGI is committed to becoming a leader in high value bio-based products that promote health through green innovation through investment in startups or leading businesses with knowledge of advanced biotechnology both domestically and internationally which corresponds to Thailand's Bio-Circular-Green Economy (BCG) model. **Natural Resource Business Group** remains committed to expanding its business, with OKEA continuing to seek investment opportunities in the petroleum exploration and production business through mergers and acquisitions (M&A). For lithium business, the company plans to trade lithium which has purchase agreement with Lithium Americas Corps along with seeks new opportunities in related-businesses such as battery to name a few. In addition, the liquefied natural gas (LNG) business of BTSG Co., Ltd. ("BTSG") plans to expand its domestic business to industrial customers

to meet the growing demand for LNG, a cleaner energy source, as well as the development of LNG projects for temperature control systems in commercial buildings such as department stores, universities, airports, and office buildings. **Bangchak Initiative and Innovation Center (BiiC)** plans to build innovative businesses within the company (internal startup) through the project to promote innovation within the organization. The internal startups will create opportunities for growth and increase revenue streams for the company, examples of projects include: a digital fuel dispensers under the name “Krating” which aims to bring innovation to communities located far away from service stations with plans to add financial services in the future. Moreover, building networks with external agencies from both the public and private sectors to support and drive innovation in the Synthetic Biology technology industry in line with the BCG (Bio-Circular-Green Economy) model that will enhance sustainable competitiveness. In addition, Bangchak plans to expand investment focus from mainly focusing on renewable energy into new areas such as hydrogen economy and carbon capture utilization and storage as well as expansion into bio-based and wellness and digital technology business in line with the company’s policy.

Research, Development, and Innovation

This year the R&D group installed and commissioned a prototype plant to make high-value products derived from microalgae and test the efficiency of high-value substances derived from the plant. In addition, it engages in academic cooperation and project development with research institutions and universities, including the National Nanotechnology Center (NANOTEC), Thailand Institute of Scientific and Technological Research (TISTR), Thailand Science Research and Innovation (TSRI), Chulalongkorn University, and the Asian Institute of Technology (AIT).

In 2021, the Company has expenditures for research and development of technology and innovations as follows. Construction and commissioning of a prototype astaxanthin plant and product efficiency testing Baht 7.4 million and Production of prototype bioplastics and plant-based protein substitute Baht 2.7 million.

5. General Information and Other Key Information

5.1 General information

Bangchak Corporation Public Company Limited

Registration No.

0107536000269

Registered capital (as of December 31, 2021)

1,376,923,157 Baht, of which Baht 1,376,923,157 was paid up, dividing into 1,376,923,157 shares, at 1 Baht per share.

Company establishment – Commercial operation

November 8, 1984 – April 1, 1985

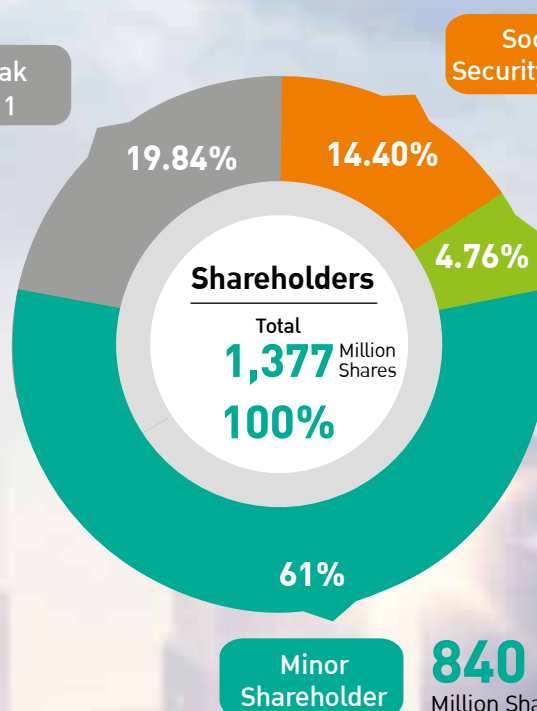
Nature of business

Oil Refinery and Trading Business, Marketing Business, Green Power Business, Bio-based Products Business, Natural Resource Business and Business Development



273
Million Shares

Vayupak
Fund 1



Social
Security Office

198
Million Shares

Ministry
of Finance

66
Million Shares

Minor
Shareholder

840
Million Shares

Contact

- Internal Audit Department
Tel. 0 2335 4566
Email: ico@bangchak.co.th
- Investor Relations Division
Tel. 0 2335 8663 Fax 0 2335 8000
Email: ir@bangchak.co.th

- The Secretary to the Board of the Directors
Division
Tel. 0 2335 4050 Fax 0 2016 3982
Email: bcpsecretary@bangchak.co.th
- Company Website
www.bangchak.co.th



Office and Terminals

Northern Region Business Office

87/9 Starwork Building, 3rd Floor,
Thung Hotel Road, Tambon Wat Ket,
Amphoe Muang, Chiang Mai 50000
Tel. 053 300 484
Fax 053 300 485

Phichit Oil Terminal

99/8 Moo 9 Tambon Banna,
Amphoe Wachirabarami,
Phichit 66140
Tel. 0 2335 8728
Email: bphcenter@bangchak.co.th

Samut Sakhon Oil Distribution Center

100/149 Moo 1, Tambon Tha Chin,
Amphoe Muang, Samut Sakhon 74000
Tel. 034 820 519-20

Southern Region Business Office

126/70, Moo 6, Bypass Road, Tambon
Makham Tia, Amphoe Muang,
Surat Thani 84000
Tel. 077 224 792
Fax 077 224 793

Surat Thani

Oil Distribution Center

104/1 Moo 2, Surat-Pak Nam Road,
Tambon Bang Kung,
Amphoe Muang, Surat Thani 84000
Tel. 077 275 056-8

Song Kla Oil Distribution Center

3/26 Moo 6, Tambon Sa Ting Mor,
Amphoe Singha Nakorn, Song Kla 90280
Tel. 074 332 782
Fax 074 332 783

Rayong Oil Distribution Center

1, 3B Road, Tambon Map Ta Phut,
Amphoe Muang, Rayong 21150
Tel. 038 609 389
Fax 038 609 413

Northeastern Region Business Office

499 Moo 12, Mitraphab Road, Tambon
Muang Kao, Amphoe Muang, Khon Kaen
40000
Tel. 043 261 751-2
Fax 043 261 790

Sri Racha

Oil Distribution Center

115/14 Moo 10, Tambon
Thung Sukhla, Amphoe
Si Racha, Chon Buri 20230
Tel. 038 493 179
Fax 038 493 129

Central Region Business Office and Bang Pa-In Terminal

99 Moo 9, Tambon Bang Krasan,
Amphoe Bang Pa-in, Ayutthaya 13160
Tel. 035 350 289, 035 350 292
Fax (Central Region Business Office)
035 350 290
Tel. (Bang Pa-In Terminal) 035 276 999

Head Office

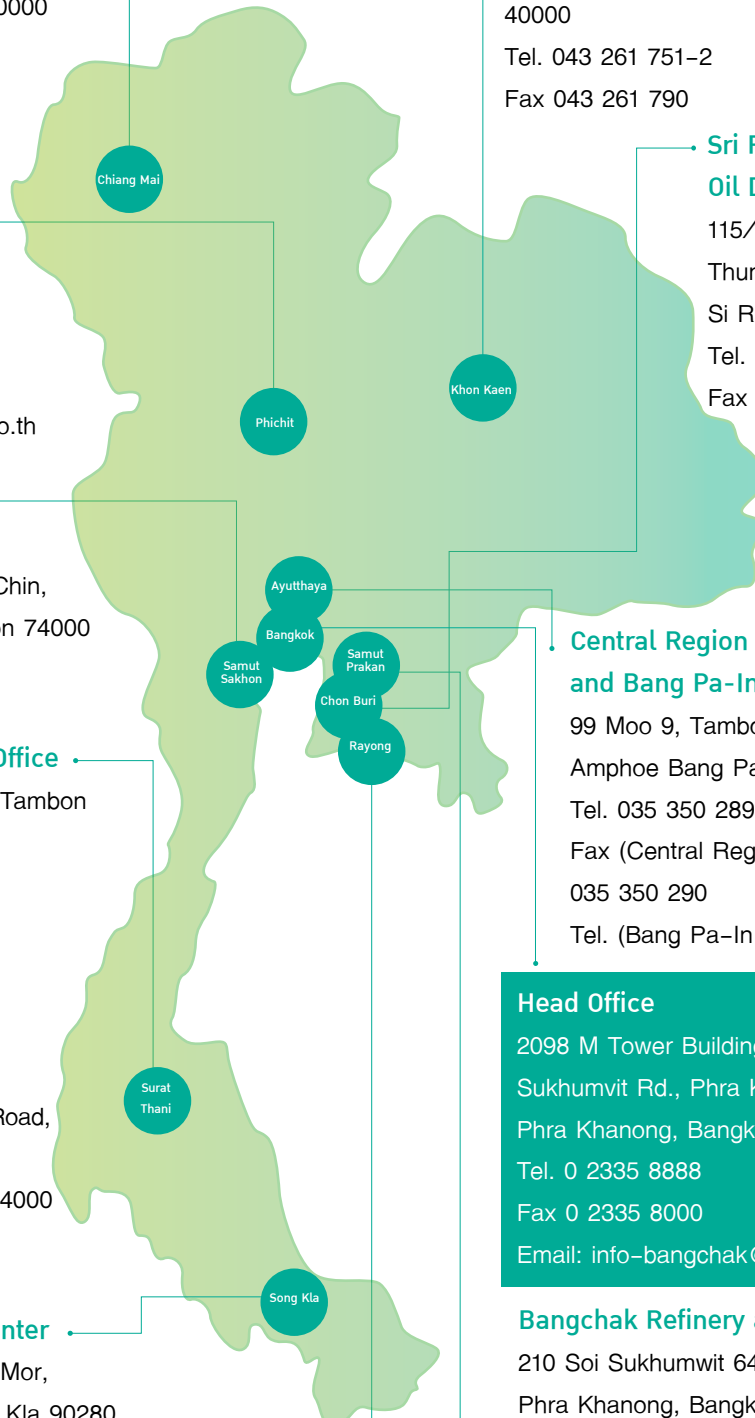
2098 M Tower Building, 8th Floor
Sukhumvit Rd., Phra Khanong Tai,
Phra Khanong, Bangkok 10260
Tel. 0 2335 8888
Fax 0 2335 8000
Email: info-bangchak@bangchak.co.th

Bangchak Refinery and Terminal

210 Soi Sukhumvit 64, Phra Khanong Tai,
Phra Khanong, Bangkok 10260
Tel. 0 2335 4999
Fax 0 2335 4009

Suksawat Lubricant Oil Distribution Center

196 Moo 1, Suksawat Road, Tambon Pak Khlong Bang Pla
Kot, Amphoe Phra Samut Chedi, Samut Prakan 10290
Tel. 0 2815 6997-8



Subsidiaries

- **BCPG Public Company Limited**
2098 M Tower Building, 12th Floor, Sukhumvit Rd.,
Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 0 2335 8999
Fax 0 2335 8900
Email: info@bcpgroup.com
Website: <http://www.bcpgroup.com>
- **BBGi Public Company Limited**
2098 M Tower Building, 5th Floor, Sukhumvit Rd.,
Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 0 2335 8899
Fax 0 2335 8800
Email: info@bbgigroup.com
Website: <http://www.bbgigroup.com>
- **Bangchak Retail Co., Ltd.**
2098 M Tower Building, 17th Floor, Sukhumvit Rd.,
Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 0 2335 8400
Fax 0 2016 3963
- **Bangchak Green Net Co., Ltd.**
2098 M Tower Building, 17th Floor, Sukhumvit Rd.,
Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 0 2335 8400
Fax 0 2016 3963
- **BCPR Co., Ltd.**
2098 M Tower Building, 8th Floor, Sukhumvit Rd.,
Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 0 2335 8654
- **BCV Bio Based Co., Ltd.**
BCV Innovation Co., Ltd.
BCV Energy Co., Ltd.
BTSG Co., Ltd.
2098 M Tower Building, 20th Floor, Sukhumvit Rd.,
Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 0 2335 4999
Fax 0 2335 4572
- **Winnonie Co., Ltd.**
2098 M Tower Building, 8th Floor, Sukhumvit Rd.,
Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 0 2335 4007
Fax 0 2335 8000
- **General Energy Manning Co., Ltd.**
2098 M Tower Building, 1st Floor, Sukhumvit Rd., Phra
Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 0 2335 8888
- **Bangkok Fuel Pipeline and Logistics Co., Ltd.**
99 Moo 9, Bang Krasan, Bang Pa-in District,
Phra Nakhon Si Ayutthaya Province
Tel. 0 2335 4038
- **BCP Innovation Pte. Ltd.**
BCPR Pte. Ltd.
8 Marina Boulevard # 05-02, Marina Bay Financial
Centre, Singapore 018981
- **BCP Trading Pte. Ltd.**
160 Robinson Road #25-03, Spore Business
Federation CTR, Singapore 068914

Others

- **Bangchak Initiative Innovation Center (Biic)**
2098 M Tower Building, 5th Floor, Sukhumvit Rd.,
Phra Khanong Tai, Phra Khanong, Bangkok 10260
Email: biic@bangchak.co.th
- **Happiness Sharing Foundation**
2098 M Tower Building, 18th Floor, Sukhumvit Rd.,
Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 0 2335 4608
Fax 0 2016 3969
- **Oam Suk Social Enterprise Co., Ltd.**
2098 M Tower Building, 18th Floor, Sukhumvit Rd.,
Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 0 2335 4600
Fax 0 2016 3969

5.2 Other key information

Reference Persons

Securities Registrar

Thailand Securities Depository Co., Ltd.

93 Ratchadaphisek Road, Dindaeng,
Bangkok 10400 Thailand
Tel. 0 2009 9000
Fax 0 2009 9991

Auditor

KPMG Phoomchai Audit Limited

48th – 51st Floors, Empire Tower
195 South Sathorn Road, Yannawa, Sathorn,
Bangkok 10120 Thailand
Tel. 0 2677 2000
Fax 0 2677 2222

Legal Counsel

Baker & Mckenzie Ltd.

25th Floor, Abdulrahim Place
990 Rama IV Road, Silom, Bangrak, Bangkok 10500 Thailand
Tel. 0 2636 2000
Fax 0 2636 2111

LS Horizon Limited

14th Floor, GPF Witthayu Tower, A 93/1 Wireless Road, Lumpini,
Phatumwan, Bangkok 10330 Thailand
Tel. 0 2627 3443
Fax 0 2627 3250

Chandler MHM Law Officers Limited

20 Bubhajit Building, 7th-9th Floor, North Sathorn Road, Silom,
Bangrak, Bangkok 10500 Thailand
Tel. 0 2266 6485
Fax. 0 2266 6483

Others

- Investor support service
- Reporting share certificates losses
- Change of investor's information

Issuer Support Unit**Thailand Securities Depository Co., Ltd.**

93 Ratchadaphisek Road, Din Daeng
Bangkok 10400 Thailand
Tel. 0 2009 9000
Fax 0 2009 9991

5.3 Legal Disputes

Bangchak is a party to a lawsuit involving an ongoing legal dispute that may render a significant effect on Bangchak's business operation and arose outside the ordinary course of business. Details of the case as at December 31, 2021, were as follows:

1. A lawsuit was filed against Bangchak as the first defendant with another company as the second defendant for breaching a distributor agreement for lubricants. The plaintiff demanded Baht 45.64 million as the amount of claim in that case. Another case was later filed against Bangchak by the same plaintiff for breach of contract and damage resulting from its suspension of lubricant distribution, where the amount of claim was set at Baht 688.28 million. On March 23, 2017, both cases were dismissed by judgement of the Civil Court, whose decision was then appealed by the plaintiff. Then on June 6, 2018, the Court of Appeals overturned the judgement of the Civil Court in both cases and ordered that Bangchak pay a total of Baht 1.2 million to the plaintiff, and that Bangchak pay the fees for both courts for the claimant, a decision that prompted both parties to file additional petitions to the Supreme Court. On February 2, 2021, the Supreme Court dismissed both cases as well as all fees for the three courts. In short, the case has reached its final conclusion without Bangchak having to make any payment under the claimant's suit.
2. One company ("debtor company") incurred an outstanding aviation fuel payment to Bangchak and later filed a petition for business reorganization, approved by the Central Bankruptcy Court on September 14, 2020, directing it to reorganize its business and appoint a planner. On October 8, 2020, Bangchak filed an application for receipt of payment to the official receiver in the amount of USD 31,707,494.94. Later, the receivership officer ordered that Bangchak receive USD 29,710,516.39 along with interest payment of 7.5 percent per year on the USD 29,086,460.59 principal from the date the court issued business rehabilitation to the end of payment. The planner submitted such plan to the receivership officer and held a creditors' meeting, which endorsed the plan on May 19, 2021. Under the plan, Bangchak belonged to the creditor group entitled to the principal repayment without interest for a series of eight consecutive payments (the debtor makes two repayments per year). The first such payment would begin in the second half of 2024. Then on June 15, 2021, the Central Bankruptcy Court issued its endorsement of the debtor company's business rehabilitation plan.
3. On July 30, 2021, a Bangchak subsidiary was the party to a dispute with a claimant company, which filed the dispute to the Thai Arbitration Institute, Arbitrator Bureau, Office of the Judiciary, accusing the subsidiary of breaching a glycerin refinery construction contract and demanding compensation worth Baht 121,183,444.65. The subsidiary, in return, filed an objection and petitioned for compensation worth Baht 232,147,449.35 from the claimant. The case is currently under the Thai Arbitration Institute's deliberation. The subsidiary confirmed its honoring of all contract terms.

5.4 Contact financial institution

**Debenture Registrar and Payment Agent
(for BCP224A, BCP273A, and BCP303A)**

Bangkok Bank Public Company Limited

333 Silom Road, Silom, Bangrak, Bangkok 10500 Thailand
Tel. 0 2230 1478
Fax 0 2626 4545-6
Website: www.bangkokbank.com

**Debenture Registrar, Payment Agent,
and Debenture Holders' Representative
(for BCP19PA))**

Krung Thai Bank Public Company Limited

Capital Market Services Department
977/2 SM Tower, 3rd Floor, Phahonyothin Rd,
Samsen Nai, Phaya Thai, Bangkok 10400 Thailand
Tel. 0 2298 0835
Website: www.ktb.co.th

**Debenture Registrar and Payment Agent
(for BCP244A)**

Bank of Ayudhya Public Company Limited

1222 Rama III Road, Bang Phongphang, Yan Nawa,
Bangkok 10120 Thailand
Tel. 0 2296 5715
Fax 0 2683 1298
Website: www.krungsri.com

**Debenture Registrar, Payment Agent
and Debenture Holders' Representative
(for BCP225A BCP238A BCP258A BCP275A
BCP28DA BCP305A BCP23NA BCP26NA
BCP29NA and BCP31NA)**

Bank of Ayudhya Public Company Limited

1222 Rama III Road, Bang Phongphang, Yan Nawa,
Bangkok 10120 Thailand
Tel. 0 2296 5715
Fax 0 2683 1298
Website: www.krungsri.com

Part 2 Corporate Governance

6. Corporate Governance Policy

6.1 Overview of Corporate Governance Policy and Practices

Bangchak Corporation Plc. has instituted its corporate governance policy in writing since 2003 as a result of a workshop engaging all employees where everyone played a part in contributing ideas for the Company's practical guidelines. To date, the Company has focused on cultivating an understanding of good corporate governance as well as awareness of how to apply such principles in their daily life. This has turned into a company culture. The Company has constantly evolved its corporate governance practices by way of studying domestic and international governing guidelines for such practices. The Board has decided to annually revise its policy.

6 Key Principles of Corporate Governance

Accountability

Action or decision-making undertaken with care and prudence supported by bona fide rationale as adequate, marked by responsibility for its consequences.



Responsibility

Full commitment and dedication to one's responsibility in Bangchak's best interests. This responsibility includes recognition of one's duty to always learn and enhance one's competency.

Transparency

Commitment to business conduct with integrity, auditability, and transparency, with valid references.

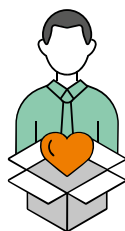
Equitable Treatment

Treatment of others fairly and righteously, without discrimination.



Ethics

Moral behavior founded on conscience and propriety and meant to create virtue and ultimately form Bangchak's employee culture of "To be virtuous, knowledgeable, and contributive to society".



Vision to Create Long-term Value

Business execution to enable Bangchak to supplement value to stakeholders and lead it toward inclusive and sustainable growth, including avoidance of any action undermining such value.

6.1.1 Policies and guidelines on the Board of Directors

As corporate leaders and ultimately responsible parties, the Board of Directors not only plays a key role in ensuring sound long-term business performance and credibility among shareholders and stakeholders in Bangchak's best interests, but also forges sustainable business values. Working independently of the management, the Board of Directors is to perform its duties with responsibility, care, and integrity, while complying with the law, Company objectives and regulations, its own article of association, and those of the shareholders' meetings. Bangchak has set policies and guidelines for the Board of Directors as follows:

• Composition and appointment

- The Board of Directors is composed of a minimum of 5 and a maximum of 15 members. At least a half of the Board must be residents in Thailand. Each director must be qualified by the law and Company regulations without sexual discrimination.
- The Board consists of at least one-third being Independent directors.
- The Board consists of directors who are knowledgeable, skillful, and experienced in the oil business, retail sales business, energy business, other related businesses (like petroleum exploration and production, power generation, and alternative energy), international business, accounting and finance, internal control, law, organizational development and innovation in information and digital technology, social / environmental / safety matters, and risk and crisis management. At least one of them must be adequately knowledgeable or experienced in accounting and finance. At least one non-executive director must possess experience in the core business or industry operated by Bangchak.
- The Chairman of the Board should be an Independent Director and must not be the same person as the President and Chief Executive Officer. Additionally, the Chairman must not hold any position in the appointed Sub-committee (sometimes called Committee) in view of clear-cut responsibilities and duties. If the Chairman is not an Independent Director, the number of Independent Directors must exceed half of the Board; alternatively, an Independent Director must be appointed to jointly decide the Board agenda.
- Each newly elected Director must attend an orientation course to ensure appreciation of objectives, main goals, vision, missions, corporate values, business

characteristics and approach, applicable regulations, corporate governance policy, and other essential information for efficient performance.

- Attend at least one training course organized by Thai Institute of Directors Association (IOD), such as Director Accreditation Program (DAP) or Director Certification Program (DCP) or equivalent, to increase expertise at work.

• Independent Directors

There is a need to ensure that independent directors are critical to good governance, looking after the interests of Bangchak and its shareholders by imposing checks and balances on Board decision-making and commanding awareness of their duties with due regard for righteousness and free views from any party's influence. The Board therefore devised definitions and qualifications of independent directors in the corporate governance policy, with stricter shareholding requirements than those of SEC and SET, that is, 0.5% against the legal maximum of 1% of the total eligible voting shares of Bangchak, its parent company, subsidiaries, associates, major shareholder or controller, and independent directors' related parties.



• Policy on Director Nomination

To nominate Directors, the Company focuses on people with knowledge, capability, experience, sound career profile, leadership, vision, morality, ethics and good attitude toward the organization, who can dedicate adequate time for the Company's benefit. Moreover, consideration was also given to Board diversity and Board skill matrix in order to nominate the directors' qualifications by considering skills which have been missing and also appropriate qualifications in compliance with the structure of Directors and in line with the Company's strategic directions. Bangchak will also use Director Pool from the Thai Institute of Directors (IOD) to nominate directors through transparent procedures to bolster the confidence of shareholders.



• Policy on Board Diversity

Nomination of directors takes into account diversity in several aspects, including educational background, career experience, skills, and expertise without any regard for gender, age, nationality, origin, religious belief, or other differences.

• Board Meetings

– The Board schedules its meetings at least once a month (every third Thursday) and as deemed necessary. The meeting schedule and agendas are agreed in advance for the year. The invitation letters accompanied by relevant documents are sent to the directors at least seven days in advance of each meeting.

- Meetings among the non-management directors and the independent directors at least twice a year, these preceded the Board meetings. The intention is to freely discuss general issues on management or corporate governance, with subsequent notification to the President and chief executive officer so that the management may take actions on such issues.
- Each Board meeting should be attended by at least three-quarters of all directors. Additionally, at least three-fourths of all board members are needed to vote on an issue.
- Each year, directors should attend no less than 75% of all Board meetings. (Directors should attend the meeting at least 9 of 12 times a year)

• Terms of Directorship

In every Annual General Meeting (AGM), one-third of the Directors must retire; moreover, if this number is not a multiple of three, then the number nearest to one-third. The directors who have completed their terms may be re-appointed. The appropriate term for directorship is no more than three consecutive terms (from 2008 onward) except for when a director is deemed suitable to hold the position for a longer period. The Board will consider the independence and effectiveness of the director who is under consideration and defend their decision to the shareholders. Independent directors do not hold their positions for more than three consecutive terms from the date of the first appointment of their independent directorship. The Board will consider their reappointment based on reason and necessity and will consider them non-independent directors.

• Board Assessments

The Board of Directors set an evaluation form for the Board's performance at least once a year. The Board conduct the evaluation in three forms, namely individual evaluation (self-evaluation), individual evaluation (cross-evaluation) and group evaluation, for the Board's review of performance outcomes and problems for performance development.

- **Board Remuneration**

Decision on Directors’ compensation (monthly & meeting fees and bonuses) aligns with Bangchak’s long-term strategies and goals. Such compensation is comparable to industry practices, experience, accountability and responsibility, and expected benefits from each Director that has assumed additional duties and responsibilities. The remuneration is enough to attract qualified directors who can complete their duties to achieve a desirable goal and direction for the Company. The remuneration process is transparent and creates shareholders’ confidence.

- **The Board’s terms on the succession planning and development of executives**

Ensuring a succession plan for the positions of the President and Chief Executive Officer and senior management, the Board requires annual reporting on compliance with this plan as a minimum. On the recruitment policy for the President and Chief Executive Officer, for optimal purposes, qualified outsiders or senior executive vice presidents upward may enter the selection

process. The Board also assigned the Nomination and Remuneration Committee to review the criteria and procedure for recruitment, development, and assessment of the President and Chief Executive Officer, including the criteria and compensation structure for the position.

- **Oversight of subsidiaries, associates, and joint-venture companies**

Bangchak runs its businesses through subsidiaries, associates, and joint-venture companies, as detailed under “Shareholding Structure”. The Board commands a mechanism for supervising the management and the responsibility of subsidiaries, associates, and joint-venture companies to safeguard the interests of Bangchak’s investment capital.

- **The sub-committees**

The Board appoints four committees to consider significant matters, consist of the Audit Committee, Nominating and Remuneration Committee, Enterprise-wide Risk Management Committee, and Corporate Governance Committee.

6.1.2 Policies and practices related to shareholders and stakeholders

- **Rights and Equitability of Shareholders**

1



Rights of shareholders

The shareholders are entitled to Bangchak’s ownership by exercising their rights to appoint directors to perform on their behalf and the rights to make decisions on key changes. The Board recognizes and values such rights by promoting such exercise and refraining from violating or depriving their rights.

2



Equitable Treatment of Shareholder

All shareholders are entitled to receive fair treatment. The Board is to ensure such fair treatment and safeguard their fundamental rights.

• **The Company’s Role toward Stakeholders**

Bangchak is committed to looking after stakeholders, whose rights are provided by applicable laws. The Board establishes a process promoting cooperation between Bangchak and stakeholders in creating wealth, financial security, and business sustainability. The Board recognizes and values the rights of stakeholders as defined by laws, human rights and fair labor treatment to ensure that the stakeholders’ rights are protected and well-treated. It also establishes suitable communication channels for all stakeholders and whistleblowing channels for employees and other stakeholders so that stakeholders may more efficiently participate in maintaining Bangchak’s interests as follows:



• **Disclosure of Information and Transparency**

Bangchak discloses key information, whether financial or non-financial, in an accurate through readily accessible channels that are equitable and credible. This policy on disclosure of information forms part of the Company’s good corporate governance policy. The Company is committed to the fair disclosure of information to the shareholders, financial institutions, securities companies, investors, those needing financial information, and the general public. It highly values communication practices that are open, complete, accurate, timely, and regular for past information and future value addition without bias against positive or negative information. The Company recognizes the need to maintain sensitive information for critical business information and operating strategies. This policy aligns with the SET and SEC criteria and terms for information disclosure.

• **Safety, Health, Environment, and Energy**

Bangchak values the stewardship of safety, occupational health, the environment, and energy to ensure that all activities fall under an international-standard management system that does not harm the environment, society, and communities. The Company is committed to raising its management excellence by

the approach of the Thailand Quality Awards, which values social responsibility; protection of health, safety and the environment; and business conduct and employees. In addition, the Company values resource conservation, which encompasses all activities, products and services—all with key business roles; loss prevention; and compliance with the law and public regulations. Viewing these regulations as opportunities for improvement over and beyond what need to be complied with, the Company devises the SHEE policy, and all executives and rank-and-file employees—including all contractors working on behalf of the Company—are held directly responsible.

• **Risk management, Internal control, and internal audit**

Bangchak has established risk management and internal control systems to enable business to achieve its objectives, while complying with related laws and regulations and lowering corruption-related risks. An internal audit system is in place to ensure achievement of Bangchak’s goals.

• **Anti-Corruption**

Bangchak has defined business ethics against corruption in every form and integrated the ethics in the corporate governance policy. Also, it has waged a campaign to

stress anti-corruption within the Company. At the same time, Bangchak has integrated the anti-corruption policy into its corporate governance policy to reiterate its intention to operate business by abiding by the law and regulations relevant to corporate governance, refusing all forms of fraud and covering all businesses in all applicable countries and agencies. It has defined anti-corruption measures to implement the policy and has regularly reviewed them to comply with changes

in laws and business circumstances and uphold Bangchak's reputation by ensuring that directors, executives, and employees implement them. The relevant implementing measures apply to all subsidiaries, associates, and other companies that the Company has control over, as well as its business agents. Bangchak became one of the first 22 companies to gain membership certification for CAC (Thai Private Sector Collective Action Coalition against Corruption).

6.2 Code of Conducts

Bangchak commands a written code of conduct as part of the Corporate Governance Policy, regarded as its definition of business standard and personnel behavior together with governance of its key corporate culture. The code of conduct states guidelines for good practices reflecting awareness of responsibility and work ethics, which are linked to and support Bangchak's vision, objectives, goals, and strategies. As role models and CG leaders, the Board ensures that management commands tools for establishing and driving a corporate culture firmly underlined by ethics and a code of conduct in all work processes. Bangchak's Code of Conduct consists of:

6.2.1 Code of Conduct for Business

- **Respect for the law and human rights principles**

In all its operations worldwide, Bangchak values and is committed to compliance with the law. Employees strictly honor laws, customs, traditions, and culture of each locality. In addition, they honor human rights principles under international laws and standards.

- **Anti-corruption of all forms**

Conduct business with a commitment to opposing corruption of all forms. Institute a risk management process and scrutiny to prevent and suppress corruption and malfeasance. Support the establishment of a company culture where people are firmly committed to integrity and ethics.

- **Moral and ethical behavior at every organization level**

Morality and ethics are important elements of good corporate governance principles. It is the work ethics at every level of the organization.

- **Responsibility to society and stakeholders**

In conducting its business, Bangchak shows due regard for duties and responsibility in line with society, the environment, and the good of all. It is committed to treating all stakeholders—shareholders, employees, customers, business partners, competitors, the public sector, and neighbors around the refinery—in line with their respective needs.

- **Strive for excellence**

Bangchak is committed to upgrading its standards for management excellence under the Thailand Quality Award criteria by promoting, for optimal outcomes, its business and employees' best performance with propriety and transparency. Also, it constantly drives curiosity and innovation.

- **Transparency and disclosure of information**

Management, financial records and financial reports are properly handled to comply with laws and regulations and meet international standards. Accurate, clear and timely information is disclosed to ensure confidence of investors, shareholders and related lenders.

6.2.2 Employee Code of Conduct

• Conduct and behavior among employees

Carry out all duties with integrity, attentiveness, and seriousness to foster quality, and efficiency. Strictly comply with relevant laws, rules, regulations, goals, and plans under the approved budget. Also, refrain from engaging in any business or investment that could potentially compete so with the Company.

• Treatment of colleagues

Respect others' rights and refrain from slandering others. Jointly forge and maintain unity among the workforce.

• Executives' duties

Executives serve as director of other companies or any other position in a business organization must have a prior approval. In addition to, executives wishing to engage in the trading of Company securities must notify Secretary to the Board of Directors Division at least one day in advance for the quarterly reporting to the Audit Committee's meeting and refrain from securities trading at least one month before the announcement of the Company's financial statements and at least three days after such announcement.

• Acceptance or giving of gifts

Refrain from requesting, accepting or agreeing to accept, undue extra benefits or improper payment with customers, business partners, contractors, agents, and sellers of products and services to the Company, or from any parties engaging in businesses with it.

• Entertainment, gifts, and other expenses

Employees must not accept or sponsor entertainment and other expenses beyond necessary extents, or those unsuitable for public officials or those engaging in business with Bangchak. Employees must never accept gifts or other tokens of any value.

• Preparation of financial reports and financial statements

Accounting entries and preparation of financial reports and financial statements must reflect actual transactions under generally accepted accounting principles. Disclosure of information must be accurate, clear, and updated so that relevant parties may examine it.

• Maintaining the Company's reputation

Refrain from any act that could potentially harm the Company's reputation or pose problems for it and uphold their own dignity in society.

• Stewardship of properties

Make the best use of Company properties, jointly care for them against defects and losses, and refrain from using them for other businesses. as well as respect others' property.

• Respect for intellectual properties

Maintain and safeguard Bangchak's intellectual property rights, while respecting and maintaining others' intellectual property rights.

• Use of information technology (IT)

Strictly comply with applicable laws governing and guidelines for Bangchak's IT applications and include IT as part of the strategies and operation.

• Use of inside information

Maintain and ensure that information recipients maintain confidentiality and market-sensitive information through suitable access methods and keep it from other employees or unrelated parties. Also, Employees must not use inside information and information regarded as Bangchak's or affiliates' confidential information for or the benefit of oneself or others wrongfully.

• Conflicts of interest

Refrain from any act posing conflicts of interest with the Company, that is, any act potentially depriving the Company of its fair interests, or from sharing benefits with the Company.



6.2.3 Procurement Code of Conduct

- **Acceptance of gifts, tokens, entertainment, and preferential treatment**

Employees must never accept gifts or other tokens of any value and must avoid getting excessively friendly with one particular supplier or vendor that others could mistake for bias and therefore avoid bidding against those preferred.

- **Injustice arising from procurement and hiring processes**

Procurement should not be based on the specifications of any particular product or deliberately biased toward such products unless adequately justified and necessary.

- **Conduct toward suppliers or vendors**

The relationship between buyers and sellers should bolster mutual confidence through goodwill and justice, with continuous treatment toward each other.

- **Purchasing priority**

Locally available products must receive first priority. In addition to supporting domestic industries, buying such products is less costly. Unless absolutely necessary, the Company shall buy products available from the Company and its affiliates and available in the market, except when those items are unavailable.

6.3 Milestones of policy, guidelines, and corporate governance of this past year

6.3.1 Milestones of policy, guideline, or corporate governance system

The Board recognizes the importance of upgraded corporate governance (CG) practices to become comparable with leading domestic and international companies, which would benefit its pursuit of sustainable growth. It therefore annually reviews the suitability and adequacy of the policy and guidelines for its CG and code of conduct to align with its business model and prevailing circumstances, which include laws, rules, guidelines, and stakeholders' views.

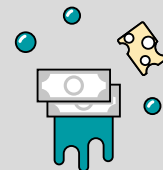
In 2021 the Board endorsed amendment of the Corporate Governance Policy (Revision 18) to align it with the requirements of the Corporate Governance Report (CGR) of listed companies, the Thai Private Sector Collective Action against Corruption (CAC), the DJSI, and leading companies' operating standards on corporate governance, while suiting the current business model. Below are the essences:

1



Renaming of the Corporate Governance Committee:
The committee will now be known as the Sustainability and Corporate Governance Committee, with amended roles and responsibility to embrace sustainability matters so as to align with Bangchak's vision, mission, and goals.

2



Amendment of related definitions and guidelines for anti-money laundering and revolving door under the Anti-Corruption Policy.

6.3.2 Compliance with CG Code

The Board reviewed the SEC-developed CG Code of 2017 and recognized its role as corporate leaders in the application of CG to create sustainable business value. It assessed compliance with each item of the code of Bangchak's policies, CG practices, and business context, concluding that its overall policies, measures, and business processes aligned with CG Code guidelines and proved appropriate for its business growth directions, except the following matters which are the aspects not yet applied, which will in time be adapted as seen fit.

CG Code guideline	Bangchak's justification or alternative measure
The appropriate number of directors is between 5 and 12 (Guideline 3.1.2)	Bangchak's articles of association requires 5–15 directors. Since 2014 it had appointed 15 directors in keeping with its articles of association and business model of continued investment in new businesses. As a result, Bangchak has needed diversity in directors' background, meaning qualifications and competencies fitting business expansion.

6.3.3 Other practices under CG Principles

Thanks to its firm commitment and intention to operate with CG, Bangchak continually ranked high among companies, with CG accolades including the excellent ranking (five emblems) under the 2021 CGR (Corporate Governance Report) survey of listed companies, organized by Thai IOD and SET. Bangchak was among those in Thailand with top scores.

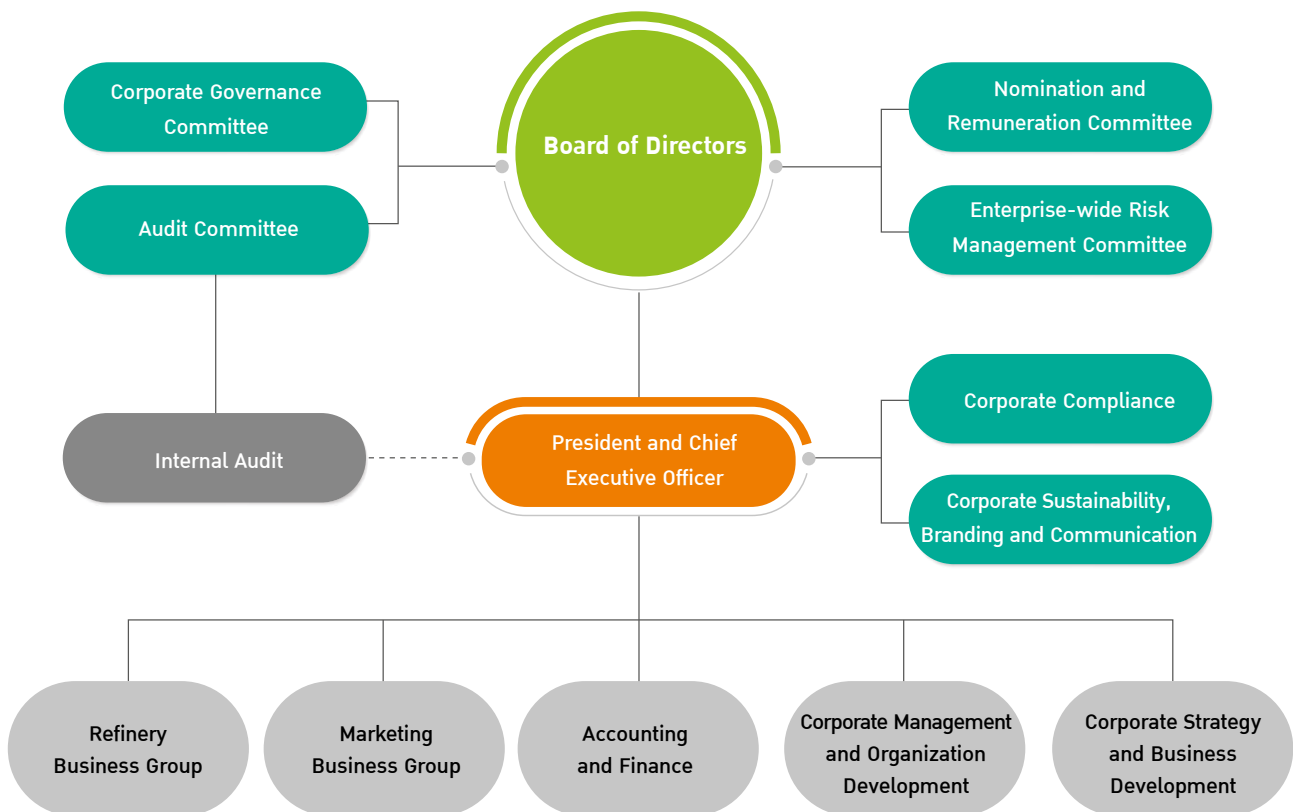


Corporate Governance Policy Full Version
<https://www.bangchak.co.th/en/cg/corporate-governance>

7. Corporate Governance Structure and Key Information about the Board, Sub-committees, Management, Employees, and Others

7.1 Corporate Governance Structure

The Board of Directors and the management perform in the best interests of Bangchak and its shareholders under a clear, balanced, and accountable management structure. The Board monitors and ensures that the management implements its policies, plans and strategies, and that there is clear distinction of roles and responsibilities between the Board and the management. The Board appoints sub-committees to consider significant matters, consist of the Audit Committee, Corporate Governance Committee, Nomination and Remuneration Committee and Enterprise-wide Risk Management Committee. The President & CEO is the top executive.



- Remark:
- The Audit Committee considers, appoints, transfers, dismisses, and undertakes annual evaluation of the Chief Audit Executive and review the independence of Internal Audit.
 - On January 1, 2022, the Board of Directors approved the Corporate Governance Committee to change its name to the Sustainability and Corporate Governance Committee.
 - On January 1, 2022, President and Chief Executive Officer change the position name to President and Group Chief Executive Officer

The Board of Directors



1. Mr. Pichai Chunchavajira
Chairperson of the Board and
Independent Director with
Authorized Signature

2. Mr. Suthep Wongvorazathe
Vice Chairperson and Director
with Authorized Signature

3. Gen. Vitth Devahasdin
Vice Chairperson and Independent Director
Chairperson of the Corporate Governance
Committee and Chairperson of the
Nomination and Remuneration Committee

4. Adm. Sucheep Whoungmaitree
Independent Director and Director
with Authorized Signature

5. Gen. Songwit Noonpackdee
Independent Director and Director
with Authorized Signature

6. Pol.Lt.Gen. Chaiwat Chotima
Independent Director and Director
with Authorized Signature

7. Mr. Teerapong Wongsiwawilas
Independent Director
(Resigned December 30, 2021)

8. Dr. Poramete Vimolsiri
Independent Director
Chairperson of the Audit Committee

9. Mr. Prasong Poontaneat
Independent Director
Chairperson of the Enterprise-wide
Risk Management Committee

10. Mrs. Prisana Praharnkhasuk
Independent Director and Director
with Authorized Signature

11. Mr. Chamroen Phothiyod
Director

12. Dr. Kulaya Tantitemit
Director

13. Mr. Boonchob Suthamanuswong
Director

14. Mr. Chaiwat Kovavisarach
Executive Director
Director with Authorized Signature
President and Group Chief Executive Officer

7.2 The Board of Directors

7.2.1 The Board Composition (as of December 31, 2021)

- Board diversity prevails, equipped with a series of skills matching Bangchak's business strategies, which are identified through Board Skill Matrix preparation. Also, there is a wide variety of education and experience without discrimination (detailed in Attachment 1).
- The Board consists of 5–15 directors without gender discrimination. **As of December 31, 2021, there are 13 of them, with two female member and one executive director.**
- Independent directors account for more than one-third of the Board. There are 8 of them, which exceeds half of the Board, thus conforming to good governance.
- **The Chairman cannot be the same person as the President and Chief Executive Officer and does not belong to any Sub-Committee in view of clear-cut responsibilities and duties.**

Board Skills Matrix

Name/Specific Expertise	Knowledge of company business	International business	Accounting and finance	Management	Compliance	Organizational development and innovation	Information and digital technology	Society, environment, and safety	Risk and crisis management
1. Mr. Pichai Chunhavajira	x	x	x	x		x		x	x
2. Mr. Suthep Wongvorazathe	x	x	x	x					x
3. Gen. Vitch Devahasdin	x			x	x	x		x	x
4. Adm. Sucheep Whoungmaitree	x			x	x	x		x	x
5. Gen. Songwit Noonpackdee	x			x		x		x	x
6. Pol.Lt.Gen. Chaiwat Chotima	x			x				x	x
7. Mrs. Prisana Praharnkhasuk	x	x	x	x		x	x		x
8. Dr. Porameteer Vimolsiri	x	x	x	x		x		x	x
9. Mr. Prasong Poontaneat	x	x	x	x	x	x			x
10. Mr. Chamroen Phothiyod	x	x	x	x	x				x
11. Dr. Kulaya Tantitemit	x	x	x	x			x		x
12. Mr. Boonchob Suthamanuswong	x			x	x	x		x	x
13. Mr. Chaiwat Kovavisarach	x	x	x	x		x	x	x	x
Total	13	8	8	13	5	9	3	8	13

7.2.2 The board information and the authorized director

There were 13 directors (As of December 31, 2021) as follows:

Name	Position	Appointment date
1. Mr. Pichai Chunhavajira	- Chairperson (Independent director)	April 24, 2012 (Independent director since June 1, 2017)
2. Mr. Suthep Wongvorazathe	- Vice Chairperson - Member of the Corporate Governance Committee	October 30, 2012
3. Gen. Vitch Devahasdin	- Vice Chairperson - Independent director - Chairperson of the Corporate Governance Committee - Chairperson of the Nomination and Remuneration Committee	April 5, 2016
4. Adm. Sucheep Whoungmaitree	- Independent director - Member of the Nomination and Remuneration Committee	May 26, 2015
5. Gen. Songwit Noonpackdee	- Independent director - Member of the Enterprise-wide Risk Management Committee	October 1, 2021
6. Pol.Lt.Gen. Chaiwat Chotima	- Independent director - Member of the Audit Committee - Member and Secretary of the Nomination and Remuneration Committee	April 9, 2014
7. Mrs. Prisana Praharnkhasuk	- Independent director - Member of the Nomination and Remuneration Committee - Member of the Audit Committee	April 5, 2016
8. Dr. Porameteer Vimolsiri	- Independent director - Chairperson of the Audit Committee	June 7, 2018
9. Mr. Prasong Poontaneat	- Independent director - Chairperson of the Enterprise-wide Risk Management Committee	November 1, 2021
10. Mr. Chamroen Phothiyod	- Director (Representative of Ministry of Finance) - Member of the Enterprise-wide Risk Management Committee	October 1, 2021
11. Dr. Kulaya Tantitemit	- Director (Representative of Ministry of Finance) - Member of the Corporate Governance Committee	April 8, 2021
12. Mr. Boonchob Suthamanuswong	- Director (Representative of Social Security Office) - Member of the Corporate Governance Committee	October 28, 2021
13. Mr. Chaiwat Kovavisarach	- President and Chief Executive Officer - Member and Secretary of Corporate Governance Committee - Member and Secretary of Enterprise-wide Risk Management Committee - Secretary of the Board of directors	October 30, 2012

Directors whose terms were completed and resigned directors in 2021

Name	Position	Appointment date
1. Dr. Anuchit Anuchitanukul	– Director (Representative of Ministry of Finance) – Member of the Enterprise-wide Risk Management Committee	April 25, 2018 (Term completed on April 8, 2021)
2. Dr. Prasert Sinsukprasert	– Director – Member of the Enterprise-wide Risk Management Committee	April 5, 2016 (Resigned 2 April 2564)
3. Gen. Thammanoon Withee	– Independent director – Member of the Nomination and Remuneration Committee	April 5, 2016 (Resigned 23 September 2564)
4. Mr. Krisada Chinavicharana	– Director (Representative of Ministry of Finance) – Member of the Corporate Governance Committee	January 28, 2021 (Resigned on October 1, 2021)
5. Mr. Suthi Sukosol	– Director (Representative of Social Security Office) – Member of the Corporate Governance Committee	July 26, 2019 (Resigned October 19, 2021)
6. Mr. Surin Chiravisit	– Vice Chairperson – Member of the Enterprise-wide Risk Management Committee	April 8, 2010 (Resigned November 1, 2021)
7. Mr. Somchai Poolsavasdi ^{1/}	– Independent director – Member of the Enterprise-wide Risk Management Committee	April 2, 2021 (Resigned on December 7, 2021)
8. Mr. Teerapong Wongsiwawilas ^{2/}	– Independent director – Member of the Audit Committee	January 26, 2017 (Resigned on December 30, 2021)

Note: ^{1/} At its meeting No. 1/2022 held on January 27, 2022, the Board of Directors of the Company resolved to appoint Mr. Chaovalit Ekabut as an independent director effective on January 27, 2022, replacing Mr. Somchai Poolsavasdi who had resigned.

^{2/} At its meeting No. 12/2021 held on December 17, 2021, the Board of Directors of the Company resolved to appoint Mr. Achporn Charuchinda as an independent director and an audit committee effective on January 4, 2022, replacing Mr. Teerapong Wongsiwawilas who had resigned.

(The Profile of the new directors appear in the Company's website. <https://www.bangchak.co.th/en/management/board-of-directors>)

The names and number of the authorized directors who have authority to sign on behalf of the Company are:

Mr. Pichai Chunhavajira jointly with Mr. Chaiwat Kovavisarach with affixation of the Company's seal or any one of these two directors signs jointly with Mr. Suthep Wongvorazathe or Pol.Lt.Gen. Chaiwat Chotima or Adm. Sucheep Whoungmaitree or Mrs. Prisana Praharnkhasuk or Gen. Songwit Noonpackdee, being two persons, with affixation of the Company's seal.

