



## **1. Policy and Business Overview**

### **1.1 Vision, Mission, Objectives, Goals, and Business Strategies**

#### **Vision**

##### *Evolving Greenovation*

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.

#### **Objectives and Goals**

Bangchak Corporation PCL 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 2024. Below are the highlights.

## **1. Business goals**

### **1.1 Refining and Oil Trading Business Group: Elevate**

competitiveness and constantly raise the refining capacity to 120,000 barrels per day by 2024. In September this year the refinery recorded an all-time-high average output of 123,500 barrels per day. It also maximized refining efficiency and stability in tandem with the reduction of carbon dioxide. For instance, the YES-R Project phase 1-3, designed to develop yield, energy, efficiency, safety, and reliability; investigation to extend the TAM cycle period from two to three years; goal-setting to profit from refining operation improvement with the Rocket Project of no less than Baht 900 million a year by the end of 2020; and the 3Es Project (Debottlenecking Hydrocracker Unit) for higher capacity. As for the trading business, BCP Trading Pte. Ltd. (BCPT), founded in Singapore, plans to raise sales volumes through BCPT to over 250 KBD by 2024.

In addition, construction of the Enclosed Ground Flare is expected to be completed in early 2020. The main elements of consideration here are the refinery's surroundings and environmental friendliness under a modern green refinery.



**1.2 Marketing Business Group:** Drive sales through retail channels to maintain the No. 2 market share this year, while recording a maximum market share of 16.5% in September. Bangchak launched a new product, Diesel B20S, with a unique additive for the first time in Thailand. Bangchak set a target for growing this share to more than 18% by 2024 by developing quality and service standards to maximize customer satisfaction, maintaining the top Net Promoter Score (NPS) along with customer relations management in order to create brand loyalty & engagement, and developing services. At the same time, Bangchak will deliver Greenovative Experience through digitalization for service users in parallel with the image improvement of service stations for uniqueness and accommodation of modern Thai's way of life, where all live their lives while participating in sustainable stewardship of the environment. SPAR convenient stores and Inthanin Coffee outlets are growing by at least 160 branches a year, while the overseas lubricant agent base will continually be expanded.

**1.3 Green Power Business:** Bangchak develops this business through BCPG Pcl domestically and abroad by leveraging the 4Es strategies:



Expanding: Focus on growth in its core business by expanding major power plants through organic growth and inorganic growth (acquisition)

Extending: Grow business to accommodate the emerging energy business direction by entering new businesses related to the core business, including digital energy and energy storage

Enhancing: Develop and grow the potential of current power plants and internal work processes for maximum efficiency

Evaluating: Manage assets by regularly monitoring performance outcomes and review investment portfolio management for satisfactory returns.

This year BCPG grew its renewable power capacity by investing in a 69-MW hydropower plant in Chiang Kwang, Lao PDR.

**1.4 Bio-based Products Business Unit:** Constantly grow capacities for biofuels, including biodiesel and ethanol, with a 2024 capacity goal of 2.05 million liters/day (1 million liters/day of biodiesel and 1.05 million liters/day of ethanol). Also, a project to improve process efficiency and construct a glycerin refinery to become Thailand's biggest biofuel business operator and seller that is poised to develop high-value bioplastics and bio-based products. Finally, Bangchak will pursue investment opportunities in the bio-based product business by mobilizing funds on the stock exchange to strengthen its group as Thailand's leader in bio-based product business.



This year steps were taken to get the Company ready to produce and sell B10 in response to government policy and accommodate future demand.

**1.5 Natural Resources Business:** Develop the exploration and production (E&P) business and new resource business, including lithium mining.

- **E&P Business:** BCPR Pte. Ltd. was founded in Singapore for investment in OKEA ASA's petroleum deposits. Holding rights to the Draugen, Gjoa, Ivar Aasen, Yme, and Grevling oil fields and exploration rights in many fields in Norway, with an output capacity of 20 KBOED, the company successfully listed on the Norway stock exchange and has set as its goal investment growth to raise the output capacity in high-potential fields.
- **New Resource Business:** BCP Innovation Pte. Ltd. was established in Singapore to engage in businesses related to overseas innovation. Today this company has the No.2 shareholding in Lithium Americas Corp., which engages in the lithium mining business, developing two lithium mines in Argentina and the USA. In Argentina, the Cauchari Project, with a capacity of 40,000 tons/year in the first phase, is expected to come on stream by 2021.

**1.6 Organization, management, and innovation:** Bangchak strives to enhance its competitiveness and organizational management by



setting goals to become an outstanding employer, foster HR excellence, and promoting employees' joint creation of innovations in business processes and new products or business models in line with the corporate vision. Bangchak's change management through its Transformation Program aligns with the "I AM BCP" corporate values. Also, it strives to foster sustainability under the Dow Jones Sustainability Indices (DJSI), which embraces economic, environmental, and social aspects under corporate governance to ensure investors that Bangchak can yield decent, sustainable investment returns. Finally, new businesses that contribute to sustainability will be extended by Bangchak's pursuit of startup investment and R&D activities with external agencies through BiiC. This year USD 8 million was invested in bio-based businesses and USD 9 million in clean-energy businesses, including investment in Thai energy startups.

- 1.7 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 Pursuit of minimized net emission of carbon dioxide for minimal impacts on climate change (low-carbon company):**

Bangchak set a goal of minimized net emission of carbon dioxide by implementing a project on relentless refinery efficiency and resource efficiency improvement while growing its investment in alternative and renewable energy production projects that contribute to the reduction of carbon dioxide.

### **2.2 Business development hand in hand with socio-environmental development:**

Bangchak fosters sustainability by engaging in businesses that benefit the environment and society in parallel with business growth. To this end, both CSR after-Process and the creation of shared values between business, society, and the environment via the CSR/CSV in-

Process are carried out. In addition, the company sets an extended goal from CSR/CSV, that is, a social enterprise to create jobs and income while promoting among community residents environmental preservation in their respective localities. Instances are the establishment of the Bai Mai Pun Sook Foundation, promotion of farmers' quality and value development of agricultural produce for distribution via Oam Suk Social Enterprise Co., Ltd., and promotion of agricultural products exporting via SPAR distribution channels. To elaborate,



Bangchak promotes sugarcane planting to produce fresh sugarcane juice for sale in SPAR outlets, and buying of kluai namwah bananas from Northeastern, Northern, and Central Region farmers, thus adding to the income of some 4,000 households, and packaging “Kluai Imjai” bananas for giveaways at Bangchak service stations.

### **Business Strategies**

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

#### **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 we still see these businesses of Bangchak as a necessity for growing national energy demand.

#### **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.

### **3. Sustainability (S3):**

Bangchak develops related businesses that support or extend its core businesses' growth and sustainability to accommodate future technology and change, including the lithium battery business that accommodates EV car growth. Another example is the development of high-value bio-based products like bioplastics and bio-based products. In addition, Bangchak leverages innovations benefiting the environment and society via BiiC, which focuses on the pursuit of startup investment and R&D activities jointly with external agencies to relentlessly grow green and bio-based product businesses worldwide. To this end, Bangchak also established a "Bangchak WOW" model as the scope of collaboration with assorted partners in the public and private sectors covering Bangchak sites, Bangkok, and operating sites worldwide. The model embraces three main aspects. First, well-being improvement, meaning joint development of the quality of life in several aspects, including a given area's garbage management, stewardship of communities,



projects on business for the environment, development of vocational knowledge for groups of farmers, joint development of a grassroots economy, and development of community goods with expanded goods distribution channels. O stands for oxygen enhancement, meaning reforestation and tree planting, contribution to PM 2.5 reduction, and improved landscaping. W stands for water management, including joint care of rivers and canals as well as the vicinity, including the Chao Phraya River banks around Bangchak Port, Bang Krachao area, Bangchak Canal, and the mobilization of Oil spill removal vessels to aid various operations on the Chao Phraya River.

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, including bioplastics and biocosmetic ingredients. 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

Bangchak strives for output capacity rises that are friendly to the environment and safe through efficient resource consumption, particularly water and energy. It adopted the ISO 14001 and IWO 50001 management systems and the OHSAS 18001 occupational health and safety system, which is poised to turn into ISO 45001, while raising safety management through the Process Safety Management (PSM) system.

## 3. Greenovative Experience

Bangchak strives to create new experience and new-look green innovation, termed the Bangchak Greenovative Experience, to accommodate Thais' new lifestyles where all can spend their lives with sustainable environmental stewardship, including:

- **Greenovative Product:** Bangchak strives for product quality development catering to customers' needs as well as being green. Today it produces and distributes fuel products of the Euro 4 standard of the public sector while selling two kinds catering to the Euro 5 standard, namely gasohol E20s and Hi-Premium Diesel S (premium diesel), designed for modern engines and reduction of dust and smoke caused by combustion. Bangchak also develops and sells Hi-Diesel B20s for sale to customers in the transport truck group and Hi-Diesel S B10, a green product supporting oil palm growers. As for the non-oil business, Bangchak values the environment, as in Inthanin Coffee's concept of "Each of your Inthanin cups for our world". So far,



several projects have evolved, including Bangchak's pioneering use of 100% biodegradable cups, tilted cup lids instead of straws, now adopted as standard by all branches, and choice of organic coffee beans derived from community farms of farmer groups in northern provinces. Projects regarding convenient stores include one to cut down on the use of plastic bags, processing fruits for sale in SPAR outlets, and the SPAR Awards project of community product development and SME businesses that are built on for domestic sale and overseas sale.

- **Greenovative Service Station:** A new look will be given to Bangchak service stations, developed for a unique identity through the 4Rs process (renewable, recycle, reuse, and reduce). To elaborate, a solar rooftop was installed at the Bangchak – Si Nakharin service station for solar power generation and power bidding with the Blockchain technology, also known as the Green Community Energy Management System (GEMS); expansion of service stations equipped with EV chargers; water-saving by using rainwater and reusing water to water trees; use of energy-saving equipment; addition of green, lush areas and installation of amenities, including toilet designs catering to seniors and the handicapped; and finally, automatic inflators for greater service convenience in the march toward The Most Admired Brand.
- **Greenovative Mind** – ICT systems compile customers' data to develop services for speed and efficiency; member database development; more extensive installation of the Point of Sale Automation System at service stations; application development



to facilitate customers' application usage, including the operator customer group, for whom the Application BCP Link system was developed, as was the Auto Ordering System (AOS). As for customers at large, a Mobile Application system was developed for basic application suiting customers' needs and addition was made to the privileges of the BCP Green Miles card.

- **Greenovative Communities** – This concept gives customers experience as part of social and environmental assistance while upholding good cultures, including the giving away of surplus agricultural products to customers or the drive to sell green products, the hiring of the handicapped, and the BCP Roadside Assistance Project development to give motorists preliminary help at Bangchak service stations, including jump start and backup tire replacement, and finally, the development of a project on organic vegetables at service stations, meant to bring a better quality of life to station attendants while giving surplus vegetables to customers.

#### 4. **Green Society**

This is a consistently implemented strategy evident in Bangchak's stewardship of the environment and its participation in developing the quality of life of Thai society through projects promoting and extending overall social development work for better lives. This move relied on the King's Philosophy and innovation, while new projects are undertaken with skillful external networks to grow Bangchak's social activities to match the requirement for sustainable national development. The work of the past year resembled a social lab for efficient work tools to jointly measure



results of development guidelines that relied on engagement and implosion of communities. To begin with, Bangchak investigates the foundation of society—education—and the extension and promotion of farmers and the new generation's participation in the development of goods and services by leveraging innovation and technology to raise national competitiveness and expand on the concept of business growth for sustainability and happiness—termed the Green Impact. Target groups have been diversified. For instance, the youth group, to drive the country one day; farmers and agricultural cooperatives, the majority of the Thai population; the startup and social group, which is a business group of the new generation that brings change and contributes to national development in assorted aspects while addressing the UN SDGs through assorted activities: Ruam Patthana School for a Better Educational Future, a contest of goods and the Green Impact Click ... Overhaul the Country Project (an online social project), the Kasettakorn Pan Suk model, and the march toward dissemination of the Synthetic Biology (SynBio) innovation, which is seen to overhaul business in the future.

## **1.2 Transition and milestone development**

### **2019**

#### **Refinery and Oil Trading Business Group**

- **All-Time High monthly refining throughput of 123.5 KBD**

The Refinery Business returned to normal with a full-steam refining throughput after a partial shutdown for equipment repair in the first half of the year. The average production hit a record high of 123.5 KBD in September, the peak since the commissioning of the



Hydrocrack Unit. Note that the healthy GRM supported a high production capacity, which at the time corresponded to the rise in refined product sale through the Marketing Business.

### **Marketing Business Group**

- **No. 2 market share maintained with a new record of 16.5% and more successful B20 sales in September**

The Marketing Business maintained Bangchak's No. 2 market share nationwide while achieving a new high of 16.5% share in September. It also registered resounding success in B20 sale through the retail market.