7.2.3 Roles, Duties, and Responsibilities of the Board of Directors

1. Carry out duties under laws, objectives and regulations of the Company as well as resolutions of shareholders' meetings with honesty, protect the Company's benefit and have accountability to the shareholders.
2. Establish Clear Leadership Role and Responsibilities of the Board
 - 2.1 The board should demonstrate a thorough understanding of its leadership role, assume its responsibilities in overseeing the company, and strengthen good governance, including:
 - (1) defining objectives;
 - (2) determining means to attain the objectives; and
 - (3) monitoring, evaluating, and reporting on performance.
 - 2.2 To achieve sustainable value creation, the board should exercise its leadership role and pursue the following governance outcomes:
 - (1) competitiveness and performance with long-term perspective;
 - (2) ethical and responsible business;
 - (3) good corporate citizenship; and
 - (4) corporate resilience.
 - 2.3 The board should ensure that all directors and executives perform their responsibilities in compliance with their fiduciary duties, and that the company operates in accordance with applicable law and standards.
 - 2.4 The board should demonstrate a thorough understanding of the division of board and management responsibilities. The board should clearly define the roles and responsibilities of management and monitor management's proper performance of its duties.
3. Define Objectives that Promote Sustainable Value Creation
 - 3.1 The board should define objectives that promote sustainable value creation and governance outcomes as a framework for the operation of the company.
 - 3.2 The board should ensure that the company's annual and medium-term objectives, goals, strategies, and plans are consistent with the long-term objectives, while utilizing innovation and technology effectively.
4. Strengthen Board Effectiveness
 - 4.1 The board should be responsible for determining and reviewing the board structure, in terms of size, composition, and the proportion of independent directors so as to ensure its leadership role in achieving the company's objectives.
 - 4.2 The board should select an appropriate person as the chairman and ensure that the board composition serves the best interest of the company, enabling the board to make its decisions as a result of exercising independent judgement on corporate affairs.
 - 4.3 The board should ensure that the policy and procedures for the selection and nomination of directors are clear and transparent resulting in the desired composition of the board.
 - 4.4 When proposing director remuneration to the shareholders' meeting for approval, the board should consider whether the remuneration structure is appropriate for the directors' respective roles and responsibilities, linked to their individual and company performance, and provide incentives for the board to lead the company in meeting its objectives, both in the short and long term.
 - 4.5 The board should ensure that all directors are properly accountable for their duties, responsibilities and (in-) actions, and allocate sufficient time to discharge their duties and responsibilities effectively.
 - 4.6 The board should ensure that the company's governance framework and policies extend to and are accepted by subsidiaries and other businesses in which it has a significant investment as appropriate.
 - 4.7 The board should conduct a formal annual performance evaluation of the board, its committees, and each individual director. The evaluation results should be used to strengthen the effectiveness of the board.
 - 4.8 The board should ensure that the board and each individual director understand their roles and responsibilities, the nature of the business, the company's operations, relevant law and standards, and other applicable obligations. The board should support all directors in updating and refreshing their skills and knowledge necessary to carry out their roles on the board and board committees.

- 4.9 The board should ensure that it can perform its duties effectively and have access to accurate, relevant and timely information. The board should appoint a company secretary with necessary qualifications, knowledge, skills and experience to support the board in performing its duties.
5. Ensure Effective CEO and People Management
- 5.1 The board should ensure that a proper mechanism is in place for the nomination and development of the chief executive officer and key executives to ensure that they possess the knowledge, skills, experience, and characteristics necessary for the company to achieve its objectives.
- 5.2 The board should ensure that an appropriate compensation structure and performance evaluation are in place.
- 5.3 The board should consider its responsibilities in the context of the company's shareholder structure and relationships, which may impact the management and operation of the company.
- 5.4 The board should ensure the company has effective human resources management and development programs to ensure that the company has adequate staffing and appropriately knowledgeable, skilled, and experienced employees and staff.
6. Nurture Innovation and Responsible Business
- 6.1 The board should prioritize and promote innovation that creates value for the company and its shareholders together with benefits for its customers, other stakeholders, society, and the environment, in support of sustainable growth of the company.
- 6.2 The board should encourage management to adopt responsible operations, and incorporate them into the company's operations plan. This is to ensure that every department and function in the company adopts the company's objectives, goals, and strategies, applying high ethical, environmental, and social standards, and contributes to the sustainable growth of the company.
- 6.3 The board should ensure that management allocates and manages resources efficiently and effectively throughout all aspects of the value chain to enable the company to meet its objectives.
- 6.4 The board should establish a framework for governance of enterprise IT that is aligned with the company's business needs and priorities, stimulates business opportunities and performance, strengthens risk management, and supports the company's objectives.
7. Strengthen Effective Risk Management and Internal Control
- 7.1 The board should ensure that the company has effective and appropriate risk management and internal control systems that are aligned with the company's objectives, goals and strategies, and comply with applicable law and standards.
- 7.2 The board shall establish an audit committee that can act effectively and independently.
- 7.3 The board should manage and monitor conflicts of interest that might occur between the company, management, directors, and shareholders. The board should also prevent the inappropriate use of corporate assets, information, and opportunities, including preventing inappropriate transactions with related parties.
- 7.4 The board should establish a clear anti-corruption policy and practices (including communication and staff training), and strive to extend its anti-corruption efforts to stakeholders.
- 7.5 The board should establish a mechanism for handling complaints and whistleblowing.
8. Ensure Disclosure and Financial Integrity
- 8.1 The board must ensure the integrity of the company's financial reporting system and that timely and accurate disclosure of all material information regarding the company is made consistent with applicable requirements.
- 8.2 The board should monitor the company's financial liquidity and solvency.
- 8.3 The board should ensure that risks to the financial position of the company or financial difficulties are promptly identified, managed and mitigated, and that the company's governance framework provides for the consideration of stakeholder rights.
- 8.4 The board should ensure sustainability reporting, as appropriate.
- 8.5 The board should ensure the establishment of a dedicated Investor Relations function responsible

for regular, effective and fair communication with shareholders and other stakeholders (such as analysts and potential investors).

8.6 The board should ensure the effective use by the company of information technology in disseminating information.

9. Ensure Engagement and Communication with Shareholders

9.1 The board should ensure that shareholders have the opportunity to participate effectively in decision-making involving significant corporate matters.

9.2 The board should ensure that the shareholders' meetings are held as scheduled, and conducted properly, with transparency and efficiency, and ensure inclusive and equitable treatment of all shareholders and their ability to exercise their rights.

9.3 The board should ensure accurate, timely and complete disclosure of shareholder resolutions and preparation of the minutes of the shareholders' meetings.

10. Maintain the Company's inside information obtained from their job performance and refrain from exploiting such information for personal or other parties' gains. Undertake no securities transactions at least one month

prior to announcement of financial statements and at least three days after such announcement.

11. Directors wishing to engage in the trading of Company securities must notify Secretary to the Board of Directors Division at least one day in advance for the quarterly reporting to the Audit Committee meeting.

12. Report on one's own portfolio of securities, as well as those of their spouses, cohabitation partners, and minor children under legal age, including legal entities where they have more than 30% shareholding of the number of all voting rights to the monthly Board meeting and must report to the Company without delay in the following cases:

12.1 Directors or related person with vested interests in the Company's or its subsidiaries' management.

2.2 Hold shares or debentures in the Company or subsidiary companies.

13. Each Director cannot hold the position of Director in more than other two listed companies in the Stock Exchange of Thailand (SET), excluding Directors' current positions (as of August 19, 2016), the policy-amending date. This excludes the executive director or CEO in the capacity of board director for companies in the group.

Roles and Responsibilities of the Chairman, leader of the Board

- Steer, monitor, and ensure efficient performance of the Board in fulfilling the Company's objectives and main goals.
- Ensure full participation by the Directors in advocating a corporate culture of ethics and good corporate governance.
- Set Board meeting agenda in consultation with the President and Chief Executive Officer, with measures to ensure that essential matters are included.
- Allocate adequate time for the management to table matters and for Directors to thoroughly discuss important matters.
- Promote Directors' exercising of full discretion, their attention to all matters brought to the meetings, and corporate governance matters.
- Promote sound relations

The Board is authorized to approve various matters, including:

- Vision, short-term and long-term strategic plans
- Annual plans and budgets
- Investment and operation of key projects for Bangchak and affiliates
- Management restructuring
- Dividend policy
- Performance assessment of itself and the President and Chief Executive Officer
- Decision on the President and Chief Executive Officer's compensation
- Appointment of Directors who resign during the year and that of sub-committees.

- Designation of Directors authorized to sign and bind Bangchak.
- Appointment of executive vice presidents upward.
- Appointment of Directors serving on Bangchak's affiliates and setting of oversight guidelines for such companies.

Matters involving shared responsibility of the board and management:

- Formulating and reviewing policies and strategies, plans and targets.
- Ensuring robust system for risk management and internal control.
- Clearly defining management's responsibilities.
- Overseeing appropriate policies and plans for resource allocation, including HR, IT, and budgeting.
- Monitoring and evaluating financial and non-financial corporate performance.
- Ensuring integrity of financial and non-financial information disclosures.

Matters that the board should delegate or not get involved with:

- Engaging in activities which under normal circumstances are not expected roles of the board, including day-to-day management and decisions (such as procurement and staffing), ongoing monitoring that conduct and operations are in compliance with the company's policies, strategies, plans, and applicable law and standards.
- Not getting involved in or influencing matters in which a director may have vested interests.

The President & CEO is authorized to execute his core duty of running Bangchak's day-to-day business as assigned by the Board. To this end, he must strictly follow the Board-approved policies, plans, and budgets with integrity and care in the best interests of Bangchak and its shareholders.

7.3 Sub-Committees

7.3.1 Sub-Committees

The Board of Directors elected Sub-committees (or Committees) to facilitate the Company's business, undertaking with four sub-committees. The Committees can serve for three years in each term. Details about sub-committee charters as follows:

1. Audit Committee (AC)

The Audit Committee must be made up of independent directors. At least three independent directors form the Audit Committee, and at least one of them must be adequately knowledgeable or experienced in accounting, finance, or audit to review the credibility of financial statements.

Roles and Responsibilities

- 1) To ensure accuracy and adequacy of the Company's financial reporting according to Accounting Principles governed by laws.
- 2) To ensure that the Company has a suitable and efficient internal control system and internal audit and to ensure the efficiency and adequacy of the risk management system.
- 3) To review the performance of the Company to ensure compliance with the securities and exchange law, regulations of the exchange or laws relating to business of the Company.
- 4) To review a connected transaction or transaction that may lead to conflict of interest or acquisition and disposition of assets transaction to ensure compliance with the laws and regulations of the Stock Exchange of Thailand (SET), and that it is reasonable and brings the highest benefit to the Company.

- 5) To inspect and consider with the management on the defects that have been found and on the responses from the management.
- 6) To empower the auditing and investigating of all related parties under the authorization of the Audit Committee and also to authorize hiring of an expert so as to audit and investigate in compliance with the Company's regulations.
- 7) To prepare a report of the Audit Committee and disclose it in the annual report of the Company, and have such report signed by Chairman of the Audit Committee.
- 8) To consider, select, nominate the person who is independent to be the Company's auditor, recommend remuneration of the Company's auditor, recommend the removal of the Company's auditor and, at least once a year, attend the private meeting with an auditor without management.
- 9) To consider auditing scopes and plans of the external auditor and the Internal Audit so that they are contributory to each other and to reduce double operations as concerns financial auditing.
- 10) To approve the Charter, audit work plans, budget, training plans and manpower of the Internal Audit.
- 11) To appoint, transfer, dismiss, and undertake annual evaluation of the Chief Audit Executive and review the independence of Internal Audit.
- 12) To review the efficiency and effectiveness of internal control and risk management focusing on the issue of information technology.
- 13) In performing the duty of the Audit Committee, if there is transaction or act which could extremely affect the Company's financial status and the Company's performance, namely
 - Transaction which leads to conflict of interest
 - Dishonest, extremely unusual or remiss internal control system
 - Breaking the securities and exchange law, regulations of the exchange or laws relating to business of the CompanyThe Audit Committee has to report it to the Board of Directors so as to modify and revise within prescribed time. If the Audit Committee or executives does not modify and revise within the prescribed time, the Audit Committee is able to report this transaction or act to the Securities and Exchange Commission or the Stock Exchange of Thailand.
- 14) To review and consider the Self-Evaluation Tool for Countering Bribery of Thailand's Private Sector Collective Action Coalition Against Corruption (CAC).
- 15) To perform any other act assigned by the Board of Directors with approval of the Audit Committee.

2. Nomination and Remuneration Committee (NRC)

The Nomination and Remuneration Committee is made up of at least three persons, and more than half must be independent directors. At least one member must be knowledgeable or experienced in personnel management. The Chairman of the committee must be an independent director.

Roles and Responsibilities

- 1) Define qualifications needed for potential Directors, and President and Chief Executive Officer.
- 2) Recommend qualified candidates for the positions of Directors, and President and Chief Executive Officer to the Board of Directors.
- 3) Define criteria of remuneration for Directors, and the President and Chief Executive Officer.
- 4) Submit the remuneration for Directors to the Board of Directors and then for the shareholders for approval.
- 5) Submit the remuneration for the President and Chief Executive Officer to the Board of Directors for approval.
- 6) Review and summarize the President and Chief Executive Officer's succession plan every year and report it to the Board of Directors.
- 7) Perform other tasks as assigned by the Board of Directors.

3. Enterprise-wide Risk Management Committee (ERMC)

The ERMC is made up of at least three members, at least one of whom must be knowledgeable in risk management. Qualified external parties can serve as members.

Roles and Responsibilities

- 1) Set policy, strategies and objectives of the enterprise-wide risk management.
- 2) Develop enterprise-wide risk management system in view of continuous efficiency.
- 3) Promote enterprise-wide risk management at all levels of the organization.
- 4) Ensure that the Company has appropriate and efficient risk management.
- 5) The Chairman of the Enterprise-wide Risk Management Committee reports the findings to the Board of Directors' next meeting.
- 6) Perform other tasks as assigned by the Board of Directors.

4. Corporate Governance Committee (CGC)

The Corporate Governance Committee is made up of at least three directors, and at least one of whom must be knowledgeable in corporate governance practices by international standards. An independent director must serve as Chairman of this committee.

Roles and Responsibilities

- 1) Recommend the implementation of corporate governance to the Board of Directors.
- 2) Monitor the work of the Committee and the management in compliance with the principles of corporate governance.
- 3) Review the implementation of corporate governance by comparing it with international standards and recommend it to the Board of Directors for continual follow-ups.
- 4) Provide the corporate governance policy to the Company's corporate governance working team.
- 5) Perform other tasks as assigned by the Board of Directors.

In 2022, the Board of Director approved renaming of the Corporate Governance Committee to be known as the Sustainability and Corporate Governance Committee, with amended roles and responsibility to embrace sustainability matters so as to align with Bangchak's vision, mission, and goals.

Sustainability

- 1) Recommend the implementation of sustainability to the Board of Directors.
- 2) Monitor the work of the Committee and the management in compliance with the principles of sustainable development.
- 3) Review the implementation of sustainability by comparing it with international standards and recommend it to the Board of Directors for continual follow-ups and respond to the needs of stakeholders.
- 4) Give the policy of sustainability to the Company's sustainability committee.
- 5) Perform other tasks as assigned by the Board of Directors.

7.3.2 List of Sub-Committee

1. Audit Committee (AC)

Name	Position
1. Dr. Porameteer Vimolsiri	Chairperson and Independent Director with expertise in accounting and finance
2. Pol.Lt.Gen. Chaiwat Chotima	Member and Independent Director
3. Mrs. Prisana Praharnkhasuk	Member and Independent Director with expertise in accounting and finance
4. Vice President, Internal Audit Department	Secretary

2. Nomination and Remuneration Committee (NRC)

Name	Position
1. Gen. Vitch Devahasdin	Chairperson and Independent Director
2. Mrs. Prisana Praharnkhasuk	Member and Independent Director
3. Adm. Sucheep Whoungmaitree	Member and Independent Director
4. Pol. Lt. Gen. Chaiwat Chotima	Member and Secretary, Independent Director

3. Enterprise-wide Risk Management Committee (ERMC)

Name	Position
1. Mr. Prasong Poontaneat	Chairperson and Independent Director
2. Gen. Songwit Noonpackdee	Member and Independent Director
3. Mr. Chamroen Phothiyod	Member and Non-executive Director
4. Mr. Chaiwat Kovavisarach	Member and Secretary, Executive Director

4. Corporate Governance Committee (CRC)

Name	Position
1. Gen. Vitch Devahasdin	Chairperson and Independent Director
2. Mr. Suthep Wongvorazathe	Member and Non-executive Director
3. Dr. Kulaya Tantitemit	Member and Non-executive Director
4. Mr. Boonchob Suthamanuswong	Member and Non-executive Director
5. Mr. Chaiwat Kovavisarach	Member and Secretary, Executive Director

The Executives



1

1. Mr. Chaiwat Kovavisarach
President and Group Chief
Executive Officer

2

2. Mr. Bundit Sapianchai
President

3

3. Mr. Pativat Tivasasit
Chief Operation Officer & Senior
Executive Vice President, Refinery
Business Group

4

4. Mr. Somchai Tejavanija
Chief Marketing Officer & Senior
Executive Vice President, Marketing
Business Group

5

5. Mr. Kittiphong Limsuwannarot
Senior Executive Vice President,
appointed to BBGI
Public Company Limited

6

6. Mr. Surachai Kositsareewong
Senior Executive Vice President,
Accounting and Finance

7

7. Mr. Chokchai Atsawarangsali
Senior Executive Vice President,
Corporate Management and
Organization Development

8

8. Mr. Viboon Wongsakul
Senior Executive Vice President,
Corporate Strategy and Business
Development

7.4 Executive Management

7.4.1 Names and Positions of Executives

The Board has set the roles and duties of the management in Bangchak's day-to-day business management in line with the company's policies, plans, goals, regulations, and rules, as well as Board resolutions, within the approved budget. To this end, they are to conform strictly with integrity and care to maintain Bangchak's and its shareholders' interests to the best of their ability under corporate governance. They are to report updates on conformance to such resolutions together with key performance outcomes to the Board at least monthly. **Today the management consists of 8 persons, whom are regarded as executives under SEC's definition (As of December 2021):**

Name	Position
1. Mr. Chaiwat Kovavisarach ^{1/}	President and Chief Executive Officer
2. Mr. Bundit Sapianchai ^{2/}	President
3. Mr. Pativat Tivasasit ^{3/}	Chief Operation Officer & Senior Executive Vice President Refinery Business Group
4. Mr. Somchai Tejavanija	Chief Marketing Officer & Senior Executive Vice President, Marketing Business Group and Acting Executive Vice President, Service Station Networking Development
5. Mr. Kittiphong Limsuwannarot	Senior Executive Vice President, appointed to BBGI Public Company Limited
6. Mr. Surachai Kositsareewong	Senior Executive Vice President, Accounting and Finance
7. Mr. Chokchai Atsawarangsalit	Senior Executive Vice President, Corporate Management and Organization Development
8. Mr. Viboon Wongsakul	Senior Executive Vice President, Corporate Strategy and Business Development

Notes: ^{1/} On January 1, 2022, President and Chief Executive Officer change the position name to President and Group Chief Executive Officer

^{2/} effectives on January 1, 2022

^{3/} effectives on January 1, 2022

Directors and executives assigned to other companies

The Board appoints representative directors of subsidiaries, associates, and joint ventures under **the guidelines for appointment of representative directors in joint ventures.** To this end, the President and Chief Executive Officer selects fully qualified persons under such guidelines for the Board's appointment. Each subsequent change is to be reported by the President and chief executive officer for the Board's acknowledgment. Today, the following directors and executives are assigned as directors of subsidiaries, associates, and joint ventures:

Subsidiary Companies

1. BCPG Plc. (BCPG)
2. BBGI Plc. (BBGI)
3. Bangchak Retail Co., Ltd. (BCR)
4. Bangchak Green Net Co., Ltd. (BGN)
5. Bangchak Solar Energy Co., Ltd. (BSE)
6. Bangchak Solar Energy (Prachinburi) Co., Ltd. (BSE-PRI)
7. Bangchak Solar Energy (Chaiyaphum 1) Co., Ltd. (BSE-CPM1)
8. Bangchak Solar Energy (Buriram) Co., Ltd. (BSE-BRM)
9. Bangchak Solar Energy (Buriram 1) Co., Ltd. (BSE-BRM1)
10. Bangchak Solar Energy (Nakhon Ratchasima) Co., Ltd. (BSE-NMA)
11. Thai Digital Energy Development Co., Ltd. (TDED)
12. BCPG Indochina Co., Ltd (BIC)
13. BSE Power Holdings (Thailand) Co., Ltd. (BSPH)
14. JKR Energy Co., Ltd. (JKR)
15. RPV Energy Co., Ltd. (RPV)
16. Lopburi Solar Co., Ltd. (LS)
17. Prachin Solar Co., Ltd. (PS)
18. Aquatist Energy Co., Ltd. (AQU)
19. NamSan 3A Sole Power Co.,Ltd. (NS3A)
20. NamSan 3B Sole Power Co.,Ltd. (NS3B)
21. BCPG Wind Cooperatief U.A. (BCPG Wind)
22. Greenergy Holdings Pte. Ltd. (Greenergy Holdings)
23. Greenergy Power Pte. Ltd. (Greenergy Power)
24. Huang Ming Japan Company Limited (Huang Ming)
25. BSE Energy Holdings Pte. Ltd.
26. BCPG Investment Holdings Pte. Ltd.
27. Bangchak Biofuel Co., Ltd. (BBF)
28. Bangchak Bioethanol (Chachoengsao) Co., Ltd. (BBE)
29. KSL Green Innovation Plc (KGI)
30. BBGI Utility and Power Co., Ltd. (BUP)
31. Win Ingredients Co., Ltd. (WIN Ing.)
32. BCPR Co., Ltd. (BCPR)
33. BCPR Pte. Ltd. (BCPR SG)
34. BCP Trading Pte. Ltd. (BCPT)
35. BCP Innovation Pte. Ltd. (BCPI)
36. BCV Energy Co., Ltd. (BCVE)
37. BCV Innovation Co., Ltd. (BCVI)
38. BTSG Co., Ltd. (BTSG)
39. BCV Biobase Co., Ltd. (BCVB)
40. Lom Ligor Co., Ltd. (LLG)
41. BCPG Japan Corporation (BCPG Japan)
42. BCPG Engineering Company (BCPG Engineering)
43. Winnonie Co., Ltd. (Winnonie)

44. General Energy Manning Co., Ltd. (GEM)
45. Bangkok Fuel Pipeline and Logistics Co., Ltd. (BFPL)
46. OKEA ASA (OKEA)

Associated Companies

1. Bongkot Marine Services Co., Ltd. (BONGKOT Marine)
2. Oam Suk Social Enterprise Co., Ltd. (Oam Suk)
3. PetroWind Energy Inc. (PWEI)
4. Impact Energy Asia Development Limited (IEAD)
5. Star Phoenix Geothermal JV B.V.(Star Phoenix)
6. Star Energy Group Holdings Pte. Ltd. (Star Energy Holding)
7. star Energy Geothermal Pte Ltd. (Star Energy1)
8. Star Energy Geothermal Holdings (Salak – Darajat) B.V. (Star Energy2)
9. Star Energy Geothermal (Salak – Darajat) B.V.(Star Energy3)

Joint Ventures

1. Fuel Pipeline Transportation Co., Ltd. (FPT)
2. Bangkok Aviation Fuel Services Plc. (BAFS)
3. Bonumose LLC.
4. Enevate Corporation
5. Geltor, Inc.
6. Manus Bio Inc., (Manus Bio)
7. Sharge Management Co., Ltd. (Sharge)
8. Thai Special Gas Co., Ltd. (TSG)
9. Ubon Bio Ethanol Co., Ltd. (UBE)
10. Ubon Bio Gas Co., Ltd. (UBG)
11. Ubon Agricultural Energy Co., Ltd. (UBA)
12. Ubon Sunflower Co.,Ltd. (UBS)

Others

1. Happiness Sharing Foundation

7.4.2 Remuneration of Executives

- 1) Executives shall receive short-term remuneration, i.e. salary and bonus, and long-term remuneration, including the Employee Stock Option Program (ESOP) and the Employee Joint Investment Program (EJIP), which the Board will consider on a case-by-case basis. These payments motivate executives, are on a par with industry practice, correlate to the Balanced Scorecard principles and to each person's key performance indices (KPIs), and connect compensation with performance.
- 2) Executives who serve as a director in a joint venture will be compensated according to the Company's regulations on the appointment of directors of joint ventures. As for the President and chief executive officer who is tasked with additional roles and responsibilities, as a subcommittee member for instance, will be paid according to the Board's decision based on merit of that task or responsibility.
- 3) The Board has ordered a report on the remuneration of executives—including the disclosure of payments made to executives who are appointed a role in a subsidiary—to be included in the Company's annual report in compliance with the Corporate Governance Policy.

7.4.3 Total executives' remuneration

Remuneration for Executives as defined by the SEC (President & Chief Executive Officer and Senior Executive Vice Presidents)

Remuneration	2020		2021	
	Persons	Baht	Persons	Baht
Salary	10	69,405,821	8	71,543,790
Bonus & Retirement pay	10	28,568,602	8	55,684,416.13
Provident fund and Social Security	10	6,120,327	8	5,811,666
Total	10	104,094,750	8	133,039,872.13

7.5 Personnel

On December 31, 2021, the Company had a total headcount of 1,103 :

Employee	Persons
Corporate Management and Organization Development	110
Accounting and Finance	63
Corporate Strategy and Business Development	47
Marketing Business Group	244
Refinery Business Group	567
The President and Chief Executive Officer	61
BPCG Plc.	5
BBGI Plc.	6

Significant changes in number employee for the past three years

The number of employees in 2021 is a decrease of approximately 11% compared to the average number of employees over the past 3 years (1,230 persons in year 2020, 1,251 in year 2019 and 1,254 persons in year 2018), partly due to Mutual Preparation Plan.

Remuneration of employee

Bangchak's policy provides for suitable compensation to employees in line with their performance outcomes. For the short term, this compensation is the bonus, in turn linked to company performance. For the long term, this compensation means the provident fund, a form of welfare that gives employees financial guarantee.

Employee receive remuneration in the form of salary; shift, night shift, overtime, and upcountry pay; operation at the refinery; discipline remuneration; special bonus and other welfare. Employees have the right to apply for membership of "Bangchak Corporation Public Company Limited Provident Fund" by choosing the accumulated at a rate of five percent or ten percent or fifteen percent of the salary and the Company will pay the same rate but not over ten percent to the Fund. In 2021 the Company paid remuneration as follows:

Remuneration	Baht
Salary	1,072,141,545.11
Overtime	95,291,194.60
Bonus	721,236,789.93
Provident Fund	92,028,092.00
Social Security	6,484,765.00
Total	1,987,182,386.64

The remuneration for President & CEO and Senior executive vice presidents upward is **6.69%** of total remuneration of employee.

Personnel Development

Bangchak focuses on continuing personnel development for greater operating capability matching corporate goals, policies, and directions—apart from international competitiveness to accommodate the growth of AEC (ASEAN Economic Community). To this end, it appointed a "Management Development Committee" to endorse personnel development, define guidelines for personnel administration, define an approach for corporate culture development, and forge a sound employee attitude so that the efficiency of Bangchak's corporate administration may be on a par with business peers and in keeping with its business status and goals.

This year, various training was provided to employees, **averaging 27.99 hours/person/year** (see details under Driving a Sustainable Business), including environmental aspects of training curricula and seminars for employees such as the Exponential Path to Net Zero seminar, an Introductory Course on the T-VER project in forestry and agriculture for external assessors and project developer, Environmental Manager Course, Refresh EnESMS for Management Representative Course, Water Footprint Assessment Course, Product Life Cycle Assessment Course and Product Life Cycle Assessment Workshops etc.

7.6 Other Key Information

7.6.1 Responsible Executives

○ **Company Secretary**

Under the Securities and Exchange law (Articles 89/15 and 89/16), Board Meeting No. 6/2009 appointed Ms. Pakawadee Janrayapes, Executive Vice President, Corporate Compliance, as Company Secretary, effective from July 1, 2009. Details of the company secretary profile appear in Attachment 3.

Roles and Responsibilities

- Prepare and maintain key documents, including the Board roster, meeting notices, minutes of Board meetings and shareholders' meetings, annual reports, and reports of vested interests
- Schedule Board meetings and shareholders' meetings under the law and company regulations. Coordinate conformance to the resolutions of Board and shareholders' meetings
- Advise and support the performance of directors and the management under the law and relevant regulations
- Coordinate between the Chairman and the President and chief executive officer together with his management team, which includes coordination between Bangchak and its shareholders
- Encourage the directors, management, and employees to conform to corporate governance
- Perform other lawful tasks and Board-assigned tasks.

Note: According to the resolutions of the Board of Directors meeting of the Company No.1/2022 held on January 27, 2022 resolved to appoint Ms. Wannasiri Trongtrakulwong to be the Company Secretary, replacing Ms. Pakawadee Junrayapes, effective from February 1, 2022 onwards.

○ **Accounting Supervisor**

The Company assigned Ms. Chantip Wongchieowittaya Vice President, Financial Accounting to be directly responsible for the supervision of accounting, effective from June 10, 2019. Please see information of the Accounting Supervisor in Attachment 1.

○ **Head of Internal Audit**

The Audit Committee meeting No. 6/2563 of June 18, 2020, selected Ms. Pornjit Sojisunsanee as Vice President, Internal Audit Department, citing her solid knowledge and understanding of Bangchak's businesses, complemented by her internal audit expertise, skills, and experience, and those in corporate governance, risk assessment, and internal control at the business and overall levels. As a result, the committee regarded her as suitable and sufficient for such duties.

The Audit Committee considers, appoints, transfers, and assesses the performance of the head of Internal Audit. Please see information of the head of Internal Audit in Attachment 3.

○ **Head of the Compliance Department**

At its meeting No. 6/2009 held on June 26, 2009, the Board of Directors appointed Ms. Pakawadee Junrayapes as Company Secretary, effective from July 1, 2009. In 2017, due to the Company's management restructuring and Set Legal and Compliance Department, the Company appointed Ms. Pakawadee Junrayapes as Executive Vice President, effective from January 1, 2018. Please see information of the head of Corporate Compliance in Attachment 3.

7.6.2 Head of Investor Relations

Investors and related parties can make queries or ask for the Company's information at Ms. Saowapap Sumeksri, Executive Vice President, Financial Controller, Acting Investor Relations Manager, Tel. 0 2335 8663 or e-mail address: ir@bangchak.co.th

7.6.3 Audit Fee

For the fiscal year 2021, the Company and its subsidiaries paid for audit fees amounting to 11.32 Million Baht to KPMG in Thailand and KPMG member firms in overseas, which the auditors worked for, and to persons or businesses related to the auditors and audit firm. This audit fee amount excluded the remuneration paid by associates. In this regard, KPMG in Thailand, and KPMG member firms in overseas and its auditors do not have any relationships or interests involving the Company, management, or major shareholders, including their related persons.

Audit fees for the year 2021

1. Fees for annual audit and quarterly review of the Company and consolidated financial statements amounted to 1.92 Million Baht to KPMG.

Audit fees of the Company	
1. Quarterly review fee for the Company's financial statement	0.36 Million Bath
2. Fees for annual audit of the Company and consolidated financial statements	1.56 Million Baht
Total audit fees of the Company	1.92 Million Baht

2. Fees for the annual audit of subsidiaries and quarterly review of listed subsidiaries performed by KPMG Thailand and KPMG overseas in which the fees were absorbed by the subsidiaries were as follows

Audit fees of subsidiaries	
1. Fees for annual audit of the subsidiaries' financial statements and quarterly review of listed subsidiaries	
– Number of subsidiaries	25 Companies
– Amount	5.57 Million Bath
2. Fees for annual audit of the overseas subsidiaries' financial statements	
– Number of subsidiaries	5 Companies
– Amount (equivalent)	3.83 Million Bath
Total audit fees of subsidiaries	9.40 Million Baht

• Non-audit Fee

The Company and its subsidiaries paid for other fees amounting to 2.15 Million Baht, and the subsidiaries paid for auditing compliance with the conditions of the BOI Promotion Certificate amounting to 0.92 Million Baht to the audit firm and persons or businesses related to the auditors and the audit firm.

8. Highlights of Corporate Governance

8.1 Performance of the Board of Directors

8.1.1 Recruitment, Development, and Performance Assessment of the Board of Directors

1. Independent Directors

The Board consists of at least one-third being independent directors, each of whom must comply with the following:

- (1) An Independent Director must hold no more than 0.5% of all the voting shares of Bangchak and its parent company, subsidiaries, affiliates, major shareholders or Corporate Governance Policy, Bangchak Corporation Public Company Limited controlling persons. An Independent Director's shares must include those held by related person to that Independent Director.
- (2) An Independent Director must not be nor ever have been a director who is involved with management, an employee, a salaried adviser, or a controlling individual of Bangchak, its parent company or any of its subsidiaries, affiliates, peer companies under the same parent company, major Shareholders or controlling individuals/entities. An exception is made in the case of a candidate who used to hold one of the positions mentioned above but left it at least two years prior. An individual who was a civil servant of or an adviser to a government agency that was a Bangchak major shareholder or controlling entity is not forbidden from being a Bangchak Independent Director.
- (3) Independent Directors must not have familial (blood ties or legal) relations to individuals such as a parent, spouse, sibling, child, spouse of the child of another Director, an Executive, a major Shareholder, a controlling individual or an individual who is about to be nominated as a Director, an Executive or a controlling individual of Bangchak or any of its subsidiaries.
- (4) Independent Directors must not have nor ever had a business relationship³ with Bangchak, its parent company or any of its subsidiaries, affiliates, major Shareholders or controlling individuals/entities in a manner that might obstruct their independent use of discretion. In addition, they must not be nor have ever been a significant Shareholder or a controlling individual of an entity having a business relationship with Bangchak, its parent company or any of its subsidiaries, affiliates, major Shareholders or Bangchak controlling individuals/entities. An exception is made in the case of a candidate who used to have such a relationship or hold one of the positions mentioned above but ended it or left it at least two years prior.
- (5) An Independent Director must not be nor ever have been an auditor of Bangchak, its parent company or any of its subsidiaries, affiliates, major Shareholders or controlling individuals/entities. In addition, he/she must not be a significant Shareholder, a controlling individual or a partner of the audit firm where the auditors of Bangchak, its parent company, or any of its subsidiaries, affiliates, major Shareholders or controlling individuals/entities work. An exception is made in the case of a candidate who used to hold any of the positions mentioned above but left it at least two years prior.
- (6) An Independent Director must not be nor ever have been a provider of any professional service (including services as a legal or financial adviser) who receives compensation to the amount of over two million baht per year from Bangchak or any of its subsidiaries, affiliates, major Shareholders or controlling individuals/entities. In addition, he/she must not be a significant Shareholder, a controlling individual, or a partner of a provider of such professional services. An exception is made in the case of a candidate who used to hold any of the positions mentioned above but left it at least two years prior.

- (7) An Independent Director must not be appointed as an agent of another Bangchak Director, a major Bangchak Shareholder or a Bangchak Shareholder connected with a major Bangchak Shareholder.
- (8) Independent Directors must not own businesses that are in the same industry and significant competition to the business of Bangchak or any of its subsidiaries. They must not be significant partners in a limited partnership or directors who are involved in management, employees, and salaried advisers or own more than one percent of all voting shares of another firm that runs a business that is in the same industry as and is in significant competition with the business of Bangchak or any of its subsidiaries.
- (9) An Independent Director must not have any other characteristics that might hinder the free expression of their opinions about Bangchak operations.

After being appointed an Independent Director who meets the nine criteria stated above, might be tasked by the Board of Directors with making decisions in regard to the operations of the Company, its parent company or any of its subsidiaries, affiliates, peer companies under the same parent company, major Shareholders or controlling individuals/entities. They must be able to make collective decisions. The definitions in regard to Independent Directors are in line with the regulations of definitions in the notification of the Capital Market Supervisory Board on the issuance and offering of securities.

2. Nomination and Appointment of Directors and the President & CEO

As of December 31, 2021, Bangchak has 13 directors, 8 of whom are independent ones. Eight are SEC-defined executives, with the President & CEO serving as the top executive. Appointment of directors and the President & CEO must be reviewed by the Nomination and Remuneration Committee. Bangchak has made it possible for directors and shareholders to play a part in nominating qualified directors, in addition to using the Director Pool of Thai IOD.

Directors' Nomination

1. Bangchak allows minor shareholders to nominate directors by submitting their names to it.
2. The Nomination and Remuneration Committee (NRC) reviews Board structure for suitability and Bangchak's strategic needs.
3. NRC defines the competency and experience for directors to be nominated by using Director Qualifications and Skill Matrix so that they may match Bangchak's goals and strategies.
4. NRC proceeds with nomination and tables qualified persons for directors in place of those whose terms expire or for additional directors, using IOD's Director Pool as part of the nomination process. NRC is also to nominate directors to its secretary.
5. NRC selects those qualified to be directors and tables their names for the Board's endorsement.
6. The Board endorses the list of directors for subsequent approval by the AGM.

Appointment and Dismissal of Directors

1. Shareholder's meetings elect Directors through majority voting with one shareholder holding one vote per share held and can elect Directors individually. The candidates with the most votes are to be appointed Directors up to the number open at the meeting. If more candidates receive equal votes than the number of Directors required, the Chairman of the meeting must cast a deciding vote.
2. In every Annual General Meeting (AGM), one-third of the Directors must retire. If this number is not a multiple of three, then the number nearest to one-third. The names of the Directors to retire during the first and second year after the Company was registered are to be drawn by lots if not agreed otherwise. For subsequent years, those with the longest terms must retire. The retired Directors can be re-elected.

3. Other than the completion of term, a director may retire for to the following reasons:
 - death
 - resignation
 - lack of qualifications according to the Public Company Limited Act and the Securities and Exchange Act
 - decision of the shareholders' meeting to resign according to the Public Company Limited Act
 - court order
4. In case a director's position is vacant due to other reason than the completion of term, the Board of Directors is to elect a candidate with qualifications according to the Company's regulations in the next meeting except when the Director's term is to be completed in less than two months. At least, a three-quarter vote of the Directors present at the meeting is required. The elected Director holds the position until the completion of term of the Director they have replaced.

New Directors' Orientation

Bangchak stages lectures and company visit and prepares a directors' manual for new directors to be informed of its business nature and approaches, relevant laws and regulations, corporate governance policy, and other essential information that will prove useful to their efficient performance. In this regard, the company secretary is the coordinator.

In 2021, information has been prepared for the orientation of 7 new directors, namely Mr. Krisada Chinavicharana, Mr. Somchai Poolsvasdi, Dr. Kulaya Tantitemit, Gen. Songwit Noonpackdee, Mr. Chamroen Phothiyod, Mr. Prasong Poontaneat and Mr. Boonchob Suthamanuswong.

Directors' Development

Bangchak encourages its Board to undergo additional study and training to enhance their knowledge of Board roles and duties in efficient management under corporate governance. To this end, it applied for IOD memberships on behalf of all directors to benefit from related intelligence and knowledge accrual. This year the following directors took advantage of such training and study visits:

- Talk on "Navigating Thailand Business Path to recover after COVID" by a speaker from Bank of Ayudhya Public Company Limited at the 2021 annual seminar on corporate strategies on September 6, 2021, to the board of directors.
- Mr. Chaiwat Kovavisarach attended Top Executive Program, Class 26 Capital Market Academy (CMA), Stock Exchange of Thailand and Senior Justice Administration, College of Justice, Judicial Training Institute, Class 25.

As of December 31, 2021, two directors have attended IOD's Director Accreditation Program (DAP) and nine have attended its Director Certification Program (DCP). Training details appear under Attachment 1.

Assessment of directors' performances

The Board completes business performance assessment forms at least once a year, which the Company Secretary will arrange for delivery and collection for making an executive summary or the results for presentation at a Board meeting. Directors jointly consider business performance and suggest improvements. Assessment scores are given in percent, with >85% = excellent, >75% = very good, >65% = good, >50% = fair, and <50% = need improvement. The assessment is summarized below:

1) Individual directors

- Self-assessment relies on three topics, namely responsibility for their roles, training and self-development, and conformance to the corporate governance policy. The overall summary of assessment findings showed an average score of 94.7%, regarded as excellent.

- Cross-assessment by group (3–4 unnamed directors assessing another director) relies on two topics, namely responsibility for their roles and directors' independence. The overall summary of assessment findings showed an average of 95.4%, regarded as excellent.
- 2) **Entire Board** relies on topics, namely Structure and Skills, Strategic Direction and Planning, Policy, Monitoring and Supervision, Accountability, CEO and Succession, Leadership and Teamwork, and Agendas, Papers, Meetings and Minutes. The overall summary of assessment findings showed an average score of 96.7%, regarded as excellent.
- 3) **Sub-committees** relies on responsibilities and meetings; the evaluations of all Committees were as follows:
- Audit Committee, the group evaluation had the average score of 96.8%, rated excellent.
 - Nomination and Remuneration Committee, the group evaluation had the average score of 97.5%, rated excellent.
 - Corporate Governance Committee, the group evaluation had the average score of 96.7%, rated excellent.
 - Enterprise-wide Risk Management Committee, the group evaluation had the average score of 92.2%, rated excellent.

Succession Planning and Management Development

Under the Board's policy on the President and Chief Executive Officer's nomination, if he or she is suitable, an external or internal person may enter the selection process under Bangchak's given circumstances. Suitable persons are selected by NRC, which defines the nomination criteria and method.

To optimize benefit in the selection of the President and Chief Executive Officer, the Board assigns the management to appoint a Management Development Committee (MDC) to oversee training and competency development of senior executives. Also, the Board has laid down additional development guidelines for rotation of duties of senior management team members to promote all-round understanding, experience, and preparedness for corporate administration. Any executive from Senior Vice President and Chief Executive Officer upward may apply for nomination as President and Chief Executive Officer if they command the required qualifications.

Procedure

1. Define management positions requiring succession planning (President and Chief Executive Officer and all senior executive vice presidents).
2. NRC defines the required competency and experience for each position.
3. NRC specifies the qualified executives to succeed each position.
4. Assign the President and chief executive officer to assess the performance and competency of qualified executives matching the required competencies needed so as to develop individual development plans (IDPs) to close the competency gaps.
5. Assign MDC to look after the training and competency development of qualified executives.
6. The President and chief executive officer institutes rotation of duties of qualified executives and lets senior executive vice presidents attend Board meetings so that they may understand and gain experience to be prepared for corporate administration as a whole.
7. The President and chief executive officer periodically reports to NRC the performances and development outcomes under IDPs of qualified executives.
8. Each year, NRC revises and summarizes succession planning outcomes for the President and Chief Executive Officer and senior executive vice presidents for the Board's acknowledgment.

Nomination and Appointment of the President and Chief Executive Officer

NRC nominates and reviews the qualifications of senior executives and others under NRC-set guidelines for the Board to appoint as President and Chief Executive Officer. These include the legally required director qualifications and those required by Bangchak's regulations, together with essential skills and experience in Bangchak's best interests and alignment with Bangchak's business directions. The Board appointed Mr. Chaiwat Kovavisarach President and Chief Executive Officer, effective from January 1, 2015, on account of his knowledge of investment in new businesses abroad and his sound financial knowledge, both of which align with Bangchak's business directions, with four-year term from 1 January 2019 to 31 December 2022.

Performance Appraisals of the President and Chief Executive Officer, and Senior Executives

Bangchak measures performance outcomes as KPIs (Key Performance Indicators), including its own performance, common practices of peer listed companies of comparable sizes, roles and responsibilities, executive development, and overall economic circumstances. The President and Chief Executive Officer must present his performance in various aspects, including the management of the refinery and marketing business units, business development, and organizational development, while discussing current management outcomes covering successes and obstacles, including the ability to expand business opportunities and competition, social and environmental policies, together with responses to public policies. NRC is to decide on the President and chief executive officer's compensation, which is then forwarded to the Board for approval. The President and Chief Executive Officer earn benefits as the top management executive in addition to the compensation as a director.



8.1.2 Meeting Attendance and Remuneration of Individual Directors

In 2020, the Board held 15 meetings (12 regular and 3 special ones) with exclusive meetings of the independent directors in March and August and meetings of the non-executive directors in April and September, and one annual seminar on corporate strategies with the management to review and revise the corporate vision on annual basis under Bangchak's vision, mission, and values, together with an assessment of business circumstances. The Board of Directors reviewed and resolved that the Company's Vision, mission and core value shall remain unchanged.

Summary of Board and Sub-committees meeting attendance

Names	Meeting attendance / total (times)							Note
	Board of Directors			Sub-Committees				
	Meeting	Seminar	Total	AC	NRC	ERMC	CGC	
1. Mr. Pichai Chunchavajira ^{1/}	12/12	1/1	13/13	-	-	-	-	
2. Mr. Suthep Wongvorazathe	12/12	1/1	13/13	-	-	-	3/3	
3. Gen. Vitch Devahasdin ^{2/}	12/12	1/1	13/13	-	7/7	-	3/3	
4. Adm. Sucheep Whoungmaitree	12/12	1/1	13/13	-	9/9	-	-	
5. Gen. Songwit Noonpackdee ^{3/}	3/3	0/0	3/3	-	-	2/2	-	Appointed on Oct. 1, 2021
6. Pol.Lt.Gen. Chaiwat Chotima	12/12	1/1	13/13	12/12	9/9	-	-	
7. Mrs. Prisana Praharnkhasuk ^{4/}	12/12	1/1	13/13	9/9	9/9	1/1	-	
8. Dr. Poramete Vimolsiri	12/12	1/1	13/13	12/12	-	-	-	
9. Mr. Prasong Poontaneat ^{5/}	2/2	0/0	2/2	-	-	2/2	-	Appointed on Nov. 1, 2021
10. Mr. Chamroen Phothiyod ^{6/}	3/3	0/0	3/3	-	-	2/2	-	Appointed on Oct. 1, 2021
11. Dr. Kulaya Tantitemit ^{7/}	9/9	1/1	10/10	-	-	3/3	1/1	Appointed on Apr. 8, 2021
12. Mr. Boonchob Suthamanuswong ^{8/}	2/2	0/0	2/2	-	-	-	1/1	Appointed on Oct. 28, 2021
13. Mr. Chaiwat Kovavisarach	12/12	1/1	13/13	-	-	6/6	3/3	
Directors whose terms were completed and resigned directors in 2021								
1. Dr. Prasert Sinsukprasert	3/3	0/0	3/3	-	-	1/1	-	Resigned on Apr. 2, 2021
2. Dr. Anuchit Anuchitanukul	3/3	0/0	3/3	-	-	1/1	-	Term completed on Apr. 8, 2021
3. Gen. Thammanoon Withee	8/8	1/1	9/9	-	6/6	-	-	Resigned on Sep 23, 2021
4. Mr. Krisada Chinavicharana	8/8	1/1	9/9	-	-	-	2/2	Appointed on Jan. 28, 2021 Resigned on Oct. 1, 2021
5. Mr. Suthi Sukosol	8/9	1/1	9/10	-	-	-	2/2	Resigned on Oct. 19, 2021
6. Mr. Surin Chiravisit	10/10	1/1	11/11	-	-	4/4	-	Resigned on Nov. 1, 2021
7. Mr. Somchai Poolsvasdi	7/8	1/1	8/9	-	-	4/4	-	Appointed on Apr. 2, 2021 Resigned on Dec. 7, 2021
8. Mr. Teerapong Wongsiwawilas	12/12	1/1	13/13	12/12	-	-	-	Resigned on Dec. 30, 2021

Note: ^{1/} Chairman did not join any Sub-Committee as Member

^{2/} Appointed as Chairman of NRC on February 18, 2021

^{3/} Appointed as Member of ERMC on October 1, 2021

^{4/} Appointed as Member of AC and dismissed from Member of ERMC on April 28, 2021

^{5/} Appointed as Chairman of ERMC on November 1, 2021

^{6/} Appointed as Member of CGC on October 1, 2021 and Appointed as Member of ERMC and dismissed from Member of CGC on November 1, 2021

^{7/} Appointed as Member of ERMC on April 28, 2021 and Appointed as Member of CGC and dismissed from Member of ERMC on November 1, 2021

^{8/} Appointed as Member of CGC on November 1, 2021

Board Remuneration

- 1) The Board's remuneration comes in three forms: monthly (retainer) remuneration, meeting allowances, and bonus. Such remuneration, made comparable to those of the same industry, is linked to the performance of the Company and individual directors.
- 2) Directors with additional responsibilities, including subcommittee service, shall receive additional remuneration in proportion to such responsibilities.
- 3) In line with good corporate governance, the Board has instituted the reporting of individual directors' remuneration and the management's remuneration – which includes disclosure of the remuneration of directors or executives, or both, if they are appointed to other positions in subsidiaries – in the annual report.

Policy on Director Remuneration

In setting directors' compensation, Bangchak takes into account suitability for duties, assigned responsibility, and parity with SET-listed industry and business peers of comparable sizes. Such compensation must be attractive enough to inspire quality performance to achieve Bangchak's goals and business directions under a transparent process to bolster shareholders' confidence.

Director Remuneration approved by 2021 AGM of April 8, 2021, are as follows:

1) Monthly remuneration and meeting allowance

The Board of Directors	Monthly Remuneration (Baht/person)	Meeting Allowance (Baht/person/time) (Only for attending directors)
The Board of Directors	30,000	30,000
The Sub-Committees		
1. The Audit Committee	10,000	15,000
2. The Nomination and Remuneration Committee	-	15,000
3. Enterprise-wide Risk Management Committee	-	15,000
4. Corporate Governance Committee	-	15,000
5. Other committees that may be appointed in the future by the Board as seen fit and necessary	-	15,000

The Chairman of the Board of Directors and the Chairman of the Sub-Committees shall receive monthly remuneration and meeting allowances higher than those of members by 25 percent, whilst the Vice Chairman of the Board of Directors shall receive monthly remuneration and meeting allowances higher than those of members by 12.5 percent respectively.

2) Bonuses for Directors

0.75 percent of the net profit, but not over 3,000,000 Baht/year per director. The calculated amounts are to reflect individual periods of service. Moreover, the Chairman and Vice Chairman shall receive the bonus higher than those of members by 25 percent and 12.5 percent respectively.

3) Other Remuneration

Group health insurance

IPD+OPD treatment with annual health insurance not exceeding 50,000 Baht (excluding VAT) per one director

Directors' Other Expenses**1) Other Essential Business Expenses**

- Position car for the Chairman's business convenience
- Driver for the Vice Chairman's business convenience
- Credit card for the Chairman's business use (credit limit 500,000 Baht)
- Fleet card for each director's business use (up to 400 liters/month/director)

2) Others

- Annual physical check-ups
- Directors' & Officers' liability insurance (limit of liability: 250 million Baht)

In 2021, the individual remuneration of Directors was as follows:

Names	Remuneration in Baht						
	BOARD	AC	NRC	ERMC	CGC	Bonus	Total
1. Mr. Pichai Chunhavajira	937,500.00	-	-	-	-	3,750,000.00	4,687,500.00
2. Mr. Suthep Wongvorazathe	765,000.00	-	-	-	45,000	3,062,671.23	3,872,671.23
3. Gen. Vitch Devahasdin	765,000.00	-	131,250	-	56,250	3,062,671.23	4,015,171.23
4. Adm. Sucheep Whoungmaitree	750,000.00	-	135,000	-	-	3,000,000.00	3,885,000.00
5. Gen. Songwit Noonpackdee ^{1/}	180,000.00	-	-	30,000	-	756,164.38	966,164.38
6. Pol.Lt.Gen. Chaiwat Chotima	750,000.00	300,000	135,000	-	-	3,000,000.00	4,185,000.00
7. Mrs. Prisana Praharnkhasuk	750,000.00	225,000	142,500	15,000	-	3,000,000.00	4,132,500.00
8. Dr. Poramete Vimolsiri	750,000.00	375,000	-	-	-	3,000,000.00	4,125,000.00
9. Mr. Prasong Poontaneat ^{2/}	120,000.00	-	-	37,500	-	501,369.86	658,869.86
10. Mr. Chamroen Phothisyod ^{3/}	180,000.00	-	-	30,000	-	756,164.38	966,164.38
11. Dr. Kulaya Tantitemit ^{4/}	562,000.00	-	-	45,000	15,000	2,194,520.55	2,816,520.55
12. Mr. Boonchob Suthamanuswong ^{5/}	123,870.97	-	-	-	15,000	534,246.58	673,117.55
13. Mr. Chaiwat Kovavisarach	750,000.00	-	-	90,000	45,000	3,000,000.00	3,885,000.00
Total	7,383,370.97	900,000	543,750	247,500	176,250	29,617,808.21	38,868,679.18
Directors whose terms were completed and resigned directors in 2021							
1. Dr. Prasert Sinsukprasert ^{6/}	181,000.00	-	-	15,000	-	747,945.21	943,945.21
2. Dr. Anuchit Anuchitanukul ^{7/}	188,000.00	-	-	15,000	-	805,479.45	1,008,479.45
3. Gen. Thammanoon Withee ^{8/}	532,000.00	-	90,000	-	-	2,178,082.19	2,800,082.19
4. Mr. Krisada Chinavicharana ^{9/}	513,870.97	-	-	-	30,000	2,021,917.81	2,565,788.78
5. Mr. Suthi Sukosol ^{10/}	557,419.35	-	-	-	30,000	2,391,780.82	2,979,200.17
6. Mr. Surin Chiravisit ^{11/}	708,750.00	-	-	75,000	-	2,810,958.91	3,594,708.91
7. Mr. Somchai Poolsvasdi ^{12/}	484,806.45	-	-	60,000	-	2,046,575.34	2,591,381.79
8. Mr. Teerapong Wongsiwawilas ^{13/}	748,064.52	300,000	-	-	-	2,983,561.64	4,031,626.16
Total	3,913,911.29	300,000	90,000	165,000	60,000	15,986,301.37	20,515,212.66

Note: ^{1/} Appointed on October 1, 2021

^{2/} Appointed on November 1, 2021

^{3/} Appointed on October 1, 2021

^{4/} Appointed on April 8, 2021

^{5/} Appointed on October 28, 2021 and transferred bonus to the Social Security Fund in compliance with the regulations of the Office of the Social Security Fund

^{6/} Resigned on April 2, 2021

^{7/} Completed term on April 8, 2021

^{8/} Resigned on September 23, 2021

^{9/} Appointed on January 28, 2021, and resigned on October 1, 2021

^{10/} Resigned on October 19, 2021, and transferred bonus to the Social Security Fund in compliance with the regulations of the Office of the Social Security Fund

^{11/} Resigned on November 1, 2021

^{12/} Appointed on April 2, 2021, and resigned on December 7, 2021

^{13/} Resigned on December 30, 2021

Comparison of Remuneration of Directors in 2020 and 2021

Remuneration	2020		2021	
	Directors	Baht	Director	Baht
Monthly remuneration and meeting allowance	15	13,716,000.00	15	13,779,782.26
Bonus	15	12,986,791.34	15	45,604,109.58
Total		26,702,791.34		59,383,891.84

Note: Bonus for 2021 performance under the resolution of the 2021 AGM, held on April 8, 2021 (0.75 percent of the net profit, but not over 3,000,000 Baht/year per director. The calculated amounts are to reflect individual periods of service. Moreover, the Chairman and Vice Chairman shall receive the bonus higher than those of members by 25 percent and 12.5 percent respectively.)

Directors' Remuneration due to Directorship of subsidiaries, associates, and joint ventures in 2021

Com panies	Name	Total remuneration (Baht)				
		Monthly remuneration	Meeting allowance	Bonus	Sub-Committee remuneration	Net Total
BCPG	Mr. Pichai Chunchavajira	450,000	487,500	1,448,221.00	-	2,385,721.00
	Mr. Chaiwat Kovavisarach	405,000	438,750	1,303,396.00	225,000	2,372,146.00
BBGI	Mr. Pichai Chunchavajira	450,000	200,000	928,761.96	-	1,578,761.96
	Mr. Surin Chiravisit	360,000	287,500	743,009.56	-	1,390,509.56
		360,000	300,000	743,009.56	-	1,403,009.56
OKEA	Mr. Chaiwat Kovavisarach	510,000 NOK	70,000 NOK	-	-	2,175,000.00

Notes: - BCPG: BCPG Public Company Limited
 - BBGI: BBGI Public Company Limited
 - OKEA: OKEA ASA
 - Exchange rate NOK 1 equivalent to approximately Baht 3.75

8.1.3 Oversight of subsidiaries, associates, and joint-venture companies

Bangchak runs its businesses through subsidiaries, associates, and joint-venture companies, as detailed under “Shareholding Structure”. The Board commands a mechanism for supervising the management and the responsibility of subsidiaries, associates, and joint-venture companies to safeguard the interests of Bangchak’s investment capital, including

- Secondment of executives by the Board to serve as directors and executives in those companies proportionate to its own shareholding. Details appear under “Corporate Governance Structure”.
- Definition of an oversight approach for joint-venture companies for representative directors to uphold so that the businesses of subsidiaries, associates, and joint-venture companies may be uniform and in line with Bangchak’s policy approach and relevant legislation. Voting or actions on important matters must secure prior approval from the President & CEO, Board, or shareholders, depending on the case.
- Institution of a corporate governance policy and a suitable, watertight internal control system in each of the subsidiaries.
- Supervision of disclosure of these companies’ financial status and performance outcomes, as well as engagement in key transactions, must be properly done in line with Bangchak’s criteria.

8.1.4 Monitoring Compliance of Corporate Governance Policy and Guidelines

1) Policy

Bangchak has instituted its corporate governance policy in writing since 2003 as a result of a workshop engaging all employees where everyone played a part in contributing ideas for the Company’s practical guidelines. This year the Board endorsed Revision 18 of the CG Policy to align it with the requirements of the Corporate Governance Report (CGR) of listed companies, the Thai Private Sector Collective Action against Corruption (CAC), the DJSI, and leading companies’ operating standards on corporate governance, while suiting the current business model.

2) Communication

The Corporate Governance Committee agreed on Bangchak’s annual corporate governance plan by requiring the Company to constantly communicate its corporate governance code and its performance to employees and stakeholders via various channels to raise awareness and communicate to stakeholders on the Company’s intention to elevate corporate governance and set a standard for conducting business such as:

- Communication of good deeds, morality and ethics, and anti-corruption, as well as guidelines of corporate governance policy through Tone from the Top, prepared as the executive’s CG Motto, on the Company’s Intranet.
- Developed a CG Policy (Booklet) as an eBook for easy learning and more accurate adaptation.
- Developed the quarterly CG Lessons Learned to clearly illustrate to employees’ applicable case studies through the BCP KMS.
- The President and CEO gave an interview to Collective Action against Corruption (CAC) as CAC had prepared and disseminated the contents on social media to publicize Bangchak’s success in joining the CAC Project as a Change Agent and encouraging business organizations in their concrete anti-corruption efforts and measures to prevent bribes to government officials.
- Staged the Bangchak Group CG DAY (16th year) on November 22, 2021 under the “CG DAY 2021: Technology & Corporate Governance: Promote or Challenge” theme. BCPG was the host via an online channel with a special talk was given by Prof. Dr. Suchatvee Suwansawat. Employees were encouraged to enter their essays and video clips to vie for prizes, designed to cultivate awareness and develop their caliber while establishing a mastery of corporate governance.

3) Measures and Guidelines

- All employees were required to undertake a Conflict of Interest Report and a test on annual corporate governance and anti-corruption policy. They must pass certain criteria to ensure proper understanding. The test was administered through the online human resource management system (HR-Services) and the online knowledge management system (“BCP KMS”) on the promotion of knowledge and understanding of corporate governance, good internal control system based on the internal control scope, as well as the contents of the Personal Data Protection Act (between November 18 – December 18, 2021) with an average score of 95%.
- Political neutrality without rendering assistance to any political party, directly or indirectly
- Donation is strictly for charity, including sponsorship for the Company’s business, which is not to be used as excuses for corruption and requires clearly documented proofs in line with the Company’s regulations
- No acceptance of gifts or objects of any value on all occasions. No acceptance of and no giving of entertainment and other unnecessary and inappropriate expenses to government officials or those dealing with the Company’s business. If any is received, employees must refuse and report the incident to their superiors for acknowledgment.
- Annual notification to stakeholders on Bangchak’s “No Gift” policy for the New Year and other occasions so as to elevate good corporate governance and set a standard for conducting business with all related parties fairly.

4) Internal Control, Risk Management, and Internal Audit

In order to monitor compliance to this corporate governance policy, Bangchak instituted internal control, risk management, and internal audit systems for key business functions, such as procurement and accounting. Bangchak also closely monitored the progress of risk management plan on a regular basis as detailed under 9.1 Internal Control.

5) Audit

Internal Audit formulates the annual audit plans and reports audit findings to the Audit Committee and the Board for acknowledgment as detailed under 8.2 Report of the Audit Committee).

6) Anti-Corruption

Bangchak incorporated business ethics for anti-corruption in all forms into its corporate governance policy and campaigned for ongoing anti-corruption in the organization through various channels. Bangchak has integrated the anti-corruption policy into its corporate governance policy under Section 4 to reiterate its intention to operate business by abiding by the law and regulations relevant to corporate governance, refusing all forms of fraud and covering all businesses in all applicable countries and agencies. It has defined anti-corruption measures to implement the policy and has regularly reviewed them to comply with changes in laws and business circumstances and uphold Bangchak’s reputation

- Bangchak is committed to complying in full of all applicable anti-money laundering laws. Bangchak will only get involved in legitimate business activities with funds derived from legitimate sources. Bangchak is determined to prevent the Company from falling into any cycle of money laundering and will not tolerate or support any acts of money laundering, including concealing, conversion, transfer, or the handling of illegitimate assets. Also, accurate accounts.
- It is forbidden to hire government employees or officers, leading to conflicts of interest. Bangchak recruits personnel that used to serve as government employees under its own criteria to prevent interpretation as a return of favor for benefits; for transparency and auditability, it also discloses such information. At present, the Company does not employ government employees or officers to do work that causes conflicts of interest.
- Bangchak has established disbursement regulations by defining financial limits, approval authorities, objectives, and recipients, all of which require clear supporting documents to prevent unlawful political help and ensure

that charitable donations do not go to corrupt purposes, business support funds are not excuses for corrupt practices, and receptions, gifts, and other expenses conform to the policy. Also in place is an audit process issued by Internal Audit.

- Bangchak has regularly established processes for auditing sales and marketing, purchasing, and contract administration concerning risk to corrupt practices in conformance to disbursement regulations and purchasing regulations. To this end, Internal Audit provides its comments and explores for suitable corrective actions.
- Bangchak has put in place a personnel administration process that underscores its commitment to anti-corruption measures, ranging from selection, training, performance assessment, compensation, to promotion.
- Bangchak has established internal control for finance, accounting, data recording, and other company processes related to anti-corruption measures, together with control self-assessment for consultation about the findings of internal control.
- Bangchak has established risk management to ward off and suppress frauds and malfeasance, by analyzing business risks, defining the importance of risks and proper measures for assessed risks, and regularly tracking the progress of risk management plans.
- Bangchak has put in place internal audit to ensure that the defined internal control system and risk management can help it achieve goals, and to audit all units' work against requirements and regulations. Internal audit also helps detect weaknesses and provides advice on the development of business processes for greater efficiency and effectiveness under the approach of corporate governance.

The Anti-Corruption policy applies to all Bangchak directors, executives, and employees and its subsidiaries. The relevant implementing measures apply to all affiliates and other companies that the Company has control over, as well as its business agents.

In addition, Bangchak values good corporate governance and anti-corruption alike. Bangchak also joined the UN Global Compact and in 2013 was one of the first 22 companies to achieve CAC (Collective Action Coalition against Corruption) membership certification. Achieving the first CAC membership in 2013 thanks to ongoing transparent business conduct, in 2019 it won the second membership recertification since its first membership recertification in 2016.

During the spread of COVID-19, Bangchak continued to encourage its business partners to join the CAC project. The Company assisted with the public relations and invited the business partners who announced their intention with CAC Road to join CAC Road to Certify and SME Clinic seminar in the form of an online channel through the WebEx system to receive information and knowledge about the laws, case studies along with guidance on how to formulate policies and practices in the preparation of risk assessment methods as well as the process of submitting certification with CAC.

7) Compliance with corporate governance for listed companies

The Stock Exchange of Thailand (SET) established "The Principles of Good Corporate Governance for Listed Companies 2012". The Securities and Exchange Commission (SEC) issued its "Corporate Governance for listed companies 2017", which contains eight major practical guidelines. This year Bangchak continued its compliance with these principles by following these five aspects:

1. Shareholders' rights

The Board of Directors has defined a policy on shareholders' rights in Section 3.3 of the corporate governance policy, as implemented below.

- A Record Date for the AGM was set so that shareholders may have enough time to review meeting notices and various data ahead of the meeting.

- Informed the shareholders about two months ahead of the meeting so that they may schedule meeting attendance, which exceeds what is required by law.
- The meeting notices with information for each agenda item and the proxy form were sent to shareholders for consideration in advance.
- Allowed the shareholders to submit queries needing Bangchak's explanation on certain points of the agenda for the AGM ahead of the meeting since September 9, 2021.
- Facilitated and supported shareholders to attend the shareholders' meeting of either by themselves or through proxies.
- Facilitated shareholders on the meeting date:
 - The AGM was held at the Company's headquarters for travel convenience and parking spaces are adequately reserved,
 - Adopted the Barcode system for registration and vote-tallying for efficiency and speed.
 - Applied the shareholders' meeting software to registration and vote-tallying for efficiency and transparency.
 - Supplied duty stamps for proxy assignment free of charge.
 - Prepared stickers for those that had already registered for getting in and out of the meeting room without rechecking.
- Before the meeting, the Company Secretary clarified the method for voting and vote-tallying for each agenda item and requests shareholders' representatives to witness vote-tallying together with the inspector.
- During the meeting
 - Conducted the meeting by the agenda items sent to the shareholders without adding or switching the agenda items
 - Allowed the shareholders equal rights for expressing views and posing questions on each agenda item and recorded key concerns and views in the minutes.
- After the meeting
 - Publicized the resolutions and vote tallies on each agenda item through SET's channels and Bangchak's website by the evening of the meeting date
 - Publicized the minutes through SET's channels and Bangchak's website and delivered to the shareholders that expressed views at the meeting.

At the 2021 AGM, **Bangchak invited Mrs. Nisanat Pongsawasdi, an independent legal counselor, to serve as an independent inspector to validate the votes and ensure transparency and compliance with the law and the Company's article of association.** This included examination of documents of shareholders or their proxies with the right to attend the meeting, quorum, stakeholders whose voting right was not exercised, and whether the voting process followed the Company's article of association or what was announced by the chair of the meeting, as well as collection of ballots, verification of meeting resolutions, as well as ballot casting. One representative from the shareholders joined the witnesses verifying the AGM ballot-counting.

Results of Quality Assessment for AGM: 100 points and listed as "Excellent" for the 13th consecutive year in participation of the AGM Quality Assurance evaluation. The evaluation was conducted by Thai Investors Association (TIA).

2. Equitable Treatment of Shareholders

The Board of Directors has defined a policy on equitable treatment of shareholders in the corporate governance policy, as implemented below:

- Publicized meeting documents on its website 31 days ahead of the meeting and delivered them to the shareholders 28 days ahead of the meeting.
- Allowed the shareholders to propose additional AGM agenda items and nominate directors from September 9 to December 31, 2021. Bangchak disclosed the criteria and methods at its website and informed the shareholders through SET's channels. The Board's policy is against adding agenda items without prior notice, particularly crucial items for which the shareholders need time to study before making a decision.
- Supported the shareholders' use of proxy forms to steer voting at the meeting (Form B) and nominated four independent directors as proxy alternatives at the meeting.
- Used ballots on every agenda item, particularly that dealing with directors' election where individual directors were voted on. To this end, the votes equaled the number of shares held for the election of one director.
- Required that directors with vested interests should have no votes and stay outside the meeting on such agenda item, as mentioned in the corporate governance policy.
- Defined practices for employees on the maintaining of Bangchak's confidential information and avoidance of benefit-seeking for themselves by exploiting such confidential information, as mentioned in the corporate governance policy.

3. Roles of stakeholders

In the corporate governance policy, the Board defined a policy for its roles toward the stakeholders. In the corporate governance system, several key groups of stakeholders are found, including customers, employees, business partners, shareholders, investors, creditors, and residents of neighboring areas, society, and the environment. Bangchak values the importance of the rights of all groups, which includes actions violating their rights and intellectual properties. Below are the policy and practices (detailed under 3. Driving business for sustainability).

Employees

- Places Individual Development Plans (IDPs) to raise staff knowledge and caliber.
- Performance assessment is based on the Balance Scorecard principles whereby all employees have Key Performance Indicators (KPIs) and will be compensated in accordance with their performance.
- Gives a competitive and fair compensation, depending on the overall performance of the company, in the short term and the long term. In this regard, each year, the Company will conduct a survey of compensation and welfare benchmark between the petroleum industry and the related industry, including the surrounding environment in order to review and improve the compensation criteria. Bangchak, moreover, provided staff welfare exceeding what was required by law, which included the provident fund, medical welfare, shuttle-bus service, staff relations activities, as well as an employee club with various recreational activities.

Customers

- The Company is dedicated to improving the quality and reliability of products and services for maximum customer satisfaction. Its policy is to deliver quality goods and services which meet or exceed customers' demands under fair conditions. Bangchak brand service stations were ranked 1st as measured by Net Promoter Score.
- The Company is also committed to consumers' safety by delivering standard-certified products and by giving accurate, adequate information about its products and services.

Suppliers/Contractors

- The Company has a suppliers' code of conduct and a policy to select and treat Suppliers/Contractors with equality and fairness. It has produced a "Business Contact" manual and drawn up a "Dealer/Station Operator Policy" for distribution to business contacts and dealers/station operators so that they may have proper understanding and strictly comply with Bangchak's corporate governance and business ethics. Bangchak also firmly adheres to contract provisions. Whenever any condition cannot be complied with, Bangchak urgently informs Suppliers/Contractors in advance to jointly solve problems.
- The Company has defined strict criteria for Suppliers/Contractors selection to bolster fair and equal procurement procedures without violation of human rights. It invites those qualified to register with it. Qualified companies are allowed to make offers to compete with others in the same business. The procurement committee then proceeds with the selection, based on price and technical aspects.

Creditors

The Company treats its creditors fairly, responsibly, and transparently and seeks to fulfill all its contractual and financial obligations, especially guarantee conditions, capital management, and payment, collaterals, potential obligations and debts, as well as appropriate capital structure management to ensure creditors of its financial status and ability of repayment. If it cannot fulfill one or more of its obligations, it must notify creditors in advance so that a resolution can be mutually agreed.

Competitors

The Company conducts business with ethics, transparency, and engages in fair competition with its competitors under the guidance of fair competition. It does not seek to find information about Competitors through dishonest or inappropriate means, for example, bribing a competitor's employees. The Company does not engage in slander or discrediting its competitors.

Shareholders

The Company is determined to follow the principles of corporate governance and is focused on creating a business which has financial stability and sustainability to maximize the value of shares for the benefit of the shareholders.

Communities surrounding the refinery, society, and the environment

- The Company conducts its business with adherence to environmental management standards, such as ISO 14000. The Company considers health and safety and the environment an integral part of the business, and has a written guideline on health, safety and the environment for the Directors, Executives, and employees to uphold. The Company also disseminated information for neighbors around the refinery in order to receive the Company's news as well as organized activities for communities and support assistance in various occasions
- Environmental Stewardship
 - Internally, the Company campaigned on reducing printing jobs or photocopying and reliance on electronic communication means instead of paper, including printing on both pages instead of one. It modified business processes to electronic, while educating employees on occupational health, safety, and energy, as well as providing knowledge and training for employees on occupational safety, health, and environment, as well as energy
 - External efforts by arranging for E-Procurement for business partners in making offers in procurement and E-Complaint for customers in filing their complaints or making recommendations, to reduce the use of paper.
- The Company produces "Krob Krua Bai Mai" (Leaf Family) newsletter and "Rob Rua Bangchak" (Bangchak Neighbors) magazine for distribution every other month to allow the community to know the goings-on of the Company as well as receiving interesting information, such as how to save energy, how to ensure safety in daily life, and health tips and how to protect the environment. This is another way for the Company to communicate with and take care of communities around its refinery.

4. Information disclosure and transparency

The Board of Directors has defined a policy on information disclosure and transparency in the corporate governance policy, as implemented below.

- Disclosed performance outcomes, company information, and outlooks to analysts and investors (domestic and international) every quarter.
- Distributed key company data and documents, including the memorandum of association, certification, and regulations beyond the corporate governance policy on its website.
- Investor Relations coordinated with analysts, investors, and other parties that need financial data, performance outcomes, company status, and transactions affecting Bangchak.
- Publicized Bangchak's key information regularly through SET's channels, annual registration statement/annual report, and its website in Thai and English.

5. Board responsibilities

In the corporate governance policy, the Board defined a policy for the roles, duties, and responsibilities of the Board. Below are Bangchak's actions taken this year:

- Revised and defined Bangchak's annual vision, missions, strategies, business plan goals, and budgets every year to maximize value to businesses and for shareholders' security. In addition, the Board endorses key strategies and policies, particularly financial KPIs (key performance indicators) and work plans. Endorsement of KPIs and metric-setting is done early in the year, with periodic tracking.
- Oversee the management's translation of strategic plans into operational plans, assess the outcomes and steer affiliates by requiring their management to report their performances and other key matters for the Board's acknowledgment every month.
- Held an annual corporate strategy seminar with the management to review the vision and set corporate goals.
- Staged a meeting of the independent directors in March and August, and a meeting of the non-management directors in April and September.
- To encourage the Board of Directors to acquire beneficial knowledge and experience, the Company held a talk on "Navigating Thailand Business Path to recover after COVID" by a speaker from Bank of Ayudhya Public Company Limited at the 2021 annual seminar on corporate strategies on September 6, 2021, to the board of directors.
- Developed performance assessment forms for the Board: individual (self-assessment and cross-assessment), group, and committee.
- Instituted an effective internal control system, internal audit, and risk management measures together with regular tracking at Board meetings.
- Established the Legal and Compliance department to monitor all functions to ensure complete compliance, including preparation of legal assessment for Bangchak units, oversight of license renewals with an alert system for responsible superiors and subordinates, and legal education through channels like Outlook, intercom, and annual law training.

8) Monitoring the Use of Inside Information

The Company has a policy detailing the accepted practices of director, executive and employees and forbidding the disclosure of important secret information to the public for personal or other gains, as well as policies on the buying and selling of Company shares as follows:

1. Directors and executives, as well as their spouses, cohabitation partners, and minor children under legal age, including legal entities where they have more than 30% shareholding of the number of all voting rights of the

juristic person, according to Article 258 of the Securities and Exchange Act of 1992 must notify and distribute information about shares held, as well as reporting any changes to SEC every time they buy, sell, transfer, or receive shares within three days of the change to comply with Article 59 or face punishment according to Clause 275 of the Securities and Exchange Act of 1992.

2. Notify the Directors and executives of the financial information which affects the price of shares. Avoid buying or selling Company shares one month prior to the disclosure of information and three days after disclosure, as well as not disclosing information to others before it is made available to the public.

The Company also has penalties against employees who use the Company's inside information for personal gains, ranging from a warning to termination of employment.

9) Conflicts of Interest

Under the corporate governance policy, the guidelines for directors, management and employees stipulated that they must refrain from any act posing potential conflicts of interest with the Company, i.e. any act potentially depriving the Company of its interests or its fair share of interests, including competing with the Company, incurring personal gains from private business dealing with the Company, abuse of Company information for personal gain and holding shares in the Company's business competitors.

The Company, in order to prevent potential conflicts of interest, has set the following forms:

- **CG Commitment and Conflict of Interests Disclosure Form**

To comply with the policy on corporate governance, which forbids directors, management and employees to commit any act which might deprive the Company of its interests, the Company has prepared the above-mentioned form to ensure that all employee acknowledge the CG policy and fill any acts or activities that might be in conflict with the Company's business interests and deliver it to their supervisors through online method.

- **Report of Directors and Management's Stake Form**

The Securities and Exchange Act stipulates that directors and the management are to report to the Company his/her or connected persons' stakes connected with the business operations of the Company or its subsidiaries. The Company has therefore prepared the above-mentioned form for its directors and management to fill out and report any change to the Company. The Corporate Secretary will forward a copy of the form to the Chairman of the Audit Committee to ensure that the directors and management perform their duties with integrity.

- **Report on connected transactions form**

To ensure that transactions between the Company and any related parties or businesses are transparent and comply with SET's rules and regulations, the Company has defined a policy and guidelines on connected transactions and prepared the above-mentioned form for responsible employees to fill out and forward it to the Secretary to the Board of Directors Division with a copy to Internal Audit for acknowledgment.

- **Intention to trade Bangchak Corporation's securities form**

To enable directors and the management to inform the Company of the intention to trade Bangchak shares through Secretary to the Board of Directors Division at least one day in advance, for reporting to the Audit Committee every quarter. Written notices can be sent through bcpssecretary@bangchak.co.th or other electronic channels, including the LINE application.

10) Investor Relations

The Company realizes that its information, both financial and non-financial, affect the decision-making process for investors and stakeholders. Therefore, the management values accurate and full disclosure in a regular and timely manner, in accordance with SEC and SET regulations. The Investor Relations department acts as a center for giving out important information to investors. Bangchak allowed all information to be equally publicized, whether financial reports, performance outcomes and business outlooks, data affecting Bangchak stock prices, or quality-assured data disclosed to investors and stakeholders. Directly and indirectly, Bangchak presented its performance outcomes and company information, summarized below:

- Direct: Bangchak staged meetings between its executives and shareholders, stock analysts, investors, and employees via regular activities to present performance outcomes through analyst meetings, roadshows, conference calls, participation in conferences (domestic and abroad), participation in meetings with minor investors at the “Opportunity Day” or at “SET in the City”, hosted by SET, or company visits by shareholders to enable them to appreciate company businesses more. In addition, institutional investors (domestic and international) and stock analysts may make appointments with executives to inquire about company data through company visits.

Activities	Number (times)
Local Roadshow และ Online roadshow	5
Analyst Meeting	4
Opportunity Day (organized by the SET)	4
Conference Call and Online meeting	4
Answering Inquiries by E-mail/telephone	522 (twice a day in average)
Performance Update one website	4
Factsheet	4
Press Conference (Strategic Plan)	1

- Indirect: Bangchak provided assorted data, performance outcomes, financial statements, and other information given to SET. Other data were presented through meeting documents, video and audio recordings, E-Newsletters, and executives’ interviewing, as well as other reports submitted to SET on the Company’s website www.bangchak.co.th, where interested parties can read and download this information. The Investor’s Relations page contains information in Thai and English which is updated frequently.

8.2 Report of the Audit Committee and Other Sub-Committee

Report of the Audit Committee

Dear Shareholders,

The current Audit Committee of Bangchak Corporation Public Company Limited consists of qualified directors who are independent and experienced, with Dr. Porameteer Vimolsiri serving as Chairman and Pol.Lt.Gen. Chaiwat Chotima, Mr. Teerapong Wongsiwawilas and Mrs. Prisana Praharnkhasuk serving as members.

In 2021, the committee met 12 times, eight of which with management (in the absence of those with invested interests on applicable items). Below are the meeting attendance records.

Name	Meeting attendance/total (times)
Dr. Porameteer Vimolsiri	12/12
Pol.Lt.Gen. Chaiwat Chotima	12/12
Mr. Teerapong Wongsiwawilas	12/12
Mrs. Prisana Praharnkhasuk *	9/9

* Member since April 2021

Below are the highlights of deliberations in 2021:

1. Review of financial statements

With the external auditor, Internal Audit, and management, the committee reviewed the quarterly and annual financial statements along with related financial reports, questioning and commenting on matters affecting the statements, including impacts of changing accounting policies, Financial Reporting Standards No. 9 (financial tools) and No. 16 (leasing), capital bookkeeping method change for OKEA from an associate to a subsidiary, and booking of profits from the sale of investment capital in LAC. The committee sought to ensure that Bangchak's preparation of financial statements followed generally accepted accounting standards and practices and that these statements contained adequately disclosed data.

2. Review of connected transactions

Reviewed connected transactions or transactions with possible conflicts of interest. Viewed that the connected transactions were in line with regular business practices and trade criteria and benefited the business operations of Bangchak and its subsidiaries, as well as with adequate.

3. Nomination of the auditor

Selected, nominated, and proposed pay for KPMG Phoomchai Audit Ltd. as Bangchak's external auditor for 2022; held quarterly discussions with the external auditor about audit problems and timely corrective actions on key issues.

4. Risk management process review

Reviewed the adequacy of Bangchak's risk management processes and proceeded with audit under the existing risks. This year two meetings were held with the Enterprise-wide Risk Management Committee for exchange of views.

5. Compliance review

Reviewed Bangchak's compliance with all announced accounting standards, legal provisions, SET's requirements, and applicable laws in a thorough, accurate fashion under the corporate governance code.

6. Internal control review

Conducted quarterly investigation of internal control with Internal Audit including operation, asset supervision, safety, prevention or reduction of mistakes/damage, leak or loss of assets or material information, reliability of financial reports, and compliance with laws, rules, regulations, as well as review of governance of subsidiaries' operations.

This year the committee stressed compliance with the refinery's safety measures for the prevention and termination of fires, as well as audit planning in line with Bangchak's key risk issues.

Management monitored and made rectifications based on the recommendations of the committee and Internal Audit to ensure a sound internal control system.

7. Internal audit review

- Approved its own charter in accordance with the criteria and regulations of SEC and SET and the corporate governance policy to ensure the shareholders, business partners and customers, and other stakeholders that Bangchak's operations complied with ethics while maintaining an efficient internal control system.
- Reviewed the policy and operation manual of Internal Audit to cover the roles, duties, and responsibilities of the committee and in accordance with the criteria and regulations of SEC and SET as practical guidelines.
- Supported the development of the Internal Audit chief to achieve quality based on international standards.
- Encouraged Internal Audit to apply computer and IT systems to the analysis of information through analytical programming and display of results, as well as the development of guidelines of investigation by focusing on continuous auditing.
- Encouraged Internal Audit to undergo third-party audit quality assessment.

Monitoring Bangchak's performance this year under the assigned scope of duties and responsibilities, the Audit Committee feels that Bangchak prepared materially correct financial statements under the generally accepted accounting principles. Data for connected transactions or those of possible conflicts of interest were duly disclosed. In place were an internal control system and risk management practices of the company and its subsidiaries that proved adequate and fit business circumstances. Finally, Bangchak accurately and thoroughly abided by the law, SET's requirements, and applicable legal provisions.

(Signed) Dr. Poramtee Vimolsiri

(Dr. Poramtee Vimolsiri)

Chairperson, Audit Committee

January 18, 2022

Report of the Nomination and Remuneration Committee

Dear Shareholders,

Board Meeting No. 2/2021 appointed the present Nomination and Remuneration Committee, chaired by Gen. Vitch Devahasdin, with Ms. Prisana Praharnkhasuk, Adm. Sucheeep Whoungmaitree and and Pol.Lt.Gen. Chaiwat Chotima as member and secretary.

This year the committee held nine meetings, highlighted below.

Director and President & CEO nomination: The committee nominated new directors to replace the retiring ones, those resigning ahead of term completion and President & CEO by reviewing their competency, experience, sound career records, leadership, vision, virtue, ethics, good attitudes toward the corporation, and the ability to dedicate adequate time—all of which benefit Bangchak. In addition, the committee considered board diversity and produced a board skills matrix to define the qualifications of desirable directors. To this end, it reviewed missing essential skills as well as proper qualifications in line with Bangchak's Board composition and structure suiting business strategies; to complement the nomination, it also leveraged Institute of Directors (IOD)'s Director Pool. Today the Board consists of 14 directors, nine of whom are independent ones, four are non-executive directors, and the President & CEO the sole management director. Their profiles appear under Governance Structure and Key Information on Board of Directors, Sub-committees, Management, Employees, and Others.

Board and President & CEO compensation consideration: The committee considered commensuration with their duties as well as responsibilities suiting Bangchak's results of operation and performance as well as parity with SET's peer listed companies of comparable sizes. Such compensation must be able to inspire quality directors and management to execute their duties and fulfill Bangchak's goals as well as business directions. Compensation information appears under Highlights of Corporate Governance.

The Nomination and Remuneration Committee independently executed its duties under the corporate governance code to ensure transparent processes and foster confidence among shareholders and all stakeholders.

(Signed) Gen. Vitch Devahasdin

(Gen. Vitch Devahasdin)

Chairperson, Nomination and Remuneration Committee

December 17, 2021

Report of the Enterprise-wide Risk Management Committee

Dear Shareholders,

To foster confidence that Bangchak Corporation can execute its businesses under volatile circumstances, it appointed an Enterprise-wide Risk Management Committee (ERMC) to define policies supporting its risk management practices affecting the corporation, dealing with strategic, operation, financial, and reputation risks. ERMC executed its Board-assigned duties under the enterprise-wide risk management criteria.

This year the committee held six meetings with management and the internal auditor as well as two meetings with the Audit Committee, highlighted below.

- **Supervision and formulation of policies and management of key corporate risks** arising from fluid business circumstances stemming from several external and internal factors with negative and positive impacts: To this end, it defined risk management plans in parallel with corporate strategies, under which three cases of scenario planning were defined for adaptation of execution fitting actual circumstances. Key risk indicators were defined and tracked, as they affected corporate KPIs in a timely way with fluid business circumstances under various factors. For instance, the lethargic world economy and repercussions of COVID-19, vigilance for flood-related disasters, climate change issues, changing economic circumstances, safety, socio-community-environmental impacts, compliance with laws, anti-corruption, and cyber-security vigilance. The committee's aim is sustainable development under Environmental, Social and Governance (ESG). As a result, ERMC valued risk management of Bangchak Group companies, which included assessment of risk management for suppliers and stakeholders' expectations together with vigilance and monitoring of overall impacts so as to produce manageable risk control and proper business conduct for the entire group.
- **Recommendations on new investments:** To accommodate the Group's global investment expansion in emerging businesses, Bangchak required that significant investment projects must command risk management plans in assorted aspects before seeking ERMC's endorsement for the Board's approval. This fostered confidence that such businesses commanded proper risk management practices, did not unduly impact communities and the environment, and stood a good chance of goal achievement. This year the committee gave recommendations and observations on the defining of investment project risk management plans including an investment project in the LNG business under BTSG Co., Ltd., and another in the fuel transport and logistics business under Bangkok Fuel Pipeline and Logistics Co., Ltd. (BFPL).
- **Support to BCM (Business Continuity Management):** Bangchak should focus on its strategic, process, and resource preparedness by advocating preparedness for the new COVID-19 pandemic waves of infection that are both rapid and severe with wide-ranging impacts, including lockdowns, which affect fuel consumption, and the domestic economy with a bleak growth outlook. The committee promoted compliance with BCM plans under the pandemic, with a focus on the safety of employees, families, suppliers, communities around the refinery, and related parties. Also, business plans have been modified for suitability and timely responses to ease impacts while still maintaining proper control over spending and investment, including management of working capital to allow for good business continuity.

The committee also advocated knowledge enhancement about the BCM system among related personnel. To this end, this year it ensured BCM Internal Audit training for awareness of duties and recommended practices while reviewing and adjusting BCM plans for connection and the ability to efficiently manage under all circumstances. As a result, this year Bangchak garnered ISO 22301:2012 certification for the Head Office at M Tower, Bangchak Refinery, Bangchak Oil Distribution Center, the Central Region Business Office, and Bang Pa-in Oil Distribution Center to foster confidence among stakeholders that its businesses can go on uninterrupted even during crises.

The Enterprise-wide Risk Management Committee is committed to ensuring that Bangchak commands supervision and properly manages risks. As a result of the actions taken this year, the committee is confident that Bangchak can indeed operate efficiently in pursuit of its goals.

(Signed) Mr. Prasong Poontaneat

(Mr. Prasong Poontaneat)

Chairperson, Enterprise-wide Risk Management
Committee

December 17, 2021

Report of the Corporate Governance Committee

Dear Shareholders,

The Board of Directors appointed a Corporate Governance Committee, chaired by Gen. Vitch Devahasdin, with Mr. Suthep Wongvorazathe, Dr. Kulaya Tantitemit and Mr. Boonchob Suthamanuswong as members together with Mr. Chaiwat Kovavisarach as member and secretary.

This committee was assigned by the Board to define and review policies as well as guidelines for corporate governance (CG) and sustainable development, and to develop optimal governance processes for shareholders and stakeholders.

This year the committee held two meetings to track actions under the CG development plan, highlighted below.

1. Rights of shareholders

- Publicized AGM information through websites 30 days ahead of the meeting and mailed documents to shareholders 28 days in advance
- Installed enough AGM registration points for the attendees for registration speed
- Publicized the 2020 AGM minutes on Bangchak's website within 14 days
- Allowed the shareholders to submit questions needing responses at the AGM from September 9, 2021.

2. Equitable treatment of shareholders

- Recommended the names of six independent directors as AGM proxy choices for shareholders
- Allowed the shareholders to propose AGM meeting agenda and nominate directors in advance from September 9 to December 31, 2021
- Reported the shareholding of directors and management at every monthly Board meeting.

3. Roles of stakeholders

- Monitored complaint (whistleblowing) reporting through Internal Audit Department. This year one case was reported through ico@bangchak.co.th (Internal Audit Department) about possible corrupt or unethical practices on job inspection. Bangchak's probe outcome was that such inspection had followed procedures, standards, and terms.

4. Information disclosure and transparency

- Announced operation results, company information, and outlook to domestic and international analysts and investors every quarter for a total of 13 times to disclose performance outcomes and the business outlook to analysts and investors.

5. Board responsibility

- Prepared orientation packages for seven new directors, namely Mr. Krisada Chinavicharana, Mr. Somchai Poolsvasdi, Dr. Kulaya Tantitemit, Gen. Songwit Noonpackdee, Mr. Chamroen Phothiyod, Mr. Prasong Poontaneat and Mr. Boonchob Suthamanuswong on Bangchak's business nature and approach, applicable laws and regulations, Corporate Governance Policy, and other essential data for their efficient performance.
- Enhanced the skills and expertise of directors as corporate leaders for effectiveness and achievement of short-term and long-term goals, thus leading the corporation toward sustainability
- Joined the annual corporate strategic seminar with management to review its vision and set goals
- Organized two meetings of the independent directors (in March and August)
- Organized two meetings of the non-management directors (in April and August).

6. Good corporate governance policy

- Amended the 2021 Corporate Governance Policy (Rev. 18) by adding texts to align with the Corporate Governance Report (CGR) criteria, Thai Private Sector Collective Action Against Corruption (CAC) criteria, Dow Jones Sustainability Index (DJSI) criteria, and leading corporations' corporate governance standards.
- Developed a CG Policy (Booklet) as an eBook for easy learning and more accurate adaptation.
- Required all employees to provide personal data and items for Bangchak's annual Conflicts of Interest Report through HR-Services or with each circumstantial change. Employees are to take the relevant policy test through the BCP KMS management system. This year Bangchak put in place promotion of CG mastery, internal control defined by COSO (The Committee of Sponsoring Organizations of the Treadway Commission), and essences of the application of the Personal Data Protection Act of 2019.
- Developed the quarterly CG Lessons Learned to clearly illustrate to employees applicable case studies through the BCP KMS.

7. Participation in the publicity of the CG code

- The President & CEO gave an interview to the CAC Project on the CAC Change Agent Success Story, as Bangchak valued concrete support to business entities in designing policies and measures to thwart corruption. This video-clip interview suited vendor and external communication. In addition, CAC publicized the clip to CAC Project participants and via other public channels, including the CAC website.

8. Public relations activities promoting the CG culture

- Discussed CG with external agencies.
- Staged the Bangchak Group CG DAY under the "CG DAY 2021: Technology & Corporate Governance: Promote or Challenge" theme. A special talk was given by Prof. Dr. Suchatvee Suwansawat. Employees were encouraged to enter their essays and video clips to vie for prizes, designed to cultivate awareness and develop their caliber while establishing a mastery of corporate governance.

9. Anti-corrupt practices

- Bangchak encourages its suppliers to become certified CAC members. This year it encouraged suppliers to undergo quarterly CAC training by organizing online seminars through the WebEx system. Thanks to these, since 2013 a total of 96 suppliers have joined the declared intention.
- Bangchak valued and stressed its No-Gift Policy for all festive and other occasions so as to elevate CG while setting good precedents for fair business dealing with all related parties.

Thanks to all these CG practices, this year Bangchak earned steady prestigious rankings and CG awards, including

- Excellent ranking (five emblems) under the 2021 CGR (Corporate Governance Report) survey of listed companies, organized by Thai IOD and SET. Bangchak was among those in Thailand with top scores.
- The 2021 Thai Chamber of Commerce Outstanding Code of Conduct Certificate, sponsored by the Thai Chamber of Commerce and the Board of Trade of Thailand, manifested Bangchak's ethical business conduct, which garnered social acceptance and trust.
- Honorable Mention, the 10th NACC Integrity Awards, organized by the National Anti-Corruption Commission (NACC), demonstrates the commitment of executives and employees to jointly develop an anti-corruption system and create a transparent and anti-corruption culture in the organization.

The Corporate Governance Committee has reviewed CG practices, which indicated its own adequate and effective performance as called for by the Corporate Governance Policy and assigned by the Board.

From 2022 onward, the Board endorsed the committee's new name (Sustainability and Corporate Governance Committee) and amended its roles and responsibility to embrace sustainability matters to align with Bangchak Corporation's vision, mission, and goals.

(Signed) Gen. Vitch Devahasdin

(Gen. Vitch Devahasdin)

Chairperson, Corporate Governance Committee

November 25, 2021

8.3 Changes in the Securities Portfolios of Directors and Executives

The Company has notified all Board of Directors and Executive members of the Securities and Exchange Commission (SEC) announcement, calling on them to report their portfolios, including those of their spouses, cohabitation partners, and minor children under legal age, including legal entities where they have more than 30% shareholding of the number of all voting rights of the juristic person, to SEC within 30 days of their appointment to the Board and the management rank, respectively, and to do so with each change in portfolio within 3 business days.

Each month the portfolios and changes of the Board and the executives are reported to the Board at their meeting. These portfolios were as follows.

Name	Shares as of Year-end 2020	Shares as of Year-end 2021	Increase (Decrease)
Board of Directors			
1. Mr. Pichai Chunhavajira	-	-	-
2. Mr. Suthep Wongvorazathe	-	-	-
3. Gen. Vitch Devahasdin	-	-	-
4. Adm. Sucheep Whoungmaitree	-	-	-
5. Gen. Songwit Noonpackdee ^{1/}	-	-	-
6. Pol.Lt.Gen. Chaiwat Chotima	-	-	-
7. Mrs. Prisana Praharnkhasuk	-	-	-
8. Dr. Porametee Vimolsiri	-	-	-
9. Mr. Prasong Poontaneat ^{2/}	-	-	-
10. Mr. Chamroen Phothiyod ^{3/}	-	-	-
11. Dr. Kulaya Tantitemit ^{4/}	-	-	-
12. Mr. Boonchob Suthamanuswong ^{5/}	-	-	-
13. Mr. Chaiwat Kovavisarach	1,200,000	1,350,000	150,000
Executive Management			
1. Mr. Bundit Sapianchai	95	95	-
2. Mr. Pativat Tivasasit	-	-	-
<i>Mrs. Suvimol Tivasasit (Spouse)</i>	12,000	33,500	21,500
3. Mr. Somchai Tejavanija	28,522	28,522	-
4. Mr. Kittiphong Limsuwannarot	-	-	-
5. Mr. Surachai Kositsareewong	-	-	-
6. Mr. Chokchai Atsawarangsalit	300	300	-
7. Mr. Viboon Wongsakul	-	-	-

Note: Directors and executives do not have any indirect shareholding (except the executive no.2).

^{1/} Appointed as Director on October 1, 2021

^{2/} Appointed as Director on November 1, 2021

^{3/} Appointed as Director on October 1, 2021

^{4/} Appointed as Director on April 8, 2021

^{5/} Appointed as Director on October 28, 2021

9. Internal Control and Connected Transactions

9.1 Internal Control

Bangchak Corporation Public Company Limited values a sound internal control system under the scope of The Committee of Sponsoring Organizations of the Treadway Commission (COSO), which requires these components of internal control: control environment, risk management, control activities, information and communication, and monitoring activities.

Having reviewed the recommendations, the Board provided its views on the adequacy and suitability of the internal control system. Below is a summary of assessment findings.

1. Control environment

Bangchak's work environment favors proceeding under the internal control system. Legal and Corporate Compliance centralizes compliance efforts for laws and regulations of agencies in a clear, concrete way to guide employees' performance. Internal Control Division promotes and steers compliance with the internal control system under COSO. This has been communicated to executives and staff to win their recognition of sound internal control. Moreover, the Control Self-Assessment process has been developed with a consulting firm to strengthen internal control.

Amendment is made to business policies, employee manual, operating manual, and organization and taskforce structuring to render the management's efficiency. Finally, Bangchak relentlessly values business integrity and ethics under its corporate governance (CG) policy, sustainable business development with the environment and society, as well as compliance.

Bangchak values the issues of fraud risks and conflicts of interest, as evident in its requirement for employees to provide data on their conflicts of interest via the HR-Service system for their convenience and up-to-date data every year.

Bangchak takes fraud risk and conflict of interest very seriously. Staff are required to declare their conflicts of interest on the HR-Services system, designed to provide

convenience and facilitate annual updates. Bangchak also values corporate governance, thus producing the CG Manual, which demands executives and staff to comply with the CG policy. Key points in the manual have been communicated and publicized among both internal and external parties. For example, the six key principles of Bangchak's corporate governance, namely accountability, responsibility, transparency, equitable treatment, vision to create long-term value, and ethics, the No-Gift Policy, and the Do's & Don'ts together with short messages from executives to staff on such matters as doing good, anti-corruption, and tone at the top leadership. The Company has organized CG Day activities for the year 2021 (16th year) under the topic "Technology & Corporate Governance, promoting or challenging" to continually enhance understanding and raise awareness of the CG policy. and organized a supplier seminar for the year 2021 (8th year) which provided knowledge about Supplier Code of Conduct to partners to support sustainable business operations. Bangchak still encourages suppliers and partners to join Thailand's Private Sector Collective Action Coalition against Corruption (CAC), which underscores continuous commitment to anti-corruption.

2. Risk assessment

Bangchak appointed an Enterprise-wide Risk Management Committee (ERMC) to steer risk management for the entire corporation and develop a continually efficient enterprise risk management system under the ISO 31000 international standard embracing strategic, operation, financial, and reputation risks. These risks imply safety and occupational health risks; risks of impacts on the environment, society, and communities; compliance risks; and risks of corrupt practices, among others. Risk management processes cover the entire corporation, namely the corporate, business group/functional group, section, and work process groups. Also, in place is a formulating process for investment project risk management in each of Bangchak's projects worldwide. And to promote ESG (Environmental, Social and Governance), the Board values risk management by affiliates

and joint ventures so that they may operate suitably, stay vigilant, and monitor overall impacts for manageable risk control. Overall, Bangchak Group successfully managed these risks.

Bangchak's defined policy and key risk management practices have been well-aligned with TQA and Dow Jones Sustainability Indices (DJSI) in parallel with corporate strategic plan formulation. Foreseeable post-Covid situations have been defined, prompting Bangchak to draw up a strategy under two scenarios to adapt to the actual situation. Key risk indicators (KRIs) have been applied to the vigilance monitoring of risk likelihood to finetune and define additional risk management plans to ease impacts on corporate goals and achieve manageable key corporate risk control and desired outcomes.

To enable Bangchak to handle unforeseen risks that could hurt business capability, including the spread of the COVID-19 virus, surveillance of the flood situation, global climate change issues, natural catastrophes, sabotage, political change, pandemic and other incidents, it appointed a Business Continuity Management Taskforce to develop a system, oversee strategic preparedness, processes, resources, and revise plans to cope with risks and crises more effectively so that Bangchak's businesses may proceed uninterrupted and mitigate repercussions. To this end, it has introduced the ISO 22301:2012 system to the corporation, embracing Head Office, Bangchak Refinery, and Bangchak Oil Distribution Center, Central Region Business Office, and Bang Pa-in Oil Distribution Center since 2013 (for eight consecutive years). This move certifies that Bangchak indeed commands a system to handle crises, manage business continuity on a par with international standards, and bolster confidence among stakeholders that it is capable of coping with crises, and of continuing to deliver products. The acquired ISO 22301:2012 certificate has been monitored each year by the standard certifier.

3. Control activities

Bangchak's control activities rely on KPIs for planning and exerting control. Duties and responsibilities are segregated for checks and balances, as are the revision and definition of authority levels and approval authority for each level for

business suitability. E-signature technology has been introduced to support business agility. Checks and balances and authority inspection are the mandates of dedicated units and committees, including Internal Audit, the Investment Committee, and ERM.

Bangchak has adopted a system for documents and evidence of delegating responsibility should errors arise. Custody of company assets prevents losses or abuses, as does the monitoring of transactions with long-term corporate commitment, under which agreed terms are to be honored. Measures are in place to prevent exploitation of opportunities or benefits from personal gain. This year Bangchak repeated to staff procedures on corporate data management and control so that all units may effectively treat company information to avoid any harm to the business.

At Bangchak, procedures ensure compliance with laws and applicable regulations as well as key operating procedures. Technology systems have been developed for promoting internal control. This year Bangchak rolled out its "Work process management policy", which takes seriously proper work practices by designated work processes. Work processes are constantly improved for effectiveness with due regard for points of control and control measures to lessen risks; these efficient processes are modern and align with Bangchak's directions and goals. The e-Work Manual system is used to keep track of the preparation and update of the work manual to be up to date. There is also an emphasis on communication and developments have been made to work processes in response to the Personal Data Protection Act B.E. 2562 (2019), such as staff training to ensure their awareness of and compliance with the act.

At Bangchak, watertight measures are in place for its transactions with major shareholders, directors, among others, to avert the siphoning of benefits. For instance, such transactions must be approved by those without vested interests and such transactions' data must be disclosed under SEC's rules, including data on parties or related undertakings under accounting standards.

Bangchak set up an ISMS Management Team to deal with information security management, which involves review

and improvement of IT policy and regulations. The team's mission includes monitoring of threats, email filtering, malware prevention, firewall system, as well as staff communication about regulations concerning information security and risk. Threat prevention is regularly run together with measures to boost awareness of possible threats to the business. Thanks to information security management, Bangchak won ISO/IEC 27001:2013 (information security management system) and a Letter of Compliance, which exhibits agreement with the standard (Guidelines for Cybersecurity) – the first to be so awarded in Thailand. Recertification has been continued to this date. Furthermore, this year Bangchak won ISO/IEC 27001:2013 concerning information security management in the oil refining control system from SGS Thailand Limited.