- **Bangchak grabs No.1 NPS Score**

Bangchak proudly reported that its customers had ranked it at the top out of the 2019 assessment of the Net Promotion Score.

### **Green Power Business**

- **In April, BCPG puts 10-MW Lom Ligor wind power facilities in Nakhon Si Thammarat on commercial production**

Lom Ligor Co., Ltd., a subsidiary of BCPG PCL, began commercial production (COD) and distribution of 10 MW to the Provincial Electricity Authority (PEA) on April 11. The contract with PEA calls for distribution of 8.965 MW for 25 years, with Baht 3.5/unit in adder to the base electric tariff for 10 years.



- **BCPG Indochina PCL, a BCPG subsidiary, acquires all shares of Nam San 3A Power Sole Co., Ltd., to invest in LPDR's hydropower project**

In September, BCPG Indochina PCL, a BCPG subsidiary, invested in a hydropower project in Laos with an installed capacity of 69 MW. This was 100% acquisition in Nam San 3A Power Sole Co., Ltd. ("Nam San 3A"), worth up to USD 174 million (Baht 5.532 billion). Nam San 3A had won a Build-Operate-Transfer concession for the development and operation of power plants under a take-or-pay contract with Electricite du Laos for 27 years, effective from January 2016.

### **Natural Resources and Business Development Business**

- **In January, BCP Innovation Pte. Ltd. approve recapitalization from USD 42 million to USD 45 million**

The Extraordinary General Meeting of the Shareholders (EGM) approved the recapitalization of this company from USD 42 million (42 million shares at USD 1 per share) to USD 45 million (45 million shares at USD 1 per share). The shares were paid up in full.

- **OKEA ASA ("OKEA") offers 15 million IPO shares on Oslo Stock Exchange in June**

OKEA ASA ("OKEA") offered IPO shares at 21 Norway Krone each, enabling the company to now command 101,839,050 shares of fully paid-up registered capital. Bangchak currently holds 47,477,563 shares, or 46.52% of OKEA's registered capital.





### **Bangchak Initiative and Innovation Center (BiiC)**

- **In January, BiiC invests in Enevate Corporation startup from the USA to extend investment in green power**

Bangchak, through the Bangchak Initiative and Innovation Center (BiiC), engaged in additional startup investment through BCP

Innovation Pte. Ltd., Bangchak's subsidiary. The California, USA, company is called Enevate Corporation, a renowned company with proficiency in lithium battery production for EVs. Thanks to its advanced innovation, energy charging is made 10 times faster.

- **BiiC invests in Bonumose startup from the USA to build on its bio-based business in April**

Bangchak, through BiiC, engaged in additional startup investment through BCP Innovation Pte. Ltd., Bangchak's subsidiary, in Bonumose, an expert in sugar production from high-starch plants, a high-potential technology that can add value to agricultural produce and extend Bangchak's bio-based business.

### **Corporate**

- **Bangchak's perpetual bonds worth Baht 10 billion warmly received in October**

On October 18, 2019, Bangchak successfully offered perpetual bonds worth Baht 10 billion, rated at BBB+ by TRIS Rating, with an A corporate rating and a stable outlook. The interest rate is 5.00% for the first five years. Investors showed remarkable interest, which



made Bangchak decide to increase the volume from Baht 6 billion to Baht 10 billion, the greenshoe option being worth Baht 4 billion. This success was attributed to investors' confidence in Bangchak, enabling it to mobilize funds as planned at a suitable cost of funds.

○ **In November, Repurchase of treasury stocks of up to Baht 2.1 billion approved**

Bangchak's Board of Directors Meeting No. 11/2562 of November 21, 2019, approved a project for repurchasing treasury stocks worth up to Baht 2.1 billion, about 5.00% of all sold shares. The purchase will take place on SET for six months from December 6, 2019, to June 5, 2020.

## **Awards of 2019**

- Awards from the SET Awards 2019 event, organized by the Stock Exchange of Thailand (SET) and the Money and Banking Magazine:
  - **Sustainability Excellence Award of Honor** for having won the Best Sustainability Award for three consecutive years. Bangchak is recognized as an inspiring role model for its sustainable business performance.
  - **Best Innovative Company Award** from the Green Community Energy Management System (GEMS), for the green community management system used at Bangchak service stations.



- **1 in 98 Thailand Sustainability Investment (THSI) listed companies** for the fifth consecutive year. The Company has applied environmental, social and governance measures to help develop a sustainable business, with sustainable management mechanisms to provide investors with a choice of a quality portfolio with a long-term returns option.
- **Thailand Corporate Excellence Awards 2019 and SMEs Excellence Award**, presented by the Thailand Management Association (TMA) and SASIN Graduate Institute of Business Administration of Chulalongkorn University:
  - **Leadership Excellence**
  - **Innovation Excellence**
  - **Sustainable Development.**
- **Prime Minister's Industry Award 2019, Outstanding S-Curve Industry.** This award honors innovative and diligent companies that contribute to Thailand's industrial development, serving as role models for industrial enterprises to achieve the 10 S-Curve targeted industries as part of the mechanism to drive Thailand's new economy through increased productivity based on technology and innovation, presented by the Ministry of Industry.
- **Board of the Year Awards 2018** for the seventh consecutive year, Silver Prize for listed companies with market values of Baht 30 – 100 billion. The award is given to effective boards with best governance practices, generating good returns for investors while looking after all stakeholders, presented by the Thai



Institute of Directors (IOD) in cooperation with SET, the Board of Trade of Thailand, the Federation of Thai Industries (FTI), the Thai Bankers' Association, the Thai Listed Company Association, and the Federation of Thai Capital Market Organization.

- **Thailand Energy Award 2019, Best Practices, Renewable Energy Project**, Off-Grid (Power) Category. The prize honors Bangchak's Green Community Energy Management System (GEMS), a form of futuristic power purchase, and the smart service station system installed at Bangchak Service Station, Srinagarindra Road, for being an exemplary and an outstanding enterprise that promotes energy conservation and renewable-energy development in Thailand. The award was presented by the Department of Alternative Energy Development and Efficiency.
- **ASEAN Energy Award 2019**, Energy , Off-Grid (Power) Category. The prize honors Bangchak's Green Community Energy Management System (GEMS), a form of futuristic power purchase, and the smart service station system installed at Bangchak Service Station, Srinagarindra Road, at the The 37th ASEAN Ministers on Energy Meeting event.
- **Thailand Enterprise Innovation Award 2019** for the BIG-D (BCP is Going Digital), a digital transformation project arising from the vision of the Company's executives that emphasizes the use of green technology and digital technology through energy innovations to promote and expand business in line with



organizational strategies. As a result, the systems and processes in the Company became simplified, faster, and smarter for business in the digital economy age. The award was presented by the Department of Digital Economy (DEPA).

- **Thailand Quality Class (TQC) 2018** for quality organizational management and for passing assessment in leadership, strategy, customers, evaluation, knowledge analysis and management, personnel, operation and outcome. The TQC was awarded by the Office of Thailand Quality Award and the Thailand Productivity Institute.
- **CAC Change Agent Award.** Bangchak was one of the five companies recognized for their emphasis on promoting systematic anti-corruption practices in private businesses by joining the CAC Change Agent Program. Bangchak also ensures that its supply chain is transparent and free of corruption by persuading more than 10 its SME suppliers to join the CAC SME Certification program in the past year. The award was presented by CAC.
- **The Global Good Governance (3G) Awards 2019** by Cambridge IFA, an international financial advisory in the UK:
  - **The 3G Best CSR Award 2019** for the second consecutive year for outstanding corporate responsibility
  - **The 3G Best Green Initiative Award 2019** for outstanding performance in new, eco-friendly projects.



- **9<sup>th</sup> Asian Excellence Recognition Awards 2019** with votes and opinions from readers of magazines, investors, analyses, etc., organized by the Corporate Governance Asia (Hong Kong) Magazine:
  - **Best Investor Relations Company** for the eighth consecutive year, awarded to outstanding companies in investor relations
  - **Asia's Best CEO (Investor Relations)** for the fourth consecutive year, awarded to the CEO
  - **Asia's Best CFO (Investor Relations)** for the second consecutive year, awarded to the CFO
  - **Best Investor Relations Professional (Thailand)** awarded to outstanding personnel in investor relations.
- **Platinum ESG Award** for the sixth consecutive year, awarded to outstanding companies in social and environmental responsibility with good governance at the Asset ESG Corporate Awards 2019 event, organized by the Asset (Hong Kong) Magazine.
- **Sustainability Disclosure Award** presented to enterprises that sustainably discloses information to the public and concerned stakeholders with completeness, credibility, and communication. The award was presented by Thaipat Institute and the Securities and Exchange Commission (SEC).
- **Superbrands 2018**. Superbrands are selected for brand quality, brand affinity, and brand personality through the voting of 15,000 consumers, market experts in brand building and public relations, and independent directors of Superbrands. The awards were



presented by Superbrands Thailand, an agency internationally recognized as an assessor of excellence in brand-building.

- **MAT Silver Award 2019** for its automobile and chemical industry's "Payback on the Day of Gasoline Price Hike" privilege campaign for members. The award was presented by the Marketing Association of Thailand in honor of outstanding innovative Thai marketing campaigns with significant measurable results.
- **Honorable Mention for Thailand HR Innovation Awards 2019** for the Employee Holistic Health & Wellness Project and the HR Digital Platform – Smart ME Projects. The award was presented jointly by the Thailand Productivity Institute, School of Human Resource Development (National Institute of Development Administration), Institute of Human Resource Professional Development, and the Personnel Management Association of Thailand.
- **Gold Award (Highest Level)** for Bangchak's QCC group of the Quality Analysis Division's international presentation at the International Convention on Quality Control Circle (ICQCC 2019), organized by the Ministry of Industry and the Union of Japanese Scientists and Engineers (JUSE) to promote quality work in the Asia-Pacific countries. More than 300 projects were presented by agencies from 19 nations, such as Japan, Canada, Korea, Malaysia, and India.



- **3 Star Award (Highest Level)** for Bangchak's QCC group of the Engineering and Project Operation Division's international presentation at the Asia Pacific Quality Organization International Conference (APQO 2019), organized by the Indonesia Quality and Productivity Management Association (IQPMA) and Wahana Kendali Mutu (WKM) to promote quality work in the Asia-Pacific countries. More than 120 projects were presented by agencies from 19 nations, such as Indonesia, Japan, Malaysia, and India.
- **Water Footprint Certification for Company products.** Six Bangchak products earned certification for their water footprints through the Water Footprint of Products Program. Bangchak was the first oil refinery in Thailand to have been certified by the program for its efficient and cost-reducing water management process that also contributes to increased capacity for competition, emphasizing sustainable development. The certification was done by the Sustainable Water and Environment Institute, FTI.
- **Suriyasasitorn Award, 2019.** Bangchak Corporation won this award from over 200 contest entries for its notebook calendar in the category of current social and environmental encouragement. The calendar was made from recycled wood scrap, whereas the recycled Green Offset notebook paper was eyesight-friendly. No plastic was used, and the entire notebook calendar was biodegradable. This award was organized by the Public Relation Society of Thailand.





- **ISO 50001:2018 Certification (Energy Management System)**  
**ISO 45001:2018 Certification, TIS 18001:2011 (Occupational Safety and Health System) and ISO 14001:2015 (Environmental Management System)**

For Bangchak Refinery and Bangchak Oil Distribution Center, which focus on capacity building for international standards and reduce risks in all aspects (occupational safety, health, and energy) so that all employees can work within a good and safe environment while conserving energy and reducing greenhouse gas emissions. **Bangchak was the first company in Thailand to have received the ISO 50001:2018 certification and the new ISO 450001 :2018 certification** for both the refinery and oil distribution centers in Bangchak and Bang Pa-in.

- **Certificate authenticating the carbon label** for product carbon footprint with verification by Kasetsart University. Bangchak has also received approval for authenticated carbon labels for four products as part of the campaign to promote the use of product carbon footprint labels. The process will grant the consumer access to the carbon emission data of each product for consumer decision-making, which will also promote competitiveness of the Thai industry in the global market. The certificate was presented by the Thailand Greenhouse Gas Organization (TGO).
- **Outstanding Toilet Standard** for Bangchak service station, Onnuj 55, Sukhumvit 62 branch, and the Kanchanaphisek branch from the Annual Super-toilet Competition, designed to develop



sufficient numbers of clean public toilets and reduce risk of being breeding grounds for infectious diseases. The award was presented by the Bangkok Metropolitan Administration (BMA).