Bangchak has guidelines for supervision, and has a process to monitor the operations of associated companies and subsidiaries in accordance with business strategies, policy framework and guidelines of the company. There are committees according to the risk management structure, namely Enterprise-wide Risk Management Committee (ERMC), Audit Committee (AC), and Strategic Investment Management Committee (SIMC) and Subsidiary Synergy & Strategic Alignment Steering Committee (SSS).

4. Information and communication

Every year Bangchak revises its Digital Roadmap to agree with its strategic plans on refinery management, marketing, and key business processes, namely finance, accounting, personnel administration. To this end, new technologies heled map out business processes to grow business caliber, including IoT (Internet of Things). A sensor was installed to monitor and increase the operation reliability of main machinery in the refinery. Additionally, an E-Work Permit Online system was implemented to raise work efficiency. On the marketing front, an e-payment through electronic data capture (EDC) device was introduced to avoid physical contact. A marketing plan for individual customers was also drawn up to better respond to customers' demand, create an impressive experience for customers and Bangchak card members assess their satisfaction with the service via the mobile application to continuously improve service quality.

The company also uses various digital technologies to support its work, such as the use of Data Analytics systems to analyze marketing data and adopted the Robotic Process Automation (RPA) technology to support work processes involving a large volume of information and repetitive work.

Bangchak's various employee communication channels and processes educate employees on various issues in a swift manner to ensure that messages get through, including the Intranet, e-mails, intercom, and digital message boards, in addition to informal but popular channels like LINE Group. Also, communication with external stakeholders is carried out through multiple media, especially online media, today's popular means of communication due to its data transmission speed, including its website and Facebook. The purpose is easy access and application as well as successful data search results through mobile devices to quickly and efficient meet business demand.

Bangchak has set up complaint channels as well as a whistleblowing system for employees and stakeholders, who can use phone numbers or e-mails; they are to be duly protected and enter the fact-finding process for eventual correction.

5. Monitoring

Bangchak commands a system that monitors compliance with internal control. The Internal Control Division works to assess corporate compliance (CSA : Control Self-Assessment), with relevant executives assessing the adequacy and suitability of the internal control system. Online technologies have been adopted for greater efficiency of the corporate assessment system. The online assessment technology is being used to increase the efficiency of the enterprise assessment process including the internal control assessment at the process level by the process owner in a workshop format for critical work processes. Meanwhile, Internal Audit takes charge of assessing internal control under an audit plan earlier approved by the Audit Committee and giving recommendations for further development of the system. Should any flaw in the system be spotted, Bangchak takes corrective actions so that the business targets could be achieved.

9.2 Connected transactions

1. Connected transactions with subsidiaries, jointly-controlled businesses, associated companies and related companies during 2020 and 2021 consisted of the following:

1.1 Sale of products and services to subsidiaries, jointly-controlled businesses, associated companies and related companies

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
Bangchak Green Net Co., Ltd.	23,620.62	27,749.01	Bangchak	49	Bangchak delegates its representatives as directors
Bangchak Biofuel Co., Ltd.	0.01	–	BBGI Plc. (Subsidiary)	70	Bangchak delegates its representatives as directors
BCP Trading Pte. Ltd.	6,467.13	15,702.55	Bangchak	100	Bangchak delegates its representatives as directors
Bangchak Retail Co., Ltd.	16.72	21.21	Bangchak	100	Bangchak delegates its representatives as directors
Bangchak Bioethanol (Chachoengsao) Co., Ltd.	2.23	2.31	BBGI Plc. (Subsidiary)	85	Bangchak delegates its representatives as directors
KSL Green Innovation Plc.	2.71	0.79	BBGI Plc. (Subsidiary)	100	Bangchak delegates its representatives as directors
Associated Company					
Ubon Bio Ethanol Plc.	10.05	8.28	BBGI Plc. (Subsidiary)	12	Bangchak delegates its representatives as directors
Ubon Bio Agricultural Co., Ltd.	1.77	–	Ubon Bio Ethanol Plc. (Associated Company)	100	Bangchak delegates its representatives as directors
Related Business					
Ubon Bio Ethanol Plc.	–	5.87	BBGI Plc. (Subsidiary)	12.39	Bangchak delegates its representatives as directors

Since September 27, 2021, Ubon Bio Ethanol Plc. has status as other related parties.

1.2 Purchase of products and services from subsidiaries, jointly-controlled businesses, associated companies and related companies

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
Bangchak Biofuel Co., Ltd.	7,142.79	8,285.05	BBGI Plc. (Subsidiary)	70	Bangchak delegates its representatives as directors
BCP Trading Pte, Ltd.	25,586.04	29,642.14	Bangchak	100	Bangchak delegates its representatives as directors
Bangchak Bioethanol (Chachoengsao) Co., Ltd	881.32	1,120.74	BBGI Plc. (Subsidiary)	85	Bangchak delegates its representatives as directors
KSL Green Innovation Plc.	1,835.80	2,453.68	BBGI Plc. (Subsidiary)	100	Bangchak delegates its representatives as directors
BBGI Plc.	-	0.67	Bangchak	60	Bangchak delegates its representatives as directors
Associated Company					
Ubon Bio Ethanol Plc.	1,183.57	676.22	BBGI Plc. (Subsidiary)	12.39	Bangchak delegates its representatives as directors
Joint Venture					
Bongkot Marine Services Co., Ltd.	453.93	468.62	Bangchak	30	Bangchak delegates its representatives as directors
Related Business					
Fuel Pipeline Transportation Co., Ltd.	301.33	244.28	Bangchak	4.78	Bangchak delegates its representatives as directors
Ubon Bio Ethanol Plc.	-	297.05	BBGI Plc. (Subsidiary)	12.39	Bangchak delegates its representatives as directors

Since September 27, 2021, Ubon Bio Ethanol Plc. has status as other related parties.

1.3 Revenue from investment and other revenues from subsidiaries, jointly-controlled businesses, and related companies

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
Bangchak Green Net Co., Ltd.	32.76	74.61	Bangchak	49	Bangchak delegates its representatives as directors
Bangchak Biofuel Co., Ltd.	1.17	1.27	BBGI Plc. (Subsidiary)	70	Bangchak delegates its representatives as directors
NIDO Petroleum Pty. Ltd.	6.86	9.71	BCP Energy International Pte. Ltd. (Subsidiary)	100	Bangchak delegates its representatives as directors
BBGI Plc.	47.78	337.94	Bangchak	60	Bangchak delegates its representatives as directors
BCPG Plc.	490.19	589.19	Bangchak	57.46	Bangchak delegates its representatives as directors
Bangchak Bioethanol (Chachoengsao) Co., Ltd	0.55	0.53	BBGI Plc. (Subsidiary)	85	Bangchak delegates its representatives as directors
Bangchak Retail Co., Ltd.	23.64	16.70	Bangchak	100	Bangchak delegates its representatives as directors
BCPR Co., Ltd.	0.17	0.17	Bangchak	100	Bangchak delegates its representatives as directors
BCP Trading Pte, Ltd.	3.98	63.66	Bangchak	100	Bangchak delegates its representatives as directors
BCP Innovation Pte, Ltd.	49.98	-	Bangchak	100	Bangchak delegates its representatives as directors
BCPR Pte, Ltd.	137.55	123.66	BCPR Co., Ltd. (Subsidiary)	100	Bangchak delegates its representatives as directors
KSL Green Innovation Plc.	-	0.15	BBGI Plc. (Subsidiary)	100	Bangchak delegates its representatives as directors

1.3 Revenue from investment and other revenues from subsidiaries, jointly-controlled businesses, and related companies

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Winnonie Co., Ltd.	-	15.94	BCV Innovation Co., Ltd. (Subsidiary)	100	Bangchak delegates its representatives as directors
BTSG Co., Ltd.	-	0.26	Bangchak	51	Bangchak delegates its representatives as directors
Bangkok Fuel Pipeline and Logistics Co., Ltd.	-	0.41	Bangchak	100	Bangchak delegates its representatives as directors
BBGI Utility and Power Co., Ltd.	0.30	-	BBGI Plc. (Subsidiary)	100	Bangchak delegates its representatives as directors
Associated Company					
OKEA ASA	2.92	-	BCPR Pte. Ltd. (Subsidiary)	45.71	Bangchak delegates its representatives as directors
Joint Venture					
Bongkot Marine Services Co., Ltd.	5.84	24	Bangchak	30	Bangchak delegates its representatives as directors
Related Business					
Fuel Pipeline Transportation Co., Ltd.	4.52	4.37	Bangchak	4.78	Bangchak delegates its representatives as directors

1.4 Other expenses paid to subsidiaries, jointly-controlled businesses, and related companies

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
Bangchak Green Net Co., Ltd.	31.88	31.53	Bangchak	49	Bangchak delegates its representatives as directors
Bangchak Retail Co., Ltd.	3.53	16.38	Bangchak	100	Bangchak delegates its representatives as directors
BCPG Plc.	–	0.03	Bangchak	57.46	Bangchak delegates its representatives as directors
BBGI Plc.	–	0.56	Bangchak	60	Bangchak delegates its representatives as directors
Bangchak Bioethanol (Chachoengsao) Co., Ltd	0.34	–	BBGI Plc. (Subsidiary)	85	Bangchak delegates its representatives as directors
Winnonie Co., Ltd.	–	0.30	BCV Innovation Co., Ltd. (Subsidiary)	100	Bangchak delegates its representatives as directors
General Energy Manning Co., Ltd.	–	1.46	Bangchak	49	Bangchak delegates its representatives as directors
Joint Venture					
Oam Suk Social Enterprise Co., Ltd.	0.79	0.76	Bangchak	30	Bangchak delegates its representatives as directors
Related Business					
Fuel Pipeline Transportation Co., Ltd.	0.05	–	Bangchak	4.78	Bangchak delegates its representatives as directors

1.5 Debtors, advance payments, and short-term loans to related businesses

1.5.1 Trade debtors

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
Bangchak Green Net Co., Ltd.	636.69	696.34	Bangchak	49	Bangchak delegates its representatives as directors
Bangchak Retail Co., Ltd.	3.66	2.57	Bangchak	100	Bangchak delegates its representatives as directors
BCP Trading Pte, Ltd.	19.96	1,381.77	Bangchak	100	Bangchak delegates its representatives as directors
Associated Company					
Ubon Bio Ethanol Plc.	1.31	–	BBGI Plc. (Subsidiary)	12.39	Bangchak delegates its representatives as directors
Related Business					
Fuel Pipeline Transportation Co., Ltd.	0.33	0.33	Bangchak	4.78	Bangchak delegates its representatives as directors
Ubon Bio Ethanol Plc.	–	2.46	BBGI Plc. (Subsidiary)	12.39	Bangchak delegates its representatives as directors

Since September 27, 2021, Ubon Bio Ethanol Plc. has status as other related parties.

1.5.2 Debtors and loans to related businesses

1.5.2.1 Loans, net of allowance for impairment

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
Bangchak Retail Co., Ltd.	550.80	–	Bangchak	100	Bangchak delegates its representatives as directors
BCPR Pte, Ltd.	1,033.54	1,036.39	BCPR Co., Ltd. (Subsidiary)	100	Bangchak delegates its representatives as directors
Bangkok Fuel Pipeline and Logistics Co., Ltd.	–	922.00	Bangchak	100	Bangchak delegates its representatives as directors
Related Business					
Fuel Pipeline Transportation Co., Ltd.	3.69	0.28	Bangchak	4.78	Bangchak delegates its representatives as directors

1.5.2.2 Other debtors, net of allowance for impairment

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
Bangchak Green Net Co., Ltd.	–	3.18	Bangchak	49	Bangchak delegates its representatives as directors
Bangchak Biofuel Co., Ltd.	0.06	0.47	BBGI Plc. (Subsidiary)	70	Bangchak delegates its representatives as directors
Bangchak Retail Co., Ltd.	10.46	2.51	Bangchak	100	Bangchak delegates its representatives as directors
BCPG Plc.	9.74	18.81	Bangchak	57.46	Bangchak delegates its representatives as directors
Bangchak Bioethanol (Chachoengsao) Co., Ltd.	0.05	0.05	BBGI Plc. (Subsidiary)	85	Bangchak delegates its representatives as directors

1.5.2.2 Other debtors, net of allowance for impairment

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
BBGI Plc.	4.56	11.28	Bangchak	60	Bangchak delegates its representatives as directors
BCP Trading Pte, Ltd.	-	1.00	Bangchak	100	Bangchak delegates its representatives as directors
Winnonie Co., Ltd.	-	3.15	BCV Innovation Co., Ltd. (Subsidiary)	100	Bangchak delegates its representatives as directors
BTSG Co., Ltd.	-	0.28	Bangchak	51	Bangchak delegates its representatives as directors
Bangkok Fuel Pipeline and Logistics Co., Ltd.	-	0.41	Bangchak	100	Bangchak delegates its representatives as directors
BBGI Utility and Power Co.,Ltd.	0.32	-	BBGI Plc. (Subsidiary)	100	Bangchak delegates its representatives as directors
Joint Venture					
Bongkot Marine Services Co.,Ltd.	0.83	-	Bangchak	30	Bangchak delegates its representatives as directors

1.6 Creditors of related businesses

1.6.1 Trader creditors

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
Bangchak Biofuel Co., Ltd.	449.65	539.29	BBGI Plc. (Subsidiary)	70	Bangchak delegates its representatives as directors
BCP Trading Pte, Ltd.	3,452.07	3,557.90	Bangchak	100	Bangchak delegates its representatives as directors
Bangchak Bioethanol (Chachoengsao) Co., Ltd.	101.14	100.19	BBGI Plc. (Subsidiary)	85	Bangchak delegates its representatives as directors
KSL Green Innovation Plc.	208.11	209.58	BBGI Plc. (Subsidiary)	100	Bangchak delegates its representatives as directors
Associated Company					
Ubon Bio Ethanol Plc.	151.03	–	BBGI Plc. (Subsidiary)	12.39	Bangchak delegates its representatives as directors
Related Business					
Ubon Bio Ethanol Plc.	–	144.83	BBGI Plc. (Subsidiary)	12.39	Bangchak delegates its representatives as directors

Since September 27, 2021, Ubon Bio Ethanol Plc. has status as other related parties.

1.6.2 Other creditors

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
Bangchak Green Net Co., Ltd.	19.90	26.27	Bangchak	49	Bangchak delegates its representatives as directors
BCP Trading Pte, Ltd.	-	11.83	Bangchak	100	Bangchak delegates its representatives as directors
Bangchak Retail Co., Ltd.	2.46	0.80	Bangchak	100	Bangchak delegates its representatives as directors
BBGI Plc.	-	0.14	Bangchak	60	Bangchak delegates its representatives as directors
Nido Petroleum Pty. Ltd.	21.35	-	BCP Energy International Pte. Ltd. (Subsidiary)	100	Bangchak delegates its representatives as directors
General Energy Manning Co., Ltd.	-	0.59	Bangchak	49	Bangchak delegates its representatives as directors
Joint Venture					
Bongkot Marine Services Co., Ltd.	9.74	16.32	Bangchak	30	Bangchak delegates its representatives as directors
Related Business					
Fuel Pipeline Transportation Co., Ltd.	26.69	28.92	Bangchak	4.78	Bangchak delegates its representatives as directors

Since September 27, 2021, Ubon Bio Ethanol Plc. has status as other related parties.

1.7 Other non-current assets, accrued interest net of allowance for impairment.

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
BCPR Pte, Ltd.	161.84	35.24	BCPR Co., Ltd. (Subsidiary)	100	Bangchak delegates its representatives as directors

1.8 Other current liabilities: These items are Bangchak's revenue received in advance for land lease and service fees

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Subsidiary					
BCPG Plc.	6.32	6.35	Bangchak	57.46	Bangchak delegates its representatives as directors

1.9 Other non-current liabilities: These items are Bangchak's revenue received in advance for land lease from related companies.

Related company	2020	2021	Relationship for the year ended 31 December 2021		
	(Million Baht)		Shareholding	Proportion	Management
Related Business					
Fuel Pipeline Transportation Co., Ltd.	1.07	0.59	Bangchak	4.78	Bangchak delegates its representatives as directors

1. Connected transactions with Bangchak Green Net Co., Ltd.

Bangchak Green Net managed Bangchak service stations and consumer product sales at Lemon Green and Bai Chak outlets. These connected transactions followed normal business terms, based on market prices, and conformed to details stated in the operating agreement.

2. Connected transactions with Bangchak Biofuel Co., Ltd.

Bangchak Biofuel Co., Ltd. an indirect subsidiary through BBGI Company Limited (BBGI), which holds 70% of its shares, was set up to produce and sell biodiesel. These connected transactions followed normal business terms, based on market prices, and conformed to details stated in the operating agreement.

3. Connected transactions with BCP Innovation Pte. Ltd.

A subsidiary company in Singapore, BCP Innovation Pte. Ltd. was set up to engage in innovation- related businesses. The service fees followed normal business terms and conformed to details stated in the operating agreement.

4. Connected transactions with BCP Trading Pte. Ltd.

A subsidiary company in Singapore, BCP Trading Pte. Ltd. was set up to trade commodities including crude oil, petroleum products, petrochemicals and related chemicals and to conduct other businesses that would benefit the company, including but not limited to oil hedging, chartering, storage and distribution. These connected transactions followed normal business terms, based on market prices, and conformed to details stated in the operating agreement.

5. Connected transactions with Nido Petroleum Pty. Ltd. (An indirect subsidiary until July 2, 2021)

Nido Petroleum Pty. Ltd. (an indirect subsidiary in Australia) was formed to run the upstream petroleum business. These connected transactions followed normal business terms and conformed to details stated in the operating agreement.

6. Connected transactions with BCPG Plc.

A subsidiary company, BCPG Plc. was established to engage in power generation from solar cells. These connected transactions followed normal business terms and conformed to details stated in the operating agreement.

7. Connected transactions with Bangchak Retail Co., Ltd.

A subsidiary company, Bangchak Retail is engaged in franchise businesses and intellectual property acquisition. These connected transactions followed normal business terms and conformed to details stated in the operating agreement.

8. Connected transactions with BBGI Plc.

A subsidiary company, BBGI Plc. was established to engage in bio-based product manufacturing. Service fees among the two followed normal business terms and conformed to details stated in the operating agreement.

9. Connected transactions with Bangchak Bioethanol (Chachoengsao) Co., Ltd.

An indirect subsidiary company through BBGI, Bangchak Bioethanol (Chachoengsao) is engaged in cassava-based ethanol production. The ethanol was used in gasohol production. Purchases and service fees followed normal business terms, based on market prices, and conformed to details stated in the operating agreement.

10. Connected transactions with KSL Green Innovation Plc.

An indirect subsidiary company through BBGI, engages in ethanol production primarily from molasses (a byproduct of the sugar process). Purchases followed normal business terms and were based on market prices.

11. Connected transactions with BCPR Co., Ltd.

A subsidiary company, BCPR Co., Ltd. was formed to be holding company which invests in BCPR Pte. Ltd. a subsidiary company in Singapore. Service fees among the two followed normal business terms and conformed to details stated in the operating agreement.

12. Connected transactions with BCPR Pte. Ltd.

An indirect subsidiary company in Singapore, BCPR Pte. Ltd. was formed to undertake petroleum exploration and production. These connected transactions followed normal business terms and were based on market prices.

13. Connected transactions with BCV Bio Based Co., Ltd.

A subsidiary company, BCV Bio Based Co., Ltd. was established to engage in a startup business in Thailand. These connected transactions followed normal business terms.

14. Connected transactions with BCV Energy Co., Ltd.

A subsidiary company, BCV Energy Co., Ltd. was established to engage in a startup business in Thailand. These connected transactions followed normal business terms.

15. Connected transactions with BCV Innovation Co., Ltd.

A subsidiary company, BCV Innovation Co., Ltd. was established to engage in a startup business in Thailand. These connected transactions followed normal business terms.

16. Connected transactions with BTSG Co., Ltd. (the former name is BCV Partnership Co., Ltd.)

A subsidiary company, BCV Partnership Co., Ltd. was established to engage in the supply and distribution of liquefied natural gas and related businesses. These connected transactions followed normal business terms.

17. Connected transactions with Winnonie Co., Ltd.

Winnonie is an indirect subsidiary through BCV Innovation, to engage in electric motorcycles and battery replacement services, including related businesses that align with Bangchak's goal, leadership in green energy innovator. These connected transactions followed normal business terms.

18. Connected transactions with OKEA ASA

An indirect associated company in Norway, OKEA ASA was formed to undertake petroleum exploration and production. These connected transactions followed normal business terms and conformed to details stated in the operating agreement.

19. Connected transactions with Ubon Bio Ethanol Plc.

(From 27 September 2021, Ubon Bioethanol Plc. changed its status from an indirect associated company to other related parties.) Other related parties through BBGI, with 12.39% equity, engages in ethanol production from fresh cassava and cassava chips for gasohol production for domestic sale and export to China for the most part. Purchases and service fees followed normal business terms and based on market prices.

20. Connected transactions with Ubon Bio Agricultural Co., Ltd. (the former name is Ubon Agricultural Energy Co., Ltd.)

(It is an indirect associate until 27 September 2021 because Ubon Bioethanol Plc. changed its status from an indirect associate to other related parties) Transactions with Ubon Agricultural Energy Co., Ltd., a related company through Bangchak's associated company, Ubon Bio Ethanol Plc., which holds its shares, followed normal business terms, and were based on market prices.

21. Connected transactions with Bongkot Marine Services Co., Ltd.

The Company entered a contract for the use of Bongkot oil depot service with Bongkot Marine Services Co., Ltd. a joint venture which provides floating storage unit services. The transaction followed normal business terms and based on market prices.

22. Connected transactions with BBGI Utility and Power Co., Ltd.

BBGI Utilities and Power Co., Ltd. an indirect subsidiary through BBGI, engages in the production and distribution of bioenergy, electricity, and utilities. Fees are based on normal business terms and in accordance with the details specified in the operating contract.

23. Connected transactions with Fuel Pipeline Transportation Co., Ltd. (FPT)

The Company entered contracts with FPT to take its oil products from Bangchak Depot to its Bang Pa-in Depot and sell them to its customers in the Central, Northern and Northeastern regions, followed normal business terms and were based on market prices.

24. Connected transactions with General Energy Manning Co., Ltd.

A subsidiary company engages in the business of recruitment and human resource management. These connected transactions followed normal business terms and based on market prices.

25. Connected transactions with Bangkok Fuel Pipeline and Logistics Co., Ltd.

A subsidiary company engages in the business of fuel transportation and logistics. These connected transactions followed normal business terms and based on market prices.

These transactions were undertaken in the normal course of business, with none representing extraordinary transactions. No siphoning of interests occurred among Bangchak, subsidiary companies, connected companies and shareholders. Approvals were scrutinized by the President, who duly approved them as authorized under Bangchak's regulations.

Disclosure of connected transactions follows the rules of the Office of the Securities and Exchange Commission (SEC), as well as the accounting standards for the disclosure of information on connected parties and businesses, as defined by the Federation of Accounting Professions.

Policy for future connected transactions

In undertaking future connected transactions, Bangchak will continue its product and oil pipeline transport service transactions with connected companies since these represent normal business practices in the same industry. The pricing of products and services follows market practices, or the details stipulated in commercial contracts, or both. The connected transaction shall be dealt on a fair and at arm's length basis. However, in such cooperation, Bangchak takes into consideration its best interests. In addition, for whichever transactions involving Bangchak executives, they are not allowed to cast their votes in meetings. Major connected transactions must be reviewed and approved by the Board.

Part **3** Financial Statements

Declaration of the Directors' Responsibility for the Financial Statements

The Board of Directors of Bangchak Corporation Public Company Limited has prepared the Company's financial statements to show its financial status and performance for 2021 under the Public Company Limited Act of 1992, the Accounting Act of 2000, the Securities and Exchange Act of 1992, and the announcement of the Capital Market Supervisory Board concerning the criteria, conditions, and reporting method for the disclosure of information on financial status and performance of companies that issue securities.

The Board recognizes its duties and responsibility for directing a listed company, particularly the responsibility for financial statements of the Company and its subsidiaries – including financial information that appears in the Annual Registration Statement / Annual Report (Form 56-1 One Report). Such statements have been prepared under generally accepted accounting standards, which regularly complies with a suitable accounting policies and due and reasonable discretion exercised in the preparation of financial statements. Adequate significant information has been disclosed in the notes to these financial statements for transparent use by shareholders and investors at large.

The Board has instituted and maintained effective risk management and internal control systems to become reasonably confident of accurate, complete, and adequate accounting information to retain Company assets and prevent frauds or significant anomalies in operation.

The Audit Committee, acting on behalf of the Board, has been assigned responsibility for the quality of financial reports and internal control system, and its opinions duly appear in its own report found in this publication.

It is our view that the Company's overall internal control system is satisfactory and can reasonably ensure that the financial statements of the Company and its subsidiaries for the year ended December 31, 2021, represented true and fairness, and showed essentially accurate financial positions, performance outcomes, and cash flows under financial reporting standards.

(Signed) Pichai Chunhavajira
(Mr. Pichai Chunhavajira)
Chairman of the Board

(Signed) Chaiwat Kovavisarach
(Mr. Chaiwat Kovavisarach)
President and Group Chief Executive Officer

Independent Auditor's Report

To the shareholders of Bangchak Corporation Public Company Limited

Opinion

I have audited the consolidated and separate financial statements of Bangchak Corporation Public Company Limited and its subsidiaries (the "Group") and of Bangchak Corporation Public Company Limited (the "Company"), respectively, which comprise the consolidated and separate statements of financial position as at 31 December 2021, the consolidated and separate statements of income, comprehensive income, changes in equity and cash flows for the year then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

In my opinion, the accompanying consolidated and separate financial statements present fairly, in all material respects, the financial position of the Group and the Company, respectively, as at 31 December 2021 and their financial performance and cash flows for the year then ended in accordance with Thai Financial Reporting Standards (TFRSs).

Basis for Opinion

I conducted my audit in accordance with Thai Standards on Auditing (TSAs). My responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Consolidated and Separate Financial Statements* section of my report. I am independent of the Group and the Company in accordance with the Code of Ethics for Professional Accountants issued by the Federation of Accounting Professions that is relevant to my audit of the consolidated and separate financial statements, and I have fulfilled my other ethical responsibilities in accordance with these requirements. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Key Audit Matters

Key audit matters are those matters that, in my professional judgment, were of most significance in my audit of the consolidated and separate financial statements of the current period. These matters were addressed in the context of my audit of the consolidated and separate financial statements as a whole, and in forming my opinion thereon, and I do not provide a separate opinion on these matters.

Gain of control of a subsidiary	
Refer to Notes 3 (a), 5 and 11 to the financial statements.	
The key audit matter	How the matter was addressed in the audit
<p>In 2021, the Group has gained control of the petroleum exploration and production business in Norway. The management applied significant judgement to classify an investment as an investment in subsidiary and has estimated the fair value of net assets acquired including consideration transferred with the differences which was recognised as goodwill amounting to Baht 2,365 million.</p> <p>Due to the materiality of the transactions and the significant judgment and complexities involved in determining the fair value, I consider this as a key audit matter.</p>	<p>My audit procedures included the following:</p> <ul style="list-style-type: none"> - Understood and assessed the classification of the investment by considering shareholding structure, power of control and key relevant activities. - Made inquiries of management to obtain an understanding of management's procedures on identification of assets acquired and liabilities assumed and on the determination of the fair value of net asset acquired. - Evaluated the independence and competency of independent appraiser. - Involved KPMG specialist to evaluate valuation methodology and financial parameters applied to the discount rate. - Evaluated significant assumptions underpinning the valuations reference to internal and external information and mathematical accuracy. - Considered the adequacy of disclosures in accordance with Thai Financial Reporting Standards.

Impairment testing of investment in associates, investment in subsidiaries, oil exploration & production assets and goodwill	
Refer to Notes 3 (m), 11, 12, 14 and 17 to the financial statements.	
The key audit matter	How the matter was addressed in the audit
<p>The Group has investment in many countries and there are risks from various external factors such as the fluctuation in economies, politics and laws. There is a risk that the operating results and the investments might be significantly less than the initial forecast and budget and might result in the assets' carrying value being higher than the recoverable amounts, which might represent losses from impairment.</p> <p>Due to the materiality of the transactions, the management's significant judgment and complexities involved in estimating a recoverable amount of investment in associates, investment in subsidiaries, oil exploration & production assets and goodwill from discounted cash flow method, I consider this as a key audit matter.</p>	<p>My audit procedures included the following:</p> <ul style="list-style-type: none"> - Understood the management's operation plan, process of the indicators identification and impairment testing process and tested the calculation of recoverable amount prepared by the management. - Assessed the key assumptions estimated by the management with reference to internally and externally derived sources after taking into account the historical forecasting accuracy. - Evaluated the appropriateness of valuation methodology and financial parameters applied to the discount rate. - Considered the adequacy of disclosures in accordance with Thai Financial Reporting Standards.

Valuation of inventories	
Refer to Notes 3 (g) and 10 to the financial statements.	
The key audit matter	How the matter was addressed in the audit
<p>Inventories are measured at the lower of cost and net realizable value. As a result of fluctuation in crude oil and oil products price which may cause the net realizable value to be lower than cost.</p>	<p>My audit procedures included the following:</p> <ul style="list-style-type: none"> - Evaluated the appropriateness of inventories valuation by management. - Verified the appropriateness of the net realizable value calculation. - Checked the selling prices of finished goods with the reference market price and contract price. - Considered the adequacy of disclosures in accordance with Thai Financial Reporting Standards.

Other Information

Management is responsible for the other information. The other information comprises the information included in the annual report, but does not include the consolidated and separate financial statements and my auditor's report thereon. The annual report is expected to be made available to me after the date of this auditor's report.

My opinion on the consolidated and separate financial statements does not cover the other information and I will not express any form of assurance conclusion thereon.

In connection with my audit of the consolidated and separate financial statements, my responsibility is to read the other information identified above when it becomes available and, in doing so, consider whether the other information is materially inconsistent with the consolidated and separate financial statements or my knowledge obtained in the audit, or otherwise appears to be materially misstated.

When I read the annual report, if I conclude that there is a material misstatement therein, I am required to communicate the matter to those charged with governance and request that the correction be made.

Responsibilities of Management and Those Charged with Governance for the Consolidated and Separate Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated and separate financial statements in accordance with TFRSs, and for such internal control as management determines is necessary to enable the preparation of consolidated and separate financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated and separate financial statements, management is responsible for assessing the Group's and the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group and the Company or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Group's and the Company's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated and Separate Financial Statements

My objectives are to obtain reasonable assurance about whether the consolidated and separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with TSAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated and separate financial statements.

As part of an audit in accordance with TSAs, I exercise professional judgment and maintain professional skepticism throughout the audit. I also:

- Identify and assess the risks of material misstatement of the consolidated and separate financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's and the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's and the Company's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the consolidated and separate financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Group and the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated and separate financial statements, including the disclosures, and whether the consolidated and separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. I am responsible for the direction, supervision and performance of the group audit. I remain solely responsible for my audit opinion.

I communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

I also provide those charged with governance with a statement that I have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on my independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, I determine those matters that were of most significance in the audit of the consolidated and separate financial statements of the current period and are therefore the key audit matters. I describe these matters in my auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, I determine that a matter should not be communicated in my report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.



(Sakda Kaothanthong)
Certified Public Accountant
Registration No. 4628

KPMG Phoomchai Audit Ltd.
Bangkok
17 February 2022

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of financial position

Assets	Note	Consolidated financial statements		Separate financial statements	
		31 December		31 December	
		2021	2020	2021	2020
		(in Baht)			
Current assets					
Cash and cash equivalents	7	32,021,772,927	21,651,076,845	7,788,085,020	6,042,910,455
Short-term investments		807,642,035	24,926,509	-	-
Trade and other current receivables	6, 8, 9	15,233,579,294	6,401,832,975	7,368,200,614	3,004,450,187
Current tax assets		211,763,094	73,286,408	190,909,841	69,195,961
Short-term loan to related parties	6	-	-	922,000,000	-
Current portion of long-term loan to related parties	6	-	-	-	550,800,115
Inventories	10	18,497,017,551	16,162,353,035	15,309,993,126	13,387,573,029
Other current financial assets		273,667,343	55,624,900	6,769,765	55,624,900
Oil fuel fund subsidies receivable		2,326,727,135	2,926,502,670	2,326,727,135	2,926,502,670
Total current assets		69,372,169,379	47,295,603,342	33,912,685,501	26,037,057,317
Non-current assets					
Other non-current financial assets	31	4,547,575,874	1,696,318,642	909,211,201	237,064,163
Investments in subsidiaries	11	-	-	16,492,319,693	13,851,135,308
Investments in associates and joint ventures	12	13,669,982,757	14,331,209,255	73,000,000	73,000,000
Long-term loans	6	399,543,393	1,254,716,892	1,036,392,016	1,033,535,738
Investment properties	13	126,965,546	126,965,546	682,953,148	682,953,148
Property, plant and equipment	14	69,233,336,356	54,567,027,553	33,056,521,001	33,478,542,269
Right-of-use assets	15	13,624,881,284	11,086,968,337	10,394,221,630	10,386,998,257
Goodwill	5, 17	4,021,919,632	2,128,980,036	-	-
Intangible assets	18	11,591,206,569	11,179,679,221	286,510,474	356,290,524
Deferred tax assets	28	2,125,520,463	2,980,980,320	2,065,515,704	2,930,043,526
Indemnification assets	5	11,393,979,223	-	-	-
Other non-current assets	6	1,678,224,768	1,674,142,789	1,101,730,968	1,336,340,000
Total non-current assets		132,413,135,865	101,026,988,591	66,098,375,835	64,365,902,933
Total assets		201,785,305,244	148,322,591,933	100,011,061,336	90,402,960,250

The accompanying notes are an integral part of these financial statements.

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of financial position

Liabilities and equity	Note	Consolidated financial statements		Separate financial statements	
		31 December		31 December	
		2021	2020	2021	2020
		(in Baht)			
Current liabilities					
Short-term loan from financial institutions	19	1,256,608,708	3,975,324,173	-	-
Trade and other current payables	6, 20	15,650,844,103	12,277,161,213	10,471,675,619	8,959,910,776
Current portion of long-term loans	19	4,964,480,782	2,674,132,316	700,153,846	425,153,846
Current portion of lease liabilities		1,219,857,079	1,316,127,944	1,008,098,718	1,283,743,076
Current portion of debentures	19	4,499,408,033	2,500,000,000	4,000,000,000	2,500,000,000
Short-term loan from related parties	6	17,236,960	-	-	-
Excise tax and oil fuel fund payable		959,765,164	947,748,884	959,765,164	947,748,884
Current income tax payable		3,046,049,614	146,235,567	-	-
Other current financial liabilities		509,692,344	184,691,621	507,118,671	157,823,261
Other current liabilities		1,981,428,314	1,480,727,593	1,155,820,566	1,387,610,341
Total current liabilities		34,105,371,101	25,502,149,311	18,802,632,584	15,661,990,184
Non-current liabilities					
Long-term loans	19	21,882,627,089	30,614,930,636	4,894,620,476	5,334,217,785
Lease liabilities		7,518,304,280	6,581,482,721	5,955,858,659	5,906,993,560
Debentures	19	47,904,187,428	23,479,970,719	26,475,665,108	23,479,970,719
Deferred tax liabilities	28	2,617,416,880	794,627,463	-	-
Non-current provisions for employee benefits	21	2,388,496,550	2,336,038,743	2,143,947,148	2,231,625,137
Provision for the decommissioning cost		15,601,638,939	256,229,922	-	-
Other non-current financial liabilities		28,995,719	87,186,280	-	-
Other non-current liabilities	6	178,944,979	353,550,703	44,153,810	52,241,594
Total non-current liabilities		98,120,611,864	64,504,017,187	39,514,245,201	37,005,048,795
Total liabilities		132,225,982,965	90,006,166,498	58,316,877,785	52,667,038,979

The accompanying notes are an integral part of these financial statements.

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of financial position

Liabilities and equity	Note	Consolidated financial statements		Separate financial statements	
		31 December		31 December	
		2021	2020	2021	2020
<i>(in Baht)</i>					
Equity					
Share capital					
Authorised share capital <i>(1,376,923,157 ordinary shares, par value at Baht 1 per share)</i>		1,376,923,157	1,376,923,157	1,376,923,157	1,376,923,157
Issued and paid-up share capital <i>(1,376,923,157 ordinary shares, par value at Baht 1 per share)</i>		1,376,923,157	1,376,923,157	1,376,923,157	1,376,923,157
Share premium on ordinary shares	23	11,157,460,051	11,157,460,051	11,157,460,051	11,157,460,051
Other surpluses	23	3,332,546,360	3,441,394,816	189,617,759	189,617,759
Warrants		14,972,497	1,811,785	-	-
Retained earnings					
Appropriated					
Legal reserve	23	153,164,346	153,164,346	153,164,346	153,164,346
Treasury shares reserve	23	505,406,210	505,406,210	505,406,210	505,406,210
Unappropriated		28,204,678,139	22,441,357,804	18,965,909,728	14,917,959,248
Treasury shares	22	(505,406,210)	(505,406,210)	(505,406,210)	(505,406,210)
Perpetual subordinated debentures	24	9,940,796,710	9,940,796,710	9,940,796,710	9,940,796,710
Other components of equity		(713,436,328)	(2,146,945,146)	(89,688,200)	-
Equity attributable to owners					
of the parent					
		53,467,104,932	46,365,963,523	41,694,183,551	37,735,921,271
Non-controlling interests	11	16,092,217,347	11,950,461,912	-	-
Total equity		69,559,322,279	58,316,425,435	41,694,183,551	37,735,921,271
Total liabilities and equity		201,785,305,244	148,322,591,933	100,011,061,336	90,402,960,250

(Signed) Pichai Chunhavajira
(Mr. Pichai Chunhavajira)
Chairman

(Signed) Chaiwat Kovavisarach
(Mr. Chaiwat Kovavisarach)
President and Group Chief Executive Officer

The accompanying notes are an integral part of these financial statements.

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of income

	Note	Consolidated financial statements		Separate financial statements	
		Year ended 31 December		Year ended 31 December	
		2021	2020	2021	2020
		<i>(in Baht)</i>			
Revenue from sale of goods and rendering of services	6, 25	199,416,997,279	136,450,288,879	155,975,862,537	114,445,188,348
Cost of sale of goods and rendering of services	6, 26	<u>(175,744,433,125)</u>	<u>(132,122,127,969)</u>	<u>(145,111,978,675)</u>	<u>(115,869,042,171)</u>
Gross profit (loss)		23,672,564,154	4,328,160,910	10,863,883,862	(1,423,853,823)
Dividend income	6	-	-	975,351,027	463,190,017
Other income	6	1,278,744,715	532,528,699	867,578,979	511,379,830
Selling expenses	6, 26	(4,181,580,714)	(4,260,278,551)	(3,036,345,210)	(3,084,650,067)
Administrative expenses	6, 26	(2,971,488,792)	(2,880,755,707)	(1,516,546,459)	(1,576,356,775)
Exploration and evaluation expenses		(516,299,210)	-	-	-
Gain (loss) from derivatives		(1,273,966,199)	16,555,015	(1,428,941,580)	55,415,169
Gain on foreign exchange		250,506,098	732,127,200	348,365,817	514,003,787
Gain (loss) from fair value adjustment of investment		614,366,153	-	(10,484,500)	-
Gain from sale of investment	11	120,268,439	-	-	-
Loss from impairment of assets	11, 12, 14, 18	<u>(1,357,623,057)</u>	<u>(2,374,857,657)</u>	<u>(180,367,503)</u>	<u>(2,085,441,944)</u>
Profit (loss) from operating activities		15,635,491,587	(3,906,520,091)	6,882,494,433	(6,626,313,806)
Finance costs	27	(2,539,510,223)	(1,969,298,106)	(1,220,613,191)	(1,029,793,132)
Impairment gain and reversal of impairment loss (impairment loss) determined in accordance with TFRS 9	31	(30,327,264)	(890,738,980)	1,472,967,615	(3,946,399,416)
Share of profit (loss) of associates and joint ventures accounted for using equity method	12	<u>1,042,110,810</u>	<u>(592,023,674)</u>	-	-
Profit (loss) before income tax expense		14,107,764,910	(7,358,580,851)	7,134,848,857	(11,602,506,354)
Tax income (expense)	28	<u>(4,263,046,969)</u>	<u>1,588,597,371</u>	<u>(820,554,434)</u>	<u>1,762,661,133</u>
Profit (loss) for the year		9,844,717,941	(5,769,983,480)	6,314,294,423	(9,839,845,221)
Profit (loss) attributable to:					
Owners of the parent		7,623,789,858	(6,967,069,656)	6,314,294,423	(9,839,845,221)
Non-controlling interests		<u>2,220,928,083</u>	<u>1,197,086,176</u>	-	-
Profit (loss) for the year		9,844,717,941	(5,769,983,480)	6,314,294,423	(9,839,845,221)
Basic earnings (loss) per share	29	5.25	(5.50)	4.28	(7.62)

(Signed) Pichai Chunhavajira
(Mr. Pichai Chunhavajira)
Chairman

(Signed) Chaiwat Kovavisarach
(Mr. Chaiwat Kovavisarach)
President and Group Chief Executive Officer

The accompanying notes are an integral part of these financial statements.

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of comprehensive income

	Consolidated financial statements		Separate financial statements	
	Year ended 31 December		Year ended 31 December	
	2021	2020	2021	2020
	<i>(in Baht)</i>			
Profit (loss) for the year	9,844,717,941	(5,769,983,480)	6,314,294,423	(9,839,845,221)
Other comprehensive income (loss)				
<i>Items that will be reclassified subsequently to profit or loss</i>				
Exchange differences on translating financial statements	1,983,515,198	(1,504,726,256)	-	-
Gain (loss) on cash flow hedges	71,479,023	(34,369,360)	-	-
Loss on hedges of net investments in foreign operations	(167,466,585)	(52,005,591)	-	-
Share of other comprehensive income (loss) of associates and joint ventures accounted for using equity method	-	40,794,813	-	-
Total items that will be reclassified subsequently to profit or loss	1,887,527,636	(1,550,306,394)	-	-
<i>Items that will not be reclassified subsequently to profit or loss</i>				
Gain (loss) on investment in equity instruments designated at FVOCI	235,702,942	156,014,650	(89,688,200)	-
Gain on investment in equity instruments designated at FVOCI sold during the year	44,881,986	2,923,696,311	-	-
Gain on remeasurements of defined benefit plans	135,056,688	911,121	133,884,687	-
Share of other comprehensive income (loss) of associates and joint ventures accounted for using equity method	7,688,678	15,205,727	-	-
Total items that will not be reclassified subsequently to profit or loss	423,330,294	3,095,827,809	44,196,487	-
Other comprehensive income (loss) for the year, net of tax	2,310,857,930	1,545,521,415	44,196,487	-
Total comprehensive income (loss) for the year	12,155,575,871	(4,224,462,065)	6,358,490,910	(9,839,845,221)
Total comprehensive income (loss) attributable to:				
Owners of the parent	9,343,979,050	(4,973,039,367)	6,358,490,910	(9,839,845,221)
Non-controlling interests	2,811,596,821	748,577,302	-	-
Total comprehensive income (loss) for the year	12,155,575,871	(4,224,462,065)	6,358,490,910	(9,839,845,221)

The accompanying notes are an integral part of these financial statements.

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of changes in equity

Note	Consolidated financial statements										Other components of equity								
	Issued and paid-up share capital	Share premium	Other surpluses	Warrants	Legal reserve	Treasury shares reserve	Unappropriated	Treasury shares	Perpetual subordinated debentures	Translation reserve	Cash flow hedge reserve	Net investment hedge reserve	Fair value reserve	Share of other comprehensive income (loss) of associates and joint ventures using equity method	Total other components of equity	Equity attributable to owners of the parent	Non-controlling interests	Total equity	
<i>(in Baht)</i>																			
Year ended 31 December 2020																			
Balance at 1 January 2020	1,376,923,157	11,157,460,051	2,742,874,460	2,121,880	153,164,346	431,860,810	27,249,233,109	(431,860,810)	9,940,796,710	(1,305,355,067)	(55,813,138)	-	386,851,912	(25,247,952)	(999,564,245)	51,623,009,468	7,172,197,979	58,795,207,447	
Transactions with owners, recorded directly in equity																			
<i>Contributions by and distributions to owners of the parent</i>																			
Treasury shares purchased	22	-	-	-	-	73,545,400	(73,545,400)	(73,545,400)	-	-	-	-	-	-	-	(73,545,400)	-	(73,545,400)	
Share options exercised		-	-	799,305	(310,095)	-	-	-	-	-	-	-	-	-	-	489,210	889,617	1,378,827	
Dividends	30	-	-	-	-	-	(407,301,572)	-	-	-	-	-	-	-	-	(407,301,572)	(335,253,220)	(742,554,792)	
Total		-	-	799,305	(310,095)	73,545,400	(480,846,972)	(73,545,400)	-	-	-	-	-	-	-	(480,357,762)	(334,363,603)	(814,721,365)	
<i>Changes in ownership interests in subsidiaries</i>																			
Acquisition of a subsidiary with non-controlling interests		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20,012,035	20,012,035	
Changes in an ownership interests in subsidiaries without a change in control		-	-	697,721,051	-	-	-	-	-	-	-	-	-	-	-	697,721,051	4,344,038,199	5,041,759,250	
Total		-	-	697,721,051	-	-	-	-	-	-	-	-	-	-	-	697,721,051	4,364,050,234	5,061,771,285	
Total transactions with owners, recorded directly in equity		-	-	698,520,356	(310,095)	73,545,400	(480,846,972)	(73,545,400)	-	-	-	-	-	-	-	217,363,289	4,029,686,631	4,247,049,920	
Comprehensive income (loss) for the year																			
Profit (loss)		-	-	-	-	-	(6,967,069,656)	-	-	-	-	-	-	-	-	(6,967,069,656)	1,197,086,176	(5,769,983,480)	
Other comprehensive income (loss)		-	-	-	-	-	3,141,411,190	-	(1,064,288,272)	(23,697,673)	(35,857,855)	(62,149,474)	38,612,373	(1,147,380,901)	1,994,030,289	(448,508,874)	1,545,521,415		
Total comprehensive income (loss) for the year		-	-	-	-	-	(3,825,658,466)	-	(1,064,288,272)	(23,697,673)	(35,857,855)	(62,149,474)	38,612,373	(1,147,380,901)	(4,973,039,367)	748,577,302	(4,224,462,065)		
Coupon payment on perpetual subordinated debentures	24	-	-	-	-	-	(501,369,867)	-	-	-	-	-	-	-	-	(501,369,867)	-	(501,369,867)	
Balance at 31 December 2020		1,376,923,157	11,157,460,051	3,441,394,816	1,811,785	153,164,346	505,406,210	22,441,357,804	(505,406,210)	9,940,796,710	(2,369,643,339)	(79,510,811)	(35,857,855)	324,702,438	13,364,421	(2,146,945,146)	46,365,963,523	11,950,461,912	58,316,425,435

The accompanying notes are an integral part of these financial statements.

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of changes in equity

Note	Consolidated financial statements										Other components of equity							
	Issued and paid-up share capital	Share premium	Other surpluses (deficits)	Warrants	Legal reserve	Treasury shares reserve	Unappropriated	Treasury shares	Perpetual subordinated debentures	Translation reserve	Cash flow hedge reserve	Net investment hedge reserve	Fair value reserve	Share of other comprehensive income (loss) of associates and joint ventures using equity method	Total other components of equity	Equity attributable to owners of the parent	Non-controlling interests	Total equity
(in Baht)																		
Year ended 31 December 2021																		
Balance at 1 January 2021	1,376,923,157	11,157,460,051	3,441,394,816	1,811,785	153,164,346	505,406,210	22,441,357,804	(505,406,210)	9,940,796,710	(2,369,643,339)	(79,510,811)	(35,857,855)	324,702,438	13,364,421	(2,146,945,146)	46,365,963,523	11,950,461,912	58,316,425,435
Transactions with owners, recorded directly in equity																		
<i>Contributions by and distributions to owners of the parent</i>																		
Share options exercised	-	-	316,948,353	-	-	-	-	-	-	-	-	-	-	-	-	316,948,353	1,159,413,017	1,476,361,370
Share-based payment transactions	-	-	766,391	13,160,712	-	-	-	-	-	-	-	-	-	-	-	13,927,103	9,339,020	23,266,123
Dividends	30	-	-	-	-	-	(1,900,228,630)	-	-	-	-	-	-	-	-	(1,900,228,630)	(771,953,147)	(2,672,181,777)
Total			317,714,744	13,160,712	-	-	(1,900,228,630)	-	-	-	-	-	-	-	-	(1,569,353,174)	396,798,890	(1,172,554,284)
<i>Changes in ownership interests in subsidiaries</i>																		
Changes in an ownership interests in subsidiary without a change in control	11	-	(368,261,809)	-	-	-	-	-	-	-	-	-	-	-	-	(368,261,809)	606,392,543	238,130,734
Changes in an ownership interests in subsidiary from sale of investment	11	-	(58,301,391)	-	-	-	-	-	253,078,733	-	-	-	-	253,078,733	-	194,777,342	-	194,777,342
Acquisition of non-controlling interests with a change in control	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	326,967,181	326,967,181
Total			(426,563,200)	-	-	-	-	-	253,078,733	-	-	-	-	253,078,733	-	(173,484,467)	933,359,724	759,875,257
Total transactions with owners, recorded directly in equity			(108,848,456)	13,160,712	-	-	(1,900,228,630)	-	253,078,733	-	-	-	-	253,078,733	(1,742,837,641)	1,330,158,614	(412,679,027)	
Comprehensive income (loss) for the year																		
Profit		-	-	-	-	-	7,623,789,858	-	-	-	-	-	-	-	-	7,623,789,858	2,220,928,083	9,844,717,941
Other comprehensive income (loss)		-	-	-	-	-	539,759,107	-	1,400,429,246	42,787,343	(167,285,721)	(100,103,225)	4,602,442	1,180,430,085	1,720,189,192	590,668,738	2,310,857,930	
Total comprehensive income (loss) for the year							8,163,548,965	-	1,400,429,246	42,787,343	(167,285,721)	(100,103,225)	4,602,442	1,180,430,085	9,343,979,050	2,811,596,821	12,155,575,871	
Coupon payment on perpetual subordinated debentures	24	-	-	-	-	-	(500,000,000)	-	-	-	-	-	-	-	-	(500,000,000)	-	(500,000,000)
Balance at 31 December 2021	1,376,923,157	11,157,460,051	3,332,546,360	14,972,497	153,164,346	505,406,210	28,204,678,139	(505,406,210)	9,940,796,710	(716,135,360)	(36,723,468)	(203,143,576)	224,599,213	17,966,863	(713,436,328)	53,467,104,932	16,092,217,347	69,559,322,279

The accompanying notes are an integral part of these financial statements.