- **Commemorative Shield** presented for distinguished 100% participation under the Partnership School Project, as an agency that promotes education and continuous activities for Bang Namphung School, organized by the Basic Education Commission.
- **Commemorative Shield** for supporting the development of the new FTI office, which will serve as the hub for driving Thai industries, with smart offices and smart service under the “Infinite Power of Unity” concept.
- **Declaration of Intent to be a Good Governance Organization for Road Safety** in partnership with government, private, and civil society sectors for campaigning to reduce road accidents. Bangchak has jointly campaigned with the Don't Drive Drunk Foundation and Daily News newspaper to reduce risk in petroleum transport, ensuring safety on roads and cutting down fatal accidents by enforcing four measures in petrol transport: Don't Drive Drunk, driving within legal speed limits, no jumping of red lights, and carrying load within capacity.
- **Results of Assessment Survey of Good Governance Report for Listed Companies:** “Excellent” score for the 13<sup>th</sup> consecutive year. The survey was conducted by IOD.
- **Results of Quality Assessment for AGM: 100 points** and listed as “Excellent” for the 11<sup>th</sup> consecutive year in participation of the



AGM Quality Assurance evaluation. The evaluation was conducted by IOD.

## **2018**

- The Refinery Business has achieved an average monthly output of 123 KBD.
- Bangchak Refinery successfully completed its 45-day major turnaround under its annual refinery maintenance plan from April 30 to June 13.
- Bangchak Retail Company Limited signed a contract granting master franchise rights of Inthanin Coffee Shop in Kingdom of Cambodia and Lao People's Democratic Republic to RCG Retail Co., Ltd. (Cambodia).
- Launching a New Membership Card "Bangchak Green Miles" and Developing Bangchak Mobile Application
- Launching the First Digital Overhead Service Station in Thailand
- Commercial Operation of Gotemba Solar Power Plant (Gotemba) in Shizuoka Prefecture, Japan
- Acquiring Common Shares of Lomligor Co., Ltd.
- Launching Commercial Operations of Two Solar Power Projects with the War Veterans Organization of Thailand
- Commercialization of Nikaho and Nagi Assets
- Establishment of BCPR Co., Ltd., for Petroleum Development and Production in Norway
- Selling Shares in Nido Production (Galoc) Pty. Ltd. with Tamarind Galoc Pte. Ltd.



- Launching the Green Community Energy Management System (GEMS)
- Establishment of 4 New Subsidiaries in Thailand to Invest in Start-up Businesses

## **2017**

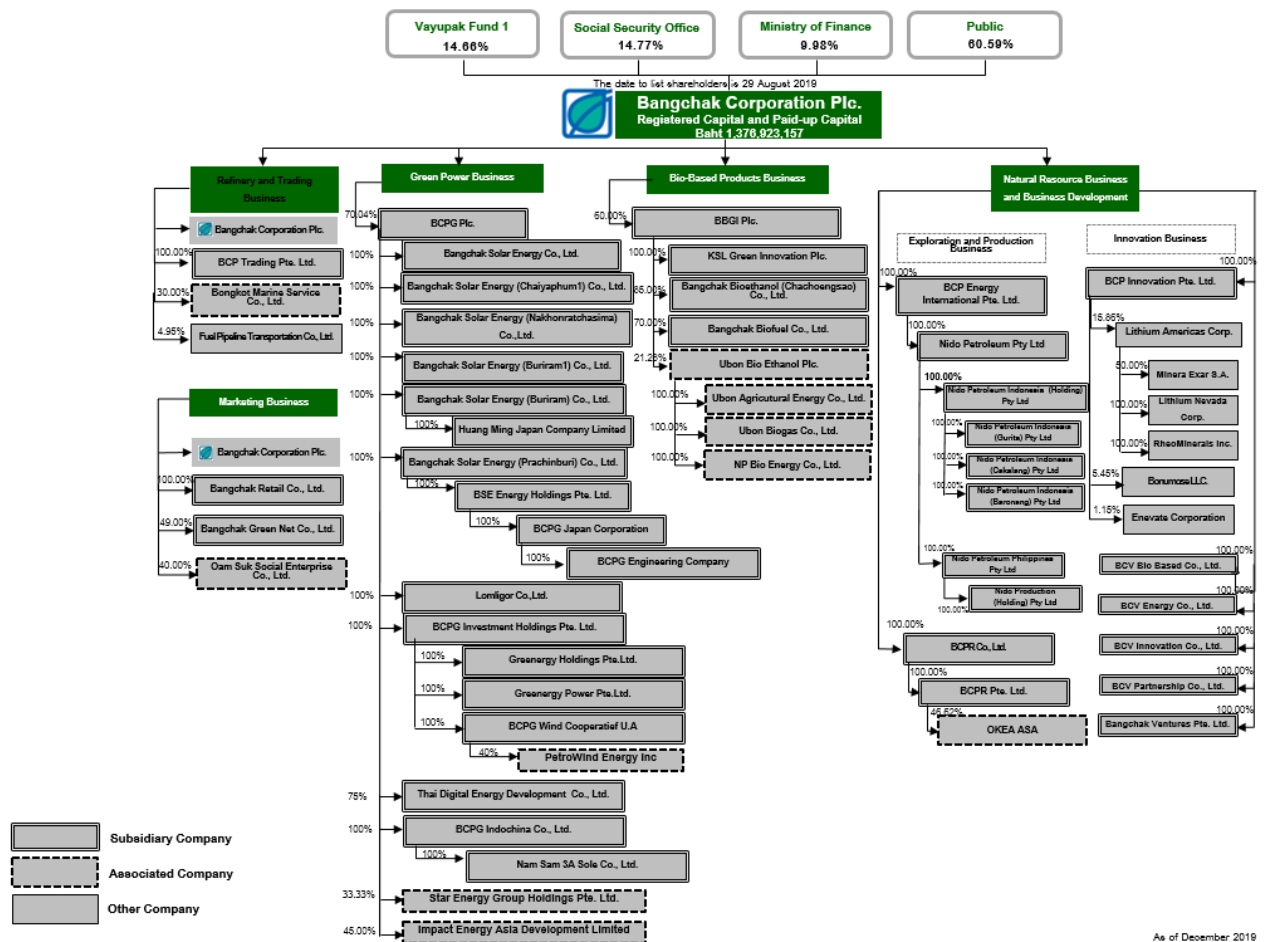
- Bangchak Petroleum renamed “Bangchak Corporation” and Head Office relocated.
- Happiness Sharing Foundation founded.
- In March, Refinery Business has achieved peak monthly output of 121.6 KBD: an all-time high.
- Electricity generation and steam production commenced from GTG-3 in August.
- In June, began storing crude oil on the Floating Storage Unit (FSU)
- In May “Hi Premium Diesel S” unveiled
- Marketing Business Continues with No.2 Market Share with Higher Net Promoter Scores.
- In November, launched premium-grade lubricant “FURiO”
- Solar Power Plant Nagi in Okayama, Japan, started commercial operation in March.
- Three solar farms under solar cooperatives program came into contracted commercial operation in March.
- BCPG purchased total interest in CapAsia ASEAN Wind Holdings Cooperatief U.A., with 40% shares of PetroWind Energy Inc.
- BCPG invested in geothermal power plant in Indonesia through acquiring 33% of issued and paid-up shares of Star Energy Group Holdings.
- BCPG and War Veterans Organization of Thailand signed MOU on concession agreement for solar projects in September.
- BCPG joined with Sansiri to develop smart green communities in November.
- BCPG joined with Power Ledger, Australia in December.
- BBP Holdings Limited established in March.



- o Amalgamation between BBP Holdings and KSLGI to form BBGI, Thailand's largest biofuel manufacturer and distributor in October.
- o More new shares for more investment in LAC Acquired
- o MOU signed with AIT on technical cooperation on R&D to enhance environment supporting startup companies.
- o Launch of Bangchak Initiative Innovation Center as technology business incubator in September.

### 1.3 Shareholding Structure

#### Equity Chart of Bangchak Corporation Plc and Other Companies



#### Refinery and Oil Trading Business Group

The complex refinery of Bangchak operates with a nameplate capacity of 120,000 barrels per day (120 KBD). The majority of the outputs are gasoline and diesel. The quality of its gasohol and diesel products meets



the public sector's Euro 4 standard. Bangchak focuses on energy stability in its processes by using electricity and steam derived from its cogeneration power plant while replacing fuel oil with cleaner-burning natural gas. It raises the efficiency of its refining processes with the implementation of its 3E, YES-R and Rocket Projects.

**BCP Trading Pte. Ltd. (BCPT)**

Incorporated in Singapore with a registered capital of US\$1 million wholly owned, BCPT engages in commodity trading including crude oil, petroleum products, petrochemicals, other chemical products, and other downstream businesses.

**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)**

With a registered capital of Baht 3.66 billion, in which Bangchak holds 4.95%, 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 was completed in 2019, and the remaining segment to Lampang is under construction.

### **Marketing Business group**

The Marketing Business Group sells fuels and lubricants to consumers through Bangchak's network of 1,201 service stations nationwide, made up of 589 standard and 612 community service stations, as of December 2019. To provide convenience to customers, the stations offer supplementary (non-oil) businesses under the operation of Bangchak Retail Co., Ltd., which also distributes products to industrial users together with the transport, airlines, vessels, construction, and agriculture sectors.

#### **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 800 million in registered capital. BCR engages in the food and drinks business to accommodate continuous growth in the retail business. BCR has been given the Master Franchise of the SPAR supermarket brand of the Netherlands and now has 46 retail outlets under the SPAR brand and 600 Inthanin coffee shops.



### **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 Energy Business**

Bangchak invests in the renewable-power business by holding 70.04% 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)**

Incorporated with a registered capital of Baht 10 billion, BCPG engages and invests in the green power business (domestic and overseas). At the end of 2019, BCPG's capacities are 404 MW.

### **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 Plc. (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. It was transformed from BBGI CO., Ltd., to BBGI Plc. In April 2018, when the registered capital was increased to Baht 3.615 billion by issuing 216.6 million recapitalization shares at Baht 5 per share for public offering. Bangchak holds 60% shares in this largest biofuel producer and distributor in Thailand, which has a total capacity of 2,000,000 liters a day, comprising 1 million liters a day of ethanol and 1 million liters a day of biodiesel. The three subsidiaries of BBGI are Bangchak Biofuel, Bangchak Bioethanol – Chachoengsao, and KSL Green Innovation; the lone associated company is Ubon Bio Ethanol.

### **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 Plc. (KGI)**

KGI is wholly owned by BBGI with a registered capital of Baht 610 million. It engages in the production and distribution of ethanol based on molasses derived from the sugar manufacturing process. KGI's two ethanol manufacturers now operate with a total capacity of 450,000 liters per day: 300,000 liters per day from a plant in Amphoe Bo Phloi, Kanchanaburi, and the other 150,000 liters per day from a plant in Amphoe Nam Phong, Khon Kaen. Moreover, KGI's biogas power plant generates power from the biogas derived from wastewater treatment from the ethanol process.

**Ubon Bio Ethanol Co., Ltd. (UBE)**

UBE was incorporated with a registered capital of Baht 3.91 billion, in which BBGI holds 21.28%. 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 Business Development Business**

This business group, one of Bangchak's five core businesses, is in charge of the development of upstream petroleum businesses and battery energy storage systems, namely the petroleum exploration and production (E&P) business and the lithium mining business. Bangchak founded BCPR Co., Ltd., in Thailand, and BCPR Pte. Ltd. Together with BCP Energy International Pte. Ltd. In Singapore, to engage in the petroleum E&P



business and founded BCP Innovation Pte. Ltd., in Singapore, to engage in the lithium mining business.

**BCP Energy International Pte. Ltd. (BCPE)**

Wholly owned by Bangchak and established in Singapore with a registered capital of US\$112.5 million, BCPE engages in foreign energy, petrochemical, and natural resources businesses and now wholly owns Nido Petroleum Pty. Ltd. Through common share purchase.

**Nido Petroleum Pty. Ltd. (Nido)**

Nido holds right in the West Linapacan field under development along with rights in fields under exploration, namely SC6B, SC14D, SC54A, SC54B, SC58, and SC63, all in the Philippines.

**BCP Innovation Pte. Ltd. (BCPI)**

BCPI, wholly owned by Bangchak, was incorporated in Singapore with a registered capital of US\$53.3 million, as of June 30, 2019, to engage in the lithium mining business and related investment. Today BCPI owns 15.86% shares in Lithium Americas Corp.

**Lithium Americas Corp. (LAC)**

Listed on the Toronto Stock Exchange, Canada, and the New York Stock Exchange, USA, LAC engages in the lithium mining business to produce lithium carbonate an essential raw material for batteries.

LAC is developing two lithium mines in Argentina and the USA. The Argentina project is under the development of Minera Exar S.A., and lithium carbonate production is expected in 2021 with a capacity of 40,000 tons per year, whereas the USA lithium mining project is under development.