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of changes in equity

	Note	Issued and paid-up share capital	Share premium	Other Surpluses	Separate financial statements			Perpetual subordinated debentures	Total equity	
					Retained earnings	Treasury shares	Treasury shares			
				Legal reserve	Treasury shares reserve	Unappropriated				
					<i>(in Baht)</i>					
Year ended 31 December 2020										
Balance at 1 January 2020		1,376,923,157	11,157,460,051	189,617,759	153,164,346	431,860,810	25,740,021,308	(431,860,810)	9,940,796,710	48,557,983,331
Transactions with owners, recorded directly in equity										
<i>Distributions to owners</i>										
Treasury shares purchased	22	-	-	-	-	73,545,400	(73,545,400)	(73,545,400)	-	(73,545,400)
Dividends to owners of the Company	30	-	-	-	-	-	(407,301,572)	-	-	(407,301,572)
Total		-	-	-	-	73,545,400	(480,846,972)	(73,545,400)	-	(480,846,972)
Comprehensive income (loss) for the year										
Loss		-	-	-	-	-	(9,839,845,221)	-	-	(9,839,845,221)
Other comprehensive income (loss)		-	-	-	-	-	-	-	-	-
Total comprehensive income (loss) for the year		-	-	-	-	-	(9,839,845,221)	-	-	(9,839,845,221)
Coupon payment on perpetual subordinated debentures	24	-	-	-	-	-	(501,369,867)	-	-	(501,369,867)
Balance at 31 December 2020		1,376,923,157	11,157,460,051	189,617,759	153,164,346	505,406,210	14,917,959,248	(505,406,210)	9,940,796,710	37,735,921,271

The accompanying notes are an integral part of these financial statements.

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of changes in equity

	Note	Separate financial statements							Other components of equity		
		Issued and paid-up share capital	Share premium	Other Surpluses	Retained earnings			Treasury shares	Perpetual subordinated debentures	Fair value reserve	Total equity
					Legal reserve	Treasury shares reserve	Unappropriated				
		(in Baht)									
Year ended 31 December 2021											
Balance at 1 January 2021		1,376,923,157	11,157,460,051	189,617,759	153,164,346	505,406,210	14,917,959,248	(505,406,210)	9,940,796,710	-	37,735,921,271
Transactions with owners, recorded directly in equity											
<i>Distributions to owners</i>											
Dividends to owners of the Company	30	-	-	-	-	-	(1,900,228,630)	-	-	-	(1,900,228,630)
Total		-	-	-	-	-	(1,900,228,630)	-	-	-	(1,900,228,630)
Comprehensive income (loss) for the year											
Profit		-	-	-	-	-	6,314,294,423	-	-	-	6,314,294,423
Other comprehensive income (loss)		-	-	-	-	-	133,884,687	-	-	(89,688,200)	44,196,487
Total comprehensive income (loss) for the year		-	-	-	-	-	6,448,179,110	-	-	(89,688,200)	6,358,490,910
Coupon payment on perpetual subordinated debentures	24	-	-	-	-	-	(500,000,000)	-	-	-	(500,000,000)
Balance at 31 December 2021		<u>1,376,923,157</u>	<u>11,157,460,051</u>	<u>189,617,759</u>	<u>153,164,346</u>	<u>505,406,210</u>	<u>18,965,909,728</u>	<u>(505,406,210)</u>	<u>9,940,796,710</u>	<u>(89,688,200)</u>	<u>41,694,183,551</u>

The accompanying notes are an integral part of these financial statements.

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of cash flows

	Consolidated financial		Separate financial	
	statements		statements	
	Year ended 31 December		Year ended 31 December	
	2021	2020	2021	2020
	<i>(in Baht)</i>			
Cash flows from operating activities				
Profit (loss) for the year	9,844,717,941	(5,769,983,480)	6,314,294,423	(9,839,845,221)
<i>Adjustments for</i>				
Tax (income) expense	4,263,046,969	(1,588,597,371)	820,554,434	(1,762,661,133)
Finance costs	2,539,510,223	1,969,298,106	1,220,613,191	1,029,793,132
Depreciation and amortisation	8,074,878,355	6,821,366,531	5,220,582,122	5,216,866,940
Unrealised (gain) loss from derivatives	229,638,225	(31,890,616)	428,445,136	(54,230,777)
Unrealised (gain) loss on foreign exchange	639,953,658	(296,502,554)	380,797,252	(310,443,260)
(Reversal of) loss on inventories devaluation	2,090,572	(4,682,087)	-	-
Impairment loss on assets	1,357,623,057	2,374,857,657	180,367,503	2,085,441,944
(Reversal of) impairment loss determined in accordance with TFRS 9	30,327,264	890,738,980	(1,472,967,615)	3,946,399,416
Write-off of Exploration and evaluation expenses	69,401,848	-	-	-
Loss on disposal of property, plant and equipment	84,558,328	134,870,409	24,194,049	2,726,744
Loss on disposal of intangible assets	-	33,604,726	-	-
(Gain) loss on fair value adjustment	(614,366,153)	21,716,960	10,484,500	-
Expense from disposal of other investment	2,126,873	21,455,271	-	-
Gain on disposal of investment in subsidiaries	(120,268,439)	-	-	-
Interest income and dividend income	(184,792,930)	(157,410,894)	(1,119,811,302)	(726,422,771)
Provision for employee benefits	160,612,439	230,478,108	133,537,585	209,736,821
Warrants	23,266,124	-	-	-
Reversal of provision for customer loyalty programmes	(4,776,371)	(9,781,272)	(4,776,371)	(9,781,272)
Deferred revenue	(7,578,417)	(7,353,215)	(7,578,418)	(7,011,452)
Share of (profit) loss of associates and joint ventures (net of tax)	(1,042,110,810)	592,023,674	-	-
	<u>25,347,858,756</u>	<u>5,224,208,933</u>	<u>12,128,736,489</u>	<u>(219,430,889)</u>
<i>Changes in operating assets and liabilities</i>				
Trade accounts receivable	(3,654,195,735)	3,196,589,518	(3,769,847,373)	3,341,760,681
Other current receivables	(1,296,202,277)	255,195,930	(20,431,464)	(222,627,469)
Inventories	(1,642,274,072)	(386,763,857)	(2,105,669,125)	750,095,874
Other non-current assets	294,643,550	(44,411,087)	35,787,344	80,629,994
Trade accounts payable	251,940,908	(1,321,458,596)	1,812,110,471	(1,209,336,540)
Other current payables	(1,702,420,512)	(576,764,001)	140,085,117	(264,271,179)
Other current liabilities	236,302,963	21,284,434	(218,496,824)	(93,288,261)
Provision for employee benefits	(277,424,736)	(165,902,903)	(271,330,915)	(161,414,171)
Other non-current liabilities	<u>(313,054,341)</u>	<u>(80,318,800)</u>	<u>(509,366)</u>	<u>(6,411,587)</u>
Net cash generated from operating	17,245,174,504	6,121,659,571	7,730,434,354	1,995,706,453
Tax received (paid)	<u>(265,017,584)</u>	<u>217,922,463</u>	<u>(111,211,665)</u>	<u>149,889,790</u>
Net cash from operating activities	<u>16,980,156,920</u>	<u>6,339,582,034</u>	<u>7,619,222,689</u>	<u>2,145,596,243</u>

The accompanying notes are an integral part of these financial statements.

Bangchak Corporation Public Company Limited and its Subsidiaries

Statement of cash flows

	Consolidated financial statements		Separate financial statements	
	Year ended 31 December		Year ended 31 December	
	2021	2020	2021	2020
	<i>(in Baht)</i>			
<i>Cash flows from investing activities</i>				
Decrease (increase) in short-term investments	(795,019,355)	267,931,247	-	200,000,000
Payment for investment in subsidiaries and associates, net of cash acquired	-	(5,015,464,810)	(2,515,767,978)	(2,226,702,335)
Proceeds from business combination	5,010,720,240	-	-	-
Payment for other investments	(1,707,699,371)	(796,514,158)	(775,248,203)	-
Cash decreased from sale of investment in subsidiary	(21,335,769)	-	-	-
Proceeds from sale of investment in subsidiary	285,916	-	-	-
Proceeds from sale of investment in associates and joint ventures	234,856,800	-	-	-
Proceeds from sale of other investments	433,087,993	4,251,704,493	3,000,000	-
Proceeds from capital reduction in associates	-	842,336,487	-	-
Acquisition of property, plant and equipment	(7,972,286,590)	(5,596,818,930)	(3,187,935,858)	(3,585,741,089)
Proceeds from sale of property, plant and equipment	438,850,572	26,584,813	15,332,816	7,516,987
Acquisition of right-of-use assets	(2,198,489,326)	(196,600,000)	(595,257,916)	(196,600,000)
Acquisition of intangible assets	(717,098,215)	(199,808,029)	(58,472,955)	(110,383,426)
Increase in short-term loans	-	-	(922,000,000)	-
Increase in long-term loans	(1,645,032,661)	(238,601,452)	-	(163,580,900)
Cash receipts from long-term loans	2,669,360,000	-	1,913,690,966	1,166,095,837
Interest received	226,644,539	239,844,849	288,281,954	149,450,444
Dividend received	203,234,333	62,342,773	966,351,027	463,190,017
Net cash used in investing activities	(5,839,920,894)	(6,353,062,717)	(4,868,026,147)	(4,296,754,465)
<i>Cash flows from financing activities</i>				
Proceeds from exercise of share options	-	1,378,826	-	-
Proceeds from increase in subsidiaries' share capital	1,654,871,361	5,149,074,814	-	-
Redemption of treasury shares	-	(73,545,400)	-	(73,545,400)
Decrease in short-term loans from financial institutions	(2,719,508,965)	(1,075,675,827)	-	-
Proceeds from long-term loans from financial institutions	3,352,091,133	13,784,122,642	-	3,610,336,000
Repayment of long-term loans from financial institutions	(13,054,950,135)	(2,835,865,581)	(425,153,846)	(375,153,846)
Proceeds from short-term loan from related parties	17,236,960	-	-	-
Payment of lease liabilities	(1,664,950,886)	(1,963,463,174)	(1,541,561,036)	(1,901,915,037)
Proceeds from issuance of debentures	20,283,563,060	8,000,000,000	7,000,000,000	8,000,000,000
Redemption of debentures	(3,322,600,494)	(3,000,000,000)	(2,500,000,000)	(3,000,000,000)
Dividend paid	(2,672,181,777)	(742,554,792)	(1,900,228,630)	(407,301,572)
Financial cost paid	(2,392,286,081)	(2,175,409,732)	(1,139,078,465)	(1,243,845,687)
Coupon payment on perpetual subordinated debentures	(500,000,000)	(501,369,867)	(500,000,000)	(501,369,867)
Net cash from (used in) financing activities	(1,018,715,824)	14,566,691,909	(1,006,021,977)	4,107,204,591
Net increase in cash and cash equivalents, before effect of exchange rates	10,121,520,202	14,553,211,226	1,745,174,565	1,956,046,369
Effect of exchange rate changes on cash and cash equivalents	249,175,880	(177,940,203)	-	-
Net increase in cash and cash equivalents	10,370,696,082	14,375,271,023	1,745,174,565	1,956,046,369
Cash and cash equivalents at 1 January	21,651,076,845	7,275,805,822	6,042,910,455	4,086,864,086
Cash and cash equivalents at 31 December	32,021,772,927	21,651,076,845	7,788,085,020	6,042,910,455
<i>Non-cash transaction</i>				
Outstanding payable from purchase of property, plant and equipment	613,431,590	682,416,423	168,546,848	432,218,743

The accompanying notes are an integral part of these financial statements.

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These notes form an integral part of the financial statements.

The financial statements issued for Thai statutory and regulatory reporting purposes are prepared in the Thai language. These English language financial statements have been prepared from the Thai language statutory financial statements, and were approved and authorised for issue by the Board of Directors on 17 February 2022.

1 General information

Bangchak Corporation Public Company Limited, the “Company” is incorporated in Thailand and was listed on the Stock Exchange of Thailand. The Company’s registered offices are as follows:

Head office : 2098 M Tower Building, 8th Floor, Sukhumvit Road, Phra Kanong Tai, Phra Kanong, Bangkok.

Refinery plant : 210 Moo 1, Soi Sukhumvit 64, Sukhumvit Road, Phra Kanong Tai, Phra Kanong, Bangkok.

As at 31 December 2021, major shareholders of the Company were Vayupak Fund 1 and Social Security Office holding 19.84% and 14.40% of issued and paid-up capital, respectively (2020: 14.66% and 14.40%, respectively).

The principal businesses of the Group are operating an oil refinery and marketing the finished products through its service stations under its company’s brand. The Group’s oil market includes consumers in various sectors, such as transportation, aviation, shipping, construction, industrial, agriculture and sale of oil which is made through the major and the minor oil traders, production and distribution of electricity from solar cell and investment in alternative energy business, manufacturing and distributing of biofuel product and relating products and exploration and production of petroleum.

Details of the Company’s subsidiaries as of 31 December 2021 and 2020 are given in note 6 and 11.

2 Basis of preparation of the financial statements

(a) Statement of compliance

The financial statements are prepared in accordance with Thai Financial Reporting Standards (“TFRS”), guidelines promulgated by the Federation of Accounting Professions and applicable rules and regulations of the Thai Securities and Exchange Commission. The financial statements are presented in Thai Baht, which is the Company’s functional currency.

The preparation of financial statements in conformity with TFRS requires management to make judgements, estimates and assumptions that affect the application of the Group’s accounting policies. Actual results may differ from these estimates. Estimates and underlying assumptions that described in each note are reviewed on an ongoing basis. Revisions to accounting estimates are recognised prospectively.

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3 Significant accounting policies

The accounting policies set out below have been applied consistently to all periods presented in these financial statements.

(a) *Basis of consolidation*

The consolidated financial statements relate to the Company and its subsidiaries (together referred to as the “Group”) and the Group’s interests in associates and joint ventures.

Subsidiaries are entities controlled by the Group. The Group controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

At the acquisition date, the Group measures any non-controlling interest at its proportionate interest in the identifiable net assets of the acquiree. In addition, when there is a change in the Group’s interest in a subsidiary that do not result in a loss of control, any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received from the acquisition or disposal of the non-controlling interests with no change in control are accounted for as other surpluses/deficits in shareholders’ equity.

When the Group loses control over a subsidiary, it derecognises the assets and liabilities, any related non-controlling interests and other components of equity of the subsidiary. Any resulting gain or loss is recognised in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies. A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities.

The Group recognised investments in associates and joint ventures using the equity method in the consolidated financial statements. They are initially recognised at cost, which includes transaction costs. Subsequent to initial recognition, the consolidated financial statement include the Group’s dividend income and share of the profit or loss and other comprehensive income of equity-accounted investees, until the date on which significant influence or joint control ceases.

Intra-group balances and transactions, and any unrealised income or expenses arising from intra-group transactions, are eliminated on consolidation. Unrealised gains arising from transactions with associates and joint ventures are eliminated against the investment to the extent of the Group’s interest in the investee. Unrealised losses are eliminated in the same way as unrealised gains, but only to the extent that there is no evidence of impairment.

Business combinations

The Group applies the acquisition method when the Group assess that the acquired set of activities and assets include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create output. The acquisition date is the date on which control is transferred to the Group, other than business combinations with entities under common control. Expenses in connection with a business combination are recognised as incurred.

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Notes to the financial statements

For the year ended 31 December 2021

Goodwill is measured as of the acquisition date as the fair value of the consideration transferred including the recognised amount of any non-controlling interest in the acquiree, less net fair value of the identifiable assets acquired and liabilities assumed. Any gain on bargain purchase is recognised in profit or loss immediately.

Consideration transferred includes the fair values of the assets transferred, liabilities incurred by the Group to the previous owners of the acquiree, and equity interests issued by the Group. Consideration transferred also includes the fair value of any contingent consideration.

Any contingent consideration is measured at fair value at the date of acquisition and remeasured at fair value at each reporting date. Subsequent changes in the fair value are recognised in profit or loss.

A contingent liability of the acquiree is assumed in a business combination only if such a liability represents a present obligation and arises from a past event, and its fair value can be measured reliably.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group estimates provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period, or additional assets or liabilities are recognised, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognised at that date.

When a business combination is achieved in stages, the Group's previously held equity interest in the acquiree is remeasured to its acquisition-date fair value and the resulting gain or loss, if any, is recognised in profit or loss. Amounts arising from interests in the acquiree prior to the acquisition date that have previously been recognised in other comprehensive income are reclassified to profit or loss where such treatment would be appropriate if that interest were disposed of.

Business combination under common control are accounted for using a method similar to the pooling of interest method, by recognising assets and liabilities of the acquired businesses at their carrying amounts in the consolidated financial statements of the ultimate parent company at the transaction date. The difference between the carrying amount of the acquired net assets and the consideration transferred is recognised as surplus or deficit from business combinations under common control in shareholder's equity. The surplus or deficit will be written off upon divestment of the businesses acquired. The results from operations of the acquired businesses will be included in the consolidated financial statements of the acquirer from the beginning of the comparative period or the moment the businesses came under common control, whichever date is later, until control ceases.

(b) Investments in subsidiaries, associates, and joint ventures

Investments in subsidiaries, associates, and joint ventures in the separate financial statements of the Company are measured at cost less allowance for impairment losses. Dividend income is recognised in profit or loss on the date on which the Group's right to receive payment is established. If the Company disposes of part of its investment, the deemed cost of the part sold is determined using the weighted average method. Gains and losses on disposal of the investments are recognised in profit or loss.

(c) Foreign currencies

Transactions in foreign currencies including non-monetary assets and liabilities dominated in foreign currencies are translated to the respective functional currencies of each entity in the Group at exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies are translated at the exchange rate at the reporting date. Non-monetary assets and liabilities measured at fair value in foreign currencies are translated at the exchange rates at the dates that fair value was determined.

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Notes to the financial statements

For the year ended 31 December 2021

Foreign currency differences are generally recognised in profit or loss. However, foreign currency differences arising from the translation of the following items are recognised in other comprehensive income:

- an investment in equity securities designated as at FVOCI
- a financial liability designated as a hedge of the net investment in a foreign operation to the extent that the hedge is effective; and
- qualifying cash flow hedges to the extent the hedge is effective.

Foreign operations

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising on acquisition, are translated to Thai Baht at the exchange rates at the reporting date. The revenues and expenses of foreign operations are translated to Thai Baht at rates approximating the exchange rates at the dates of the transactions.

Foreign exchange differences and the effective portion of any foreign currency differences arising from hedges of a net investment in a foreign operation (see note 3(d.4)) are recognised in other comprehensive income and accumulated in the translation reserve in equity until disposal of the investment, except to the extent that the translation difference is allocated to non-controlling interest.

When a foreign operation is disposed of in its entirety or partially such that control, significant influence or joint control is lost, the cumulative amount in the translation reserve related to that foreign operation is reclassified to profit or loss as part of the gain or loss on disposal. If the Group disposes of part of its interest in a subsidiary but retains control, then the relevant proportion of the cumulative amount is reattributed to non-controlling interests. When the Group disposes of only part of an associate or joint venture while retaining significant influence or joint control, the relevant proportion of the cumulative amount is reclassified to profit or loss.

When the settlement of a monetary item receivable from or payable to a foreign operation is neither planned nor likely in the foreseeable future, exchange gains and losses arising from such a monetary item are considered to form part of a net investment in a foreign operation and are recognised in other comprehensive income and presented in the translation reserve in equity until disposal of the investment.

(d) Financial instruments

(d.1) Recognition and initial measurement

Debt securities that the Group issued are initially recognised when they are originated. Other financial assets and financial liabilities (except trade accounts receivables (see note 3(f))) are initially recognised when the Group becomes a party to the contractual provisions of the instrument, and measured at fair value, taking into account for transaction costs that are directly attributable to its acquisition or issue of the securities, except for financial assets and financial liabilities measured at FVTPL, which are initially and subsequently measured at fair value, and any transaction costs that are directly attributable to its acquisition or issue of the securities are recognised in profit or loss.

On initial recognition, a financial asset is classified as measured at: amortised cost; fair value through other comprehensive income (FVOCI); or fair value through profit or loss (FVTPL). Financial assets are not reclassified subsequent to their initial recognition unless the Group changes its business model for managing financial assets, in which case all affected financial assets are reclassified prospectively from the reclassification date.

On initial recognition, financial liabilities are classified as measured at amortised cost using the effective interest method or FVTPL. Interest expense, foreign exchange gains and losses and any gain or loss on derecognition are recognised in profit or loss.

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For the year ended 31 December 2021

Financial assets measured at amortised costs are subsequently measured at amortised cost using the effective interest method. The amortised cost is reduced by expected credit losses. Interest income, foreign exchange gains and losses, expected credit loss and any gain or loss on derecognition are recognised in profit or loss.

Equity investments measured at FVOCI are subsequently measured at fair value. Dividend income is recognised as income in profit or loss on the date on which the Group's right to receive payment is established, unless the dividend clearly represents a recovery of part of the cost of the investment. Other net gains and losses are recognised in OCI and are never reclassified to profit or loss.

(d.2) Derecognition and offset

The Group derecognises a financial asset when the contractual rights to receive the cash flows from the financial asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all of the risks and rewards of ownership of the financial asset are transferred or in which the Group neither transfers nor retains substantially all of the risks and rewards of ownership and it does not retain control of the financial asset.

The Group derecognises a financial liability when its contractual obligations are discharged or cancelled, or expire. The Group also derecognises a financial liability when its terms are modified and the cash flows of the modified liability are substantially different, in which case a new financial liability based on the modified terms is recognised at fair value.

The difference between the carrying amount extinguished and the consideration received or paid is recognised in profit or loss.

Financial assets and financial liabilities are offset, and the net amount presented in the statement of financial position when, and only when, the Group currently has a legally enforceable right to set off the amounts and the Group intends either to settle them on a net basis or to realise the asset and settle the liability simultaneously.

(d.3) Derivatives

Derivative are recognised at fair value and remeasured at fair value at each reporting date. The gain or loss on remeasurement to fair value is recognised immediately in profit or loss, except where the derivatives qualify for cash flow hedge accounting or hedges of net investment in a foreign operation, in which case recognition of any resultant gain or loss depends on nature of the item being hedged (see note 3 (d.4)).

(d.4) Hedging

At inception of designated hedging relationships, the Group documents the risk management objective and strategy for undertaking the hedge, the economic relationship between the hedged item and the hedging instrument, including consideration of the hedge effectiveness at the inception of the hedging relationship and throughout the remaining period to determine the existence of economic relationship between the hedged item and the hedging instrument.

Cash flow hedges

When a derivative is designated as a cash flow hedging instrument, the effective portion of changes in the fair value of the derivative is recognised in OCI and accumulated in the hedging reserve. Any ineffective portion of changes in the fair value of the derivative is recognised immediately in profit or loss.

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For the year ended 31 December 2021

The Group designates only the change in fair value of the spot element of forward exchange contracts as the hedging instrument in cash flow hedging relationships. The change in fair value of the forward element of forward exchange contracts (forward points) is recognised in a cash flow hedging reserve within equity.

When the hedged forecast transaction subsequently results in the recognition of a non-financial item such as inventory, the amount accumulated in the cash flow hedging reserve is included directly in the initial cost of the non-financial item when it is recognised.

For all other hedged forecast transactions, the amount accumulated in the cash flow hedging reserve is reclassified to profit or loss in the same period or periods during which the hedged expected future cash flows affect profit or loss.

If the hedge no longer meets the criteria for hedge accounting or the hedging instrument is sold, expires, is terminated or is exercised, then hedge accounting is discontinued prospectively. When hedge accounting for cash flow hedges is discontinued, the amount that has been accumulated in the cash flow hedging reserve remains in equity until, for a hedge of a transaction resulting in the recognition of a non-financial item, it is included in the non-financial item's cost on its initial recognition or, for other cash flow hedges, it is reclassified to profit or loss in the same period or periods as the hedged expected future cash flows affect profit or loss.

If the hedged future cash flows are no longer expected to occur, then the amounts that have been accumulated in the cash flow hedging reserve are immediately reclassified to profit or loss.

Net investment hedges

When a derivative instrument or a non-derivative financial liability is designated as the hedging instrument, the effective portion of, for a derivative, changes in the fair value of the hedging instrument or, for a non-derivative, foreign exchange gains and losses is recognised in OCI and presented in the translation reserve within equity. Any ineffective portion is recognised immediately in profit or loss. The amount recognised in OCI is reclassified to profit or loss as a reclassification adjustment on disposal of the foreign operation.

(d.5) Impairment of financial assets other than trade accounts receivables

The Group recognises allowances for expected credit losses (ECLs) on financial assets measured at amortised cost, lease receivables, and loan commitments issued which are not measured at FVTPL.

The Group recognises ECLs equal to 12-month ECLs unless there has been a significant increase in credit risk of the financial instrument since initial recognition or credit-impaired financial assets, in which case the loss allowance is measured at an amount equal to lifetime ECLs.

ECLs are a probability-weighted estimate of credit losses based on forward-looking and historical experience. Credit losses are measured as the present value of all cash shortfalls discounted by the effective interest rate of the financial asset.

The Group considers a financial asset to have low credit risk when its credit rating is equivalent to the globally understood definition of 'investment grade'. The Group recognises ECLs for low credit risk financial asset as 12-month ECLs.

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The Group assumes that the credit risk on a financial asset has increased significantly if there are significant deterioration in credit rating, significant deterioration in the operating results of the debtor and existing or forecast changes in the technological, market, economic or legal environment that have a significant adverse effect on the debtor's ability to meet its obligation to the Group.

The Group considers a financial asset to be in default when the debtor is unlikely to pay its credit obligations to the Group in full, without recourse by the Group to actions such as realising security (if any is held).

(d.6) Write off

The gross carrying amount of a financial asset is written off when the Group has no reasonable expectations of recovering. Subsequent recoveries of an asset that was previously written off, are recognised as a reversal of impairment in profit or loss in the period in which the recovery occurs.

(d.7) Interest

Interest income and expense is recognised in profit or loss using the effective interest method. In calculating interest income and expense, the effective interest rate is applied to the gross carrying amount of the asset (when the asset is not credit-impaired) or to the amortised cost of the liability. However, for financial assets that have become credit-impaired subsequent to initial recognition, interest income is calculated by applying the effective interest rate to the amortised cost of the financial asset. If the asset is no longer credit-impaired, then the calculation of interest income reverts to the gross basis.

(e) Cash and cash equivalents

Cash and cash equivalents comprise cash balances, call deposits and highly liquid short-term investments which has a maturity of three months or less from the date of acquisition. Bank overdrafts that are repayable on demand are a component of financing activities for the purpose of the statement of cash flows.

(f) Trade accounts receivable

A trade receivable is recognised when the Group has an unconditional right to receive consideration. A trade receivable is measured at transaction price less allowance for expected credit loss. Bad debts are written off when incurred.

The Group estimates lifetime expected credit losses (ECLs), using a provision matrix to find ECLs rate. This method groups the debtors based on shared credit risk characteristics and past due status, taking into account historical credit loss data, adjusted for factors that are specific to the debtors and an assessment of both current economic conditions and forward-looking general economic conditions at the reporting date.

(g) Inventories

Inventories are measured at the lower of cost and net realisable value. Cost is calculated using the weighted average cost principle. Cost includes direct costs incurred in acquiring the inventories. In the case of manufactured inventories and work-in-progress, cost includes an appropriate share of production overheads based on normal operating capacity. Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs to complete and to make the sale.

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(h) Investment properties

Investment properties are measured at cost less accumulated depreciation and impairment losses. Cost includes expenditure that is directly attributable to the acquisition of the investment property. The cost of self-constructed assets includes capitalised borrowing costs.

No depreciation charged on freehold land.

(i) Property, plant and equipment

Property, plant and equipment are measured at cost less accumulated depreciation and impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes capitalised borrowing costs and the costs of dismantling and removing the items and restoring the site on which they are located including transfers from other comprehensive income of any gain or loss on qualifying cash flow hedges of foreign currency purchases of property, plant and equipment. Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment.

Differences between the proceeds from disposal and the carrying amount of property, plant and equipment are recognised in profit or loss.

Subsequent costs

The cost of replacing a part of an item of property, plant and equipment is recognised in the carrying amount of the item when the future economic benefits embodied within the part will flow to the Group, and its cost can be measured reliably. The carrying amount of the replaced part is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

Depreciation

Depreciation is calculated on a straight-line basis over the estimated useful lives of each component of an asset and recognised in profit or loss. No depreciation is provided on freehold land and assets under construction.

The estimated useful lives are as follows:

Buildings	10 - 50 years
Machinery, equipment refinery plants and terminal	2 - 30 years
Equipment solar plants	10 - 25 years
Marketing and office equipment	3 - 20 years
Vehicles	5 - 7 years
Other assets	21 years

Oil exploration and production assets

When the technical and commercial feasibility of an undeveloped oil or gas field has been demonstrated, the field enters its development phase. The costs of oil exploration and production assets are transferred from exploration and evaluation expenditure and reclassified into development phase.

The costs of oil exploration and production assets include past exploration and evaluation costs, pre-production development costs and the ongoing costs of continuing to develop reserves for production as well as decommission costs.

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For the year ended 31 December 2021

Depletion charges are calculated using a unit of production method over the life of the estimated proved plus probable reserves.

(j) Goodwill

Goodwill is measured at cost less accumulated impairment losses. In respect of equity-accounted investee, the carrying amount of goodwill is included in the carrying amount of the investment.

(k) Other intangible assets

Intangible assets that have definite useful lives are measured at cost less accumulated amortisation and impairment losses. Subsequent expenditure is capitalised only when it will generate the future economic benefits. Amortisation is calculated on a straight-line basis over the estimated useful lives of intangible assets and recognised in profit or loss.

The estimated useful lives are as follows:

Right to use and cost of development of computer software	3 - 10	years
Right to connect electrical transmission line	20 - 25	years
Power purchase agreement	20	years
Power purchase agreement and assets under concession agreement	28	years

Exploration and evaluation expenditure

Exploration and evaluation expenditure is stated at cost as intangible assets and is accumulated in respect of each identifiable area of interest. These costs are capitalised until the viability of the area of interest is determined.

Accumulated costs in relation to an abandoned area are written off through profit or loss in the period in which the decision to abandon the area is made.

Once an area of interest enters the development phase, exploration and evaluation expenditures are transferred to oil and gas properties.

Service concession arrangements

The Group recognises intangible assets arising from a service concession arrangement when it has a right to charge for use of the concession infrastructure. An intangible asset received as consideration for providing construction services in a service concession arrangement is measured at fair value on initial recognition with reference to the fair value of the services provided. Subsequent to initial recognition, the intangible asset is measured at cost, which includes capitalised borrowing costs, less accumulated amortisation and accumulated impairment losses.

(l) Leases

At inception of a contract, the Group assesses that a contract is, or contains, a lease when it conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

As a lessee

At commencement or on modification of a contract, the Group allocates the consideration in the contract to each lease component on the basis of its relative stand-alone prices of each component. For the leases of property, the Group has elected not to separate non-lease components and account for the lease and non-lease components wholly as a single lease component.

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For the year ended 31 December 2021

The Group recognises a right-of-use asset and a lease liability at the lease commencement date, except for leases of low-value assets and short-term leases which is recognised as an expense on a straight-line basis over the lease term.

Right-of-use asset is measured at cost, less any accumulated depreciation and impairment loss, and adjusted for any remeasurements of lease liability. The cost of right-of-use asset includes the initial amount of the lease liability adjusted for any prepaid lease payments made plus any initial direct costs incurred and an estimate of restoration costs, less any lease incentives received. Depreciation is charged to profit or loss on a straight-line method from the commencement date to the end of the lease term, unless the lease transfers ownership of the underlying asset to the Group by the end of the lease term or the Group will exercise a purchase option. In that case the right-of-use asset will be depreciated over the useful life of the underlying asset, which is determined on the same basis as those of property and equipment.

The lease liability is initially measured at the present value of all lease payments that shall be paid under the lease. The Group uses the Group's incremental borrowing rate to discount the lease payments to the present value. The Group determines its incremental borrowing rate by obtaining interest rates from various external financing sources and makes certain adjustments to reflect the terms of the lease and type of the asset leased.

The lease liability is measured at amortised cost using the effective interest method. It is remeasured when there is a lease modification, or a change in the assessment of options specified in the lease. When the lease liability is remeasured, a corresponding adjustment is made to the carrying amount of the right-of-use asset or is recorded in profit or loss if the carrying amount of the right-of-use asset has been reduced to zero.

As a lessor

At inception or on modification of a contract, the Group allocates the consideration in the contract to each component on the basis of their relative standalone selling prices.

At lease inception, the Group considers to classify a lease that transfers substantially all of the risks and rewards incidental to ownership of the underlying asset to lessees as a finance lease. A lease that does not meet this criteria is classified as an operating lease.

The Group recognises lease payments received under operating leases in profit or loss on a straight-line basis over the lease term as part of 'other income.' Contingent rents are recognised as rental income in the accounting period in which they are earned.

The Group estimates lifetime expected credit losses (ECLs), using a provision matrix to find ECLs rate. This method groups the lease receivables based on shared credit risk characteristics and past due status, taking into account historical credit loss data, adjusted for factors that are specific to the debtors and an assessment of both current economic conditions and forward-looking general economic conditions at the reporting date. The Group derecognises the lease receivables as disclosed in note 3(d).

(m) Impairment of non-financial assets

The carrying amounts of the Group's assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, the assets' recoverable amounts are estimated. For goodwill, the recoverable amount is estimated each year at the same time.

An impairment loss is recognised in profit or loss if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount, unless it reverses a previous revaluation credited to equity, in which case it is charged to equity.

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The recoverable amount is the greater of the asset's value in use and fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For an asset that does not generate cash inflows largely independent of those from other assets, the recoverable amount is determined for the cash-generating unit to which the asset belongs.

Impairment losses of assets recognised in prior periods is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss in respect of goodwill is not reversed. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

(n) *Employee benefits*

Defined contribution plans

Obligations for contributions to the Group's provident funds are expensed in profit or loss in the period as the related service is provided.

Defined benefit plans

The Group's net obligation in respect of defined benefit plans is calculated by estimating the amount of future benefit that employees have earned in the current and prior periods. The defined benefit obligations is discounted to the present value, which performed every 3 years by a qualified actuary using the projected unit credit method.

Remeasurements of the net defined benefit liability, actuarial gain or loss are recognised immediately in OCI. The Group determines the interest expense on the net defined benefit liability for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period, taking into account any changes in the net defined benefit liability during the period as a result of contributions and benefit payments. Net interest expense and other expenses related to defined benefit plans are recognised in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognised immediately in profit or loss. The Group recognises gains and losses on the settlement of a defined benefit plan when the settlement occurs.

The Group's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. Remeasurements are recognised in profit or loss in the period in which they arise.

Termination benefits are expensed at the earlier of when the Group can no longer withdraw the offer of those benefits and when the Group recognises costs for a restructuring. If benefits are not expected to be settled wholly within 12 months of the end of the reporting period, then they are discounted.

Short-term employee benefits are expensed as the related service is provided. A liability is recognised for the amount expected to be paid if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

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(o) Share-based payments

The grant-date fair value of equity-settled share-based payment awards granted to employees is generally recognised as an expense, with a corresponding increase in equity, over the vesting period of the awards. The amount recognised as an expense is adjusted to reflect the number of awards for which the related service and non-market performance conditions are expected to be met, such that the amount ultimately recognised is based on the number of awards that meet the related service and non-market performance conditions at the vesting date. For share-based payment awards with non-vesting conditions, the grant-date fair value of the share-based payment is measured to reflect such conditions and there is no true-up for differences between expected and actual outcomes.

(p) Provisions

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount is recognised as finance cost.

(q) Fair value measurement

‘Fair value’ is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date in the principal or, in its absence, the most advantageous market to which the Group has access at that date. The fair value of a liability reflects its non-performance risk.

When measuring the fair value of an asset or a liability, the Group uses observable market data as far as possible. Fair values are categorised into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows:

- Level 1: quoted prices in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly or indirectly.
- Level 3: inputs for the asset or liability that are based on unobservable input.

If an asset or a liability measured at fair value has a bid price and an ask price, then the Group measures assets and asset positions at a bid price and liabilities and liability positions at an ask price.

The best evidence of the fair value of a financial instrument on initial recognition is normally the transaction price – i.e. the fair value of the consideration given or received. If the Group determines that the fair value on initial recognition differs from the transaction price, the financial instrument is initially measured at fair value adjusted for the difference between the fair value on initial recognition and the transaction price and the difference is recognised in profit or loss immediately. However, for the fair value categorised as level 3, such difference is deferred and will be recognised in profit or loss on an appropriate basis over the life of the instrument or until the fair value level is transferred or the transaction is closed out.

(t) Share capital

Ordinary shares

Ordinary shares are classified as equity. Incremental costs directly attributable to the issue of ordinary shares are recognised as a deduction from equity.

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Treasury shares

When share capital recognised as equity is repurchased, the amount of consideration paid, including directly attributable costs, is classified as treasury shares and recognised as a deduction from equity. An equal amount is appropriated from retained earnings and taken to a reserve for treasury shares within equity. When treasury shares are sold, the amount received is recognised as an increase in equity by crediting the cost of the treasury shares sold, calculated using the weighted average method, to the treasury shares account and transferring the equivalent amount back from reserve for treasury shares to retained earnings. Surpluses on the sale of treasury shares are taken directly to a separate category within equity, 'Share premium on treasury shares. Net deficits on sale or cancellation of treasury shares are debited to retained earnings after setting off against any remaining balance of surplus on treasury shares.

(u) Perpetual subordinated debentures

Perpetual subordinated debentures are recognised as equity when the Group has the sole right and discretion to early redeem the debentures per conditions as stipulated in the terms of the debentures and to defer interest and cumulative interest payment without time and deferral amount limitation and the coupon payments are discretionary. Accordingly, any coupon payments are accounted for as dividends and are recognised directly in equity at the time the payment obligation arises. Coupon payments are recognised in the statement of cash flows in the same way as dividends to ordinary shareholders.

(v) Revenue

Revenue is recognised when a customer obtains control of the goods or services in an amount that reflects the consideration to which the Group expects to be entitled, excluding those amounts collected on behalf of third parties, value added tax and is after deduction of any trade discounts and volume rebates.

Sale of goods and services rendered

Revenue from sales of goods is recognised on the date on which the goods are delivered to the customers. For the sales that permit the customers to return the goods, the Group estimates the returns based on the historical return data, does not recognise revenue for this transaction and remains recognition of inventory for the estimated products to be returned.

For bundled packages, the Group recognises revenue from sales of products and rendering of services separately if a product or service is separately identifiable from other items and a customer can benefit from it or the multiple services are rendered in different reporting periods. The consideration received is allocated based on their relative stand-alone selling prices.

Income from sale of electricity

Income from the sale of electricity is recognised in profit or loss in accordance with delivery units supplied as stipulated in the contract. Income from the sale of electricity for some entities within Thailand is entitled to receive ADDER for a period of 10 years from the commencement of commercial sales. Thereafter, subsequent to this initial period income from sale of electricity is recognised at normal rates.

Income from operating rights

Income from operating right is recognised in accordance with the timing of the rights utilisation and with conditions as stipulated in the contract.

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Loyalty programmes

For customer loyalty programme that the Group offers to customers, the consideration received are allocated based on the relative stand-alone selling price of the products and the loyalty points. The amount allocated to the loyalty points is recognised as contract liabilities and revenue is recognised when loyalty points are redeemed or the likelihood of the customer redeeming the loyalty points becomes remote. The stand-alone selling prices of the points is estimated based on discount provided to customers and the likelihood that the customers will redeem the points, and the estimate shall be reviewed at the end of the reporting period.

Service concession arrangements

Revenue related to construction under a service concession arrangement is recognised over time. Operation or service revenue is recognised in the period in which the services are provided by the Group. If the service concession arrangement contains more than one performance obligation, the consideration received is allocated with reference to the relative stand-alone selling prices of the services delivered.

(w) Income tax

Income tax expense for the year comprises current and deferred tax, which is recognised in profit or loss except to the extent that they relate to a business combination, or items recognised directly in equity or in other comprehensive income.

Current tax is recognised in respect of the taxable income or loss for the year, using tax rates enacted or substantively enacted at the reporting date, and any adjustment to tax payable in respect of previous years.

Deferred tax is recognised in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. Deferred tax is not recognised for the temporary differences: the initial recognition of goodwill; the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss; and differences relating to investments in subsidiaries to the extent that it is probable that they will not reverse in the foreseeable future.

The measurement of deferred tax reflects the tax consequences that would follow the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities, using tax rates enacted or substantively enacted at the reporting date.

A deferred tax asset is recognised to the extent that it is probable that future taxable profits will be available against which the temporary differences can be utilised. Deferred tax assets are reviewed at each reporting date and reduced to the extent that it is no longer probable that the related tax benefit will be realised.

(x) Earnings per share (EPS)

Basic EPS is calculated by dividing the profit or loss attributable to ordinary shareholders of the Company by the weighted average number of ordinary shares outstanding during the period, adjusted for own shares held.

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4 Impact of COVID-19 pandemic

COVID-19 pandemic is still on going, while vaccines for COVID-19 are being rolled out during 2021. Due to uncertainty of the situation in 2020, the Group applied accounting guidance on *temporary accounting relief measures for additional accounting options in response to impact from the situation of COVID-19* in preparing the financial statements for the year ended 31 December 2020 by excluding COVID-19 situation in impairment of assets, lease modifications, fair value measurement and deferred tax assets. As the accounting guidance already expired on 31 December 2020, the Group has adjusted the value of assets in 2021 (see note 8, 15, and 31).

5 Gain of control of a subsidiary

The Group has considered to change the recording of investment in OKEA ASA (“OKEA”) from investment in indirect associate to indirect subsidiary since 1 July 2021. This is because there are events and supporting evidence to support the conclusion that the Group has significant control over operations of OKEA, which the Group previously had a significant influence but has no right to control.

During the period from 1 July 2021 to 31 December 2021, OKEA contributed revenue of Baht 10,068 million and profit of Baht 1,488 million to the Group’s results. If the acquisition had occurred on 1 January 2021, management estimates that consolidated revenue would have increased by Baht 4,128 million and consolidated profit for the year would have increased by Baht 44 million. In determining these amounts, management has assumed that the fair value adjustments, determined provisionally, that arose on the date of acquisition would have been the same if the acquisition had occurred on 1 January 2021.

Identifiable assets acquired and liabilities assumed

	Note	Book value	Adjustment	Fair value
		(in million Baht)		
Cash and cash equivalents		5,011	-	5,011
Trade and other current receivables		1,986	-	1,986
Inventories		861	-	861
Property, plant and equipment	14	17,317	(6,280)	11,037
Right-of-use assets	15	626	-	626
Intangible assets	18	82	-	82
Other non-current assets		11,458	-	11,458
Trade and other payables		(3,528)	-	(3,528)
Other current liabilities		(229)	-	(229)
Lease liabilities		(626)	-	(626)
Debenture	19	(8,994)	-	(8,994)
Deferred tax liabilities	28	(6,060)	4,887	(1,173)
Non-current provisions for employee benefits	21	(125)	-	(125)
Provisions for decommissioning cost		(15,752)	-	(15,752)
Total identifiable net assets		2,027	(1,393)	634
Less Non-controlling interests (53.91 %)				(342)
Total identifiable net assets received				292
Goodwill				2,365
Consideration transferred				2,657

Other non-current assets mainly consisted of indemnification assets which was expenses related to close down and removal of oil equipment of oil field, which could be collected from a seller of oil field.

The fair value of exploration and production of petroleum assets was determined based on income approach. Key assumptions included forecast oil and gas price, oil reserve, production capacity and discount rate.

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6 Related parties

A related party is a person or entity that has direct or indirect control or joint control, or has significant influence over the financial and managerial decision-making of the Group; a person or entity that are under common control or under the same significant influence as the Group; or the Group has direct or indirect control or joint control or has significant influence over the financial and managerial decision-making of a person or entity.

Relationships with subsidiaries, associates, joint venture and other related parties were as follows:

Name of entities	Country of incorporation/ nationality	Nature of relationships
Major shareholders		
Vayupak Fund 1	Thailand	Some common directors
Social Security Office	Thailand	Some common directors
Subsidiaries or indirect subsidiaries		
Bangchak Green Net Co., Ltd.	Thailand	The Company's management as director
BCPG Public Company Limited	Thailand	The Company's management as director
BBGI Public Company Limited	Thailand	The Company's management as director
Bangchak Retail Co., Ltd.	Thailand	The Company's management as director
BCPR Co., Ltd.	Thailand	The Company's management as director
BCV Bio Based Co., Ltd.	Thailand	The Company's management as director
BCV Energy Co., Ltd.	Thailand	The Company's management as director
BCV Innovation Co., Ltd.	Thailand	The Company's management as director
BTSO Company Limited.)Formerly, BCV Partnership Co., Ltd.(Thailand	The Company's management as director (See note 11)
BCP Energy International Pte. Ltd.	Singapore	The Company's management as director (See note 11)
BCP Innovation Pte. Ltd.	Singapore	The Company's management as director
BCP Trading Pte. Ltd.	Singapore	The Company's management as director
BCPR Pte. Ltd.	Singapore	The Company's management as director
Bangchak Solar Energy Co., Ltd.	Thailand	Subsidiary's management as director
Bangchak Solar Energy (Prachinburi) Co., Ltd.	Thailand	Subsidiary's management as director
Bangchak Solar Energy (Chaiyaphum1) Co., Ltd.	Thailand	Subsidiary's management as director
Bangchak Solar Energy (Buriram) Co., Ltd.	Thailand	Subsidiary's management as director
Bangchak Solar Energy (Buriram1) Co., Ltd.	Thailand	Subsidiary's management as director
Bangchak Solar Energy (Nakhon Ratchasima) Co., Ltd.	Thailand	Subsidiary's management as director
Thai Digital Development Company Limited	Thailand	Subsidiary's management as director
BCPG Indochina Company Limited Group	Thailand	Subsidiary's management as director
Lomligor Co., Ltd.	Thailand	Subsidiary's management as director
RPV Energy Co., Ltd. Group	Thailand	Subsidiary's management as director and management
BSE Power Holding (Thailand) Co., Ltd.	Thailand	Subsidiary's director and management as director and management
Prathumwan Smart District Cooling Co., Ltd.	Thailand	Subsidiary's director and management as director

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Name of entities	Country of incorporation/ nationality	Nature of relationships
<i>Subsidiaries or indirect subsidiaries (continued)</i>		
KSL Green Innovation Public Company Limited	Thailand	The Company's management as director
Bangchak Biofuel Co., Ltd.	Thailand	The Company's management as director
Bangchak Bioethanol (Chachoengsao) Co., Ltd.	Thailand	The Company's management as director
BBGI Utility and Power Co., Ltd.	Thailand	Subsidiary's director and management as director and management
Nido Petroleum Pty. Ltd. Group	Australia/ British Virgin Islands/ Bahrain	Subsidiary's director and management as director (<i>See note 11</i>)
OKEA ASA	Norway	The Company's management as director (<i>See note 5</i>)
BCPG Investment Holdings Pte. Ltd.	Singapore	Subsidiary's management as director
BSE Energy Holdings Pte. Ltd.	Singapore	Subsidiary's management as director
BCPG Japan Corporation Group	Japan	Subsidiary's management as director/ indirect subsidiary of the subsidiary affiliate in TK investment
Greenergy Holdings Pte. Ltd.	Singapore	Subsidiary's management as director
Greenergy Power Pte. Ltd.	Singapore	Subsidiary's management as director
BCPG Wind Cooperatief U.A.	Netherland	Subsidiary's management as director
Nam San 3A Power Sole Co., Ltd.	Laos	Subsidiary's director and management as director and management
Nam San 3B Power Sole Co., Ltd.	Laos	Subsidiary's director and management as director and management
Indochina Development and Operation Holdings Pte. Ltd.	Singapore	Subsidiary's management as director
BCPG Formosa Co., Ltd.	Taiwan	Subsidiary's management as director
<i>Indirect associates and joint venture</i>		
Bongkot Marine Services Co., Ltd.	Thailand	The Company's management as director
Oam Suk Social Enterprise Co., Ltd.	Thailand	The Company's management as director
PetroWind Energy Inc.	Philippines	Subsidiary's management as director
Star Energy Group Holdings Pte. Ltd.	Singapore	Subsidiary's management as director
Impact Energy Asia Development Limited	Hong Kong	Subsidiary's management as director
WIN Ingredients Co., Ltd.	Thailand	Subsidiary's management as director
<i>Other related parties</i>		
Fuel Pipeline Transportation Ltd.	Thailand	The Company's management as director
Ubon Bio Ethanol Pte. Ltd.	Thailand	Subsidiary's management as director (<i>See note 12</i>)
Ubon Bio Agricultural Co., Ltd.	Thailand	Subsidiary's management as director (<i>See note 12</i>)
PEA Encom International Company Limited	Thailand	Shareholder of the subsidiary
Key management personnel	Thailand	Persons having authority and responsibility for planning, directing and controlling the activities of the entity, directly or indirectly, including any director (whether executive or otherwise) of the Group

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<i>Significant transaction with related parties</i> <i>Year ended 31 December</i>	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Subsidiaries and indirect subsidiaries				
Sales of goods	-	-	43,476	30,109
Purchases of goods	-	-	41,502	35,446
Dividend income	-	-	951	463
Other income	-	-	155	124
Interest income	-	-	127	208
Other expenses	-	-	50	36
Indirect associates and joint ventures				
Sales of goods	8	12	8	12
Purchases of goods	676	1,184	676	1,184
Dividend income	-	-	24	-
Other income	8	10	-	9
Interest income	16	10	-	-
Other expenses	469	454	469	454
Key management personnel				
Key management personnel compensation				
Short-term employee benefits	349	276	142	122
Post-employment benefits and other long-term benefits	17	13	5	9
Share-based payments	17	-	-	-
Total key management personnel compensation	383	289	147	131
Other related parties				
Sales of goods	7	-	6	-
Purchases of goods	319	-	297	-
Other income	6	4	4	4
Interest income	-	83	-	-
Pipeline transportation expenses	244	301	244	301
Other expenses	1	-	-	-

Balances as at 31 December with related parties were as follows:

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Trade accounts receivable				
Subsidiaries and indirect subsidiaries	-	-	2,080	661
Other related parties	7	1	3	1
Total	7	1	2,083	662
Other current receivables				
Subsidiaries and indirect subsidiaries	-	-	41	36
Indirect associate and joint ventures	13	1	9	-
Other related parties	-	32	-	-
Total	13	33	50	36
Less allowance for expected credit loss	-	-	-	(10)
Net	13	33	50	26

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	<i>Interest rate</i>	Consolidated financial statements					
		At 31 December (% p.a.)	At 1 January	Increase	Effect of change in exchange rates	At 31 December	
<i>Loans to</i>							
2021							
Indirect associate							
Impact Energy Asia Development Limited	4.7	255	122	34	411		
Total		255	122	34	411		
Less allowance for expected credit loss		(7)			(11)		
Net		248			400		
2020							
Indirect associate							
Impact Energy Asia Development Limited	4.7	152	107	(4)	255		
Total		152	107	(4)	255		
Less allowance for expected credit loss		(10)			(7)		
Net		142			248		
	<i>Interest rate</i>	Separate financial statements					
		At 31 December (% p.a.)	At 1 January	Increase	Decrease	Effect of change in exchange rates	At 31 December
<i>Loans to</i>							
2021							
Subsidiaries							
Bangchak Retail Co., Ltd.	-	-	645	-	(645)	-	-
Bangkok Fuel Pipeline and Logistics Co., Ltd.	1.75	-	-	922	-	-	922
Indirect subsidiaries							
Nido Petroleum Pty. Ltd.	-	-	1,105	-	(1,105)	-	-
BCPR Pte. Ltd.	4.5	-	3,189	-	(1,269)	79	1,999
Total			4,939	922	(3,019)	79	2,921
Less short-term loan to			-				(922)
Less current portion due within one year			(551)				-
Less allowance for expected credit loss			(3,355)				(963)
Net			1,033				1,036
2020							
Subsidiaries							
Bangchak Retail Co., Ltd.	4.2	-	610	35	-	-	645
BCP Innovation Pte. Ltd.	4.5	-	878	129	(997)	(10)	-
Indirect subsidiaries							
Nido Petroleum Pty. Ltd.	0.5	-	1,199	-	(94)	-	1,105
BCPR Pte. Ltd.	4.5	-	3,104	-	-	85	3,189
Total			5,791	164	(1,091)	75	4,939
Less current portion due within one year			-				(551)
Less allowance for expected credit loss			(585)				(3,355)
Net			5,206				1,033

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	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Other non-current assets				
Indirect subsidiary	-	-	35	473
Indirect associate	29	11	-	-
Other related parties	-	4	-	4
Total	29	15	35	477
Less allowance for expected credit loss	-	-	-	(311)
Net	29	15	35	166
(Reversal of) allowance for expected credit loss				
Year ended 31 December				
Other current receivables	-	-	(10)	-
Loans to	3	(3)	(1,454)	2,724
Other non-current assets	-	-	-	333
Trade accounts payable				
Subsidiaries and indirect subsidiaries	-	-	4,407	4,211
Indirect associate	-	151	-	151
Other related parties	158	-	145	-
Total	158	151	4,552	4,362
Other current payables				
Subsidiaries and indirect subsidiaries	-	-	40	44
Joint ventures	16	9	16	9
Other related parties	32	27	29	27
Total	48	36	85	80
Other current liabilities				
Subsidiaries	-	-	6	6
Total	-	-	6	6

	Interest rate	Consolidated financial statements			
		At 1 January	Increase	Effect of change in exchange rates	At 31 December
Loans	At 31 December (% p.a.)				
2021					
Other related parties	2.83	-	17	-	17
Total		-	17	-	17

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Other non-current liabilities				
Other related parties	1	1	1	1
Total	1	1	1	1

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Significant agreements with related parties

Fuel Pipeline Transportation Agreement

The Company entered into a Fuel Pipeline Transportation Agreement with a related company. The related company will provide transportation service of fuel products to Don-mueang and Suvarnabhumi International Airport and transportation service for petroleum products to fuel depot at Bang-pa-in. The agreement was amended to specify the expiration date as 31 December 2021.

Oil Terminal Rental Agreement

The Company has entered into an Oil Terminal Rental Agreement with a joint venture. The rental fee is stipulated in the agreement which will be expired in 2022.

Bio-diesel Sales and Purchase Agreement

The Company entered into a Bio-diesel Sales and Purchase Agreement with an indirect subsidiary. Such agreement has effective since April 2018 to October 2027 and will be automatically renewed unless terminated by either party as stipulated in the agreement. The Company will purchase bio-diesel oil at yearly average volumes not less than 60% of maximum bio-diesel production capacity of indirect subsidiary at the price reference to market as stipulated in the agreement.

Denature Ethanol Sales and Purchase Agreement

The Company entered into a Denatured Ethanol Sales and Purchase Agreement with a subsidiary. Such agreement has effective since April 2018 to October 2027 and will be automatically renewed unless terminated by either party as stipulated in the agreement. The Company will purchase denatured ethanol at yearly average volumes not less than 50% of denatured ethanol production per year of the indirect subsidiary within the same Group at the price reference to market as stipulated in the agreement.

Fuel Product Sale and Purchase Agreement

The Company entered into a fuel product sale and purchase agreement with a subsidiary. The Company will purchase fuel product at quantity and price in accordance with obligation under the agreement.

Service Station Operating Right Agreement

The Company entered into Service Station Operating Right Agreement which include the right to operate related business within service station, selling and purchasing of fuel products with a subsidiary for a period of 5 years. Operating right fee and sale and purchase price are as stipulated in the agreement.

Store Operation Right Agreement

The Company entered into Store Operation Right Agreement with a subsidiary to operate retail stores within service stations under the Company's brand for a period of 5 years. Fee is as stipulated in the agreement.

Information Technology Service Agreement

The Company has entered into information technology service agreements with subsidiaries and indirect subsidiaries. Agreements will be reviewed annually. The Company is responsible for management information system, system structure, maintenance system and advisory in accordance with subsidiaries' direction. Service fees is as stipulated in the agreement.

Bangchak Corporation Public Company Limited and its Subsidiaries

Notes to the financial statements

For the year ended 31 December 2021

Management Service Agreement

The Company entered into management service agreement with subsidiaries and indirect subsidiaries for general management service for a period of 1 to 3 years. The Company agreed to provide human resources to manage operation process in accordance with subsidiaries' direction. Service fees is as stipulated in the agreement.

Land Rental Agreement

The Company has entered into land rental agreement with BCPG Public Company Limited, which is of a subsidiary of the group, for the purpose of 38 MW solar farm project at Bang Pa-In establishment and related objectives. The agreement term is for a period of 22 years effective from 1 December 2015 to 30 November 2037. The rental fee is as stipulated in the same agreement.

The Company has entered into additional land rental agreement with BCPG Public Company Limited, which is a subsidiary of the Group, for the purpose of related objectives of solar farm project. The agreement term is for a period of 21 years 2 months effective from 1 October 2016 to 30 November 2037. The rental fee is as stipulated in the same agreement.

Joint Development Area Agreement

The Company has entered into operating rights agreement with a subsidiary to operate a service and product distribution in service station under its subsidiary's operation for a period of not exceeding 20 years. The subsidiary agrees to pay operating right fee as stipulated in the agreement.

Lending Agreement

The Company has an unsecured lending agreement with Bangchak Retail Company Limited, which is a subsidiary of the Group, for the credit facility of Baht 700 million. The interest rate and repayment schedule are as stipulated in the agreement.

The Company has an unsecured lending agreement with BCP Innovation Pte. Ltd", which is a subsidiary of the Group, for the credit facility of USD 80 million. The loan bears interest and repayment schedule as stipulated in the agreement.

The Company has an unsecured lending agreement with BCPR Pte. Ltd., which is an indirect subsidiary of the Group, for the credit facility of USD 120 million. Subsequently in 2019, the Company amended the lending agreement by revision lending currency of the loan of USD 100 million to NOK 917 million. The loan has a repayment schedule, bears interest and conditions as stipulated in the agreement

The Company has an unsecured lending agreement with Bangkok Fuel Pipeline and Logistics Co., Ltd., which is a subsidiary of the Group, for the credit facility of Baht 810 million. The loan has a repayment schedule, bears interest and conditions as stipulated in the agreement.

According to the transfer of all shares in Impact Energy Asia Development Limited ("IEAD"), the Group's associate, held by BCPG Public Company Limited ("BCPG") to Indochina Development and Operation Holdings Pte. Ltd. ("IDO"), BCPG cancelled its loan agreement with IEAD. IDO has entered into an unsecured loan agreement with IEAD which has the same repayment schedule, interest and conditions as the previous loan agreement between BCPG and IEAD. As at 31 December 2021, the outstanding balance of this loan is USD 12 million (approximately Baht 411 million) (2020: None).

Bangchak Corporation Public Company Limited and its Subsidiaries

Notes to the financial statements

For the year ended 31 December 2021

Borrowing Agreement

Thai Digital Energy Development Company Limited, which is a subsidiary of the Group entered into an unsecured loan agreement with PEA ENCOM International Company Limited, a shareholder of the subsidiary, for the purpose of investing in operational equipment. The loan has a repayment schedule, bears interest and conditions as stipulated in the agreement.

Guarantee Agreement

BCPG Public Company Limited, which is a subsidiary of the Group, has entered into guarantee agreement with BCPG Engineering Company, an indirect subsidiary of the Group, in accordance with solar power system operation and maintenance of power system from solar energy contract which BCPG Engineering Company has with Tarumizu Solar Solution Godo Kaisha in the event that BCPG Engineering Company causes damage to the assets within the power plant of Tarumizu Solar Solutions Godo Kaisha and is not able to compensate. The guarantee agreement is JPY 28 million per annum, with a guarantee facility totalling JPY 280 million, covering the period of operation and maintenance of power system from solar energy contract. Under the conditions within the loan agreement between Tarumizu Solar Solutions Godo Kaisha and certain financial institution in Japan, it is specified that the parent company is responsible for the guarantee of possible damage loss.

BCPG Public Company Limited, which is a subsidiary of the Group, has entered into guarantee agreement for loans from financial institutions of a subsidiary, in the amount not exceeding USD 172 million. As at 31 December 2021, the balance of loans from financial institutions is USD 157 million (2020: USD 166 million) with a condition of installment payment of principal and interest within the year 2030.

7 Cash and cash equivalents

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Cash on hand	106	167	-	-
Cash at banks - current accounts	8,614	4,351	98	36
Cash at banks - savings accounts	15,844	17,133	7,690	6,007
Highly liquid short-term investments	7,458	-	-	-
Total	32,022	21,651	7,788	6,043

As at 31 December 2021, certain indirect subsidiaries has a restricted deposits at financial institution totaling Baht 1,576 million (2020: Baht 764 million) under the long-term loan agreement with several financial institutions which required such indirect subsidiaries to obtain a permission on withdrawal of restricted deposits with the financial institution.

Bangchak Corporation Public Company Limited and its Subsidiaries

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For the year ended 31 December 2021

8 Trade accounts receivables

<i>31 December</i>	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Within credit terms	7,440	4,365	5,930	2,351
Overdue:				
Less than 3 months	736	508	205	59
3-6 months	341	39	4	-
6-12 months	404	887	1	870
Over 12 months	413	40	10	20
Total	9,334	5,839	6,150	3,300
Less allowance for expected credit loss	(76)	(919)	(3)	(883)
Net	9,258	4,920	6,147	2,417

<i>Allowance for expected credit loss</i>	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
At 1 January	919	38	883	14
Addition	37	907	-	893
Reversal	(13)	(2)	(11)	-
Classified as non-current assets	(905)	-	(905)	-
Effect of change in exchange rates	38	(24)	36	(24)
At 31 December	76	919	3	883

Information of credit risk is disclosed in note 31 (c.1).

9 Other current receivables

<i>Note</i>	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Related parties	13	33	50	26
Other parties				
Accrued income	1,854	20	-	-
Receivable from revenue department	1,117	252	685	151
Advance payment for goods	436	420	-	10
Prepaid expenses	253	92	17	16
Underlift of petroleum products	848	-	-	-
Working capital and overcall, joint operation/licenses	619	-	-	-
Indemnification assets	314	-	-	-
Others	522	665	469	385
Total	5,976	1,482	1,221	588

Bangchak Corporation Public Company Limited and its Subsidiaries

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For the year ended 31 December 2021

10 Inventories

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Crude oil and other raw materials	9,483	7,047	7,989	5,814
Finished oil products	7,535	8,052	6,548	6,704
Materials and supplies	1,680	1,104	1,151	1,064
Consumer products	52	49	-	-
Semi - finished products	127	105	-	-
	<u>18,877</u>	<u>16,357</u>	<u>15,688</u>	<u>13,582</u>
Less: allowance for obsolete and slow moving allowance for decline in value	(378) (2)	(195) -	(378) -	(194) -
Net	<u>18,497</u>	<u>16,162</u>	<u>15,310</u>	<u>13,388</u>
Inventories recognised in cost of sale (<i>Note 26</i>)				
- Cost of sale	104,718	75,074	92,973	65,723
- (Reversal of) write-down to net realisable value	2	(5)	-	-
Total	<u>104,720</u>	<u>75,069</u>	<u>92,973</u>	<u>65,723</u>

As at 31 December 2021 and 2020, the Company's inventories included petroleum legal reserve of 253 million liters with approximated value of Baht 4,388 million and 256 million liters with approximated value of Baht 2,477 million, respectively.

11 Investments in subsidiaries

<i>Year ended 31 December</i>	Separate financial statements	
	2021	2020
	<i>(in million Baht)</i>	
At 1 January	13,851	13,659
Addition	2,516	2,227
Difference of interest rate per lending agreement and market rate	-	11
Reversal of (loss from impairment)	125	(2,046)
At 31 December	<u>16,492</u>	<u>13,851</u>

Change in investment in subsidiaries

Bangchak Retail Co., Ltd.

On 25 March 2021, at the Board of Directors' meeting of the Company, the Board approved an increase in share capital at of Bangchak Retail Co., Ltd. ("BCR") of Baht 700 million from the existing share capital of Baht 800 million to Baht 1,500 million through newly issued 70 million ordinary shares at a par value of Baht 10 each. The Company's ownership interest in BCR has not been changed. The subsidiary registered the increase in paid-up share capital with Ministry of Commerce on 30 March 2021.

Bangchak Corporation Public Company Limited and its Subsidiaries

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For the year ended 31 December 2021

BCV Innovation Co., Ltd.

On 25 March 2021, at the Board of Directors' meeting of the Company, the Board approved an increase in share capital of BCV Innovation Co., Ltd. amounting to Baht 30 million to enter into a share purchase agreement to acquire 100% shareholding in WINNONIE Company Limited ("WINNONIE") which the principal business of WINNONIE are electric motorcycle rental, battery replacement service and others. The registration for the increased in share capital increase was complete and the paid-up capital was received in April 2021.

On 1 November 2021, at the Board of Directors' meeting of the Company, the Board approved an increase in the registered share capital of BCVI amounting to Baht 15 million from the existing share capital of Baht 50 million to Baht 65 million. The Company's ownership interest in BCVI has not been changed. The subsidiary registered the increase in paid-up share capital with Ministry of commerce on 26 November 2021.

General Energy Manning Co., Ltd.

On 25 March 2021, at the Board of Directors' meeting of the Company, the Board approved the establishment of General Energy Manning Co., Ltd. ("GEMS") for recruitment and human resource management which is 49% owned by the Company. On 29 April 2021, GEMS registered the initial authorised share capital of Baht 1 million with Ministry of Commerce and the paid-up capital was fully received in August 2021.

BCP Energy International Pte. Ltd.

On 2 July 2021, the Group sold all shares held in BCP Energy International Pte. Ltd. ("BCPE") to Sargasco Limited, a company listed in Australian Securities Exchange. The Group recognised gain from sale of investment net of exchange differences on translating financial statements of Baht 122 million. The transaction resulted in BCPE and Nido Petroleum Limited Group, which are subsidiaries of BCPE, ceasing to be a subsidiary of the Group.

BCPG Public Company Limited

On 20 July 2021, the Company exercised Warrant of BCPG Public Company Limited No. (BCPG-W1) which is warrants of BCPG Public Company Limited ("BCPG"). The Company has exercised warrants for 69.15 million units at exercise price of Baht 8 each, amounting to Baht 553 million. The Company's ownership interest in BCPG has changed to be at 61.31% without change in control over BCPG.

On 28 October 2021, BCPG issued the registered share capital for an exercise of warrant of BCPG No.1 (BCPG-W1) for 3.14 million units and for warrant of BCPG which allocated to private placement investors (BCPG-W3) for 178.57 million units. The Company's ownership interest in BCPG has changed to be at 57.46% without change in control over BCPG.

BCP Trading Pte. Ltd.

On 29 July 2021, at the Board of Directors' meeting of the Company, the Board approved an increase in the registered share capital of USD 10 million of BCP Trading Pte. Ltd. ("BCPT") and BCPT issued of USD 9 million bonus shares. As a result, the existing share capital of USD 1 million has changed to USD 20 million (Baht 661 million) through newly issued 19 million ordinary shares at a par value of USD 1 each. The Company's ownership interest in BCPT has not been changed. The subsidiary registered the increase in paid-up share capital on 24 August 2021.

Bangchak Corporation Public Company Limited and its Subsidiaries

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For the year ended 31 December 2021

BTSG Company Limited

On 29 July 2021, at the Board of Directors' meeting of the Company, the Board approved the development of liquefied natural gas (LNG) business in response to future business expansion strategy by having BCV Partnership Co., Ltd. ("BCVP"), which the Company has 100% shareholding, register the change of the company name from to BTSG Company Limited ("BTSG") and register an increase in capital from Baht 20 million to Baht 200 million. On 23 September 2021, the Company had 51% shareholding in BTSG and Thai Special Gas Co, Ltd. has 49% shareholding without change in control over BTSG.

Bangkok Fuel Pipeline and Logistics Co., Ltd.

On 4 October 2021, at the Board of Directors' meeting of the Company, the Board approved the establishment of Bangkok Fuel Pipeline and Logistics Co., Ltd. ("BFPL") for operating fuel and transportation and logistics business which is 100% owned by the Company. On 4 October 2021, BFPL registered the initial authorised share capital of Baht 1 million with Ministry of Commerce and the paid-up capital was fully received in October 2021.

On 28 October 2021, at the Board of Directors' meeting of the Company, the Board approved an increase in share capital of BFPL amounting to Baht 799 million from the existing share capital of Baht 1 million to Baht 800 million through newly issued 79.90 million shares at a par value of Baht 10 each. The Company's ownership interest in BFPL has not been changed. The subsidiary registered the increase in paid-up share capital with Ministry of Commerce on 1 December 2021.

Impairment of investment in subsidiary

During the year ended 31 December 2021, the Group reversed impairment loss of investment in BCPR Co., Ltd. in the separate financial statements amounting to Baht 125 million to adjust the book value to be close to the recoverable amount.

Non-controlling interests

The following table summarises the information relating to each of the Group's subsidiaries that has a material non-controlling interest, before any intra-group eliminations:

	BCPG Public Company Limited		BBGI Public Company Limited		OKEA ASA
	For the year ended 31 December 2021	For the year ended 31 December 2020	For the year ended 31 December 2021	For the year ended 31 December 2020	From 1 July to 31 December 2021
Non-controlling interest percentage	43%	40%	40%	40%	54%
Current assets	13,933	12,493	3,037	3,281	13,708
Non-current assets	44,788	38,727	9,870	9,451	32,904
Current liabilities	(4,678)	(4,046)	(2,940)	(3,697)	(6,736)
Non-current liabilities	(26,815)	(24,625)	(3,063)	(2,530)	(33,438)
Net assets	27,228	22,549	6,904	6,505	6,438
Carrying amount of non-controlling interest	11,708	9,020	2,762	2,602	3,477
Revenue	4,669	4,231	14,095	12,571	10,068
Profit	2,010	1,912	1,188	1,112	1,448
Other comprehensive income	1,499	(1,444)	(62)	-	40
Total comprehensive income	3,509	467	1,127	1,112	1,488
Profit allocated to non-controlling interest	1,408	144	587	605	817
Dividends to non-controlling interest	346	192	426	144	-
Cash flows from operating activities	2,426	3,079	1,742	1,693	5,606
Cash flows from investing activities	(4,117)	(5,309)	(167)	(1,693)	(1,813)
Cash flows from financing activities	1,622	12,068	(1,349)	89	(1,187)

Bangchak Corporation Public Company Limited and its Subsidiaries

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For the year ended 31 December 2021

Investments in subsidiaries as at 31 December 2021 and 2020 and dividend income from the investment for each years were as follows:

	Separate financial statements										Dividend income	
	Ownership interest		Paid-up capital		Cost		Impairment		At cost - net		for the year	
	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020
	(<i>%</i>)						<i>(in million Baht)</i>					
<i>Subsidiaries</i>												
Bangchak Green Net Co., Ltd.	49.00	49.00	1	1	-	-	-	-	-	-	54	15
BCPG Public Company Limited	57.46	60.36	14,470	13,202	9,780	9,227	-	-	9,780	9,227	537	448
Bangchak Retail Co., Ltd.	100.00	100.00	1,500	800	1,500	800	-	-	1,500	800	-	-
BCP Energy International Pte. Ltd.	-	100.00	-	3,673	-	3,673	-	(3,673)	-	-	-	-
BCP Innovation Pte. Ltd.	100.00	100.00	1,790	1,790	1,790	1,790	-	-	1,790	1,790	-	-
BCP Trading Pte. Ltd.	100.00	100.00	661	35	371	35	-	-	371	35	59	-
BBGI Public Company Limited	60.00	60.00	2,532	2,532	1,700	1,700	-	-	1,700	1,700	301	-
BCPR Co., Ltd.	100.00	100.00	661	661	661	661	(317)	(442)	344	219	-	-
BCV Bio Based Co., Ltd.	100.00	100.00	20	20	20	20	-	-	20	20	-	-
BCV Energy Co., Ltd.	100.00	100.00	20	20	20	20	-	-	20	20	-	-
BCV Innovation Co., Ltd.	100.00	100.00	65	20	65	20	-	-	65	20	-	-
BTSB Company Limited (Formerly, BCV Partnership Co., Ltd.)	51.00	100.00	200	20	102	20	-	-	102	20	-	-
General Energy Manning Co., Ltd.	49.00	-	1	-	-	-	-	-	-	-	-	-
Bangkok Fuel Pipeline and Logistics Co., Ltd.	100.00	-	800	-	800	-	-	-	800	-	-	-
Nido Petroleum Pty. Ltd.					-	134	-	(134)	-	-	-	-
					16,809	18,100	(317)	(4,249)	16,492	13,851	951	463

Bangchak Corporation Public Company Limited and its Subsidiaries

Notes to the financial statements

For the year ended 31 December 2021

12 Investments in associates and joint ventures

<i>Year ended 31 December</i>	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Indirect associates				
At 1 January	14,149	17,888	-	-
Share of net profit (loss) of associates	1,015	(623)	-	-
Share of other comprehensive income of associates	8	56	-	-
Dividend income	(179)	(40)	-	-
Reversal of (loss from impairment)	400	(1,013)	-	-
Effect of change in exchange rates	1,596	(1,277)	-	-
Sale of investment	(128)	(842)	-	-
Reclassification	(3,375)	-	-	-
At 31 December	13,486	14,149	-	-
Joint ventures				
At 1 January	182	110	73	73
Share of net profit of joint ventures	26	31	-	-
Dividend income	(24)	-	-	-
Increase	-	41	-	-
At 31 December	184	182	73	73
Total				
At 1 January	14,331	17,998	73	73
Share of net profit (loss) of associates and joint ventures	1,042	(592)	-	-
Share of other comprehensive income of associates	8	56	-	-
Dividend income	(203)	(40)	-	-
Reversal of (loss from impairment)	400	(1,013)	-	-
Effect of change in exchange rates	1,595	(1,277)	-	-
Increase	-	41	-	-
Sales of investment	(128)	(842)	-	-
Reclassification	(3,375)	-	-	-
At 31 December	13,670	14,331	73	73

Changes in investment in indirect associates

Ubon Bio Ethanol Public Company Limited

During the third quarter of 2021, Ubon Bio Ethanol Public Company Limited (“UBE”) registered the increase in paid-up share capital with Ministry of Commerce, resulting in the Group’s ownership interest in UBE has decreased thereby ceased to be an indirect associate and became an other financial assets. The Group recognised gain on fair value adjustment of such investment of Baht 616 million. And the Board of Directors’ meeting of the subsidiary approved a sale of 98 million shares of UBE amounting to Baht 235 million. As a result, on 31 December 2021, the Group’s ownership interest in UBE has decreased to 12.39%. The Group classified such investment as equity securities measured at FVOCI.

Bangchak Corporation Public Company Limited and its Subsidiaries

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OKEA ASA

On 1 April 2021, OKEA (“OKEA”) registered the share capital increase of 502,700 shares. As a result, OKEA has 103,005,350 registered and paid-up share capital, which resulting in BCPR Pte. Ltd.’s shareholding in OKEA to decrease from 46.32% to 46.09%

On 1 July 2021, the Group has considered to change the status of investment in OKEA from an indirect associate to an indirect subsidiary (*see note 5*).

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For the year ended 31 December 2021

Investments in associates and joint ventures as at 31 December 2021 and 2020 and dividend income for each years were as follows:

	Note	Consolidated financial statements										Dividend income			
		Ownership interest		Paid-up capital		Cost		Equity		Impairment		At equity - net		for the year	
		2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020
		(%)						(in million Baht)							
Indirect associates															
Ubun Bio Ethanol Plc.		-	21.28	-	2,740	-	763	-	816	-	-	-	816	79	2
PetroWind Energy Inc.		40.00	40.00	895	895	922	922	1,191	1,128	-	-	1,191	1,128	-	38
Star Energy Group Holding Pte. Ltd.		33.33	33.33	25,214	25,214	10,949	10,949	12,295	10,595	-	-	12,295	10,595	100	-
OKEA ASA	5	-	46.32	-	38	-	3,844	-	2,623	-	(1,013)	-	1,610	-	-
Impact Energy Asia Development Limited		45.00	45.00	-	-	-	-	-	-	-	-	-	-	-	-
						11,871	16,478	13,486	15,162	-	(1,013)	13,486	14,149	179	40
Joint ventures															
Bongkot Marine Services Co., Ltd.		30.00	30.00	240	240	72	72	144	140	-	-	144	140	24	-
Oam Suk Social Enterprise Co., Ltd.		40.00	40.00	3	3	1	1	1	1	-	-	1	1	-	-
WIN Ingredients Co., Ltd.		51.00	51.00	81	81	41	41	39	41	-	-	39	41	-	-
						114	114	184	182	-	-	184	182	24	-
Total						11,985	16,592	13,670	15,344	-	(1,013)	13,670	14,331	203	40

As at 31 December 2021, none of the Group's equity-accounted investee is publicly listed and consequently does not have published price quotations.

Bangchak Corporation Public Company Limited and its Subsidiaries

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	Ownership interest		Paid-up capital		Separate financial statements				Dividend income for the year			
	2021	2020	2021	2020	Cost		Impairment		At cost - net		2021	2020
	(%)				2021	2020	2021	2020	2021	2020		
Joint ventures												
Bongkot Marine Services Co., Ltd.	30.00	30.00	240	240	72	72	-	-	72	72	24	-
Oam Suk Social Enterprise Co., Ltd.	40.00	40.00	3	3	1	1	-	-	1	1	-	-
Total					73	73	-	-	73	73	24	-

None of the Company's equity-accounted investee is publicly listed and consequently does not have published price quotations.

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Material associates

The following table summarises the financial information of the material associates as included in their own financial statements, adjusted for fair value adjustments at acquisition and differences in accounting policies. The table also reconciles the summarised financial information to the carrying amount of the Group's interest in these companies.

	OKEA ASA.		Star Energy Group Holdings Pte. Ltd.	
	From 1 January to 30 June 2021	For the year ended 31 December 2020	For the year ended 31 December 2021	For the year ended 31 December 2020
	<i>(in million Baht)</i>			
Statement of income				
Revenue	4,128	5,506	17,208	16,925
Net profit (loss)	815	(2,008)	5,185	3,714
Other comprehensive income (loss)	-	(2)	23	321
Total comprehensive income (loss) for the year	815	(2,010)	5,208	4,035
Group's share of total comprehensive income (loss)	371	(914)	584	289

	OKEA ASA.		Star Energy Group Holdings Pte. Ltd.	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
As at 31 December				
Statement of financial position				
Current assets	-	6,668	17,538	13,158
Non-current assets	-	27,473	97,635	87,014
Current liabilities	-	(3,412)	(4,625)	(4,019)
Non-current liabilities	-	(26,948)	(77,667)	(70,874)
Net assets (100%)	-	3,781	32,881	25,279
Less non-controlling interest in net asset associates	-	-	(16,279)	(14,153)
Net assets of associates	-	3,781	16,602	11,126
Group's share of net assets	-	1,751	5,533	3,708
Goodwill	-	872	6,762	6,887
Carrying amount of interest in associates	-	2,623	12,295	10,595

Bangchak Corporation Public Company Limited and its Subsidiaries

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For the year ended 31 December 2021

Immaterial associates and joint ventures

The following is summarised financial information for the Group's interest in immaterial of associates and joint ventures based on the amounts reported in the Group's consolidated financial statements:

	2021	2020
	<i>(in million Baht)</i>	
Carrying amount of interests in immaterial of associates and joint ventures	1,375	2,125
Share of net profit from investment in associates and joint ventures in consolidated financial statements:		
- Profit for the year	95	87
- Other comprehensive income	-	-
- Total comprehensive income	95	87

13 Investment properties

	Consolidated		Separate	
	financial statements		financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
<i>Cost</i>				
At 1 January	127	127	683	683
At 31 December	127	127	683	683
<i>Depreciation and impairment losses</i>				
At 1 January	-	-	-	-
At 31 December	-	-	-	-
<i>Net book value</i>				
At 31 December	127	127	683	683

The leases of investment properties comprise a number of commercial properties that are leased to BCPG Public Company Limited, which is a subsidiary of the Group (*see note 6*), are leased to third parties under operating leases. Each of the leases contains an initial non-cancellable period of 2 - 3 years. Subsequent renewals are negotiated with the lessee. For all investment property leases, the rental income is fixed under the contracts, but some leases require the lessee to reimburse the insurance costs of the Group. When this is the case, the amounts of insurance costs are determined annually.

The fair value is appraised by an independent appraiser at market comparison value. As at 31 December 2021, investment properties had fair value for consolidate and separate financial statements at Baht 346 million and Baht 1,180 million, respectively (*2020: Baht 346 million and Baht 1,180 million, respectively*).

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14 Property, plant and equipment

	Consolidated financial statements										
	Land	Buildings	Machinery, equipment refinery plants and terminal	Electricity producing equipment	Exploration and production of petroleum assets	Marketing and office equipment	Platinum catalyst	Vehicles	Other assets	Construction work in progress	Total
	<i>(in million Baht)</i>										
Cost											
At 1 January 2020	4,133	4,055	50,088	11,911	-	8,824	239	420	28	10,763	90,461
Impact of changes in accounting policies	(156)	(206)	(23)	-	-	-	-	(15)	-	-	(400)
Additions	12	1	35	2	-	18	-	10	-	6,334	6,412
Acquisitions through business combination	87	24	-	256	-	-	-	-	-	-	367
Transfers	-	253	1,376	73	-	486	-	14	-	(2,245)	(43)
Disposals	-	(153)	-	(2)	-	(232)	-	(58)	-	-	(445)
Effect of movement in exchange rate	19	2	(71)	61	-	1	-	-	-	102	114
At 31 December 2020 and 1 January 2021	4,095	3,976	51,405	12,301	-	9,097	239	371	28	14,954	96,466
Additions	18	20	63	10	2,793	45	-	52	-	7,727	10,728
Acquisitions through business combination (Note 5)	-	301	-	-	2,283	47	-	-	-	8,406	11,037
Transfers	16	1,173	11,922	1,927	9,034	240	-	1	-	(24,461)	(148)
Disposals	-	(443)	(1,728)	(98)	-	(104)	-	(7)	-	-	(2,380)
Effect of movement in exchange rate	(1)	8	-	(10)	8	2	-	-	-	224	231
At 31 December 2021	4,128	5,035	61,662	14,130	14,118	9,327	239	417	28	6,850	115,934

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	Consolidated financial statements										
	Land	Buildings	Machinery, equipment refinery plants and terminal	Electricity producing equipment	Exploration and production of petroleum assets	Marketing and office equipment <i>(in million Baht)</i>	Platinum catalyst	Vehicles	Other assets	Construction work in progress	Total
Depreciation and impairment losses											
At 1 January 2020	(6)	(1,297)	(28,859)	(2,489)	-	(4,955)	-	(265)	(6)	-	(37,877)
Impact of changes in accounting policies	-	2	1	-	-	-	-	-	-	-	3
Depreciation charge for the year	-	(187)	(2,928)	(579)	-	(599)	-	(42)	(1)	-	(4,336)
Impairment losses	-	(4)	(16)	-	-	(3)	-	-	-	-	(23)
Transfer	-	1	-	-	-	(2)	-	(1)	-	-	(2)
Disposals	-	40	-	-	-	185	-	56	-	-	281
Effect of movement in exchange rate	-	(1)	67	(11)	-	-	-	-	-	-	55
At 31 December 2020 and 1 January 2021	(6)	(1,446)	(31,735)	(3,079)	-	(5,374)	-	(252)	(7)	-	(41,899)
Depreciation charge for the year	-	(209)	(3,052)	(616)	(1,117)	(581)	-	(39)	(2)	-	(5,616)
Impairment losses	(1)	-	(121)	(49)	(840)	-	-	-	(1)	-	(1,012)
Transfer	-	(91)	39	52	-	-	-	-	-	-	-
Disposals	-	131	1,700	29	-	92	-	7	-	-	1,959
Effect of movement in exchange rate	-	(6)	-	-	(126)	(1)	-	-	-	-	(133)
At 31 December 2021	(7)	(1,621)	(33,169)	(3,663)	(2,083)	(5,864)	-	(284)	(10)	-	(46,701)
Net book value											
At 31 December 2020	4,089	2,530	19,670	9,222	-	3,273	239	119	21	14,954	54,567
At 31 December 2021	4,121	3,414	28,493	10,467	12,035	3,463	239	133	18	6,850	69,233

As at 31 December 2021, certain subsidiaries have mortgaged its land, buildings and machinery as collateral with financial institutions for credit facilities totalling Baht 30,306 million (2020: Baht 12,812 million).

As at 31 December 2021, the Group has capitalised borrowing costs relating to construction of the new factory amounted to Baht 339 million (2020: Baht 374 million), with a capitalisation rate of 1.30% - 3.83% p.a. (2020: 0.95% - 4.52% p.a.) (see note 27).

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For the year ended 31 December 2021

	Separate financial statements									
	Land	Buildings	Machinery, equipment refinery plants and terminal	Electricity producing equipment	Marketing and office equipment	Platinum catalyst <i>(in million Baht)</i>	Vehicles	Other assets	Construction work in progress	Total
Cost										
At 1 January 2020	2,369	616	45,175	72	8,107	239	341	28	7,890	64,837
Additions	-	-	33	-	-	-	9	-	4,365	4,407
Transfers	-	72	1,197	-	475	-	-	-	(1,772)	(28)
Disposals	-	(5)	(66)	-	(121)	-	(49)	-	-	(241)
At 31 December 2020 and 1 January 2021	2,369	683	46,339	72	8,461	239	301	28	10,483	68,975
Additions	6	-	35	-	-	-	4	-	3,018	3,063
Transfers	-	8	11,695	-	251	-	-	-	(11,954)	-
Disposals	-	(6)	(1,706)	-	(69)	-	(7)	-	(1)	(1,789)
At 31 December 2021	2,375	685	56,363	72	8,643	239	298	28	1,546	70,249
Depreciation and impairment losses										
At 1 January 2020	(6)	(483)	(27,255)	(9)	(4,523)	-	(225)	(6)	-	(32,507)
Depreciation charge for the year	-	(19)	(2,621)	(6)	(524)	-	(32)	(2)	-	(3,204)
Reversal of (impairment losses)	-	-	(16)	-	1	-	-	-	-	(15)
Disposals	-	5	64	-	112	-	49	-	-	230
At 31 December 2020 and 1 January 2021	(6)	(497)	(29,828)	(15)	(4,934)	-	(208)	(8)	-	(35,496)
Depreciation charge for the year	-	(22)	(2,756)	(6)	(508)	-	(29)	(1)	-	(3,322)
Impairment losses	-	-	(121)	-	-	-	-	(1)	-	(122)
Disposals	-	5	1,684	-	57	-	2	-	-	1,748
At 31 December 2021	(6)	(514)	(31,021)	(21)	(5,385)	-	(235)	(10)	-	(37,192)
Net book value										
At 31 December 2020	2,363	186	16,511	57	3,527	239	93	20	10,483	33,479
At 31 December 2021	2,369	171	25,342	51	3,258	239	63	18	1,546	33,057

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Capitalised borrowing costs relating to construction of the new plant amounted to Baht 139 million (2020: Baht 360 million), with a capitalisation rate of 3.14% - 3.83% p.a. (2020: 3.51% - 4.52% p.a.) (see note 27).

15 Right-of-use assets

	Consolidated financial statements					
	Land and buildings	Rental	Tank farm	Machinery, equipment refinery plants and terminal (in million Baht)	Vehicle and oil tanker	Total
Cost						
At 1 January 2020	9,860	10	1,125	23	736	11,754
Acquisitions through business combination	27	-	-	-	-	27
Additions	1,175	1	892	-	667	2,735
Transfers	-	-	-	-	(12)	(12)
Disposal	(50)	-	-	-	(1)	(51)
Effect of movement in exchange rate	13	-	-	-	-	13
At 31 December 2020 and 1 January 2021	11,025	11	2,017	23	1,390	14,466
Acquisitions through business combination (Note 5)	-	626	-	-	-	626
Additions	1,083	301	168	-	2,191	3,743
Transfers	2	-	-	-	-	2
Disposal	(8)	-	-	-	-	(8)
Effect of movement in exchange rate	1	6	-	-	-	7
At 31 December 2021	12,103	944	2,185	23	3,581	18,836

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	Consolidated financial statements					
	Land and buildings	Rental	Tank farm	Machinery, equipment refinery plants and terminal	Vehicle and oil tanker	Total
<i>Depreciation and impairment losses</i>						
At 1 January 2020	(1,526)	-	-	(1)	-	(1,527)
Depreciation for the year	(756)	(2)	(643)	(4)	(475)	(1,880)
Disposal	27	-	-	-	1	28
At 31 December 2020 and 1 January 2021	(2,255)	(2)	(643)	(5)	(474)	(3,379)
Depreciation for the year	(779)	(49)	(608)	(5)	(392)	(1,833)
Transfers	-	-	(2)	-	(1)	(3)
Disposal	7	-	-	-	-	7
Effect of movement in exchange rate	-	(3)	-	-	-	(3)
At 31 December 2021	(3,027)	(54)	(1,253)	(10)	(867)	(5,211)
<i>Net book value</i>						
At 31 December 2020	<u>8,770</u>	<u>9</u>	<u>1,374</u>	<u>18</u>	<u>916</u>	<u>11,087</u>
At 31 December 2021	<u>9,076</u>	<u>890</u>	<u>932</u>	<u>13</u>	<u>2,714</u>	<u>13,625</u>

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Separate financial statements

	Land and buildings	Rental	Tank farm (in million Baht)	Vehicle and oil tanker	Total
Cost					
At 1 January 2020	8,690	10	1,125	708	10,533
Additions	1,161	1	892	662	2,716
Disposal	(44)	-	-	-	(44)
At 31 December 2020 and 1 January 2021	9,807	11	2,017	1,370	13,205
Additions	990	-	168	567	1,725
Transfers	1	-	-	-	1
Disposal	(8)	-	-	-	(8)
At 31 December 2021	10,790	11	2,185	1,937	14,923
Depreciation and impairment losses					
At 1 January 2020	(1,027)	-	-	-	(1,027)
Depreciation for the year	(703)	(2)	(643)	(467)	(1,815)
Disposal	24	-	-	-	24
At 31 December 2020 and 1 January 2021	(1,706)	(2)	(643)	(467)	(2,818)
Depreciation for the year	(725)	(1)	(609)	(382)	(1,717)
Transfers	1	-	(2)	(1)	(2)
Disposal	8	-	-	-	8
At 31 December 2021	(2,422)	(3)	(1,254)	(850)	(4,529)
Net book value					
At 31 December 2020	8,101	9	1,374	903	10,387
At 31 December 2021	8,368	8	931	1,087	10,394

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16 Leases

<i>Year ended 31 December</i>	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
<i>Amounts recognised in profit or loss</i>				
Interest on lease liabilities	227	201	186	176
Expenses relating to short-term leases	28	44	2	14
Expenses relating to leases of low-value assets	11	21	7	17
Variable lease payments	430	425	408	408

In 2021, total cash outflow for leases of the Group and the Company were Baht 1,665 million and Baht 1,542 million, respectively (2020: Baht 1,963 million and Baht 1,902 million, respectively).

17 Goodwill

	Consolidated financial statements <i>(in million Baht)</i>
<i>Cost</i>	
At 1 January 2020	1,921
Acquisitions through business combination	253
Effect of contingent consideration adjustment	(31)
Effect of movement in exchange rate	(14)
At 31 December 2020 and 1 January 2021	2,129
Acquisitions through business combination (Note 5)	2,365
Loss from impairment	(571)
Effect of movement in exchange rate	99
At 31 December 2021	4,022

Impairment testing for the cash generating unit containing goodwill

BCPG Public Company Limited

Goodwill amounted to Baht 586 million from business combinations of BCPG Public Company Limited Group, the Group calculated the recoverable amount by using the value in use models which was determined by discounting future cash flows. The key assumptions used in the estimation of the future cash flows were based on the concession agreements, power purchase agreements, estimated selling production unit of electricity, with reference to historical data and external source such as inflation and exchange rate.

The discount rate was weighted average after-tax cost of capital by using Capital Asset Pricing Model (CAPM). Risk free rate was derived from long-term U.S. treasury bond yield. The adjustment for market risk premium to reflect risk of equity investment and country risk premium is also taking into consideration.

The estimated recoverable amount of the CGU exceeded its carrying amount, therefore no impairment loss is recognised at 31 December 2021.

The management have also conducted sensitivity test by increasing discount rate or inflation 0.7% and found no impairment for goodwill.

Bangchak Corporation Public Company Limited and its Subsidiaries

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For the year ended 31 December 2021

BBGI Public Company Limited

For goodwill amounted to Baht 1,602 million from business combinations of BBGI Public Company Limited Group, the Group calculated the recoverable amount by using the value in use models which was determined by discounting future cash flows for the next 5 years. The key assumptions used in the estimation of the recoverable amount included the discount rate which was a post-tax measure based on the rate of 10-year government bonds issued by the government in the relevant market and in the same currency as the cash flows, adjusted for a risk premium to reflect both the increased risk of investing in equities generally.

The discount rates of the relevant industries in which the Company operates are ranged from 4% - 6%. The subsidiary's discount rate which applied in the calculation of recoverable amounts was fall within the industries' range.

The impairment test has been prepared by the management and no impairment charges are required for goodwill.

If the assumption used in the calculation on impairment tests for goodwill change, the selling price decrease by 1 Baht per Litre or cost of raw material increase by 1 Baht per litre, there is still no impairment of goodwill.

OKEA ASA

At 1 July 2021, the Group has goodwill amounted to NOK 636 million (equivalent to Baht 2,365 million from the acquisition of control of OKEA ASA. The Group calculated the recoverable amount based on the estimated future cash flows. The key assumptions used in the cash flow projections include the oil and gas prices, oil reserve, production profile and discount rates. The discount rate was weighted average after-tax cost of capital by using Capital Asset Pricing Model (CAPM). Risk free rate was derived from long-term U.S. treasury bond yield. The adjustment for market risk premium to reflect risk of equity investment and country risk premium is also taking into consideration.

The carrying amount of cash generating unit was lower than its recoverable amount. The Group, therefore, recognised impairment loss of goodwill amounting to NOK 149 million (equivalent to Baht 571 million) and recognised impairment loss of oil exploration and production assets amounting to NOK 217 million (equivalent to Baht 840 million) for the year 2021.

Bangchak Corporation Public Company Limited and its Subsidiaries

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18 Intangible assets

	Consolidated financial statements					Total
	Right to use and cost of development of computer software	Right to connect electric transmission line	Power purchase agreement (in million Baht)	Power purchase agreement and assets under concession agreement	Exploration and evaluation expenditure	
Cost						
At 1 January 2020	1,402	86	1,350	5,096	3,250	11,184
Acquisitions through business combination	-	1,109	-	3,386	-	4,495
Additions	200	-	-	-	-	200
Transfer	3	-	-	-	(49)	(46)
Disposals	(110)	-	-	-	-	(110)
Effect of movements in exchange rates	15	2	71	(192)	(11)	(115)
At 31 December 2020 and 1 January 2021	1,510	1,197	1,421	8,290	3,190	15,608
Acquisitions through business combination (Note 5)	-	-	-	-	82	82
Additions	74	-	-	-	22	96
Transfer	(157)	161	-	-	-	4
Disposals	(3)	-	-	-	(3,469)	(3,472)
Effect of movements in exchange rates	2	(2)	-	935	215	1,150
At 31 December 2021	1,426	1,356	1,421	9,225	40	13,468

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	Consolidated financial statements					
	Right to use and cost of development of computer software	Right to connect electric transmission line	Power purchase agreement <i>(in million Baht)</i>	Power purchase agreement and assets under concession agreement	Exploration and evaluation expenditure	Total
<i>Amortisation and impairment losses</i>						
At 1 January 2020	(606)	(12)	(83)	(54)	(1,935)	(2,690)
Amortisation for the year	(193)	(20)	(23)	(333)	-	(569)
Disposals	76	-	-	-	-	76
Impairment losses	-	-	-	-	(1,315)	(1,315)
Effect of movements in exchange rates	-	-	(4)	14	60	70
At 31 December 2020 and 1 January 2021	(723)	(32)	(110)	(373)	(3,190)	(4,428)
Amortisation for the year	(148)	(6)	(64)	(363)	-	(581)
Disposals	-	-	-	-	3,404	3,404
Effect of movements in exchange rates	-	-	-	(58)	(214)	(272)
At 31 December 2021	(871)	(38)	(174)	(794)	-	(1,877)
<i>Net book value</i>						
At 31 December 2020	787	1,165	1,311	7,917	-	11,180
At 31 December 2021	555	1,318	1,247	8,431	40	11,591

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	Separate financial statements	
	Right to use and cost of development of computer software	
	2021	2020
	<i>(in million Baht)</i>	
Cost		
At 1 January	1,013	903
Additions	59	110
At 31 December	1,072	1,013
Amortisation and impairment losses		
At 1 January	(657)	(504)
Amortisation for the year	(128)	(153)
At 31 December	(785)	(657)
Net book value		
At 31 December	287	356

19 Loans and debentures

	Consolidated		Separate	
	financial statements		financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Current				
Short-term loan from financial institutions				
secured	76	2,027	-	-
unsecured	1,181	1,948	-	-
	1,257	3,975	-	-
Current portion of long-term loans from financial institutions				
secured	2,447	1,957	-	-
unsecured	2,372	717	700	425
	4,819	2,674	700	425
Current portion of other long-term loans secured	145	-	-	-
	145	-	-	-
Debenture unsecured	4,500	2,500	4,000	2,500
	4,500	2,500	4,000	2,500
Total current	10,721	9,149	4,700	2,925
Non-current				
Long-term loans from financial institutions				
secured	6,508	21,897	-	-
unsecured	13,661	8,718	4,895	5,334
	20,169	30,615	4,895	5,334
Other long-term loans secured	1,714	-	-	-
	1,714	-	-	-

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	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Debtentures				
secured	8,645	-	-	-
unsecured	39,259	23,480	26,476	23,480
	<u>47,904</u>	<u>23,480</u>	<u>26,476</u>	<u>23,480</u>
Total non-current	<u>69,787</u>	<u>54,095</u>	<u>31,371</u>	<u>28,814</u>
Total	<u>80,508</u>	<u>63,244</u>	<u>36,071</u>	<u>31,739</u>

The loan agreements contain certain conditions such as maintaining certain financial ratios such as maintaining of certain debt to equity ratio, debt service coverage ratio and current ratio and transfer right of any agreements. These loans are secured by mortgage of the land, building, land improvement and infrastructure, machinery and 33.33% shares of issued and paid-up capital of Star Energy Group Holdings Pte. Ltd which is an indirect associate of the group and total shares of issued and paid-up capital of BCPG Indochina Company Limited, an indirect subsidiary of the Group.

The movements of loans and debtentures during the year were as follows:

	Note	Consolidated financial statements		Separate financial statements	
		2021	2020	2021	2020
<i>Year ended 31 December</i>		<i>(in million Baht)</i>			
At 1 January		63,244	48,041	31,739	23,699
Acquisitions through business combination	5	8,994	583	-	-
Increase		25,446	21,834	7,000	11,610
Decrease		(19,073)	(6,912)	(2,925)	(3,375)
Transaction cost capitalised-net of amortisation		72	(41)	(15)	(1)
Effect of change in exchange rates		1,824	(261)	271	(194)
Total		<u>80,507</u>	<u>63,244</u>	<u>36,071</u>	<u>31,739</u>
Less Current portion of long-term loans		(4,964)	(2,674)	(700)	(425)
Current portion of debtentures		(4,500)	(2,500)	(4,000)	(2,500)
Short term loans		(1,256)	(3,975)	-	-
At 31 December		<u>69,787</u>	<u>54,095</u>	<u>31,371</u>	<u>28,814</u>

The Group had unutilised credit facilities as follow:

As at 31 December	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
Baht	11,399 million	15,078 million	5,030 million	7,530 million
USD	-	35 million	-	-
JPY	8,703 million	15,888 million	-	-

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Debentures

Detail of debentures as at 31 December 2021 and 2020 were as follows:

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Debentures	52,589	26,000	30,500	26,000
Less Unamortised deferred expenses on debentures	(185)	(20)	(24)	(20)
	52,404	25,980	30,476	25,980
Less Current portion due within one year	(4,500)	(2,500)	(4,000)	(2,500)
Total	47,904	23,480	26,476	23,480

The Company and subsidiaries issued debentures which are named-registered, unsubordinated, unsecured and no bond holder (except debenture no.6 to 17 have bond holder) and no early redemption with representative with a face value of Baht 1,000 each with interest is payable semi-annually. The details are as follows:

No.	Consolidated Financial statements		Separate financial statements		Interest rate (% p.a.)	Term (years)	Maturity Date
	2021	2020	2021	2020			
	<i>(in million Baht)</i>						
<i>Bangchak Corporation Public Company Limited</i>							
1	1,000	1,000	1,000	1,000	5.35	10	30 April 2022
2	-	2,500	-	2,500	4.81	7	11 April 2021
3	3,500	3,500	3,500	3,500	5.18	10	11 April 2024
4	2,000	2,000	2,000	2,000	4.72	12	3 March 2027
5	1,000	1,000	1,000	1,000	5.05	15	3 March 2030
6	400	400	400	400	2.96	5	10 August 2023
7	600	600	600	600	3.42	7	10 August 2025
8	7,000	7,000	7,000	7,000	4.04	10	20 December 2028
9	3,000	3,000	3,000	3,000	2.60	2	8 May 2022
10	500	500	500	500	3.00	7	8 May 2027
11	4,500	4,500	4,500	4,500	3.40	10	8 May 2030
12	2,000	-	2,000	-	1.45	2	5 November 2023
13	1,000	-	1,000	-	2.29	5	5 November 2026
14	1,400	-	1,400	-	3.11	8	5 November 2029
15	2,600	-	2,600	-	3.43	10	5 November 2031
<i>BBGI Public Company Limited</i>							
16	500	-	-	-	2.53	1.5	11 November 2022
17	800	-	-	-	3.30	3	11 May 2024
<i>BCPG Public Company Limited ⁽¹⁾</i>							
18	2,000	-	-	-	1.64	3	15 September 2024
19	1,000	-	-	-	2.14	5	15 September 2026
20	1,000	-	-	-	2.51	7	15 September 2028
21	4,000	-	-	-	3.31	10	15 September 2031
21	4,000	-	-	-	3.61	12	15 September 2033

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21 Provisions for employee benefits

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Statement of financial position				
Non-current provisions for:				
Post-employment benefits	2,413	2,580	2,176	2,481
Other long-term employee benefits	64	62	57	57
Total	2,477	2,642	2,233	2,538
Current	89	306	89	306
Non-current	2,388	2,336	2,144	2,232
Total	2,477	2,642	2,233	2,538
Year ended 31 December				
Statement of comprehensive income:				
Recognised in profit or loss				
Post-employment benefits	154	216	128	203
Other long-term employee benefits	7	7	5	6
Total	161	223	133	209
Recognised in other comprehensive income:				
Actuarial gain recognised in the year	(162)	(3)	(167)	-
Cumulative actuarial losses recognised	496	658	528	695

Defined benefit plan

The Group and the Company operate a defined benefit plan based on the requirement of Thai Labour Protection Act B.E 2541 (1998) to provide retirement benefits to employees based on pensionable remuneration and length of service. The defined benefit plans expose the Group to actuarial risks, such as longevity risk, currency risk, interest rate risk and market (investment) risk.