### **BCPR Co., Ltd.(BCPR)**

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 engages 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 AS, 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 US\$ 18.2 million as of June 30,2019, and is wholly owned by BCPR Co., Ltd. The company engages in foreign energy, petrochemical, and natural resources businesses and currently invests in OKEA AS, which engages in local petroleum exploration, development and production in Norway.

### **OKEA AS**

OKEA AS, incorporated under the laws of Norway, engages in Norway's petroleum exploration, development and production. BCPR Pte. Ltd., Bangchak's subsidiary, holds 46.52% of OKEA AS. OKEA AS holds the right in Draugen, Gjøa, Ivar Aasen, Yme, and Grevling Oil Fields, as well as the exploration rights in several other fields in Norway and has been the operator of Draugen and Grevling Field.



### **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. In 2018, Bangchak set up four more venture-capital companies to engage or jointly invest in 10 domestic startup businesses, or both, promoted by the government along with a Singapore-formed subsidiary.

#### **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 20 million to engage in the venture capital business for funding domestic startups relating to innovation.

#### **BCV Partnership Co., Ltd.(BCVP)**

BCVP, 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 innovation in collaboration with the public and private sectors.



**Bangchak Ventures Pte. Ltd. (BCV)**

This wholly-owned Bangchak subsidiary was formed in Singapore with a registered capital of US\$100,000 as of December 31, 2019. Bangchak Ventures engages in joint-venture capital for startups involving innovations.



## **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 1,000 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 (with a refining capacity of 120,000 barrels per day)



### **Refining and Oil Trading Business Group**

Bangchak Refinery is a modern complex refinery with a nameplate capacity of 120 KBD. It can produce a large volume of premium gasoline and diesel. Gasohol and diesel from Bangchak Refinery are certified by the government as Euro 4 Standard-compliant. Its refinery is the first in Asia that produces eco-friendly Gasohol E20 to meet the Euro 5 Standard with less than 10 parts per million (ppm) of sulfur or five times lower than



the Euro 4 standard. Bangchak also focuses on improving process energy stability by using electricity and steam from a cogeneration power plant, using more environmentally friendly natural gas in place of fuel oil, and enhancing the efficiency of refining processes with the 3E and YES-R projects. To enhance its production capability, Bangchak launched assorted projects to raise outputs and improved operation for optimal benefits amid the volatility of oil prices and doldrums of the world economy. To this end, below are Bangchak's management actions.

- Instituted management by stressing caliber improvement and business opportunity development, cost reduction and expense-saving, ranging from crude oil supply sourcing, production processes, oil tanks, oil intake/offtake pipes, to oil vessels, for efficient refining. This year's average output stood at 112.6 KBD, with shutdowns due to equipment repair and catalyst replacement at the hydrocracking unit. Once refining returned to normal, Bangchak set an all-time high at 123.5 KBD of throughput in September.
- Planned crude oil procurement and purchase for suitable GRMs, leveraging roll-month derivatives to lower costs, thus resulting in the year's average GRM of USD 5.41 per barrel.
- Carried out projects including the Continuous Catalyst Regeneration Unit (CCR), Debottleneck Hydrocracker Unit (HCU), and reliability improvement of the cogeneration power plant to raise the refining capacity and improve related processes for greater flexibility in line with market needs,





achieve cost-saving for fuels, and achieve power security for refining processes.

- Constantly developed the oil trading business through BCP Trading Pte. Ltd., stressing growth in out-out trading (meaning securing overseas oil supply for sale to overseas customers), for which the main traded products were gasoline, crude oil, fuel oil, and naphtha. In addition, it has grown the trading market to new business partners, including new groups of countries like Australia and the USA; traded new products in the market, including MTBE; generated more income from logistics management and freight trading; and fostered good relations with suppliers amid favorable market conditions, thus raising traded volumes.



## Marketing Business Group

In 2019, some 79% of refined products were sold to customers directly through Bangchak's service stations networks. There are 1,201 Bangchak service stations in Thailand: 589 standard service stations and 612 agriculture cooperative service stations (as of December 2019). Most of the new service stations launched this year are spacious with a modern



image, designed with a unique identity and complete with non-oil businesses and assorted service to constantly grow Bangchak's market share and maintain it at No.2 nationwide. Sales also went to industrial and transport users, airlines, marine vessels, construction and agricultural sectors. Bangchak service stations focus on green, renewable fuels with high performance, embracing the gasohol and diesel groups. The stations also meet customers' needs with non-oil businesses and auxiliary services to attract more service station clients, including convenient stores, coffee shops, and centers for lubricant replacement and car wash.

This year, developing the B20 and B10 diesel, Bangchak was the pilot company that blended additives in B20 biodiesel, called Hi-Diesel B20s and Hi-Diesel S B10, featuring the Green S technology that protects and cleans engines while improving engine acceleration. As a result, Bangchak topped the market in cumulative B20 sales for January to December 2019.

As for the convenient store and coffee businesses, these are operated by subsidiary Bangchak Retail Co., Ltd. (BCR), which has obtained the master franchise of the SPAR supermarket from the Netherlands. Today SPAR stores number 46. With a concept of "The Best Fresh & Easy Foods Market in Thailand", SPAR outlets offer impressive services along with freshly cooked and healthy food; SPAR plans to develop community products and SME businesses for sale domestically and abroad. The over-600 Inthanin Coffee shops, located on the premises of Bangchak service stations as well as outside, including shopping centers, office buildings, government agencies, hospitals, and leading education institutions, are



constantly eyeing assorted key commercial locations. Besides BCR's businesses, Bangchak sells consumer products at "Bai Chak", "Lemon Green", and "Big C Mini" convenient stores on the premises of more spacious service stations near some 137 communities. Finally, service stations also house auto-maintenance centers that provide lubricant replacement and car wash services, consisting of "FURiO Care", "Wash Pro", "Green Serve", "Green Wash", and "Green Tyre".

Launched in 1990 under a project called "Oil for Rice, Bangchak community service stations have moved into the 30th year of business with community entities. Bangchak's policy envisages development for sustainability by raising these stations' quality standards as well as service standards on a par with other standards so that these stations may drive a sustainable community economy. In 2019 Bangchak proceeded with assorted projects in support of community service stations, including the COOP Coaching, where teams from standard service stations educate staff in-house on management, COOP Bonding, in support of service station improvement and adding to the diversity of products for sale to high-potential cooperative groups, and a project to drive sales volumes under the vision to develop business in a participatory, sustainable way.

Recognizing social transformation and modern Thai lifestyles, Bangchak has developed the "Greenovative Experience" service stations, leveraging 4Rs (renewable, recycle, reuse, and reduce), including installation of solar rooftops for power generation and EV charger stations for electric vehicles. As for the coffee business, Inthanin operates under the "Each of your Inthanin cups for our world" concept. To date several projects have



been developed, including the choice of Bio Cups, use of organic coffee beans derived from community farms of farmer groups in northern provinces, and design of tilted cup lids to cut down on the use of straws. As for convenient stores, projects have been launched to cut down on the use of plastic bags, fruit processing and sale in SPAR outlets, the SPAR Awards Project for community product development and SMEs for business extension and sale domestically and abroad, application of energy-saving materials, and the addition of green areas at service stations. Since 2018, Bangchak has launched an ultra-modern service station with overhead digital fuel dispensers on Sukhumvit 62 Road for greater customers' convenience, while launching innovation at its Si Nakharin Road service station, featuring an installed Green Community Energy Management System (GEMS), designed to pioneer power bidding through Blockchain; in the future this could evolve into a power generation system outside the authority's grid (Smart Isolated Microgrid) for buildings and shops in the vicinity to trade maximum power at a low cost.

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, sold to domestic markets via its service stations, outlets, industrial works, original equipment manufacturer (OEM) markets, as well as exported.

Finally, Bangchak also launched premium lubricants under the FURiO brand that saves on fuels, prevents engine wear, and protects engines under all operating circumstances.



## Bio Based Products Business Unit

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.

In late 2017 Bangchak produced merger acquisition between BBP Holding Co., Ltd. (a subsidiary) and KSL Green Innovation Pcl (a subsidiary of Khon Kaen Sugar Industry Pcl), resulting in BBGI Co., Ltd., which in turn registered transformation into BBGI Pcl in April 2018, in which Bangchak held 60% shares. BBGI engages in the production and sale of biofuels as Thailand's largest player. Its subsidiaries and associates command a total capacity of 2 million liters/day (1 million liters/day each for ethanol and biodiesel). Three BBGI subsidiaries and one associated company 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; commercial operation is due in Q3/2020.

- **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). In 2019, KGI's capacity totaled 148.50 million liters/year.
- **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.



## **Green Power Business**

Today Bangchak invests in the green power business via BCPG Pcl, a subsidiary formed to engage in the generation and distribution of power from renewables and new forms of clean energy in Thailand and abroad. As of yearend 2019, BCPG commanded 404 MW in total commercial capacity, made up of the following projects:

- Solar farms in Thailand, with 139.0 MW in commercial operation (including solar rooftops)
- Solar farms in Japan, with 14.7 MW in commercial operation
- Wind power facilities in the Philippines, with 14.4 MW of equity capacity
- Geothermal power plants in Indonesia, with 157.5 MW of equity capacity
- In 2019, BCPG completed the construction of the Lom Ligor Wind Power Project in Nakhon Si Thammarat with 8.97 MW in commercial operation since April 2019
- In September 2019, BCPG engaged in renewable energy expansion by investing in a hydropower plant project in Chiang Kwang, Lao People's Democratic Republic, with a capacity of 69 MW.





### **Natural Resources Business**

- **Exploration and Production Business:** Bangchak formed BCPR Pte. Ltd., in Singapore to invest in OKEA ASA, which holds rights in the Draugen, Gjoa, Ivar Aasen, Yme, and Grevling oil fields together with exploration rights in several other fields in Norway. The current capacity is 20 KBDOE (thousand barrels per day of oil equivalent). OKEA's investment goal is to grow the output capacity in fields of high potential.
- **Natural Resource Business and Business Development:** Bangchak also formed BCP Innovation Pte. Ltd. in Singapore to engage in businesses related to innovation abroad. Today this company holds the No.2 equity in Lithium Americas Corp., which engages in the lithium mining business in Argentina and the USA. The Cauchari mine in Argentina is set to produce 40,000 tons/year of lithium; production is due to begin by 2021.

### **Research and Development (R&D) and Innovation Business**

Bangchak established **Bangchak Initiative and Innovation Center (BiiC)** to establish a Green Ecosystem to drive innovation by focusing on green energy and bio-based products to extend businesses both domestic and





abroad from Research and Development (R&D), with technological and network management, and incubation of startup businesses in support of the Thailand 4.0 economy. The ultimate goal is Bangchak as a Leading Asian Greenovation Group.

Apart from this, Bangchak established academic and project development cooperation with agencies and universities, including Mahidol University, Chulalongkorn University, King Mongkut's University of Technology Thonburi, Rajamongol University Phranakhon, Thai Scientific Research and Innovation Commission, Thailand Institute of Scientific and Technological Research, and the Asian Institute of Technology. This year saw USD 8 million invested by Bangchak in bio-based businesses and USD 9 million in clean-energy businesses. Finally, Bangchak also invested in Thailand's startup companies.



## Revenue Structure

	Operated by	% shareholding	2019		2018		2017	
			Revenue (million Baht)	%	Revenue (million Baht)	%	Revenue (million Baht)	%
Revenue from Oil refining and related businesses <sup>1/</sup>								
	Bangchak Corporation Plc.	-	118,261	61.5	132,764	68.4	126,862	72.4
	Bangchak Green Net Co., Ltd.	49.00	34,300	17.8	35,530	18.3	32,440	18.5
	Bangchak Retail Co., Ltd.	100.00	902	0.5	676	0.3	391	0.2
	BCP Trading Pte. Ltd.	100.00	31,277	16.3	14,965	7.7	5,130	2.9
	Nido Petroleum Pty. Ltd.	100.00	9	0.0	983	0.5	1,510	0.9
Total			184,749	96.1	184,898	95.2	166,333	94.9
Revenue from Power production								
	BCPG Group	70.04	3,427	1.8	3,320	1.7	3,323	1.9
Total			3,427	1.8	3,320	1.7	3,323	1.9
Revenue from Bio-Based Products								
	BBGI Group <sup>2/</sup>	60.0	2,313	1.2	3,807	2.0	765	0.4
	Bangchak Biofuel Co., Ltd. <sup>2/</sup>		-	-	-	-	1,697	1.0
Total			2,313	1.2	3,807	2.0	2,462	1.4
Total revenue from sales and services			190,489	99.1	192,025	98.9	172,138	98.2
Others <sup>3/</sup>	Bangchak and subsidiaries		1,674	0.9	2,148	1.1	3,069	1.8
Total			192,163	100.0	194,171	100.0	175,207	100.0

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

<sup>1/</sup> Revenue from domestic fuel sales in 2019, 2018, and 2017 accounted for 91.4%, 90.5%, and 90.3% respectively.

<sup>2/</sup> During 2017, the Company divested its investment in Bangchak Biofuel Co., Ltd. to BBP Holding Co., Ltd. which amalgamated with KSLGI Co., Ltd. in October 2017.

<sup>3/</sup> Other revenues, excluding revenue from sales and services: Revenue from investment, gains from crude purchase contracts, futures of oil products and forward foreign exchange contracts, gains from foreign exchange, share of profit from investment in associates and joint ventures.



## **2.1 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 Gasoline**

Gasoline is for gasoline-fueled vehicles. The quality of gasoline is classified by its octane number, which indicates resistance to engine knocking. Gasohol offers benefit in many areas, for instance, reduction of air pollution, financial savings for import avoidance of MTBE (Methyl Tertiary Butyl Ether), reduction of impacts from high oil price, and shoring up of crop prices – which draw investment and employment to rural areas. Currently, Bangchak developed new formula for gasohol which is suitable for new engine, Gasoline Direct Injection Engine (GDI), and old engine, called “**Green S Revolution**”.

#### **1.3 Aviation fuels**

Intended for commercial jets, Jet fuels must be clean from any contamination. They have extremely low freezing points with specified gravities and heat values. Jet fuels produce clean combustion with its properties remaining constant throughout the operation.



#### 1.4 High-speed diesel

High-speed diesel is for vehicles with diesel engine, such as cars, trucks, fishing trawlers, passenger boats, and tractors. Bangchak launched “Hi Diesel S” features outstanding properties which complete fuel combustion in the engine, thus providing power and environmental protection.

In June 2019, Bangchak developed and launched “Hi Diesel B20S”, which is the first company in Thailand adding additive to B20 diesel. This product features engine protection, high combustion efficiency, a longer engine life, under the name “Bangchak Hi Diesel B20S”. In October, Bangchak launched new special grade for B10 diesel, called “Bangchak Hi Diesel S B10”.

#### 1.5 Fuel oil

Fuel oil is part of the crude with a high boiling point. It is largely used in the industrial and transport sectors. It also powers marine vessels and power generation. Produced fuel oil is low sulfur with high quality and environment friendly.

**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’s auto lubes under the brand “BCP Lubricants”, comprise the GE Series for gasoline vehicles and the D3 Series for diesel vehicles, lubricant for two-stroke engines, transmission oil, and brake fluid, and so



forth. In 2017, Bangchak developed the “FURiO” premium-grade lubricant that can save on fuels, prevent corrosion, and protects the engine in all modes of operation.

## 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 Reformate

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

### 3.3 Isomerate

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

**4) By-product:** 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, fertilizer, bleaching, sugar, and shampoo, and for production of Sulphur compounds.

## **2.2 Marketing and Competition**

The petroleum products industry business faces tough competition in the regional market because products trading are constraint by advantage over transportation from the refinery. Therefore, refineries are found scattered around the locations where demand exists. Whereas for the crude oil industry, the competition at the global level depends on the quality of crude oil and the field's geographical conditions.

**In the refining industry, there are two main types of refinery, namely:**

- **Hydroskimming is Simple Refinery** with distillation processes.

The simple process separates components of crude into light oil (gasoline), middle distillates (aviation fuel and diesel), and heavy oil (fuel oil), the proportions of which depend on the properties of crude.

- **Conversion Cracking is Complex Refinery** with a cracking unit, a process added to the distillation process. Conversion cracking turns



some heavy oil into lighter products of higher value. However, this type of refinery requires some additional investment in the cracker and bears higher operating costs.

In general, yields from a Simple Refinery vary from those from a Complex Refinery, depending on the following factors:

- (1) The desired products, such as gasoline, diesel, and fuel oil
- (2) The type of crude, such as sweet crude, sour crude, light crude, and heavy crude
- (3) Some special specifications of the desired products, such as the sulphur content.

### **Thailand Economic Overview**

The Thai economy in 2019 was in deceleration. The Bank of Thailand estimated that the economic expansion will be lower than the potential level and lower than estimated at 2.5%, a decrease from 4.1% in 2018, following the contracted export volumes of the first half of the year. The recovery trend is slow because of diminishing world trade volumes and the appreciation of Baht compared to trading partner countries affecting exports due to our inability to compete in price. In addition, public and private spending tends to slow down, partly resulting from the postponement of state enterprise investments and joint-venture projects between the public and private sectors (Public Private Partnership: PPP).

The headline inflation is expected to be lower than the target of 0.7% because of reduced energy prices during the past year, the increase in the minimum wage in 2020 to 1.5%, which is lower than previously estimated at 6% and the Bank of Thailand's implementation on a more



relaxing monetary policy by reducing the policy interest rate twice in August and November from 1.75% to 1.50% and 1.25%.

For 2020, the Bank of Thailand projected in January 2020 that the economy will expand 2.8%, a mild improvement from the previous year. Exports will gradually improve with the world trade volume expansion after the US and China have reached an initial agreement and the electronic product cycle's likely recovery. Yet, there are still many negative factors, for example the Covid-19 outbreak in China and numerous infected patients in many countries including Thailand. This has affected the tourism sector, the export sector, employment and household income. Delays in the national budget for the year 2020, drought and a sporadic rainy season have hurt the agricultural sector with a high level of household debts, not to mention the PM 2.5 problem (dust particles smaller than 2.5 microns), which has inhibited the Thai economy below expectations. A private-sector projection in March 2020 put GDP growth for Thailand in 2020 at 1.5-2%. All these factors contribute to an inflation forecast this year of 0.5-0.8%. The rampant spread of Covid-19 has wielded severe economic impacts on the economy, possibly lowering the headline inflation from the previous estimate.

### **Domestic oil business**

Thailand's fuel demand in 2019 (January - November) increased from 122.28 million liters per day to 124.39 million liters per day, equivalent to 1.7% increase, in line with the national GDP, which continues to expand even though slowing down. As a result of **growth in** the government's





stimulus measures, public services and spending 2018, one notes continued growing demand for gasohol and diesel from 2018, increasing by 3.9% and 1.9% respectively. The bulk of the growth rate is accounted for by gasohol products, which increased 4.5% from 2018, resulting in the proportion of gasohol usage increasing to 97% of total gasoline consumption.

### Domestic demand for refined products

Product	Demand (million liters/day)		
	2019	2018	Growth variation
Regular Gasoline	0.96	1.09	-12.0%
Gasohol	31.24	29.88	+4.5%
Gasoline Group	32.20	30.98	+3.9%
Jet fuel	67.27	66.02	+1.9%
Diesel Group	19.45	19.31	+0.7%
Fuel Oil	5.48	5.98	-8.3%
Total	124.39	122.28	+1.7%

Source: Department of Energy Business

On the domestic supply side, the capacities of the six domestic refineries in 2019, consisting of Thai Oil Refinery, IRPC Refinery, PTT Global Chemical Refinery, Esso Refinery, Star Petroleum Refinery, and Bangchak Refinery yielded an average crude run of 1,023 thousand barrels per day, decreased 9.21% from 2018. This is due to annual maintenance shutdowns of Thai Oil Refinery, Esso Refinery, PTT Global Chemical Refinery, and Star Petroleum Refinery. Therefore, the overall refining capacity was reduced. It is expected that by 2020 the capacity will increase, as there is only one annual maintenance shutdown at Bangchak Refinery.



### Average crude run by domestic refineries

Refinery	Crude run (thousand barrels per day, KBD)		
	2019	2018	Growth variation
Thaioil	287	305	-5.81%
IRPC	204	206	-1.10%
Esso	116	144	-19.40%
Star Petroleum (SPRC)	146	177	-17.53%
PTT Global Chemical	159	196	-19.02%
Bangchak	112	100	+12.40%
Total	1,023	1,127	-9.21%

Source: Department of Energy Business Jan-Nov.2018 and Bangchak Corporation Public Company Limited

## Marketing Business

In 2019, the average crude oil price in the global market dropped from the previous year as a result of the trade war between the US and China, thus decelerating demand for oil. The price of oil in 2019 was highly volatile, rising in the first quarter due to tensions in the Middle East and severely fluctuating when the Kingdom of Saudi Arabia's oil processing plant was attacked. As a result, oil traders could not adjust the oil prices to keep up with the costs during certain periods of price spikes. In addition, the Thai government requested cooperation from oil companies to maintain their retail diesel prices to reduce impacts on consumers during the New Year. This affected the marketing margin of oil traders, which decreased from the previous year. It is expected that the marketing margin this coming year will be lower than that in 2019, as the global oil demand is likely to decrease. However, there remain uncertainties in the costs of oil in the global market, faced with internal and external factors, namely the completion of trade accord between the US and China, tension in the



Middle East, which also affect supply concerns, and the spread of Covid-19.

The total number of service stations continues to rise. About 800 new service stations were added this year, making the total number stand at 29,138 at the year-end, roughly 2.8% from the total. With respect to the E20 gasohol and E85 gasohol service stations in 2019 (as of 31 December 2019), the numbers have increased by 360 stations and 183 stations respectively, resulting in the numbers of service stations that sell gasohol E20 and gasohol E85 totaling 4,616 stations and 1,516 stations respectively because of the continuous rise in cars that use gasohol such as E20 and E85 in the market.

Competition in the oil industry in Thailand in 2019 will continue to intensify. The number of service stations, modernized with new forms of services focusing on consumers' convenience, will still increase to meet rising demand. Non-oil businesses and services have been added to provide more alternatives to consumers and improve retail business performance and competitiveness. Moreover, many Thai retail business operators have opted to expand to neighboring countries under the AEC (ASEAN Economic Community) scheme, where demand for petroleum products consumption and economic growth are phenomenal.



### Number of service stations

Unit: station

Oil trader	2019 <sup>1</sup>	2018	2017
PTT	1,988	1,879	1,775
Shell	538	517	508
Esso	638	608	543
<b>Bangchak</b>	<b>1,201</b>	<b>1,175</b>	<b>1,114</b>
Chevron	387	357	354
PTTRM	159	156	153
PTG	1,836	1,883	1,696
Others	22,393	21,763	21,157
<b>Total</b>	<b>29,138</b>	<b>28,338</b>	<b>27,300</b>

Source: Department of Energy Business

Remarks: <sup>1</sup> number of stations as of December 31, 2019

In 2019, sales volumes by domestic service stations averaged 2,236.5 million liters a month, a 4.5% rise from last year's 2,140.6 million liters per month. Bangchak posted 7.2% more sales through its service stations, which raised its market share through service stations from 15.6% to 16.0%, while maintaining the No. 2 domestic market share through service stations.

### Sales volume of fuels through service stations for 2018-2019

Operator	Average Sales volume (million liters/month)			Market share (%)		
	2019	2018	Δ	2019	2018	Δ
PTT	805.8	766.4	+5.1%	36.0	35.8	+0.2
<b>Bangchak</b>	<b>357.8</b>	<b>333.8</b>	<b>+7.2%</b>	<b>16.0</b>	<b>15.6</b>	<b>+0.4</b>
Esso	263.7	269.0	-2.0%	11.8	12.6	-0.8
Shell	272.1	267.5	+1.7%	12.2	12.5	-0.3
Thai Oil	223.9	198.3	+12.9%	10.0	9.3	+0.7
PTTRM	99.0	103.7	-4.5%	4.4	4.8	-0.4
Caltex	92.0	91.2	+0.8%	4.1	4.3	-0.1
PTG Energy	39.9	35.6	+11.9%	1.8	1.7	+0.1
Susco Group	36.9	36.3	+1.7%	1.6	1.7	-0.0
IRPC	43.5	38.7	+12.0%	1.9	1.8	+0.1
Others	2.0	0.2	+948.3%	0.1	0.0	+0.1
<b>Total</b>	<b>2,236.5</b>	<b>2,140.6</b>	<b>+4.5%</b>	<b>100</b>	<b>100</b>	



Source: Department of Energy Business and Bangchak Corporation PLC.

The lubricating oil sold by Article 7 traders amounted to roughly 37.4 million liters a month (according to the Department of Energy Business, December 31, 2019), an 0.3% rise. The lubricating oil market appears to continue growing mainly in line with the domestic economy and the public policy.