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Present value of the defined benefit obligations				
At 1 January	2,642	2,588	2,538	2,490
Acquisition through business combination)Note5(125	-	-	-
Decrease from sale of investment in subsidiary	(15)	-	-	-
Include in profit or loss:				
Current service costs and interest on obligation	161	223	133	209
	161	223	133	209

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<i>Present value of the defined benefit obligations</i>	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
<i>Included in other comprehensive income:</i>				
Actuarial (gain) loss				
- Demographic assumptions	16	2	16	-
- Financial assumptions	198	3	192	-
- Experience adjustment	(376)	(8)	(375)	-
Effect of movements in exchange rate	3	-	-	-
	(159)	(3)	(167)	-
Others				
Benefit paid	(277)	(166)	(271)	(161)
At 31 December	2,477	2,642	2,233	2,538

<i>Principal actuarial assumptions</i>	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(%)</i>			
Discount rate	0.1 - 3.16	0.1 - 3.95	1.36 - 1.81	1.61
Future salary growth	2 - 6	2 - 6	6	6
Employee turnover	0 - 57.3	0 - 52	1.91 - 8.6	1 - 8

Assumptions regarding future mortality have been based on published statistics and mortality tables.

At 31 December 2021, the weighted-average duration of the defined benefit obligation was 5 - 29 years (2020: 10-29 years).

Sensitivity analysis

Reasonably possible changes at the reporting date to one of the relevant actuarial assumptions, holding other assumptions constant, would have affected the defined benefit obligation by the amounts shown below.

<i>Impact to the employee benefits obligation at 31 December</i>	Consolidated financial statements			
	1% increase in assumption		1% decrease in assumption	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Discount rate	(203)	(227)	233	262
Future salary growth	242	318	(215)	(276)
Employee turnover	(111)	(115)	126	130
<i>Impact to the employee benefits obligation at 31 December</i>	Separate financial statements			
	1% increase in assumption		1% decrease in assumption	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Discount rate	(195)	(219)	224	253
Future salary growth	234	308	(207)	(267)
Employee turnover	(102)	(104)	117	120

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22 Treasury shares

On 21 November 2019, the meeting of the Board of Directors approved the share repurchase program for financial management purpose (Treasury Stock), in the maximum amount of share repurchase not exceeding Baht 2,100 million and maximum number of shares not exceed 70 million shares with a par value of Baht 1 per share. The number of shares to be repurchased is 5% of the total issued shares. The Company can purchase the share during the period from 6 December 2019 to 5 June 2020 with the condition that the share purchase must be resold after 6 months from the date that the repurchase is completed but must not exceed 3 years.

As at 31 December 2021, the Company has repurchased treasury shares under such program totaling 19 million shares, at Baht 505 million (2020: 19 million shares at Baht 505 million) and presented as a separated item in equity and as a deduction item in equity in the consolidated financial statements. Accordingly, the Company has appropriated retained earnings at the same amount as treasury share reserve.

23 Surpluses and reserves

Share premium

Section 51 of the Public Companies Act B.E. 2535 (1992) requires companies to set aside share subscription monies received in excess of the par value of the shares issued to a reserve account ("share premium"). Share premium is not available for dividend distribution.

Capital surplus on registered and paid-up share reduction

Capital surplus on share reduction is from capital surplus on registered and paid-up share reduction in the Company's registered share capital from Baht 1,032,761,220 to Baht 843,143,461 and the paid-up share capital from Baht 753,040,940 to Baht 563,423,181. These changes were due to the reduction of 189,617,759 shares.

Other surpluses

Surplus from the change in the ownership interest in subsidiaries

Change in parent's ownership interest in subsidiaries within equity comprises of effect from dilution of percentage of holding of the Company in a subsidiary and difference from changes in parent's ownership interest in subsidiaries that do not result in a loss of control.

Surplus from business combination

Surplus from business combination represents the measurement of net assets acquired and recognised at fair value from business combination.

Legal reserve

Section 116 of the Public Companies Act B.E. 2535 (1992) requires that a company shall allocate not less than 5% of its annual net profit, less any accumulated losses brought forward (if any), to a reserve account ("legal reserve"), until this account reaches an amount not less than 10% of the registered authorised capital. The legal reserve is not available for dividend distribution.

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Treasury shares reserve

The treasury shares reserve is the amount appropriated from the retained earnings equal to the cost of the Company's own shares held by the Company. The treasury shares reserve is not available for dividend distribution.

Other components of equity

Translation reserve

The translation reserves comprises all foreign currency differences arising from the translation of the financial statements of foreign operations, as well as the effective portion of any foreign currency differences arising from hedges of a net investment in a foreign operation (see note 3 (d.4)).

Hedging reserve

The hedging reserve comprises the effective portion of the cumulative net change in the fair value of hedging instruments used in cash flow hedges pending subsequent recognition in profit or loss or directly included in the initial cost or other carrying amount of a non-financial asset or non-financial liability.

Fair value reserve

The fair value reserve comprise the cumulative net change in the fair value of equity securities designated at FVOCI.

24 Subordinated perpetual debentures

On 18 October 2019, the Company completed the issuance of Subordinated Perpetual Debentures of Baht 10,000 million. The debentures are unsecured, unconvertible, with debenture holder representatives and no scheduled repayment of principal. Bullet payment is upon dissolution of the Company or upon the exercise of the debenture issuer's early redemption right per conditions as stipulated in the terms and conditions of the debentures. These debentures bear fixed interest rate of 5% per annum during the first year to the fifth year. The debenture issuer will adjust the interest rate of the debentures every 5 years and interest is payable on a semi-annual basis throughout the term of the debentures. The Company has the sole right to unconditionally defer interest and cumulative interest payments to debentures holders without time and deferral amount limitation. If the Company defers the interest payment, the Company shall not declare and make any dividend payment. From the determination of the terms and conditions of the debentures, Subordinated perpetual debentures are classified as equity. Issuance cost of debentures of Baht 59 million are recognised as a part of equity in the consolidated and separate financial statements as at 31 December 2021. The Company paid coupon payment on perpetual subordinated debentures of Baht 500 million (2020: Baht 501 million) which were recognised as a part of equity in consolidated and separate financial statement.

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25 Operating segments

Management determined that the Group has six reportable segments, as described below, which are the Group's strategic divisions for different products and services, and are managed separately because they require different technology and marketing strategies. The following summary describes the operations in each of the Group's reportable segments.

<i>Segment 1</i>	<i>Refinery and oil trading</i>
<i>Segment 2</i>	<i>Marketing</i>
<i>Segment 3</i>	<i>Electricity</i>
<i>Segment 4</i>	<i>Bio-based product</i>
<i>Segment 5</i>	<i>Natural resource</i>
<i>Segment 6</i>	<i>Others</i>

Each segment's performance is measured based on segment profit (loss) before tax, financial costs, depreciation and amortisation, gain on foreign exchange, gain (loss) on derivatives from forward contracts and impairment losses ("Group's Profit (loss) from operating segment"), as included in the internal management reports that are reviewed by the Group's CODM. Group's Profit (loss) from operating segment is used to measure performance as management believes that such information is the most relevant in evaluating the results of certain segments relative to other entities that operate within these industries. Inter-segment pricing determined on an arm's length basis.

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For the year ended 31 December 2021

<i>For the year ended 31 December 2021</i>	Consolidated financial statements							Total
	Refinery and oil trading	Marketing	Electricity	Bio-based product <i>(in million Baht)</i>	Natural resources	Others	Eliminations	
External revenue	65,161	117,265	4,661	2,234	10,093	3	-	199,417
Inter-segment revenue	108,483	3	8	11,861	-	-	(120,355)	-
Total revenue	173,644	117,268	4,669	14,095	10,093	3	(120,355)	199,417
Profit (loss) from operating segment	9,363	2,614	4,193	1,863	8,251	(466)	-	25,818
Depreciation and amortisation								(8,075)
Loss from derivatives								(1)
Gain on foreign exchange								251
Gain from fair value adjustment of investment								43
Impairment loss								(1,388)
Finance costs								(2,540)
Tax expense								(4,263)
Profit for the year								9,845
Interest income	-	14	52	2	117	-	-	185
Financial costs	(644)	(414)	(892)	(108)	(397)	(85)	-	(2,540)
Depreciation and amortisation	(3,854)	(1,388)	(994)	(415)	(1,373)	(51)	-	(8,075)
Segments assets	68,104	18,365	58,645	12,084	44,512	75	-	201,785
Investments in associates and joint ventures	144	1	13,486	39	-	-	-	13,670
Capital expenditure	(4,437)	(1,117)	(3,341)	(482)	(1,083)	(28)	-	(10,488)

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<i>For the year ended</i> <i>31 December 2020</i>	Consolidated financial statements							Total
	Refinery and oil trading	Marketing	Electricity	Bio-based product <i>(in million Baht)</i>	Natural resources	Others	Eliminations	
External revenue	34,191	95,325	4,223	2,710	-	1	-	136,450
Inter-segment revenue	86,791	5	8	9,860	-	-	(96,664)	-
Total revenue	120,982	95,330	4,231	12,570	-	1	(96,664)	136,450
Profit (loss) from operating segment	(2,169)	2,174	3,640	1,828	(1,004)	(365)	-	4,104
Depreciation and amortisation								(6,821)
Gain from derivatives								20
Gain on foreign exchange								732
Impairment loss								(3,266)
Finance costs								(1,969)
Tax income								1,589
Others								(159)
Loss for the year								(5,770)
Interest income	22	23	25	2	85	-	-	157
Financial costs	(380)	(394)	(816)	(123)	(220)	(36)	-	(1,969)
Depreciation and amortisation	(3,863)	(1,413)	(1,072)	(420)	(3)	(50)	-	(6,821)
Segments assets	59,764	18,807	51,118	11,984	6,649	-	-	148,322
Investments in associates and joint ventures	139	1	11,723	858	1,610	-	-	14,331
Capital expenditure	(3,664)	(270)	(1,140)	(928)	-	-	-	(6,002)

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Disaggregation of revenue

Timing of revenue recognition of major revenues of the Group and the Company are point in time, except power plant segment, which timing of revenue recognition is over time.

Geographical segments

In presenting information on the basis of geographical segments, segment sales are based on the entity's country of domicile. Segment non-current assets (exclude derivatives and deferred tax) are based on the geographical location of the assets.

<i>Geographical information</i>	Consolidated financial statements			
	Revenue		Non-current assets	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Thailand	151,694	111,610	67,415	64,859
Singapore	17,944	20,066	1,553	3,024
Norway	10,068	-	12,689	1,610
Korea	7,127	2,177	-	-
Brunei	2,900	-	-	-
Malaysia	2,115	177	-	-
Russia	2,057	-	-	-
Japan	1,934	382	9,478	6,675
Laos	1,776	1,652	9,469	8,465
China	1,154	-	-	-
Philippines	4	2	1,190	1,143
Indonesia	-	-	12,312	10,595
Others	644	384	4,775	1,674
Total	199,417	136,450	118,881	98,045

Major customer

Revenues from one customer of the Group's 1 and 2 segments represents approximately Baht 16,637 million (2020: Baht 10,846 million) of the Group's total revenues.

Promotional privileges

The Group has been granted promotional certificates by the Office of the Board of Investment by virtue of the provisions of the Industrial Investment Promotion Act of B.E. 2520 for Petroleum Refinery process, production of Biodiesel and production of electricity from solar cell. The privileges granted include:

Production of Biodiesel, Ethanol and Biogas

- (a) Exemption from payment of import duty on machinery approved by the Board;
- (b) Exemption from payment of income tax for certain operations for a period of six and eight years from the date on which the income is first derived from such operations.

Production of electricity from solar cell

- (a) Exemption from payment of import duty on machinery approved by the Board;
- (b) Exemption from payment of income tax for certain operations for a period of eight years from the date on which the income is first derived from such operations.

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- (c) A 50% reduction in the normal income tax rate on the net profit derived from certain operations for a period of five years, commencing from the expiry date in (b) above.

As promoted companies, the Group must comply with certain terms and conditions prescribed in the promotional certificates.

Summary of revenue from promoted and non-promoted businesses:

	Consolidated financial statements					
	2021			2020		
	Promoted businesses	Non-promoted businesses	Total	Promoted businesses	Non-promoted businesses	Total
	<i>(in million Baht)</i>					
Export sales	91	78,657	78,748	54	47,440	47,494
Local sales	10,955	194,509	205,464	9,155	145,497	154,652
Eliminations	-	-	(84,795)	-	-	(65,696)
Total	11,046	273,166	199,417	9,209	192,937	136,450

The Company has no revenue from promoted business.

26 Expenses by nature

The financial statements include an analysis of expenses by function. Expenses by nature disclosed in accordance with the requirements of various TFRS were as follows:

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Changes in inventories of finished goods and work in progress	(65)	844	(155)	777
Raw materials and consumables used	104,718	75,074	92,973	65,723
Tax expenses and oil fuel fund	24,386	27,529	24,386	27,529
Depreciation and amortisation	8,075	6,821	5,221	5,217
Employee benefit expenses	4,579	3,402	2,117	2,025
Advertisement expenses	553	519	399	400
Transportation expenses	1,580	1,538	1,375	1,319
Rental expenses	29	83	15	51
Professional and advisory fees	723	596	232	437

Defined contribution plans

The defined contribution plans comprise provident funds established by the Group for its employees. Membership to the funds is on a voluntary basis. Contributions are made monthly by the employees at rates ranging from 3% to 15% of their basic salaries and by the Group at rates ranging from 3% to 10% of the employees' basic salaries. The provident funds are registered with the Ministry of Finance as juristic entities and are managed by licensed Fund Manager.

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27 Finance costs

	Note	Consolidated financial statements		Separate financial statements	
		2021	2020	2021	2020
<i>(in million Baht)</i>					
Interest expense					
Financial institutions		993	1,034	153	184
Debentures		1,402	1,017	1,003	1,017
Lease liabilities		194	201	186	176
Total interest expense		2,589	2,252	1,342	1,377
Amortisation of transaction costs capitalised		121	51	17	12
Others finance costs		169	40	1	1
		2,879	2,343	1,360	1,390
<i>Less</i> Amount included in the cost of property, plant and equipment under construction	14	(339)	(374)	(139)	(360)
Net		2,540	1,969	1,221	1,030

28 Income tax

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
<i>(in million Baht)</i>				
Income tax recognised in profit or loss				
Current tax expense				
Current year	2,831	231	-	-
Over provided in prior years	(17)	(42)	(10)	(27)
	2,814	189	(10)	(27)
Deferred tax expense				
Movements in temporary differences	1,449	(1,778)	831	(1,736)
	1,449	(1,778)	831	(1,736)
Total tax expense (income)	4,263	(1,589)	821	(1,763)

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
<i>(in million Baht)</i>				
Profit (loss) before income tax expense	14,108	(7,359)	7,135	(11,603)
Corporate income tax rate (%)	20.00	20.00	20.00	20.00
Profit (loss) before income tax using the Thai corporation tax rate	2,821	(1,472)	1,427	(2,321)
Effect of difference tax rates in foreign jurisdictions	2,735	(47)	-	-
Income not subject to tax / Expenses that are deductible at a greater amount	(1,047)	(647)	(320)	(233)
Expenses not deductible / Other adjustments	177	435	(276)	818
Current year losses for which no deferred tax assets was recognised	78	184	-	-
Over provided in prior years	(17)	(42)	(10)	(27)
Others	(484)	-	-	-
Total	4,263	(1,589)	821	(1,763)
Tax rate (%)	30.22	(21.59)	11.50	(15.19)

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<i>Deferred tax</i> <i>At 31 December</i>	Consolidated financial statements			
	Assets		Liabilities	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Total	7,369	3,074	(7,861)	(888)
Set off of tax	(5,243)	(93)	5,243	93
Net deferred tax assets (liabilities)	2,126	2,981	(2,618)	(795)

<i>Deferred tax</i> <i>At 31 December</i>	Separate financial statements			
	Assets		Liabilities	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Total	2,133	2,952	(67)	(22)
Set off of tax	(67)	(22)	67	22
Net deferred tax assets	2,066	2,930	-	-

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Movements in total deferred tax assets and liabilities during the year were as follows:

	At 1 January 2021	Consolidated financial statement Charged / Credited to:			Acquisition through business combinations (note 5)	Exchange differences	At 31 December 2021
		Profit or loss	Other comprehensive income (in million Baht)				
<i>Deferred tax assets</i>							
Loss from impairment of assets	1,074	(950)	-	-	-	124	
Property, plant and equipment	158	(39)	-	-	-	119	
Provisions for employee benefits	525	(25)	(34)	-	-	466	
Provision for the decommissioning cost	-	217	-	4,823	55	5,095	
Loss carry forward	1,231	130	-	3	-	1,364	
Others	86	115	-	-	-	201	
Total	3,074	(552)	(34)	4,826	55	7,369	
<i>Deferred tax liabilities</i>							
Property, plant and equipment	(83)	(1,212)	-	(4,986)	(53)	(6,334)	
Intangible assets	(776)	516	-	(551)	(37)	(848)	
Inventories	-	(103)	-	(442)	(3)	(548)	
Others	(29)	(98)	16	(20)	-	(131)	
Total	(888)	(897)	16	(5,999)	(93)	(7,861)	
Net	2,186	(1,449)	(18)	(1,173)	(38)	(492)	

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	At 1 January 2020	Consolidated financial statement Charged / Credited to:			Exchange differences	At 31 December 2020
		Profit or loss	Other comprehensive income <i>(in million Baht)</i>	Acquisition through business combinations		
<i>Deferred tax assets</i>						
Loss from impairment of assets	607	467	-	-	-	1,074
Property, plant and equipment	77	21	-	59	1	158
Provisions for employee benefits	505	24	(4)	-	-	525
Loss carry forward	42	1,188	-	-	1	1,231
Others	80	5	-	-	1	86
Total	1,311	1,705	(4)	59	3	3,074
<i>Deferred tax liabilities</i>						
Property, plant and equipment	(153)	76	-	(8)	2	(83)
Intangible assets	(502)	6	-	(260)	(20)	(776)
Leasehold rights	(1)	-	-	-	-	(1)
Others	(19)	(9)	-	-	-	(28)
Total	(675)	73	-	(268)	(18)	(888)
Net	636	1,778	(4)	(209)	(15)	2,186

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	Separate financial statements			Separate financial statements				
	At 1 January 2021	Charged / Credited to:		At 31 December 2021	At 1 January 2020	Charged / Credited to:		At 31 December 2020
		Profit or loss	Other comprehensive income			Profit or loss	Other comprehensive income	
		<i>(in million Baht)</i>				<i>(in million Baht)</i>		
<i>Deferred tax assets</i>								
Loss from impairment of assets	1,074	(958)	-	116	607	467	-	1,074
Property, plant and equipment	90	(28)	-	62	70	20	-	90
Provisions for employee benefits	508	(28)	(33)	447	499	9	-	508
Loss carry forward	1,197	124	-	1,321	-	1,197	-	1,197
Others	83	104	-	187	70	13	-	83
Total	2,952	(786)	(33)	2,133	1,246	1,706	-	2,952
<i>Deferred tax liabilities</i>								
Property, plant and equipment	(21)	(45)	-	(66)	(51)	30	-	(21)
Others	(1)	-	-	(1)	(1)	-	-	(1)
Total	(22)	(45)	-	(67)	(52)	30	-	(22)
Net	2,930	(831)	(33)	2,066	1,194	1,736	-	2,930

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29 Earnings per share

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Profit (loss) for the period attributable to ordinary shareholders of the Company	7,624	(6,967)	6,314	(9,840)
Less Cumulative coupon payment for the year on perpetual subordinated debentures	(500)	(501)	(500)	(501)
Profit (loss) for calculating earnings (loss) per share	7,124	(7,468)	5,814	(10,341)
Number of ordinary shares outstanding	1,377	1,377	1,377	1,377
Effect of treasury shares	(19)	(19)	(19)	(19)
Weighted average number of ordinary shares outstanding	1,358	1,358	1,358	1,358
Earnings (loss) per share (basic) <i>(in Baht)</i>	5.25	(5.50)	4.28	(7.62)

30 Dividends

	Approval Date	Payment schedule	Dividend rate per share <i>(Baht)</i>	Amount <i>(in million Baht)</i>
2021				
Annual dividend 2020	8 April 2021	22 April 2021	0.40	543
An interim dividend 2021	26 August 2021	21 September 2021	1.00	1,357
Dividend payment during the year 2021			1.40	1,900
2020				
Annual dividend 2019	30 March 2020	24 April 2020	0.80	1,096
An interim dividend 2019	15 August 2019	10 September 2019	(0.50)	(689)
Dividend payment during the year 2020			0.30	407

31 Financial instruments

(a) Carrying amounts and fair values

The following table shows the carrying amounts and fair values of financial assets and financial liabilities, including their levels in the fair value hierarchy. It does not include fair value information for financial assets and financial liabilities measured at amortised cost if the carrying amount is a reasonable approximation of fair value.

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	Consolidated financial statements						Fair value		
	Fair value - applied hedge accounting	Fair value through profit or loss	Carrying amount Fair value through other comprehensive income	Amortised cost - net	Total	Level 1	Level 2	Level 3	Total
<i>At 31 December</i>									
2021									
Financial assets									
Investment in equity instruments	-	41	1,713	-	1,754	1,754	-	-	1,754
Investment in convertible bond	-	914	-	-	914	-	914	-	914
Investment in other non-marketable equity instruments	-	-	1,865	-	1,865	-	-	1,865	1,865
Loans to (fixed interest rate)	-	-	-	428	428	-	440	-	440
Derivatives assets	84	202	-	-	286	-	286	-	286
Financial liabilities									
Loans from financial institutions (fixed interest rate)	-	-	-	4,008	4,008	-	2,244	1,859	4,103
Debentures	-	-	-	52,404	52,404	9,081	43,253	-	52,334
Derivatives liabilities	32	507	-	-	539	-	539	-	539
2020									
Financial assets									
Investment in equity instruments	-	-	192	-	192	192	-	-	192
Investment in other non-marketable equity instruments	-	90	1,411	-	1,501	-	-	1,501	1,501
Loans to (fixed interest rate)	-	-	-	1,266	1,266	-	1,437	-	1,437
Derivatives assets	-	56	-	-	56	-	56	-	56
Financial liabilities									
Loans from financial institutions (fixed interest rate)	-	-	-	2,571	2,571	-	2,720	-	2,720
Debentures	-	-	-	25,980	25,980	-	26,925	-	26,925
Derivatives liabilities	114	158	-	-	272	-	272	-	272

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	Separate financial statements						Fair value		
	Fair value - applied hedge accounting	Fair value through profit or loss	Carrying amount Fair value through other comprehensive income	Amortised cost - net (in million Baht)	Total	Level 1	Level 2	Level 3	Total
At 31 December									
2021									
Financial assets									
Investment in equity instruments	-	41	342	-	383	383	-	-	383
Investment in other non-marketable equity instruments	-	-	525	-	525	-	-	525	525
Loans to (fixed interest rate)	-	-	-	2,957	2,957	-	-	2,997	2,997
Derivatives assets	-	7	-	-	7	-	7	-	7
Financial liabilities									
Loans from financial institutions (fixed interest rate)	-	-	-	1,201	1,201	-	1,245	-	1,245
Debentures	-	-	-	30,476	30,476	-	30,845	-	30,845
Derivatives liabilities	-	507	-	-	507	-	507	-	507
2020									
Financial assets									
Investment in other non-marketable equity instruments	-	-	234	-	234	-	-	234	234
Loans to (fixed interest rate)	-	-	-	4,939	4,939	-	4,132	-	4,132
Derivatives assets	-	56	-	-	56	-	56	-	56
Financial liabilities									
Loans from financial institutions (fixed interest rate)	-	-	-	1,501	1,501	-	1,582	-	1,582
Debentures	-	-	-	25,980	25,980	-	26,925	-	26,925
Derivatives liabilities	-	158	-	-	158	-	158	-	158

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In July 2021, BCPG Public Company Limited, which is a subsidiary of the Group, has invested in convertible bond of VRB Energy Inc. (“VRB”) amounting to USD 24 million (approximately Baht 775 million). The objective is to expand the investment in energy storage system business and for further use as an application to support the Group’s current renewable energy businesses. In accordance with the terms and conditions set out in the agreement, such convertible bond can be converted into ordinary share of VRB.

Level 2 fair values for simple over-the-counter derivative financial instruments are based on broker quotes. Those quotes are tested for reasonableness by discounting expected future cash flows using market interest rate for a similar instrument at the measurement date. Fair values reflect the credit risk of the instrument and include adjustments to take account of the credit risk of the Group and counterparty when appropriate.

Level 3 fair values for debt instruments and equity instruments measured at fair value through profit and loss and equity instruments measured at fair value through other comprehensive income are as follows;

- For investments in non-marketable securities, the fair values are based on cost which considered as estimated fair values, except there are significant changes in their operations.

(b) Marketable financial instruments

Marketable equity securities	Consolidated financial statements						Effect of change in exchange rates	At 31 December
	At 1 January	Purchase	Disposal	Transfer	Fair value adjustment			
	(in million Baht)							
2021								
Non-current financial assets								
Equity securities measured at								
- FVTPL	-	52	-	-	(11)	-	41	
- FVOCI	192	431	(381)	1,491	(41)	21	1,713	
2020								
Non-current financial assets								
Equity securities measured at								
- FVOCI	1,349	-	(1,131)	-	(69)	43	192	

During the year ended 31 December 2021, a subsidiary had sold all of its investment in Lithium America Corp. amounted to Baht 381 million and recognised gain on sale of equity instruments designated at fair value through other comprehensive income amounted to Baht 45 million in equity.

During the year ended 31 December 2021, the Company purchase an investment in Bangkok Fuel Pipeline and Logistics Co., Ltd. Of 15 million shares amounted to Baht 483 million, of which 1.6 million shares are measured at FVTPL and 13.4 million shares are measured at FVOCI, in order to comply with the company’s investment policy.

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<i>Marketable equity securities</i>	At 1 January	Separate financial statements		At 31 December
		Purchase	Fair value adjustment <i>(in million Baht)</i>	
2021				
<i>Non-current financial assets</i>				
Equity securities measured at				
- FVTPL	-	52	(11)	41
- FVOCI	-	431	(90)	341

(c) *Financial risk management policies*

Risk management framework

The Group's board of directors has overall responsibility for the establishment and oversight of the Group's risk management framework. The board of directors has established the risk management committee, which is responsible for developing and monitoring the Group's risk management policies. The committee reports regularly to the board of directors on its activities.

The Group's risk management policies are established to identify and analyses the risks faced by the Group, to set appropriate risk limits and controls and to monitor risks and adherence to limits. Risk management policies and systems are reviewed regularly to reflect changes in market conditions and the Group's activities.

The Board of Directors' policy is to maintain a strong capital base so as to maintain investor, creditor and market confidence and to sustain future development of the business. The Board monitors the return on capital, which the Group defines as result from operating activities divided by total shareholders' equity, excluding non-controlling interests and also monitors the level of dividends to ordinary shareholders.

(c.1) Credit risk

Credit risk is the risk of financial loss to the Group if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the Group's receivables from customers and loans to related parties of the Group.

(c.1.1) Trade accounts receivables

The Group's exposure to credit risk is influenced mainly by the individual characteristics of each customer. However, management also considers the factors that may influence the credit risk of its customer base, including the default risk associated with the industry and country in which customers operate.

The Group limits its exposure to credit risk from trade accounts receivables by performing an impairment analysis at each reporting date. The provision rates of expected credit loss are based on actual credit loss experience over the past 1 year. These rates have included the consideration of current economic conditions and the Group's view of economic conditions over the expected lives of the receivables. The normal credit term granted by the Group ranges from 1 day to 120 days.

Information relevant to trade accounts receivables and contract assets are disclosed in note 8

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(c.1.2) Loans to related parties and accrued interest.

The following table presents the exposure to credit risk and expected credit loss for loans to related parties and accrued interest.

<i>Movement of allowance for expected credit loss of loans to related parties and accrued interest</i>	Consolidated financial statements			
	12-months ECL (Stage 1)	Lifetime ECL- not credit-impaired (Stage 2)	Lifetime ECL - credit-impaired (Stage 3)	Total
	<i>(in million Baht)</i>			
2021				
At 1 January	-	7	-	7
New financial assets acquired	-	3	-	3
Effect of change in exchange rates	-	1	-	1
At 31 December	-	11	-	11
2020				
At 1 January	-	10	-	10
Net remeasurement of loss allowance	-	(10)	-	(10)
New financial assets acquired	-	8	-	8
Effect of change in exchange rates	-	(1)	-	(1)
At 31 December	-	7	-	7
<i>Movement of allowance for expected credit loss of loans to related parties and accrued interest</i>	Separate financial statements			
	12-months ECL (Stage 1)	Lifetime ECL- not credit-impaired (Stage 2)	Lifetime ECL- credit-impaired (Stage 3)	Total
	<i>(in million Baht)</i>			
2021				
At 1 January	94	2,156	1,411	3,661
Net remeasurement of loss allowance	-	(651)	(1,411)	(2,062)
Financial assets repaid	(94)	(709)	-	(803)
Effect of change in exchange rates	-	167	-	167
At 31 December	-	963	-	963
2020				
At 1 January	107	478	-	585
Net remeasurement of loss allowance	68	1,967	1,161	3,196
Transfer from Stage 1 to Stage 2	(44)	44	-	-
Transfer from Stage 2 to Stage 3	-	(478)	478	-
Financial assets repaid	(37)	-	(98)	(135)
Effect of change in exchange rates	-	145	(130)	15
At 31 December	94	2,156	1,411	3,661

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(c.1.3) Cash and cash equivalent and derivatives

The Group's exposure to credit risk arising from cash and cash equivalents and derivative assets is limited because the counterparties are banks and financial institutions for which the Group considers to have low credit risk.

(c.2) Liquidity risk

The Group monitors its liquidity risk and maintains a level of cash and cash equivalents deemed adequate by management to finance the Group's operations and to mitigate the effects of fluctuations in cash flows.

The following table are the remaining contractual maturities of financial liabilities at the reporting date. The amounts are gross and undiscounted and include contractual interest payments and exclude the impact of netting agreements.

<i>At 31 December</i>	Consolidated financial statements				Total
	Carrying amount	1 year or less	More than 1 years but less than 5 years <i>(in million Baht)</i>	More than 5 years	
2021					
<i>Non-derivative financial liabilities</i>					
Trade payables	9,779	9,779	-	-	9,779
Contingent consideration	150	150	-	-	150
Loans from financial institutions	26,245	6,093	17,420	14,838	38,351
Lease liabilities	8,738	1,251	4,013	4,316	9,580
Debentures	52,404	4,500	20,089	28,000	52,589
	97,316	21,773	41,522	47,154	110,449
<i>Derivative financial liabilities</i>					
Interest rate swaps					
- Cash outflow	(32)	(22)	(67)	(36)	(125)
- Cash inflow	-	15	44	23	82
Forward exchange contracts					
- Cash outflow	(13)	(23)	-	-	(23)
- Cash inflow	-	-	-	-	-
Crude and product oil price hedging contract					
- Cash outflow	(494)	(494)	-	-	(494)
- Cash inflow	-	-	-	-	-
	(539)	(524)	(23)	(13)	(560)

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<i>At 31 December</i>	Carrying amount	Contractual cash flows			Total
		1 year or less	More than 1 years but less than 5 years	More than 5 years	
Consolidated financial statements					
Contractual cash flows					
More than 1 years but less than 5 years					
More than 5 years					
(in million Baht)					
2020					
Non-derivative financial liabilities					
Trade payables	9,108	9,108	-	-	9,108
Contingent consideration	150	-	150	-	150
Loans from financial institutions	37,264	6,510	24,178	7,321	38,009
Lease liabilities	7,898	1,510	3,800	3,944	9,254
Debentures	25,980	2,500	8,500	15,000	26,000
	80,400	19,628	36,628	26,265	82,521
Derivative financial liabilities					
Interest rate swaps					
- Cash outflow	(103)	(68)	(172)	(88)	(328)
- Cash inflow	-	31	92	57	180
Cross currency swaps					
- Cash outflow	(10)	(50)	(133)	(140)	(323)
- Cash inflow	-	48	128	135	311
Forward exchange contracts					
- Cash outflow	(2)	(50)	-	-	(50)
- Cash inflow	-	41	-	-	41
Crude and product oil price hedging contract					
- Cash outflow	(156)	(149)	(55)	-	(204)
- Cash inflow	-	6	-	-	6
	(271)	(191)	(140)	(36)	(367)
Separate financial statements					
Contractual cash flows					
More than 1 years but less than 5 years					
More than 5 years					
(in million Baht)					
2021					
Non-derivative financial liabilities					
Trade payables	8,591	8,591	-	-	8,591
Loans from financial institutions	5,595	700	4,913	-	5,613
Lease liabilities	6,964	1,008	2,840	3,235	7,083
Debentures	30,476	4,000	7,500	19,000	30,500
	51,626	14,299	15,253	22,235	51,787

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<i>At 31 December</i>	Carrying amount	Separate financial statements Contractual cash flows			Total
		1 year or less	More than 1 years but less than 5 years <i>(in million Baht)</i>	More than 5 years	
2021					
<i>Derivative financial liabilities</i>					
Forward exchange contracts					
- Cash outflow	(13)	(23)	-	-	(23)
- Cash inflow	-	-	-	-	-
Crude and product oil price hedging contract					
- Cash outflow	(494)	(494)	-	-	(494)
- Cash inflow	-	-	-	-	-
	(507)	(517)	-	-	(517)
2020					
<i>Non-derivative financial liabilities</i>					
Trade payables	6,800	6,800	-	-	6,800
Loans from financial institutions	5,759	425	5,342	-	5,767
Lease liabilities	7,191	1,452	3,271	3,688	8,411
Debentures	25,980	2,500	8,500	15,000	26,000
	45,730	11,177	17,113	18,688	46,978
<i>Derivative financial liabilities</i>					
Forward exchange contracts					
- Cash outflow	(2)	(8)	-	-	(8)
- Cash inflow	-	-	-	-	-
Crude and product oil price hedging contract					
- Cash outflow	(156)	(149)	(55)	-	(204)
- Cash inflow	-	6	-	-	6
	(158)	(151)	(55)	-	(206)

The cash inflows and cash outflows disclosed in the above table represent the contractual undiscounted cash flows relating to derivative financial liabilities held for risk management purposes and which are not usually closed out before contractual maturity. The disclosure shows net cash flow amounts for derivatives that are net cash-settled and gross cash inflow and outflow amounts for derivatives that have simultaneous gross cash settlement.

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(c.3) Market risk

The Group is exposed to the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices. Market risk is as follows:

(c.3.1) Foreign currency risk

The Group is exposed to the transactions with foreign currency risk to the extent that there is a mismatch between the currencies in which sales, purchases, lending's and borrowings are denominated and the respective functional currencies of the Group. The functional currencies of the Group are primarily Thai Baht. The currencies in which these transactions are primarily denominated are US Dollars and Japanese Yen.

The Group primarily utilises forward exchange contracts with maturities of less than one year to hedge such financial assets and financial liabilities denominated in foreign currencies. The forward exchange contracts entered into at the reporting date also relate to anticipated sales, purchases and loans to denominated in foreign currencies. These contracts are designated as cash flow hedges. The Group's policy specifies the critical terms of the forward exchange contracts to align with the hedged item.

The Group primarily utilises cross currency swap contracts to hedge such financial liabilities denominated in foreign currencies. The cross currency swap contracts entered into at the reporting date also relate to borrowings denominated in foreign currencies. These contracts are designated as cash flow hedges.

The Group determines the existence of an economic relationship between the hedging instrument and hedged item based on the currency, amount and timing of their respective cash flows. The Group assesses whether the derivative designated in each hedging relationship is effective in offsetting changes in cash flows of the hedged item using the hypothetical derivative method.

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<i>Exposure to foreign currency at 31 December</i>	Consolidated financial statements				Separate financial statements			
	United States Dollars	Japanese Yen <i>(in million Baht)</i>	Others	Total	United States Dollars	Krone Norway <i>(in million Baht)</i>	Others	Total
2021								
Cash and cash equivalents	3,814	20	492	4,326	2,183	-	-	2,183
Trade and other receivables	1,124	-	71	1,195	2,445	-	-	2,445
Loan to related parties	104	-	-	104	-	1,072	-	1,072
Interest-bearing liabilities	(16,016)	(4,966)	(2)	(20,984)	(2,688)	-	-	(2,688)
Trade and other payables	(1,741)	(2)	(38)	(1,781)	(4,990)	-	(4)	(4,994)
Net statement of financial position exposure	(12,715)	(4,948)	523	(17,140)	(3,050)	1,072	(4)	(1,982)
Loans from financial institution designated as net investment hedge	2,688	1,017	-	3,705	-	-	-	-
Currency swaps contracts	270	-	-	270	-	-	-	-
Forward exchange purchase contracts	-	-	-	-	-	-	-	-
Forward exchange selling contracts	(447)	-	-	(447)	(447)	-	-	(447)
Net exposure	(10,204)	(3,931)	523	(13,612)	(3,497)	1,072	(4)	(2,429)
2020								
Cash and cash equivalents	2,375	22	132	2,529	973	-	-	973
Trade and other receivables	336	-	-	336	344	-	-	344
Loan to related parties	248	-	-	248	-	1,033	-	1,033
Interest-bearing liabilities	(6,097)	(6,158)	-	(12,255)	(2,416)	-	-	(2,416)
Trade and other payables	(500)	(1)	(4)	(505)	(3,899)	-	(21)	(3,920)
Net statement of financial position exposure	(3,638)	(6,137)	128	(9,647)	(4,998)	1,033	(21)	(3,986)
Loans from financial institution designated as net investment hedge	-	978	-	978	-	-	-	-
Currency swaps contracts	287	-	-	287	-	-	-	-
Forward exchange purchase contracts	2,010	-	-	2,010	1,968	-	-	1,968
Forward exchange selling contracts	(252)	-	-	(252)	(252)	-	-	(252)
Net exposure	(1,593)	(5,159)	128	(6,624)	(3,282)	1,033	(21)	(2,270)

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Sensitivity analysis

A reasonably possible strengthening (weakening) of the Thai Baht against all other currencies at the reporting date would have affected the measurement of financial instruments denominated in a foreign currency. This analysis assumes that all other variables, in particular interest rates, remain constant.

<i>Impact to profit or loss</i>	Movement (%)	Consolidated financial statements		Separate financial statements	
		Strengthening	Weakening <i>(in million Baht)</i>	Strengthening	Weakening
<i>At 31 December 2021</i>					
USD	5	630	(630)	43	(43)
JPY	2	(94)	94	-	-
NOK	5	(54)	54	(54)	54
<i>At 31 December 2020</i>					
USD	5	134	(134)	250	(250)
JPY	2	(13)	13	-	-
NOK	5	(159)	159	(159)	159

(c.3.2) Interest rate risk

Interest rate risk is the risk that future movements in market interest rates will affect the results of the Group's operations and its cash flows because loan interest rates are mainly float. The Group mitigates this risk by using interest rate swaps, to manage exposure to fluctuations in interest rates on specific borrowings.

The Group adopts a hedging policy to ensure that interest rate risk exposure is at an appropriate level. This is achieved partly by entering fixed-rate instruments and partly by borrowing at a floating rate and using interest rate swaps as hedges of the variability in cash flows attributable to movements in interest rates.

The Group determines the existence of a relationship between the hedging instrument and hedged item based on the reference interest rates, tenors, repricing dates and maturities and the notional or par amounts.

The Group assesses whether the derivative designated in each hedging relationship is expected to be effective in offsetting changes in cash flows of the hedged item using the hypothetical derivative method.

In these hedge relationships, the main sources of ineffectiveness are:

- the effect of the counterparty's and the Group's own credit risk on the fair value of the swaps, which is not reflected in the change in the fair value of the hedged cash flows attributable to the change in interest rates and;
- differences in repricing dates between the swaps and the borrowings.

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<i>Exposure to interest rate risk at 31 December</i>	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
<i>Financial instruments with variable interest rates</i>				
Financial assets	-	-	-	-
Financial liabilities	(27,601)	(34,693)	(4,394)	(4,258)
Net statement of financial position exposure	(27,601)	(34,693)	(4,394)	(4,258)
Interest rate swaps	740	2,890	-	-
Net exposure	(26,861)	(31,803)	(4,394)	(4,258)

Fair value sensitivity analysis for fixed-rate instruments

The Group does not account for any fixed-rate financial assets or financial liabilities, at FVTPL, and the Group does not designate derivatives (interest rate swaps) as hedging instruments under a fair value hedge accounting model. Therefore, a change in interest rates at the reporting date would not affect profit or loss.

Cash flow sensitivity analysis for variable-rate instruments

A reasonable possible change of 0.25% in interest rates at the reporting date would have increased (decreased) equity and profit or loss by the amounts shown below. This analysis assumes that all other variables, in particular foreign currency exchange rates, remain constant.

<i>Impact to profit or loss</i>	Consolidated financial statements		Separate financial statements	
	0.25% increase in interest rate	0.25% decrease in interest rate	0.25% increase in interest rate	0.25% decrease in interest rate
	<i>(in million Baht)</i>			
2021				
Financial instruments with variable interest rate	(33)	33	2	(2)
2020				
Financial instruments with variable interest rate	(51)	51	7	(7)

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(d) Hedge accounting

(d.1) Cash flow hedges

At 31 December 2021, the Group held the following financial instruments to hedge exposures to changes in foreign currency and interest rates.

At 31 December	Consolidated financial statements					
	2021			2020		
	Within one year	Maturity More than 1 year but less than 5 years	More than 5 years	Within one year	Maturity More than 1 year but less than 5 years	More than 5 years
Foreign currency risk						
<i>Cross currency swaps</i>						
Net exposure (in million Baht)	48	121	124	48	128	135
Average THB:USD forward contracts rate	29.51	29.94	30.42	29.60	29.74	30.34
<i>Forward exchange contracts</i>						
Net exposure (in million Baht)	2,906	-	-	41	-	-
Average THB:USD forward contracts rate	-	-	-	30.29	-	-
Average THB:JPY forward contracts rate	0.2986	-	-	-	-	-
Interest rate risk						
<i>Interest rate swaps</i>						
Net exposure (in million Baht)	15	44	23	31	92	57
Average fixed interest rate (%)	3.13	3.12	3.06	2.74	2.76	3.02

The amounts at the reporting date relating to items designated as hedged items were as follows.

At 31 December	Consolidated financial statements		
	Change in value used for calculating hedge ineffectiveness	Cash flow hedge reserve (in million Baht)	Balance remaining in the cash flow hedge reserve from hedging relationships for which hedge accounting is no longer applied
2021			
Interest rate risk			
Loans from financial institutions – variable interest	-	72	-
2020			
Foreign currency risk			
Loans from financial institutions – foreign	-	4	-
2020			
Interest rate risk			
Loans from financial institutions – variable interest	-	(38)	-

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The amounts relating to items designated as hedging instruments and hedge ineffectiveness were as follows.

	Consolidated financial statements	
	2021	2020
	<i>(in million Baht)</i>	
Foreign currency risk		
At 31 December		
Cross currency swaps – nominal amount	270	287
Carrying amount included in:		
- other current financial assets (liabilities)	3	(1)
- other non-current financial assets (liabilities)	13	(9)
Forward exchange contracts – nominal amount	2,906	41
Carrying amount included in:		
- other current financial assets	68	-
For the year ended 31 December		
<i>Recognised in OCI</i>		
- changes in value of the hedging instrument	-	4
Interest rate risk		
Interest rate swaps – nominal amount	82	180
Carrying amount included in:		
- other current financial liabilities	(3)	(25)
- other non-current financial liabilities	(29)	(78)
For the year ended 31 December		
<i>Recognised in OCI</i>		
- changes in value of the hedging instrument	72	(38)

The following table provides a reconciliation by risk category of components of equity and analysis of OCI items, net of tax, resulting from cash flow hedge accounting.

	Consolidated financial statements	
	2021	2020
	<i>(in million Baht)</i>	
Balance at 1 January	(114)	(80)
Cash flow hedges		
Changes in fair value:		
Foreign currency risk - Loans from financial institutions	-	4
Interest rate risk - Loans from financial institutions	72	(38)
Balance at 31 December	<u>(42)</u>	<u>(114)</u>

Bangchak Corporation Public Company Limited and its Subsidiaries

Notes to the financial statements

For the year ended 31 December 2021

(d.2) Net investment hedges

A foreign currency exposure arises from the Group's net investment in its Japanese subsidiary that has a Japanese Yen functional currency and the Group's net investment in its Singaporean subsidiary that has a United States Dollar functional currency. The risk arises from the fluctuation in spot exchange rates between the Japanese Yen and the Thai Baht and the fluctuation in spot exchange rates between the United States Dollar and the Thai Baht, which causes the amount of the net investment to vary.

The hedged risk in the net investment hedge is the risk of a weakening Japanese Yen against the Thai Baht and the risk of a weakening United States Dollar against the Thai Baht that will result in a reduction in the carrying amount of the Group's net investment in the Japanese and net investment in the Singaporean subsidiaries.

The Group's net investment in its Japanese subsidiary is hedged by a Japanese Yen-denominated loans from financial institutions and the Group's net investment in its Singaporean subsidiary is hedged by a United States Dollar-denominated loans from financial institutions, which mitigates the foreign currency risk arising from the subsidiary's net assets. The loan is designated as a hedging instrument for the changes in the value of the net investment that is attributable to changes in the THB/JPY spot rate and THB/USD spot rate.

To assess hedge effectiveness, the Group determines the economic relationship between the hedging instrument and the hedged item by comparing changes in the carrying amount of the debt that is attributable to a change in the spot rate with changes in the investment in the foreign operation due to movements in the spot rate (the offset method). The Group's policy is to hedge the net investment only to the extent of the debt principal.

The amounts related to items designated as hedged items were as follows.

	Consolidated financial statements		
	Change in value used for calculating hedge ineffectiveness	Foreign currency translation reserve	Balance remaining in the foreign currency translation reserve from hedging relationships for which hedge accounting is no longer applied
	<i>(in million Baht)</i>		
2021			
USD net investment	563	(167)	396
JPY net investment	1	-	-
2020			
JPY net investment	-	(52)	-

Bangchak Corporation Public Company Limited and its Subsidiaries

Notes to the financial statements

For the year ended 31 December 2021

The amounts related to items designated as hedging instruments were as follows.

	Consolidated financial statements	
	2021	2020
	<i>(In million Baht)</i>	
At 31 December		
Foreign exchange - denominated debt (USD) - nominal amount	2,688	-
Foreign exchange - denominated debt (JPY) - nominal amount	1,017	1,017
Carrying amount included in loan and borrowings	3,705	1,017
For the year ended 31 December		
<i>Recognised in OCI</i>		
- changes in value of the hedging instrument	(167)	(52)
<i>Recognised in profit or loss</i>		
- change in value used for calculating hedge ineffectiveness	1	-

Capital Management

The Board of Directors' policy is to maintain a strong capital base so as to maintain investor, creditor and market confidence and to sustain future development of the business. The Board regularly monitors the return on capital, by evaluating result from operating activities divided by total shareholders' equity, excluding non-controlling interests and also monitors the level of dividends to ordinary shareholders.

32 Commitments with non-related parties

	Consolidated financial statements		Separate financial statements	
	2021	2020	2021	2020
	<i>(in million Baht)</i>			
Capital commitment				
Construction contracts	3,643	4,090	224	391
Total	3,643	4,090	224	391
Other commitment				
Bank guarantees	257	150	155	68
Total	257	150	155	68

33 Contingent liabilities and contingent assets

During the second quarter of 2016, the Company (the first defendant) was co-accused with another company (the second defendant) for alleged breach of a lubricant product distribution contract for a claim totalling Baht 46 million. Subsequently, the plaintiff filed additional claim against the Company for alleged breach of a contract as a result of ceasing lubricant product distribution for a claim totalling Baht 688 million. During the first quarter of 2017, the civil court ordered a dismiss on both cases. The plaintiff was re-appealed to the Appeal Court. Subsequently, during the second quarter of 2018, the Appeal Court had ordered the Company to pay the plaintiff for two claims totalling Baht 1 million. During the first quarter of 2021, the Supreme Court reserved the judgement of the Appeal Court and ordered a dismiss on both cases. As a result, the Company does not have to pay any claims to the plaintiff and the cases are final according to the judgement of the Supreme Court.