**Product distribution and distribution channels:** Bangchak products are distributed through:

**1.1) 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.	<b>Company-Owned, Company-Operated stations (COCO):</b> 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.	226	18.8
2.	<b>Company-Owned, Dealer-Operated stations (CODO):</b> Bangchak is the investor and land owner, while the station management is carried out by experienced operators, who rent the stations.	50	4.2
3.	<b>Joint Venture stations (JV):</b> This is a joint investment between Bangchak and operators interested in running the service station business.	53	4.4



Station Format		Number (station)	Share (%)
4.	<b>Dealer-Owned, Dealer-Operated stations (DODO):</b> The operator is the station owner, land owner, and sole investor, as well as a distribution agent.	260	21.6
5.	<b>Co-Operative stations (CO-OP):</b> These stations are invested by the community. In most cases, the community is the land owner and investor.	612	51.0
<b>Total</b>		<b>1,201</b>	<b>100</b>

Remarks: Bangchak Corporation PLC, as of December 31, 2019.

**1.2) 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 direct with the company, and deliveries are arranged by tanker trucks, except for some factories with their own piers.

**1.3) 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.

**1.4) 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.

**1.5) 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.

**1.6) Export sale** – Deliveries are normally carried out by marine vessel to overseas oil traders.

**Types of customer** – 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, agriculture 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, such as PTT, 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	2019		2018		2017	
	Volume	%	Volume	%	Volume	%
1. Outlet & End-User Customers	105.4	74.9	100.2	74.2	100.5	71.3
2. Supply Sales Customers	14.9	10.6	15.0	11.1	17.3	12.3
3. Export Customers	20.5	14.6	19.9	14.7	23.2	16.5
Total	140.8	100.0	135.1	100.0	141.0	100.0

Source: Bangchak Corporation PLC.

### **Sales value of Bangchak's products and services**

Products	2019		2018		2017	
	million baht	%	million baht	%	million baht	%
<u>Domestic Sale</u>						
1. High-speed diesel	86,760	51.3	89,409	50.7	81,822	50.5
2. Fuel oil	1,529	0.9	2,078	1.2	1,864	1.1
3. Gasoline	46,248	27.3	47,634	27.0	45,428	28.0
4. Other products and services	18,413	10.9	19,319	11.0	16,852	10.4
Total domestic sale	152,950	90.4	158,440	89.8	145,966	90.0
<u>Export sale</u>						
1. High-speed diesel	1,991	1.2	5,105	2.9	2,846	1.8
2. Fuel oil	13,126	7.8	11,376	6.4	11,120	6.9
3. Gasoline	510	0.3	521	0.3	674	0.4
4. Other products and services	526	0.3	937	0.5	1,577	1.0
Total export sale	16,153	9.6	17,939	10.2	16,217	10.0
<u>Combined sales value</u>						
1. High-speed diesel	88,751	52.5	94,514	53.6	84,668	52.2
2. Fuel oil	14,655	8.7	13,454	7.6	12,984	8.0
3. Gasoline	46,758	27.7	48,155	27.3	46,102	28.4
4. Other products and services	18,939	11.2	20,256	11.5	18,429	11.4
Total sales value	169,103	100.0	176,379	100.0	162,183	100.0
% increase/decrease	-4.13		8.75		17.66	

Source: Bangchak Corporation PLC.





## **2.3 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

	2019	2018	2017
Nameplate capacity			
: 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	57.10	57.47	56.74
2. UCO	4.42	3.48	2.62
3. Fuel oil	12.78	9.43	14.15
4. Gasoline	20.39	22.46	21.17
5. Aviation fuel, kerosene	15.07	13.54	13.1
6. LPG	2.7	3.33	2.89
7. Products for internal use and product loss during operation	0.13	-0.32	0.66
Total output volume (B)	112.59	109.39	111.33
% increase of output volume	2.9	-1.91	9.79
% of capacity utilization (B/A)	99.29	96.46	98.17

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.

## 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 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.

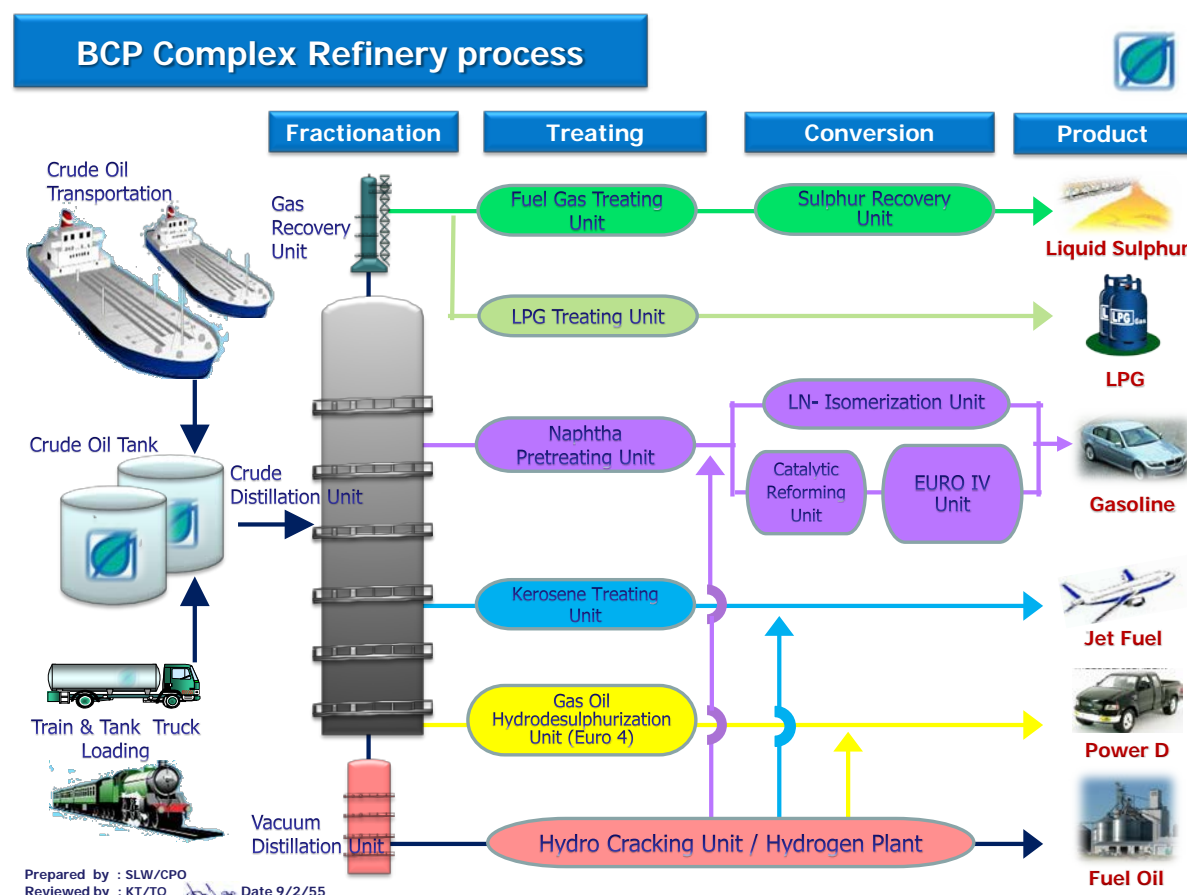
Fuel gas obtained from the process will be refined by removing the sulphur content. Treated fuel oil, diesel after sulphur content removal under the Euro 4 standard, aviation fuel, and cooking gas are kept in storage tanks for sale.



**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.

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

**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.



### 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 seven 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 UAE, Qatar, Saudi Arabia, Iran, and Dubai, as well as those in Southeast Asia, such as



Malaysia, Indonesia, Brunei, the Philippines, 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	Production Capacity					
	2019		2018		2017	
	Volume	%	Volume	%	Volume	%
Sirikit	30,029	23.9	27,036	20.9	25,665	18.2
Tantawan	20,718	16.5	18,790	14.5	24,557	17.4
Erawan	25,748	20.5	28,302	21.9	30,037	21.3
Nasanun/Nasanun East	731	0.6	1,266	1.0	1,665	1.2
Jasmine	10,808	8.6	11,653	9.0	11,853	8.4
Manora	5,342	4.2	6,397	5.0	7,187	5.1
Others	32,513	25.8	35,756	27.7	40,316	28.5
<b>Total</b>	<b>125,889</b>	<b>100</b>	<b>129,200</b>	<b>100</b>	<b>141,280</b>	<b>100</b>

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 2019, Bangchak procured indigenous crude oil from many fields in domestics, totaling 13,749 thousand barrels, which mainly from Benchamas Field, Pattani Field and Sirikit (Phet) field and others.



This year, Bangchak imported crude 27,722 thousand barrels. There are 69.8% Crude from the Far East fields, such as Labuan and Bunga Orchid from Malaysia; Seria Light Export Blend, and Champion from Brunei; Banyu Urib from Indonesia. Also, there are 30.2% Crude from other sources, such as Montara from Australia.

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	2019		2018		2017	
	Million Baht	%	Million Baht	%	Million Baht	%
<u><i>Cost of indigenous feedstock</i></u>						
1. Crude and semi-finished products	37,911	34.6	34,840	27.9	36,313	34.3
2. Finished products	10,174	9.3	11,931	12.0	8,402	7.9
Total	48,086	43.9	49,771	39.9	44,715	42.2
<u><i>Cost of imported feedstock</i></u>						
1. Crude and semi-finished products	53,876	49.2	65,355	52.4	53,498	50.5
2. Finished products	7,495	6.9	9,711	7.8	7,752	7.3
Total	61,371	56.1	75,066	60.1	61,250	57.8
<u><i>Combined costs of indigenous and imported feedstock</i></u>						
1. Crude and semi-finished products	91,788	83.9	100,195	80.3	89,811	84.8
2. Finished products	17,669	16.1	24,642	19.7	16,154	15.2
<b>Total feedstock cost</b>	<b>109,457</b>	<b>100</b>	<b>124,837</b>	<b>100</b>	<b>105,969</b>	<b>100</b>

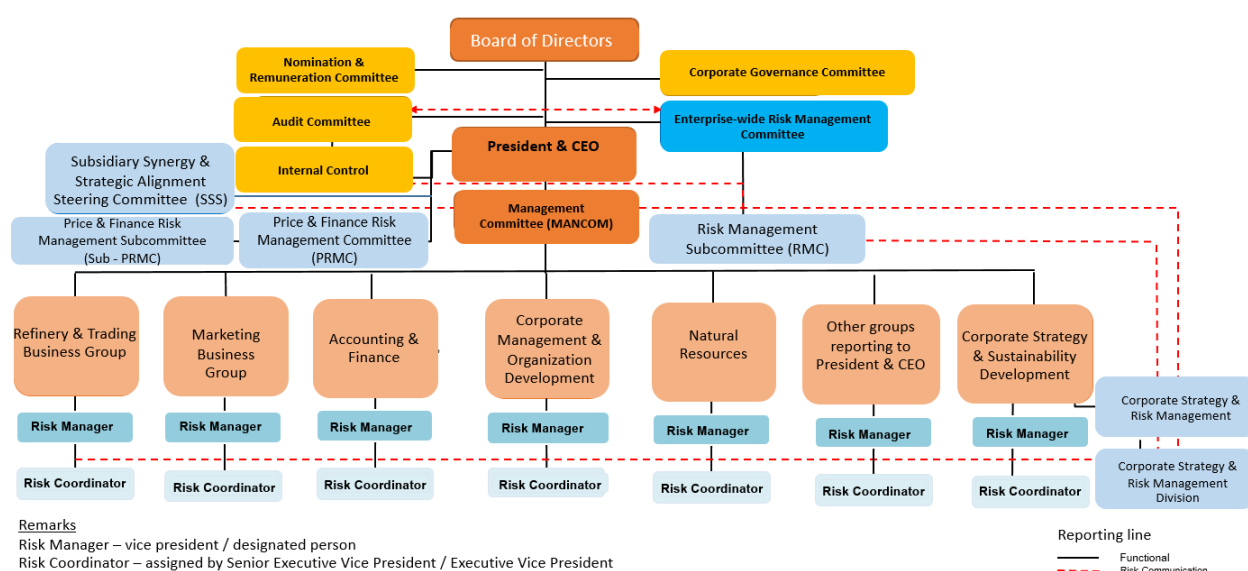
Source: Bangchak Corporation PLC.





### 3. Risk Factors

Bangchak has adopted an international integrated enterprise-wide risk management system based on COSO ERM and ISO 31000 for more than 15 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.





## **Risk Management Outcomes**

The sluggish global and domestic economy haunted the manufacturing and household sectors throughout 2019. Moreover, the extraordinary volatility of Thai Baht currency, crude oil price and prices of agricultural produce directly impacted the growth of all industries and business performance of Bangchak. Enterprise-wide risk management significantly provided Bangchak and its joint ventures with the ability to pursue all businesses with minimal negative impacts under continuous monitoring and tracking mechanisms as well as mitigating risks to acceptable levels with appropriate mitigation plans. From a broad enterprise-wide perspective, Bangchak met all its targets with such risk management system.

To cope with constant business changes and sustainability, the system has taken into account global megatrends and risks to provide Bangchak with the ability to successfully manage medium-term to long-term risks including business and industrial competitiveness, economic conditions, consumer behavioral changes, changes in the environment and climate from global warming, transformation of technologies and innovations, particularly those on renewable energy and energy storage, advancement in electric vehicles, biological technology, and movement of regulatory controls. 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.

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 2019, Bangchak assessed and managed corporate risks aligned with the corporate strategy and sustainability development involving the environment, society and governance as follows.

### **Economic Risks**

#### **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 Prices and Finance Risk Management Committee and Subcommittee to consider and decide suitable options to manage, and report directly to the executive management committee.

- 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 stepping stone to high-value bio-based product development and value additions to the company.

### **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:

- Procure quality crude oil suitable for production processes to optimize refining margins and generate additional value for the business.
- 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.



- Vertically expand its natural resource business upstream. This includes acquisition of OKEA ASA, an upstream entity developing and producing crude oil in Norway, securing continuous crude supply for the existing business and supporting new and future businesses.
- 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.

### **Risks of volatility of exchange rates and interest rates**

The exchange rate of the Baht currency fluctuated wildly throughout 2019 due to the uncertain exchange rate policies of many countries and aggressive trading policies of certain large economies. Bangchak's businesses in petroleum and trading in international markets therefore relate directly to exchange risks. The company's risk management on exchange rates and interest rates includes:

- 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 Prices and Finance Risk



Management Committee to ensure successful businesses as planned.

### **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.

- Invest through Lithium Americas Corp. in lithium mining to expand its natural resource business and energy innovation in preparation for lithium battery production and electric vehicles.
- Establish Bangchak Initiative and Innovation Center (BiiC) as an institute for innovations and startups business for Green Ecosystems to promote innovative development of green energy and bio-based businesses.
- 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.

### **Societal 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.

- Consistently develop safety and occupational health systems under ISO 45001 to raise safety and health standards and systematize work processes in relation to associated risks, regulatory controls and other constraints. Thanks to these successful efforts, Bangchak was certified with the ISO 45001 standard in May 2019.
- Install an enclosed ground flare to minimize community impacts due to glare and noise from flaring. The project construction, completed in 2019, is set to be commissioned in early 2020.
- Commissioned a new oil spill prevention system with the Sri Thararak 8 vessel equipped with side-collecting booms and automatic belt skimmers capable of collecting up to 30,000 liters of spill per hour. This vessel can operate independently, replacing the old system that required three vessels to operate jointly. This new system can operate with much higher efficiency and speed. Bangchak is ready to exploit this system to support spill prevention and other tasks required by the authorities and IESG (Oil Industry Environmental Safety Group Association) upon request.
- Pursue oil spill protection by redefining crude oil and refined-product vessel specifications from single-hull to double-hull and equip them with emergency accessories and spill prevention



control. Conduct oil spill prevention drills with double-boom laying during offloading every six months, together with full staffing for training and development, and all safety, instrument and machinery gear and port and harboring systems under the Oil Company International Marine Forum Institute standard.

- 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.

- Escalate ERMCo's year-round roles in overseeing risks in the surrounding communities such as water disposal treatment involving joint-venture operations. This program is designed to monitor and prevent negative impacts on surrounding communities.

### **Environmental Risks**

#### **Risks of climate and environmental changes and measures on GHG emission control**

Bangchak's focuses on reducing all impacts causing global warming by cutting down on energy consumption and carbon dioxide or greenhouse gas (GHG) emissions with the following programs.

- Through BCPG Public Company Limited, expand businesses to green power, generating power from clean renewable energy sources including solar, wind, hydro, and geothermal in domestic and international markets. Bangchak has so far been capable of reducing carbon dioxide emission from generating power by 645,399 tons per year, equivalent to plantation of up to 474,558 rai of forest.
- With a commitment to continuously managing the reduction of GHGs, Bangchak won three awards in 2019 for excellent management of GHG emission reduction, presented by Thailand Greenhouse Gas Management Organization (Public Organization); an award on Carbon Footprint of Product (CFP),



an award on Thailand Voluntary Emission Reduction Program (T-VER) in its third consecutive year – a voluntary program awarded to refineries capable of reducing GHGs with a 2% target – and an award on Carbon Footprint Reduction (CFR). These accolades honor extraordinary achievements as a role model for others, aimed to promote project development efficiency while protecting the ecology and project economics toward sustainability of the refining business.

- Install a continuous catalyst regeneration unit in place of the catalytic reforming unit to increase oil distillation efficiency and decrease energy consumption. The system is set for commissioning in 2020.
- 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.
- Focus on sale of environmentally friendly oil products from renewable sources to the industry. In 2019, Bangchak heavily promoted sale of Bangchak Hi-Diesel B20 S, mixed with clean and environmentally friendly biodiesel B100, a specialty product reducing pollutants and volatile dust from ignition. Most sales were made to the industrial group, large vessels and trucks. This special diesel product is available nationwide, and its business directly supports palm farmers through an alternative market for their produce and stable income.



- 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.
- Organize campaigns of the non-oil activities to reduce plastics, including the “Gaew Phaw Gla” (recycling for seedling) project to collect used Inthanin coffee cups from customers and recycle them as a container (Gaew) for nursing seedlings (Phaw Gla) to support plantation. The project is jointly run with the Royal Forest Department, intended to reduce black garbage bags for nursing seedlings, which is the current practice. Another campaign is the ending of plastic-bag use in all “SPAR” convenient stores at Bangchak, intended to reduce waste and impacts on the environment.
- Nurture environmental and social stewardship and care as a corporate culture by iterating energy conservation and care for the environment. Examples are campaigns on banning styrofoam for food packaging for all activities in the offices, banning plastic bags in the company's canteens, cutting down on printing workloads and stop using paper for photocopying while



converting communication and coordination activities to more online in the digital format, reducing the use of fuels for all individual transport between Headquarters and the refinery by using EV (electric vehicle) buses. These buses also help reduce the volumes of dust, volatile pollutants from exhaust pipes, and carbon dioxide emissions on Sukhumvit Road.

### **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.



- This year Bangchak successfully reduced the water used in tap water quality improvement via the micro-filtration, reverse osmosis, and electro de-ionization systems by 50,650 cubic meters. It also reused condensate water and stripped water in its production processes, which saved 633,440 cubic meters. In addition, it improved mildly contaminated condense water and treated wastewater via the reverse osmosis system, resulting in 525,179 cubic meters of reused water. Thanks to these water reduction measures, Bangchak saved the equivalent of water used by 3,185 households.
- Implement water management in all processes with the water footprint of product (WFP) program to track and record Gate-to-Gate (G2G) water consumption in detail in each process. These records are analyzed to directly and indirectly optimize the consumption pattern and production efficiency. Bangchak was Thailand's first refinery recipient of the Water Footprint of Product certificate in 2019, with six products certified by the Water and Environment Institute for Sustainability of the Thai Federation of Industries.
- 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 groundwater was initiated for water storage and supply for the facilities.



- Bangchak has also partnered with the World Soil Association, Land Development Department, and Pidthong Lang Phra Institute (Pidthong Institute) in initiating the “Stop Soil Erosion, Save our Future” program by promoting King Rama IX’s philosophy on halting soil erosion at Tambon Kaen Makrut, Uthai Thani, classified as a watershed forest bordering a national forest reserve. The philosophy defines ways to protect soil erosion so that water can be fully preserved. The area therefore becomes green and the community will avoid drought and food shortage in the long run.

### **Emerging Risks**

#### **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. These technologies are designed for increasing work efficiency and competitive edge of the organization and industry. However, risks borne by digital technology transformation and cybersecurity can paralyze the entire business. Assessment and treatment of these risks are therefore critical and are managed 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 2019.

- Introduce the Robotic Process Automation (RPA) system to increase productivity and decrease turnaround time in work processes, including business partner verification, service station maintenance planning, and sales document processing.
- Install predictive maintenance technology for pre-planning maintenance shutdowns of the refining facilities. The technology is connected and interactive with databases, equipment and an analytical system to ensure flawless timing for maintenance shutdowns.
- 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.
- Establish a dedicated cybersecurity function, tasked with planning, monitoring and tracking, testing and procuring necessary equipment and systems to counter threats from cyber-attacks. During 2019, the ERMC approved the purchase of cybersecurity tools and systems for Bangchak's computer center and development of cybersecurity system architecture. The approval was initiated to prevent Bangchak's operations from cyber interruptions. The system provides real-time security system alerts through key risk indicators.



- Develop a refinery cybersecurity system program to safeguard work systems from cyber-attacks or interruptions which might affect refining processes. Bangchak was certified with the ISO 27001 standard covering the Distributed Control System, a central controlling system of the overall processes, thus ensuring no interruption to the refining processes and company businesses.
- Determined preventive measures for personal data protection in compliance with the Personal Information Protection Act B.E. 2562 (2019) by establishing a taskforce consisting of representatives from relevant departments to work closely with a renowned consulting firm to manage and control personal information, including establishing preventive and corrective measures in case of personal information breach or abuse that might harm Bangchak.

### **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.





## **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.

## **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.

- Development phase risk
- Construction phase risk
- Operation phase risk including risks concerning operation, finance, taxation imposed by the tax policy of the country of investment, business, and reputation
- Natural disaster risk.



The major project investment risk determined, approved and monitored by ERM in 2019 was the acquisition of additional shares in OKEA AS (“OKEA”), an operator of petroleum development and production in Norway. During 2019, OKEA successfully listed on the Oslo Stock Exchange, leading to higher liquidity for Bangchak to expand its business in the development of petroleum resources.

### **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. In 2019, 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 sixth 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.

During 2019, Bangchak made significant improvement in its enterprise-wide crisis management and BCM, including development of new key indicators and a review of all resources. A drill was conducted on both crisis management and business continuity with a simulated port collision by a cargo vessel. The drill involved communication between and among internal executives and responsible staff. External authorities and observers included officials from the Department of Energy Business, Pollution Control Department, Marine Department, Port Authority of



Thailand, Phra Khanong District Office, Oil Industry Environmental Safety Group Association (IESG), and the Bang Nam Phueng community. The outcome was later brought up for analyses to continuously improve work processes and procedures under BCM to ensure the ability of Bangchak to end the crisis and operate its businesses uninterrupted.

**4. Review of business assets**

Asset	Ownership	Book value Baht million <sup>1</sup>	Obligation
Refinery land	Long-term lease	297	None
Other properties	Ownership	2,363	None
Buildings	Ownership	133	None
Machinery & distillation tower equipment	Ownership	17,920	None
Power generators	Ownership	63	None
Sales and office equipment	Ownership	3,584	None
Platinum catalysts <sup>2</sup>	Ownership	239	None
Vehicles	Ownership	116	None
Other assets <sup>3</sup>	Ownership	21	None
Works in progress	Ownership	7,890	None
Total	-	32,626	-

**Note:**

- 1/ This year Bangchak set aside Baht 78 million in allowance (reversal of) for impairment of land property, machinery, and equipment, consisting of Baht 6 million in property, Baht 45 million in machinery and distillation tower equipment, and Baht 27 million in sales and office equipment.
- 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 <sup>๑</sup>
<b><u>Copyrights</u></b>			
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	Nov. 20, 2021 Dec. 25, 2021 Feb. 12, 2022 Jan. 13, 2023 Jan. 15, 2027
5. GE PLUS	4	Gasoline-engine lubricant	Nov. 20, 2021 Dec. 25, 2021 Jan. 13, 2023 Jan. 15, 2027
6. GE SILVER	3	Semi-synthetic gasoline-engine lubricant	Dec. 25, 2021 Nov. 4, 2024 Jan. 15, 2027
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	Oct. 9, 2023 Jan. 15, 2027
12. D3 TURBO	1	Diesel-engine lubricant	Jan. 25, 2021
13. D3 EXTRA	1	Diesel-engine lubricant	Jan. 25, 2021
14. D3 PICK UP	1	Diesel-engine lubricant	Jan. 25, 2021
15. D3 COMMONRAIL	1	Diesel-engine lubricant	Oct. 30, 2028
16. D3 TURBO PLUS COMMONRAIL	1	Semi-synthetic diesel-engine lubricant	Oct. 30, 2028
17. D3 Max	1	Diesel-engine lubricant	May 14, 2027
18. D3 EXTRA PLUS	1	Diesel-engine lubricant	Jan. 15, 2027
19. D3 PICK UP PLUS	1	Diesel-engine lubricant	Jan. 15, 2027
20. D3 TURBO PLUS	1	Diesel-engine lubricant	Jan. 15, 2027