Bangchak Corporation Public Company Limited and its Subsidiaries

Notes to the financial statements

For the year ended 31 December 2021

An indirect subsidiary of the Group has been filed and accusation of failing to comply with the hire of work agreement by a contractor. The dispute is requested the indirect subsidiary to compensate for the loss of breaching the construction contract totalling of Baht 121 million. In September 2021, the indirect subsidiary has filed and objection to the Arbitration Institute. The management of the indirect subsidiary believes that the indirect subsidiary has fully comply with the condition in the agreement, and this dispute is still in the arbitration process. Therefore, as at 31 December 2021, the indirect subsidiary did not recognise contingent liabilities from the dispute.

34 Events after the reporting period

Changes in investment in subsidiary

At the Extraordinary General Meeting of Shareholders of the subsidiary held on 24 December 2021, the shareholders of subsidiary approved to change the par value from 5 Baht per share to 2.50 baht per share. The subsidiary registered the change in the par value with the Department of Business Development, Ministry of Commerce on 6 January 2022. The change in the par value will cause the number of shares of the subsidiary to increase from 506 million shares to 1,013 million shares.

At the Board of Directors' meeting held on 27 January 2022, the Board has resolved to approve the framework and procedures for determination of the Company's shareholders that are entitled to subscribe newly-issued ordinary shares in the total number of 65 million shares and has resolved to schedule the record date for the right to subscribe additional shares of the subsidiary on 14 February 2022 and the Ex-Other Benefits Date (XB) on 11 February 2022.

Changes in investment in associate

At the Board of Directors' meeting of the subsidiary held on 26 January 2022, the Board approved a sale of the whole investment in Star Energy Group Holdings Pte. Ltd., the indirect associate of the Group, to Springhead Holdings Pte. Ltd. (buyer) which was not the Group's related party at the selling price of USD 440 million (approximately Baht 14,567 million). Subsequently, on 28 January 2022, the subsidiary and the buyer entered into the share purchase agreement. The subsidiary and the buyer are in progress of completing conditions stipulated in the share purchase agreement. It is expected that all conditions will be satisfied, the shares shall be transferred, and the payment shall be made to the subsidiary within the first quarter of 2022.

At the Board of Directors' meeting of the subsidiary held on 26 January 2022, the Board also approved on the signing of Memorandum of Agreement ("MOA") with Capital Asia Investments Pte. Ltd. ("CAI") (as a co-investor of the subsidiary), which was not the Group's related party, and the Ministry of Finance of the Lao People's Democratic Republic acting for and on behalf of the Government of Lao People's Democratic Republic ("GOL") with the subsidiary's preliminary investment amount of not exceeding USD 100 million. Subsequently, the subsidiary and CAI had signed in the MOA on 8 February 2022. This investment results in a pre-investment right in renewable energy business in the Lao People's Democratic Republic that GOL has a policy to grant an investment through Lao State Holding Enterprise ("LHSE") and revenue from providing business consultation to LHSE relating to renewable energy business management under terms and conditions.

Dividend payment

At the Board of Directors' meeting held on 17 February 2022, the Board approved to submit for approval at the Annual General Meeting of the Shareholders, a full year 2021 dividend payment at the rate of Baht 2 per share of which Baht 1 per share was paid as an interim dividend. Thus, the remaining dividend will be at the rate of Baht 1 per share payable to the shareholders entitled to receive dividends. This dividend is subject to the approval of the Shareholders at the Annual General Meeting to be held on 8 April 2022.

Bangchak Corporation Public Company Limited and its Subsidiaries

Notes to the financial statements

For the year ended 31 December 2021

At the Board of Directors' meeting of the subsidiary held on 15 February 2022, the Board of subsidiary approved to submit for approval at the Annual General Meeting of the Shareholders, a full year 2021 dividend payment at the rate of Baht 0.33 per share, of which Baht 0.16 per share was paid as an interim dividend. Thus, the remaining dividend will be at the rate of Baht 0.17 per share payable to the shareholders entitled to receive dividends. This dividend is subject to the approval of the Shareholders at the Annual General Meeting to be held on 7 April 2022.

35 Thai Financial Reporting Standards (TFRS) not yet adopted

The Federation of Accounting Professions has revised TFRS 7 *Financial instruments: Disclosure* and TFRS 9 *Financial instruments* due to Interbank Offer Rate (IBOR) reform - Phase 2, which will become effective for annual reporting periods beginning on or after 1 January 2022. The Group has assessed the potential impact of these revised TFRSs and expects that there will be no material impact on the financial statements in the period of initial application.

Part 4 Certification of Information and Data Accuracy

Certification of information and data accuracy for submitting 56-1 One Report

Having carefully verified the information and data shown in this annual registration statement / annual report, Bangchak certifies that they are completely accurate, factual, and not misleading or lacking in essential detail. In addition:

1. The financial statements and data summarized in annual registration statement / annual report show essentially accurate information and data about its financial standing, performance, and cash flow of Bangchak and its subsidiaries.
2. It has put in place a good information and data disclosure system to ensure that it discloses essential details about itself and its subsidiaries completely and accurately, while ensuring due compliance.
3. It has put in place a good internal control system and ensured due compliance with such system. Bangchak has provided internal control system assessment details as of December 31st, 2021, to the external auditor and the Audit Committee, including defects and key changes in the internal control system together with wrongdoing potentially affecting the preparation of the financial reports for itself and its subsidiaries.

As evidence that all documents are identical to those certified by Bangchak, the company has assigned Ms. Pakawadee Junrayapes to put her initials on every page of the documents. Therefore, if her initials are missing on any given page, Bangchak will disown such data.

Name	Position	Signature
1. Mr. Pichai Chunhavajira	Chairman of the Board	<i>(Signed) Pichai Chunhavajira</i>
2. Mr. Chaiwat Kovavisarach	President and Group Chief Executive Officer	<i>(Signed) Chaiwat Kovavisarach</i>

Authorized person	Position	Signature
Ms. Pakawadee Junrayapes	Executive Vice President, Corporate Compliance	<i>(Signed) Pakawadee Junrayapes</i>

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Review of Business Assets and Asset Revaluation

Attachment 1

Profiles of Directors, Executives, Head of finance and accounting, Accounting Supervisor and Company Secretary

The Board of Directors

Mr. Pichai Chunhavajira

Chairperson of the Board and Director with Authorized Signature (Independent Director)

(Started on April 24, 2012 and Independent director since June 1, 2017)

- Age 72
- Education / Training
 - Master of Business Administration, Indiana University of Pennsylvania, USA
 - Bachelor of Business Administration (Accounting), Thammasat University
 - Honorary Ph.D. (Accounting), Thammasat University
 - Honorary Ph.D. (Financial Management), Mahasarakham University
 - Honorary Ph.D. (Financial Management), Sripatum University
 - Public and Private Joint Program, Class 13, The National Defence College
 - Certified Auditor, Federation of Accounting Professions
 - Director Accreditation Program (DAP49/2006), Thai Institute of Directors (IOD)
 - Director Certification Program (DCP143/2011), Thai Institute of Directors (IOD)
 - Top Executive Program, Class 5, Capital Market Academy (CMA), Stock Exchange of Thailand
- Experience (5 years past experiences)
 - 2012 – Present : Chairperson of the Board, Bangchak Corporation Public Company Limited
 - 2014 – 2017 : Member of Board, Bank of Thailand
 - 2001 – 2013 : Director, PTT Exploration and Production Public Company Limited
- Other directorship positions / other positions at present
 - Other listed companies
 - o Chairman, BCPG Public Company Limited
 - Non-listed companies
 - o Chairman, BBGI Public Company Limited
 - o Director, Golden Triangle Group Company Limited
 - o President, Thailand Boxing Association
 - o Vice President, National Olympic Committee of Thailand
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Mr. Suthep Wongvorazathe

Vice Chairperson and Director with Authorized Signature

(Started on October 30, 2012)

- Age 73
- Education / Training
 - Master of Business Administration, University of Wisconsin, USA
 - Bachelor of Business Administration, University of Wisconsin, USA
 - Director Accreditation Program (DAP48/2005), Thai Institute of Directors (IOD)
- Experience (5 years past experiences)
 - 2019 : Director, HSH-Siam Chaophraya Holdings Company Limited
 - 2003 – 2016 : Chairman of Audit Committee and Independent Director, Chumporn Palm Oil Industry Public Company Limited
 - 2010 – 2011 : Chairman of the Executive Board, Export-Import Bank of Thailand
- Other directorship positions / other positions at present
 - Other listed companies
 - o Chairman, Khonburi Sugar Public Company Limited
 - o Chairman, M.K. Real Estate Development Public Company Limited
 - o Chairman of the Nomination Committee OKEA ASA – Oslo Stock Exchange (OSE)
 - Non-listed companies
 - o Director, Asia Kangnam Company Limited
 - o Director, New Corp Company Limited
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Gen. Songwit Noonpackdee

Independent Director and Director with Authorized Signature (Started on October 1, 2021)

- Age 56
- Education / Training
 - Master of Science in Civil Engineering, Florida Institute of Technology, FL, USA
 - Bachelor of Civil Engineering, Virginia Military Institute, VA, USA
 - Armed Forces Academies Preparatory School, Class 24
 - Regular Course, Command and General Staff College, Serie 75/40
 - Command and General Staff Officer's Course, Fort Leavenworth, KS, USA
 - Academy of Business Creativity Course (ABC, Class 1), Sripatum University
 - National Defence Course (NDC62), The National Defence College
 - Rules of Law for Democracy Course (Class 9), College of the Constitutional Court
 - Airborne Course, Fort Benning, GA, USA
 - Pathfinder Course, Fort Benning, GA, USA
 - Ranger Course, Fort Benning, GA, USA
 - VIP Protection Course, U.S. Diplomatic Security Service (DSS)
 - The Queen's Regiment Special Course, Class 9
 - Counter Terrorism Course, Command and General Staff College
 - Commissioned Officer Course, Royal Guard Organization, Class 11/60, Royal Military School, Mahadlek Rajawanlop Royal Guard
- Experience (5 years past experiences)
 - Present : Chief of Staff to the Chief of Staff of the Commanding General
 - 202 : Deputy Chief of Staff, Royal Thai Army
 - 2019 : Deputy Commander of the 1st Region
 - 201 : Commander of the 1st Brigade, King's Guard
 - 2017 : Commander of the 11th Infantry Brigade
 - 2017 : Director, Tobacco Authority of Thailand
- Other directorship positions / other positions at present
 - Other listed companies
None
 - Non-listed companies
None
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Pol.Lt.Gen. Chaiwat Chotima

Independent Director and Director with Authorized Signature (Started on April 9, 2014)

- Age 69
- Education / Training
 - Master of Political Science, New Mexico University, USA
 - Bachelor of Political Science, Thammasat University
 - Top Executive program, Capital Market Academy, Class 15
 - Advance Security Management Program (3/2011), The National Defence College
 - The Joint State – Private Sector Course (19/2006), The National Defence College
 - Advanced Police Administration Program, Class 17, Institute of Police Administration Development
 - Conference concerning Narcotics and launder money Control in other countries, i.e., USA, UK, Canada, Germany, Australia, Japan, Hong Kong etc.
 - Director Certification Program (DCP194/2014), Thai Institute of Directors (IOD)
 - Financial Statements for Directors (FSD26/2014), Thai Institute of Directors (IOD)
 - Certificate, Executive Program in Energy Literacy for a Sustainable Future, Class 7, Thailand Energy Academy (TEA)
 - Top Executive Program, Class 15, Capital Market Academy (CMA), Stock Exchange of Thailand
- Experience (5 years past experiences)
 - 2011 : Commissioner, Narcotics Suppression Bureau
 - 2010 : Inspector-General (Inspection Division 8)
- Other directorship positions / other positions at present
 - Other listed companies
None
 - Non-listed companies
 - o Vice President and Secretary, Thailand Boxing Association
 - o Vice Chairman, Asian Boxing Confederation
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Mrs. Prisana Praharnkhasuk

Independent Director and Director with Authorized Signature (Started on April 5, 2016)

- Age 67
- Education / Training
 - Master of Business Administration, Tarleton State University, USA
 - Bachelor of Business Administration, Chulalongkorn University
 - Bachelor of Business Administration (Accounting), Kirk University
 - Certificate of Insurance, College of Insurance, London, UK
 - Sasin Senior Executive Program (SEP13), Sasin Graduate Institute of Business Administration of Chulalongkorn University
 - Certificate of Completion CFO Certification Program, Federation of Accounting Professions
 - Certificate of NIDA-Wharton Executive Leadership Program, Wharton University of Pennsylvania
 - Director Certification Program (DCP119/2009), Thai Institute of Directors (IOD)
 - The Board's Role in Mergers and Acquisitions (M&A1/2011), Thai Institute of Directors (IOD)
 - Top Executive Program, Class 14, Capital Market Academy (CMA), Stock Exchange of Thailand
 - PTT Executive Leadership Development, GE Crotonville, USA
 - Financial and Fiscal Management Program for Senior Executive, Class 1
- Experience (5 years past experiences)
 - 2019 – 2021 : Director, OKEA ASA – Oslo Stock Exchange (OSE)
 - 2018 – 2019 : Director, Industrial Estate Authority of Thailand
 - 2017 – 2019 : Director, Siam Solar Power Public Company Limited
 - 2016 – 2019 : Director, Industrial Estate Authority of Thailand
 - 2015 – 2018 : Director, 10th Workmen's Compensation Fund Committee, Social Security Office
 - 2014 – 2015 : Senior Executive Vice President, Finance and Accounting, Thai Oil Public Company Limited
 - 2006 – 2013 : Executive Vice President, Corporate Accounting, PTT Public Company Limited
- Other directorship positions / other positions at present
 - Other listed companies
 - o Independent Director, Chairperson of the Audit Committee and Member of Nomination and Remuneration Committee TOA Paint (Thailand) Public Company Limited
 - o Independent Director and Chairperson of the Audit Committee, Siamese Asset Public Company Limited
 - Non-listed companies
 - None
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives: None
- Criminal records on violation of securities and futures contract laws: None

Mr. Teerapong Wongsiwawilas

Independent Director (Started on January 26, 2017)

Resigned December 30, 2021

- Age 57
- Education / Training
 - Bachelor of Laws, Thammasat University
 - The National Defence Course Class (NDC57), National Defence College
 - Certificate, Public Law and Management, King Prajadhipok's Institute, Class 12/2013
 - Senior Executive Program, Class 8, The office of the Civil Service commission
 - Director Certification Program (DCP246/2017), Thai Institute of Directors (IOD)
- Experience (5 years past experiences)
 - 2021 : Government Official Advisor to Prime Minister, The Secretariat of the Cabinet
 - 2017 : Secretary-General to the Cabinet, The Secretariat of the Cabinet
 - 2019 : Member, National Legislative Assembly Coordination Committee
 - 2015 : Deputy Secretaries-General to the Cabinet
 - 2014 : Advisor of the Secretariat of the Cabinet
 - 2013 : Director of Bureau of Cabinet Submission Analysis
- Other directorship positions / other positions at present
 - Other listed companies
 - o Director, Krung Thai Bank Public Company Limited
 - Non-listed companies
 - o Honorable Executive Director of the Judicial Administration (Administration and Management), Court of Justice
 - o Committee member of the Political Reform of the Thailand's National Reform, Office of the National Economic and Social Development Council
 - o Council of State No.7 (Natural Resources and Environment Law), Office of the Council of State
 - o National Science and Technology Development Committee, National Science and Technology Development Agency
 - o Honorable Special Investigation Committee (Law), Department of Special Investigation, Ministry Of Justice
 - o Advisor to the Prime Minister, The Secretariat of the Cabinet
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Mr. Prasong Poontaneat

Independent Director (Started on November 1, 2021)

Chairperson of the Enterprise-wide Risk Management Committee

- Age 62
- Education / Training
 - Ph.D. in Public Administration (Management for Development College), Thaksin University
 - Master of Business Administration (Organization Management), Dhurakij Pundit University
 - Bachelor of Business Administration in Accounting, Rajamangala University of Technology
 - Bachelor of Laws, Sukhothai Thammathirat Open University
 - Director Certification Program (DCP76/2006), Thai Institute of Directors (IOD)
 - Top Administrator Program Class 49, Interior College, Prince Damrong Rajanupab Institute of Research and Development
 - Senior Police Officers Course Class 18, Police College
 - Leader Program Class 14, Capital Market Academy, The Stock Exchange of Thailand
 - Executive Program, Energy Academy, Thailand Energy Academy (TEA2)
 - The National Defence Course Class (NDC52), National Defence College
- Experience (5 years past experiences)
 - Present : Member of the Council of State, Office of the Council of State
 - 2020 : Chairperson, Krung Thai Public Company Limited
 - 2018 – 2020 : Permanent Secretary, Ministry of Finance
 - : Chairperson, The Office of Insurance Commission
 - : Commissioner, The Securities and Exchange Commission
 - : Chairperson, TMB Bank Public Company Limited
 - 2014 – 2020 : Chairperson, Airports of Thailand Public Company Limited
 - 2014 – 2018 : Director-General of the Revenue Department
 - 2012 – 2020 : Director, Bangchak Corporation Public Company Limited
 - 2011 : Chairperson, Export-Import Bank of Thailand
 - Subcommittee on Finance, Thai Bar Association under the Royal Patronage
 - Director of the Mahamakut Rajavidyalaya Foundation under Royal Patronage
- Other directorship positions / other positions at present
 - Other listed companies
 - o Chairman, Krungthai Card Public Company Limited
 - Non-listed companies
 - o Member of the Council of State, Office of the Council of State
 - o Member of , Mahasarakham University
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Mr. Chamroen Phothiyod

Director (Started on October 1, 2021)

- Age 58
- Education / Training
 - Master of Public Administration, National Institute of Development Administration
 - Bachelor of Laws, Ramkhamhaeng University
 - Senior Public Sector Finance and Fiscal Manager Program (Class 7), The Comptroller General's Department
 - Certificate, Executive Program in Energy Literacy for a Sustainable Future, Class 13, Thailand Energy Academy (TEA)
 - Top Executive Program in Commerce and Trade (TEPCoT), Class 11, Commerce Academy, University of the Chamber of Commerce
 - Executive Professional Development Course : Port and Shipping Trend & Technology, World Maritime University
 - Corporate Governance Program for Directors and Executives of State Enterprises and Public Organizations (PDI), Class 17, King Prajadhipok's Institute
 - Director Certification Program (DCP242/2017), Thai Institute of Directors (IOD)
 - Inspector General Course for the Fiscal Year 2017, The Office of the Permanent Secretary, The Prime Minister's Office.
 - National Defence Course (NDC 58), The National Defence College
 - Anti-corruption Strategic Management for Senior Executives Course (Class 4), Sanya Dharmasakti Anti-Corruption Institute, Office of the National Anti-Corruption Commission
 - Senior Executive Program (Class 73), College of Administrators, Civil Service Development Institute, The office of the Civil Service Commission
- Experience (5 years past experiences)
 - Present : Deputy Permanent Secretary, Ministry of Finance
 - 2019 – 2020 : Director, Bangkok Mass Transit Authority
 - 2019 – 2020 : Director, Sports Authority of Thailand
 - 2018 – 2020 : Chief Inspector General, Ministry of Finance
 - 2018 – 2019 : Director, National Housing Authority
 - 2016 – 2019 : Director, S.R.T. Electrified Train
 - 2016 – 2018 : Inspector General, Ministry of Finance
 - 2016 : Consultant for Taxation Development and Management
 - 2015 – 2016 : Deputy Director General, The Customs Department
 - 2014 – 2019 : Director, Port Authority of Thailand
 - 2014 – 2016 : Chairman, Trade Siam Company Limited
- Other directorship positions / other positions at present
 - Other listed companies
None
 - Non-listed companies
 - o Director, National Telecom Public Company Limited
 - o Director, Bank for Agriculture and Agricultural Cooperatives
 - o Director, Anti-Corruption Foundation
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Dr. Kulaya Tantitemit

Director (Started on April 8, 2021)

- Age 49
- Education / Training
 - PhD in International Economics and Finance, Brandeis University, USA
 - Master of Science in Finance, Brandeis University, USA
 - Master of Arts in Economics, Boston University, USA
 - Bachelor of Economics Thammasat University (First-Class Honors, Gold Medal)
 - Ethical Leadership Program (ELP7/2017) Thai Institute of Directors (IOD)
 - Director Certification Program (DCP239/2017) Thai Institute of Directors (IOD)
 - Board Matters and Trends (BMT 5/2018) Thai Institute of Directors (IOD)
- Experience (5 years past experiences)
 - 2021 – Present : Comptroller-General, The Comptroller General's Department
 - 2021 : Director of the Fiscal Policy Office
 - 2020 – 2021 : Inspector General, Ministry of Finance, acting as Director of the Fiscal Policy Office
 - 2020 : Inspector General, Ministry of Finance
 - 2018 – 2020 : Executive Director, World Bank Group
 - 2016 – 2018 : Inspector General, Ministry of Finance
 - 2016 – 2018 : Director, Krungthai Bank Public Company Limited
 - 2016 – 2018 : Director, PTT International Trading Pte. Ltd.
 - 2016 : Adviser on Policy and Strategy, Ministry of Finance
 - 2015 – 2016 : Director and Executive Director, Export-Import Bank of Thailand
- Other directorship positions / other positions at present
 - Other listed companies
 - o Director, Krung Thai Bank Public Company Limited
 - Non-listed companies
 - o Comptroller-General, The Comptroller General's Department
 - o Krungthai Asset Management Public Company Limited
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Mr. Boonchob Suthamanuswong

Director (Started on October 28, 2021)

- Age 58
- Education / Training
 - Bachelor of Arts (Political Science), Ramkhamhaeng University
 - Master of Public Administration, National Institute of Development Administration
 - Certificate, Senior Executive Program, Class 48
 - Advanced Certificate Course in Public Administration and Law for Executives, Class 7
 - Certificate, The Joint Public – Private Sector Course, Class 25, National Defence College,
 - Corporate Governance Program for Committee Members and Senior Officials of State Enterprises and Public Organizations, Class 12
 - Certificate, Executive Program in Energy Literacy for a Sustainable Future, Class 5, Thailand Energy Academy (TEA)
 - E-Government Program for Senior Officials (e-GSO), Class 1
 - Senior Executive Program in Urban Development Management, Class 5
 - Inspector-General Program, 2015
 - Certificate, Justice Administration for Senior Officials, Class 6
 - Certificate, Public Laws Administration for Senior Officials, Class 4
 - Volunteer Spirit 904 Training, Permanent Core Curriculum Cohort no. 4/62
- Experience (5 years past experiences)
 - 2021- Present : Permanent Secretary, Ministry of Labour
 - 2014- 2021 : Chief of Inspector-General, Ministry of Natural Resources and Environment
 - 2012 : Director-General, Royal Forest Department
 - 2011 : Director-General, Department of Marine and Coastal Resources
- Other directorship positions / other positions at present
 - Other listed companies
None
 - Non-listed companies
 - o Permanent Secretary, Ministry of Labour
 - o Director, Debaratana Vejjanukula Foundation
 - o Advisor to Chairman, Pid Thong Lang Phra Foundation
 - o Advisor, Mae Fah Luang Foundation under the Royal Patronage
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Executive Director

Mr. Chaiwat Kovavisarach

President and Group Chief Executive Officer

Executive Director, Director with Authorized Signature

(Started on October 30, 2012 and served as the President since January 1, 2015)

(The title of the Company's President and Chief Executive Officer has been changed to President and Group Executive Officer on January 1, 2022)

- Age 55
- Education / Training
 - Master of Engineering, Asian Institute of Technology (AIT)
 - Master of Business Administration (MBA), Thammasat University
 - Bachelor of Engineering (Honor), King Mongkut's Institute of Technology Ladkrabang (KMITL)
 - Investment Banking, Kellogg Business School, Northwestern University, USA
 - Director Certification Program (DCP 168/2013), Thai Institute of Directors (IOD)
 - Role of the Nomination and Governance Committee (RNG 4/2013), Thai Institute of Directors (IOD)
 - The National Defence Course Class (NDC58), National Defence College
 - Certificate, Executive Program in Energy Literacy for a Sustainable Future, Class 10, Thailand Energy Academy (TEA)
 - Role of the Chairman Program (RCP 46/2020), Thai Institute of Directors (IOD)
 - Top Executive Program, Class 26 Capital Market Academy (CMA), Stock Exchange of Thailand
 - Senior Justice Administration, College of Justice, Judicial Training Institute, Class 25
- Experience (5 years past experiences)
 - 2015 – Present : President and Group Chief Executive Officer, The Bangchak Corporation Public Company Limited
- Other directorship positions / other positions at present
 - Other listed companies
 - o Vice Chairman, BCPG Public Company Limited
 - o Chairman, OKEA ASA – Oslo Stock Exchange (OSE)
 - Non-listed companies
 - o Director, BBGI Public Company Limited
 - o Member of Board of Director, Government Pension Fund
 - o Advisor of Investment Committee, Government Pension Fund
 - o President, Suan Kulab Witthayalai Alumnus Association Under the Royal Patronage of H.M. the King
 - o Chairman of The Institute of Research Development and Innovation for Industry, The Federation of Thai Industries
 - o Chairman of Thai-Europe Business Council, The Federation of Thai Industries
 - o Vice Chairman, The Federation of Thai Industries
 - o Director, Thailand Management Association (TMA)
 - o Executive Chairman / Board of Trustees, Asian Institute of Technology (AIT)
 - o Advisory Board, The Petroleum and Petrochemical College, Chulalongkorn University
 - o Director, International Chamber of Commerce of Thailand (ICC Thailand)
- Shareholding in the Company : 1,350,000 shares or 0.098% directly held (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Executive

Mr. Bundit Sapianchai

President (Effective on January 1, 2022)

- Age 57
- Education / Training
 - Honorary Doctorate of Electrical Engineering, Rajamagala University of Technology Krungthep
 - Master of Engineering, Asian Institute of Technology (AIT)
 - Bachelor of Engineering, King Mongkut's Institute of Technology Ladkrabang (KMITL)
 - Director Accredited Program (DAP28/2004), Thai Institute of Directors (IOD)
 - Director Certification Program (DCP53/2005), Thai Institute of Directors (IOD)
 - Advanced Diploma, Public Administration and Public Law, Class10/2011 King Prajadhipok's Institute
 - Certificate, National Defence Course (NDC55), The National Defence College
 - Top Executive Program, Class 20, Capital Market Academy (CMA), Stock Exchange of Thailand
 - Certificate, Executive Program in Energy Literacy for a Sustainable Future, Class 11, Thailand Energy Academy (TEA)
 - Diploma, Executive Management with Business Development and Investment (IBID5), Institute of Business and Industrial Development
 - Certificate, Health Ambassador class 1, Chulabhorn Royal Academy
 - Digital Transformation for CEO class 1, Thansettakij
 - Advanced Security Management Program (ASMP), The Association National Defence College of Thailand
- Experience
 - Bangchak Corporation Public Company Limited
 - 2022 – Present : President
 - 2015 : Senior Executive Vice President, appointed to BCPG Public Company Limited
 - 2013 : Senior Executive Vice President, Renewable Energy Business
 - 2012 : Senior Executive Vice President, Business Development and Strategy
 - 2008 : Executive Vice President, Corporate Business Development
- Others
 - 2004 : Executive Vice President, Finance and Strategy, NFC Fertilizer Public Company Limited
 - 1997 : Business Director, Air Liquid (Thailand) Company Limited
 - 1994 : Marketing Director, PTT Petrochemical Company Limited
 - 1988 : Commercial Manager, National Petrochemical Public Company Limited
- Other directorship positions / Other positions at present
 - Other listed companies
None
 - Non-listed companies
None
- Shareholding in the Compan : 95 shares or 0.000000% directly held (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Mr. Pativat Tivasasit

Chief Operation Officer & Senior Executive Vice President, Refinery Business Group

- Age 61
- Education / Training
 - Bachelor of Science (Chemical Technology), Chulalongkorn University
 - Executive Development Program (EDP), Thai Listed Companies Association (TLCA)
 - Advanced Diploma, Public Administration and Public Law, Class17/2018, King Prajadhipok's Institute
 - Advanced Security Management Program, Class 11/2019, Security Management Foundation
- Experience

Bangchak Corporation Public Company Limited

 - 2021 – Present : Chief Operation Officer & Senior Executive Vice President, Refinery Business Group
 - 2020 – Present : Senior Executive Vice President, Refinery Business Group
 - 2019 : Executive Vice President, Refinery Manufacturing Business acting Senior Executive Vice President, Refinery Business Unit
 - 2017 : Executive Vice President, Refinery Manufacturing Business
 - 2016 : Acting Executive Vice President, Refinery Manufacturing Business
 - 2015 : Senior Vice President, Refinery Operation
 - 2014 : Vice President, Refinery Operation
 - 2012 : Vice President, Safety Health and Environment
 - 2009 : Senior Manager, Process Division 2
 - 2006 : Senior Manager, Commissioning Project
- Other directorship positions / Other positions at present
 - Other listed companies
None
 - Non-listed companies
 - o Director, Bongkot Marine Service Co., Ltd.
 - o Director, BCP Trading Pte. Ltd.
 - o Director, General Energy Manning Co., Ltd.
- Shareholding in the Company : 33,500 shares (spouse 33,500 shares) or 0.00243% (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Mr. Somchai Tejavanija

Chief Marketing Officer & Senior Executive Vice President, Marketing Business Group

- Age 59
- Education / Training
 - Master of Business Administration (MBA), Thammasat University
 - Bachelor of Engineering, Kasetsart University
 - Stanford-SEAC Leading in a Disruptive World 4 (LDW4) The Stanford Center for Professional Development (SCPD), Stanford University
 - Strategy and Innovation for Business in Asia (SIBA7) Massachusetts Institute of Technology (MIT), College of Management Mahidol University (CMMU)
 - Director Certification Program (DCP157/2012), Thai Institute of Directors (IOD)
 - Successful Formulation & Execution of Strategy (SFE28/2016), Thai Institute of Directors (IOD)
 - Top Executive Program, Class 30, Capital Market Academy (CMA), Stock Exchange of Thailand
 - Top Executive Program in Commerce and Trade (TEPCoT11/2018), University of the Thai Chamber of Commerce
 - Executive Management with Business Development and Investment (IBID3), Institute of Business and Industrial Development
 - Advanced Security Management Program (ASMP6), The Association National Defence College of Thailand
 - Thammasat Leadership Program (Class4), Thammasat University
 - Advanced Certificate Course in Public Administration and Law for Executives (Class12), King Prajadhipok's Institute
 - Executive Development Program (EDP6), Thai Listed Companies Association (TLCA)
 - Energy Leadership Development for Senior Managers (Class4), Ministry of Energy
- Experience

Bangchak Corporation Public Company Limited

 - 2017 – Present : Chief Marketing Officer and Senior Executive Vice President, Marketing Business Group
 - 2016 : Senior Executive Vice President, Natural Resources and Business Development
 - 2014 : Senior Executive Vice President, Corporate Strategy and Business Development
 - 2013 : Executive Vice President, Business Development and Strategy
 - 2011 : Executive Vice President, Marketing Business, responsible for Retail Marketing, and Acting Vice President, Marketing Business Strategy and Planning
 - 2010 : Senior Vice President-Marketing Business Strategy and Planning, Marketing Business
- Other directorship positions / Other positions at present
 - Other listed companies
 - None
 - Non-listed companies
 - o Chairman, Bangchak Retail Company Limited
 - o Director, Bangchak Green Net Company Limited
- Shareholding in the Company : 28,522 shares or 0.002071% directly held (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Mr. Kittiphong Limsuwannarot

Senior Executive Vice President, appointed to BBGI Public Company Limited

- Age 57
- Education / Training
 - Master of Business Administration (MBA), University of Dallas, Texas, USA
 - Bachelor of Science, Chemical Engineering, Chulalongkorn University
 - Director Certification Program (DCP191/2014), Thai Institute of Directors (IOD)
 - Top Executive Program in Commerce and Trade (TEPCoT13/2020), University of the Thai Chamber of Commerce
 - McKinsey Management Program (MMP) 2020, Thai Listed Companies Association (TLCA) & McKinsey
 - Thunderbird School of American Graduate School of International Management Arizona, USA (2004)
 - Esso Leading ship Program II, Malaysia (2002)
 - Esso Leading Change Program, Singapore (2001)
- Experience
 - Bangchak Corporation Public Company Limited
 - 2021 – Present : Senior Executive Vice President, Acting as President and Chief Executive Officer to BBGI Public Company Limited
 - 2020 : Acting Senior Executive Vice President, appoint to BBGI Public Company Limited Managing Director, Bangchak Biofuel Company Limited
 - 2019 : Executive Vice President, Acting as Senior Vice President, Biodiesel and New Business, BBGI Public Company Limited
 - Others
 - 2015 – 2020 : President Thai Bioplastics Industry Association : TBIA
 - 2015 – 2019 : Vice President – Downstream Market Development PTT Global Chemical Public Company Limited
 - 2014 – 2018 : Managing Director, Solution Creation Company Limited
 - 2013 – 2015 : Vice President – Green Chemical Business
: PTT Global Chemical Public Company Limited
 - 2007 – 2012 : Product manager, Global Polypropylene and Global Hydrocarbon Fluids ExxonMobil Chemical, Texas, USA
 - 2002 – 2007 : Regional Manager, Sales Supply, ExxonMobil Chemical, Texas, Hongkong
- Other directorship positions / Other positions at present
 - Other listed companies
 - None
 - Non-listed companies
 - o President and Chief Executive Officer, BBGI Public Company Limited
 - o Chairman, KSL Green Innovation Public Company Limited
 - o Chairman, BBGI Utility and Power Company Limited
 - o Chairman, Bangchak Biofuel Company Limited
 - o Chairman, Ubon Bio Agricultural Company Limited
 - o Chairman, Ubon Bio Gas Company Limited
 - o Chairman, Ubon Sunflower Company Limited
 - o Director, Bangchak Bioethanol (Chachoengsao) Company Limited
 - o Director, Ubon Bio Ethanol Public Company Limited

- o Director, Manus Bio Inc.
 - o Director, BCP Trading Pte. Ltd.
 - o Director, WIN Ingredients Co., Ltd.
 - o Managing Director, Bangchak Biofuel Company Limited
 - o Managing Director, National Energy Technology Center
 - o Director, The Institute of Industrial Energy, The Federation of Thai Industries
 - o Director, Industrial Promotion and Support, The Federation of Thai Industries
 - o Vice Chairman, Engineering Institute of Thailand (Chemical and Petrochemical Engineering)
 - o Director, National Center for Genetic Engineering and Biotechnology (BIOTEC)
 - o Director, Council of Scientific and Technological Associations of Thailand (COSTAT)
 - o Managing Director, Plastics Institute of Thailand
- Shareholding in the Company : None (both directly and indirectly held) (As of 31 December, 2021)
 - Familial relationship between directors and executives : None
 - Criminal records on violation of securities and futures contract laws : None

Mr. Chokchai Atsawarangsali

Senior Executive Vice President, Corporate Management and Organization Development

- Age 53
- Education / Training
 - Master of Business Administration, Kasetsart University
 - Director Certification Program (DCP108/2008), Thai Institute of Directors (IOD)
 - Executive Development Program (EDP), Thai Listed Companies Association (TLCA)
 - Energy Leadership Development for Senior Managers, Class6, Ministry of Energy
 - Executive Development Program 2011, Minister of Finance
 - Senior Executive Program (SEP26), The Sasin Graduate Institute of Business Administration of Chulalongkorn University
 - Diploma courses in Public Economics Management for Executives, Class 13, King Prajadhipok's Institute
 - Leadership Succession Program (LSP5), Institute of Research and Development for Public Enterprises (IRDP)
 - Leading in a Disruptive World Program (LDW), Southeast Asia Center (SEAC), Stanford University
 - Thammasat Leadership Program, Thammasat for Society (Class 12)
 - The National Defence Course Class (NDC63), National Defence College
- Experience

Bangchak Corporation Public Company Limited

 - 2020 – Present : Senior Executive Vice President, Corporate Management and Organization Development
 - 2019 : Executive Vice President acting Senior Executive Vice President, Corporate Management and Organization Development
 - 2015 : Executive Vice President, Marketing Business and Oil Terminal
 - 2015 : Executive Vice President, Exploration and Production, Corporate Strategy and Business Development
 - 2014 : Senior Vice President, Exploration and Production, Corporate Strategy and Business Development
 - 2012 : Senior Vice President, Business Development, Corporate Business Development
 - 2009 : Vice President, Business Development, Corporate Business Development
 - 2007 : Vice President, Company Secretariat, and Company Secretary
- Other directorship positions / Other positions at present
 - Other listed companies
 - None
 - Non-listed companies
 - o Vice Chairman, Happiness Sharing Foundation
 - o Director, General Energy Manning Co., Ltd.
- Shareholding in the Company : 300 shares or 0.000022% directly held (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Mr. Viboon Wongsakul

Senior Executive Vice President, Corporate Strategy and Business Development

- Age 53
- Education / Training
 - Master of Business Administration – Marketing, University of Wisconsin–Whitewater, USA
 - Bachelor of Business Administration – Finance & Banking, Chulalongkorn University
 - Leading in a Disruptive World Program (LDW), Southeast Asia Center (SEAC), Stanford University
 - Entrepreneurial Leadership Program, Boston, Babson University, USA
 - Leadership Development Program, Harvard Business School
 - Strategic Marketing in Action Program, IMD Business School, Switzerland
 - Senior Executive Program (SEP), Sasin Business School
 - Enterprise Leadership Program, Insead University
 - Director Certification Program (DCP294/2020), Thai Institute of Directors (IOD)
 - The National Defence Course Class (NDC61), National Defence College
- Experience

Bangchak Corporation Public Company Limited

 - 2020 – Present : Senior Executive Vice President, Corporate Strategy and Business Development
 - 2019 : Executive Vice President acting Senior Executive Vice President, Corporate Strategic Planning and Sustainability Development Group, and appointed to Bangchak Retail Company Limited
 - 2018 : Executive Vice President, appointed to Bangchak Retail Co.Ltd.
 - 2015 : Executive Vice President, Retail Business and Marketing Support
 - 2015 : Executive Vice President, Marketing Business
- Others
 - 2013 : Vice President, Retail Business Department, PTT Public Company Limited
 - 2007 : Deputy Managing Director, Marketing& Retail Business Support Department, PTT Retail Management Company Limited
 - 2006 : Assistant Director Dry Food Merchandise & Buying, Big-C Supercenter Public Company Limited
 - 1990 : Regional Manager – Asia Pacific Non-Oil Alliances, ExxonMobil Fuels Marketing Business
 - : C-Store Manager, Retail Marketing and Investment Retail Strategist, Network Planning, Capital/Opex and Feasibility, ESSO Thailand
 - : International Marketing, Motorola Inc., Chicago USA
- Other directorship positions / Other positions at present
 - Other listed companies
 - None
 - Non-listed companies
 - o Director, Oam Suk Social Enterprise Company Limited
 - o Director, Happiness Sharing Foundation
 - o Chairman, Winnonie Co., Ltd.
 - o Chairman, BTSG Co., Ltd.
 - o Director, Thai Special Gas Co., Ltd.
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

The person taking the highest responsibility in finance and accounting since August 1, 2009

Mr. Surachai Kositsareewong

Senior Executive Vice President, Accounting and Finance

- Age 59
- Education / Training
 - Master of Business Administration, Steton School of Economics and Business Administration Mercer University, USA
 - Bachelor of Business Administration, Chulalongkorn University
 - Director Certification Program (DCP152/2011), Thai Institute of Directors (IOD)
 - Director Accreditation Program (DAP49/2006), Thai Institute of Directors (IOD)
 - Audit Committee Program (ACP16/2007), Thai Institute of Directors (IOD)
 - CFO Certification Program, Federation of accounting professions
 - The Training Program on Structured Notes, Thailand Securities Institute
 - Frontiers in Infrastructure Finance Distance Learning Course, The World Bank Institute
 - Energy Training Program, AON
 - Executive Development Program (EDP), Fiscal Policy Research Institute
 - Intermediate Certificate Course in Good Governance for Middle Level Executives, Class 12, Public Director Institute
 - The National Defence Course Class (NDC56), National Defence College
 - CEDI BABSON Entrepreneurial Leadership Program, Babson College Wellesley, Massachusetts, USA
 - Top Executive Program, Class 23, Capital Market Academy (CMA), Stock Exchange of Thailand
 - Certificate, Program for Thai – Chinese Leadership Institute, Huachew Chalermprakiet University
 - Certificate, Program for Thammasat World Leadership Program (TWLP3)
 - Certificate, Thai Financial Reporting Standards 3 (Business Combination) (2019), EY Office Limited
 - Certificate, Thai Financial Reporting Standards 9 (Fundamental) (2019), Federation of Accounting Professions of Thailand
 - Financial Reporting Standards Program related to the operations of the group of companies (2020), KPMG Phoomchai Audit Company Limited
 - Accounting Update for the year 2021, KPMG Phoomchai Audit Company Limited
- Experience
 - Bangchak Corporation Public Company Limited
 - 2015 – Present : Senior Executive Vice President, Accounting and Finance Group
 - 2013 : Senior Executive Vice President, Accounting and Finance
 - 2012 : Acting Senior Executive Vice President, Accounting and Finance
 - 2009 : Executive Vice President, Accounting and Finance
- Others
 - 2012 – 2018 : Commissioner of the Arbitration Committee
 - 2014 – 2017 : Commissioner, The Electronic Transactions Commission
 - 2012 – 2014 : Director, MCOT Public Company Limited
 - 2012 – 2014 : Director, Government Saving Bank
 - 2007 – 2009 : Vice President (Administration) and Chief Finance Officer, Dhanarak Asset Development Company Limited

- Other directorship positions / Other positions at present
 - Other listed companies
 - None
 - Non-listed companies
 - o Director, BCPR Pte. Ltd.
 - o Director, BCPR Company Limited
 - o Director, Bangchak Biofuel Company Limited
 - o Director, BCV Bio Based Company Limited
 - o Director, BCV Energy Company Limited
 - o Director, BCV Innovation Company Limited
 - o Director, BCP Innovation Pte. Ltd.
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Company Secretary

Ms. Pakawadee Junrayapes

Executive Vice President, Corporate Compliance and Company Secretary

(Take the position of Company Secretary until January 31, 2022)

Profile details are shown in Attachment 3 Head of Compliance

Ms. Wannasiri Trongtrakulwong

Senior Vice President, Corporate Compliance and Company Secretary

(Effective from February 1, 2022, onwards)

- Age 50
- Education / Training
 - Master of Business Administration (MBA), Chulalongkorn University
 - Bachelor's Degree in Commerce and Accounting, Thammasat University
 - Financial Advisor Course, Association of Investment Management Companies
 - Director Certification Program (DCP307/2021), Thai Institute of Directors (IOD)
 - Company Secretary Program (CSP126/2022), Thai Institute of Directors (IOD)
- Experience
 - Bangchak Corporation Public Company Limited
 - 2022 : Senior Vice President, Corporate Compliance
 - 2021 : Senior Vice President, Acting as Senior Executive Vice President, BBGI Public Company Limited
 - 2016 – 2021 : Senior Vice President, Acting as Senior Executive Vice President, Accounting and Finance, Bangchak Retail Company Limited
- Others
 - 2007 – 2015 : Director and Deputy Managing Director, Avantgarde Capital Company Limited
 - 2004 – 2006 : Director of Investment Banking, Turnaround Company Limited
 - 1999 – 2004 : Manager, Deloitte Touche Tohmatsu Corporate Company Limited
- Other directorship positions / Other positions at present
 - Other listed companies
 - None
 - Non-listed companies
 - o Director, KSL Green Innovation Public Company Limited
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Accounting Supervisor

Ms. Chantip Wongchieowittaya

Vice President, Financial Accounting

(The person assigned to the direct responsibility of supervising accounting preparation and be a professional accountant charged with accounting duties with qualifications and conditions prescribed by the Notification of the Department of Business Development)

- Age 43
- Education / Training
 - Master of Accountancy, Faculty of Commerce and Accountancy, Chulalongkorn University
 - Bachelor degree of Accountancy, Faculty of Commerce and Accountancy, Thammasat University
 - Digital Transformation, Kasetsart University
 - Financial Management and Business Planning, Japan Cooperation Center Petroleum (JCCP)
 - Executive Management Development Program (EMDP), Thailand Management Association (TMA)
 - CFO Focus on Financial Reporting Class 6, Federation of Accounting Professions (TFAC)
- Continuing Professional Development (CPD) in 2021
 - Trends and Strategies for successful M&A, the Stock Exchange of Thailand (SET)
 - Summary issues to be aware of 2021 TFRS for PAEs, The Stock Exchange of Thailand (SET)
 - In 2021, completed a continuing development in accounting profession and number of hours for attending training course is in accordance with The Securities and Exchange Commission (SEC) requirement
- Experience
 - Bangchak Corporation Public Company Limited
 - 2020 – Present : Vice President, Financial Accounting
 - 2019 : Acting Vice President, Financial Accounting
 - 2017 – 2018 : Manager, Accounting Policy and Consolidation Division
- Others
 - 2014 – 2016 : Senior Manager, EY Office Limited
- Other directorship positions / Other positions at present
 - Other listed companies
 - None
 - Non-listed companies
 - o Director, Bangchak Corporation Public Company Limited Registered Provident Fund
- Shareholding in the Company : None (both directly and indirectly held) (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Attachment 2

Details of subsidiaries' directors

Subsidiary	Directors	Position
1. Bangchak Green Net Co., Ltd.	1.1 Mr. Meechai Veeravaidya	X
	1.2 Mr. Somkiat Thatrithorn	/
	1.3 Mr. Somchai Tejavanija	/
	1.4 Mr. Warakorn Kosolpisitkul	/
	1.5 Mr. Vattana Phornpatkul	/
	1.6 Mr. Preecha Sutthilertaroon	//
2. BCP Trading Pte. Ltd.	2.1 Mr. Pativat Tivasasit	/
	2.2 Mr. Kittiphong Limsuwannarot	/
	2.3 Ms. Phatpuree Chinkulkitnivat	/
	2.4 Mr. Bundit Hansapaiboon	/
	2.5 Mr. Nut Pooree	/
	2.6 Mr. Paroche Hutachareon	/

- Note:
1. As of December 31, 2021
 2. 1.3 to 1.6 and 2.1 to 2.6 directors are representative directors of Bangchak
 3. X = Chairman / = Director // = Managing Director
 4. Subsidiary is a significant subsidiary company with revenues exceeding 10% of total revenues reported in the latest annual consolidated statements of income of Bangchak.

Attachment 3

Details of Head of Internal Audit and Head of Compliance Department

Head of Internal Audit

Ms. Pornjit Sojisunsanee

Vice President, Internal Audit Department

- Age 49
- Education / Training
 - Master of Accountancy, Chulalongkorn University
 - Bachelor of Business Administration, (Accounting) (Honor), Prince of Songkla University
 - Certified Internal Auditor (CIA)
 - Certification in Risk Management Assurance (CRMA)
- Experience
 - Bangchak Corporation Public Company Limited
 - 2020–present : Vice President, Internal Audit Department
 - 2015 : Senior Manager, Internal Audit Office
 - 2011 : Manager, Internal Audit Office
- Other directorship positions / Other positions at present
 - Other listed companies
None
 - Non-listed companies
None
- Shareholding in the Company : 16,166 shares or 0.00117% directly held (As of December 31, 2021)
- Familial relationship between directors and executives : None
- Criminal records on violation of securities and futures contract laws : None

Head of Compliance Department

Ms. Pakawadee Junrayapes

Executive Vice President, Corporate Compliance and Company Secretary

- Age 60
- Education / Training
 - Master of Law, Ramkhamhaeng University
 - Bachelor of Law, Thammasat University
 - Thai Barrister at law, The Institute of Legal Education Thai Bar Association Under The Royal Patronage
 - Certificate in Business Law, Thammasat University
 - Certificate in English for Specific Careers (Law), Sukhothai Thammathirat Open University
 - Company Secretary Program (CSP34/2010), Thai Institute of Directors (IOD)
 - Director Certification Program (DCP142/2010), Thai Institute of Directors (IOD)
 - Executive Development Program (EDP2012), Ministry of Finance
 - Successful Formulation and Execution of Strategy (SFE16/2012), Thai Institute of Directors (IOD)
 - Anti-Corruption: The Practical Guide (ACPG2/2013) Thai Institute of Directors (IOD)
 - Thailand and the ASEAN Economic Community class 4/2013, King Prajadhipok's Institute
 - Advances for Corporate Secretaries, Class 2/2017, Thai Listed Companies Association (TLCA)
 - Certificate of Top Management (2017), Company cooperate with Thailand Management Association (TMA) and Duke Corporate Education (DUKE)
 - Advanced Diploma, Public Administration and Public Law, Class 17/2018 King Prajadhipok's Institute
 - Executive Program for Senior Justice class 23/2018, Judicial Training Institute
 - Boards that Make a Difference (BMD9/2019), Thai Institute of Directors (IOD)
 - IOD Open House 2020, Thai Institute of Directors (IOD)
 - Director Briefing 2021, Thai Institute of Directors (IOD)
 - Director Forum 2021, Thai Institute of Directors (IOD)
- Experience
 - Bangchak Corporation Public Company Limited
 - 2020 – Present : Executive Vice President, Corporate Compliance and Company Secretary
 - 2018 : Executive Vice President, Sustainability Development and Corporate Compliance and Company Secretary
 - 2015 : Senior Vice President, Corporate Compliance and Company Secretary, and Company Secretary
 - 2011 : Vice President, The Secretary to The Board of the Directors Office, and Company Secretary
 - 2009 : Senior Manager, The Secretary to The Board of the Directors Office, and Company Secretary
 - 2007 : Senior Manager, Legal Office
- Others
 - 2006 – 2008 : Personal Specialist of National Legislative Assembly Member and Sub-Committee on Energy

- Other directorship positions / Other positions at present
 - Other listed companies
 - None
 - Non-listed companies
 - o Director, BCPR Pte. Ltd.
 - o Director, BCPR Company Limited
 - o Director, BCP Innovation Pte. Ltd
 - o Director, Thai Listed Companies Association, Thai Institute of Directors (IOD)
- Shareholding in the Company: 18,000 shares or 0.00131% directly held (As of December 31, 2021)
- Familial relationship between directors and executives: None
- Criminal records on violation of securities and futures contract laws: None

Scope of duties

- Prepare and maintain key documents, including the Board roster, meeting notices, minutes of Board meetings and shareholders' meetings, annual reports, and reports of vested interests
- Schedule Board meetings and shareholders' meetings under the law and company regulations. Coordinate conformance to the resolutions of Board and shareholders' meetings
- Advise and support the performance of directors and the management under the law and relevant regulations
- Coordinate between the Chairman and the President and chief executive officer together with his management team, which includes coordination between Bangchak and its shareholders
- Encourage the directors, management, and employees to conform to corporate governance
- Perform other lawful tasks and Board-assigned tasks.

Attachment 4

Review of Business Asset and Asset Revaluation

Review of Business Asset

Details appear under (1.2) Business Description

Asset Revaluation

None



Bangchak Corporation Public Company Limited

Head office : 2098 M Tower Building, 8th Floor, Sukhumvit Road,
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