Trademark	Number of registered trademarks	Goods/services under trademark	Expiry <sup>①</sup>
21. BANGCHAK POWER D	1	High-speed diesel	Jul. 10, 2028
22. SUPER POWER D B5 (EURO 4)	2	Diesel-engine lubricant Diesel	Nov. 3, 2020 May 2, 2022
23. SUPER POWER D (EURO 4)	2	Diesel-engine lubricant Diesel	Nov. 3, 2020 May 2, 2022
24. GE NGV	1	Semi-synthetic gasoline-engine lubricant	Dec. 25, 2021
25. GE PLATINUM	1	Synthetic gasoline-engine lubricant	Dec. 25, 2021
26. Bangchak Max Drive	1	Gasoline Fuel Conditioner	Dec. 25, 2026
27. Super HDX	1	Diesel Fuel Conditioner	Jan. 15, 2027
28. FURIO	1	Lubricant	Mar. 2, 2027
29. FURIO F2	1	Lubricant	Feb. 11, 2028
30. FURIO F2 DIESEL	1	Lubricant	Feb. 11, 2028

### **Service Marks**

Service logo	Number of registered logos	Goods/service under logo	Expiry <sup>①</sup>
<b><u>Copyrights</u></b>			
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	Vehicle maintenance	Sep. 1, 2025



Service logo	Number of registered logos	Goods/service under logo	Expiry <sup>๑</sup>
11. Green Wash	1	Vehicle cleaning & lubrication	Sep. 1, 2025
12. GREEN WASH AUTOCARE	2	Vehicle cleaning	Jul. 25, 2026
13. GREEN WASH EXPRESS	1	Vehicle cleaning	Jul. 25, 2026
14. GREEN BIKE EXPRESS	1	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. Bangchak leaf and Chinese characters (registered in PRC (China))	1	Gasoline, diesel, and lubricants	Dec. 27, 2020
2. Bangchak leaf and BANGCHAK LUBRICANTS - Registered in Myanmar <sup>®</sup> - Registered in LPDR (Laos)	2	Fuel products	- Mar. 20, 2023
3. Bangchak leaf and BCP LUBRICANTS (Registered in Myanmar <sup>®</sup> )	1	Fuel products	-
4. Bangchak leaf and BANGCHAK (Registered in Myanmar <sup>®</sup> )	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) <sup>®</sup>	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, 2021





Trademark	Number of registered trademarks	Goods/services under trademark	Expiry
12. Bangchak leaf and BCP LUBRICANTS (Registered in Jordan)	1	Fuel products	Nov. 24, 2023
13. Bangchak leaf and BCP LUBRICANTS (Registered in Philippines <sup>3</sup> )	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 <sup>4</sup> )	1	Fuel products	Dec. 6, 2023
16. BAICHAK MART (Registered in PRC (China))	1	Miscellaneous goods for consumers' convenience	Jan. 27, 2025
17. BAICHAK MART (Registered in Vietnam)	1	Miscellaneous goods for consumers' convenience	Sep. 3, 2023
18. BAICHAK MART (Registered in LPDR (Laos))	1	Miscellaneous goods for consumers' convenience	Dec. 5, 2024
19. GREEN SERVE (Registered in LPDR (Laos))	1	Vehicle maintenance	Dec. 5, 2024
20. Bangchak leaf and BANGCHAK (Registered in PRC (China))	1	Service stations	Jan. 27, 2025
21. Bangchak leaf and BANGCHAK (Registered in LPDR (Laos))	2	Fuel products, service stations	Dec. 5, 2024
22. Bangchak leaf and BANGCHAK (Registered in Vietnam)	2	Fuel products, service stations	Sep.30, 2023 Nov. 19, 2023
23. Bangchak leaf and BCP (Registered in PRC (China))	2	Fuel products	Jan. 13, 2025 Oct. 20, 2025



Trademark	Number of registered trademarks	Goods/services under trademark	Expiry
24. Bangchak leaf and BCP (Registered in LPDR (Laos))	2	Fuel products, service stations	Dec. 5, 2024
25. Bangchak leaf and BCP (Registered in Vietnam)	1	Fuel products, service stations	Sep.30, 2023
26. Bangchak leaf and Bangchak (Registered in Cambodia)	2	Fuel products, service stations	Oct. 1, 2023
27. Bangchak leaf and BCP (Registered in Cambodia)	2	Fuel products, Service stations	Oct. 1, 2023
28. Bangchak leaf and BCP LUBRICANTS (Registered in LPDR (Laos))	1	Fuel Products	Jan. 17, 2024
29. Bangchak leaf and BANGCHAK (Registered in PRC (China))	1	Fuel products	Jan. 27, 2025
30. BANGCHAK MART (Registered in Cambodia)	1	Miscellaneous goods for consumers' convenience	Sep. 5, 2023
31. GREEN SERVE (Registered in Cambodia)	1	Vehicle maintenance	Sep. 5, 2023
32. Bangchak leaf and BCP LUBRICANTS (Registered in PRC (China))	1	Fuel products	Aug. 13, 2025
33. Bangchak leaf and BCP LUBRICANTS (Registered in Turkmenistan)	1	Fuel products	Jun. 23, 2025
34. FURIO (Registered in Myanmar®)	1	Fuel products	-
35. FURIO (Registered in the Philippines)	1	Fuel products	Aug. 16, 2028
36. FURIO (Registered in LPDR (Laos))	1	Fuel products	Apr. 2, 2029
37. FURIO (Registered in PRC (China))	1	Fuel products	Feb. 6, 2029



Trademark	Number of registered trademarks	Goods/services under trademark	Expiry
38.FURIO (Registered in Cambodia)	1	Fuel products	Apr. 4, 2028

**Trademarks and Service Marks under deliberation in Thailand**

Trademark	Number of registered trademarks	Goods/services under trademark	Remarks
1. GREEN S REVOLUTION	2	Fuel products, vehicle service station	Appealed Jan. 26, 2018
2.BCP LUBRICANTS	1	Lubricant	Filed May 3, 2019

**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. FURIO (Registered in Vietnam)	1	Fuel products	Filed on Apr. 2, 2018
3. Bangchak leaf and BCP LUBRICANTS (Registered in Bangladesh)	1	Fuel products	Filed on Nov. 18, 2019

**Note:**

- ❶ Registered trademarks and service logos are in effect 10 years from registration dates and extendable every 10 years
- ❷ 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
- ❸ In registering trademarks in Philippines, one must submit Declaration of Actual Use within 3 years from filing.
- ❹ 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



## 5. 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, 2019, were as follows:

- 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, in addition to court expenses and lawyer's fees for the litigation in both courts for the plaintiff. Both parties have submitted their application to the Dika Court (Supreme Court) for approval to lodge dika appeals; both applications have been filed and accepted by the court. This is therefore pending the Dika Court's decision. Bangchak confirms having duly complied with the terms.



## **6. General information and other key information**

- Company Name : Bangchak Corporation Public Company Limited
- Head Office : 2098 M Tower Building, 8<sup>th</sup> Floor  
Sukhumvit Rd., Phra Khanong Tai,  
Phra Khanong, Bangkok 10260
- Nature of business : Oil Refinery and Trading Business,  
Marketing Business, Green Power  
Business, Bio-based Products Business,  
Natural Resource Business and Business  
Development
- Registration No. : 0107536000269
- Telephone : 0 2335 8888
- Fax : 0 2335 8000
- Website : <http://www.bangchak.co.th>
- Company establishment: November 8, 1984
- Commercial operation : April 1, 1985
- Registered capital (as of December 31, 2019) 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.
- Shareholders of BCP
  - Social Security Office 203 Million shares 14.77%
  - Vayupak Fund 1 202 Million shares 14.66%
  - Ministry of Finance 137 Million shares 9.98%
  - Minor Shareholders 835 Million shares 60.59%
  - Total 1,377 Million shares 100.00%



- Office and Terminals
  - Head Office\*  
2098 M Tower Building, 8<sup>th</sup> Floor, Sukhumvit Road, Phra Khanong Tai, Phra Khanong, Bangkok 10260  
Tel. 0 2335 8888, Fax 0 2335 8000  
Email: [info@bangchak.co.th](mailto:info@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
  - 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
  - Northern Region Business Office  
87/9 Starwork Building, 3<sup>rd</sup> Floor, Thung Hotel Road, Tambon Wat Ket, Amphoe Muang, Chiang Mai 50000  
Tel. 053 300 484, Fax 053 300 485
  - Northeastern Region Business Office  
499 Moo 12, Mitraphab Road, Tambon Muang Kao, Amphoe Muang, Khon Kaen 40000  
Tel. 043 261 751-52, 043 261 789, 043 261 791, Fax 043 261 790
  - 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
  - Samut Sakhon Oil Distribution Center  
100/149 Moo 1, Tambon Tha Chin, Amphoe Muang, Samut Sakhon 74000 Tel. 034 820 519-20
  - 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
  - Rayong Oil Distribution Center  
1, 3B Road, Tambon Map Ta Phut, Amphoe Muang, Rayong 21150, Tel. 038 609 389, Fax 038 609 413



- 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
- 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
- Phichit Oil Terminal  
99/8 Moo 9 Tambon Banna, Amphoe Wachirabarami, Phichit 66140  
Tel.0 2335 8728 Email: [bphcenter@bangchak.co.th](mailto:bphcenter@bangchak.co.th)
- **Subsidiaries**
  - BCPG Public Company Limited (BCPG)  
2098 M Tower Building, 12<sup>th</sup> Floor, Sukhumvit Rd., Phra Khanong Tai, Phra Khanong, Bangkok 10260  
Tel.0 2335 8999 Fax.0 2335 8900  
Email: [info@bcpgroup.com](mailto:info@bcpgroup.com)  
Website: <http://www.bcpgroup.com>
  - BBGI Public Company Limited  
2098 M Tower Building, 5<sup>th</sup> Floor, Sukhumvit Rd., Phra Khanong Tai, Phra Khanong, Bangkok 10260  
Tel.0 2335 8899 Fax.0 2335 8800  
Website: <http://www.bbgigroup.com>
  - Bangchak Retail Co., Ltd. (BCR)  
2098 M Tower Building, 17<sup>th</sup> Floor, Sukhumvit Rd., Phra Khanong Tai, Phra Khanong, Bangkok 10260  
Tel.0 2335 8400 Fax.0 2016 3963



- Bangchak Green Net Co., Ltd. (BGN)  
223/94 Country Complex, Building A, 19<sup>th</sup> Floor, Sanpawut Rd.,  
Bangna, Bangna, Bangkok 10260  
Tel. 0 2367 2699 Fax. 0 2745 7945
- BCPR Co., Ltd.  
2098 M Tower Building, 8<sup>th</sup> Floor, Sukhumvit Rd., Phra  
Khanong Tai, Phra Khanong, Bangkok 10260  
Tel. 0 2335 8654
- BCV Partnership Co., Ltd.  
2098 M Tower Building, 20<sup>th</sup> Floor, Sukhumvit Rd., Phra  
Khanong Tai, Phra Khanong, Bangkok 10260  
Tel. 0 2335 4999 Fax. 0 2335 4572
- BCV Bio Based Co., Ltd.  
2098 M Tower Building, 20<sup>th</sup> Floor, Sukhumvit Rd., Phra  
Khanong Tai, Phra Khanong, Bangkok 10260  
Tel. 0 2335 4999 Fax. 0 2335 4572
- BCV Innovation Co., Ltd.  
2098 M Tower Building, 20<sup>th</sup> Floor, Sukhumvit Rd., Phra  
Khanong Tai, Phra Khanong, Bangkok 10260  
Tel. 0 2335 4999 Fax. 0 2335 4572
- BCV Energy Co., Ltd.  
2098 M Tower Building, 20<sup>th</sup> Floor, Sukhumvit Rd., Phra  
Khanong Tai, Phra Khanong, Bangkok 10260  
Tel. 0 2335 4999 Fax. 0 2335 4572
- BCP Energy International Pte. Ltd. (BCPE)  
8 Marina Boulevard # 05-02, Marina Bay Financial Centre,  
Singapore 018981
- BCP Innovation Pte. Ltd. (BCPI)  
8 Marina Boulevard # 05-02, Marina Bay Financial Centre,  
Singapore 018981





- BCP Trading Pte. Ltd. (BCPT)  
160 Robinson Road #25-03, Spore Business Federation CTR,  
Singapore 068914
- Nido Petroleum Limited  
Level 46, Tower One – International Towers Sydney, 100  
Barangaroo Avenue, Barangaroo NSW 2000, Australia
- BCPR Pte. Ltd.  
8 Marina Boulevard # 05-02, Marina Bay Financial Centre,  
Singapore 018981
- Bangchak Venture Pte. Ltd.  
8 Marina Boulevard # 05-02, Marina Bay Financial Centre,  
Singapore 018981

**Others:**

- **Bangchak Initiative Innovation Center (BiiC)**  
2098 M Tower Building, 5<sup>th</sup> Floor, Sukhumvit Rd., Phra Khanong  
Tai, Phra Khanong, Bangkok 10260  
Email: [biic@bangchak.co.th](mailto:biic@bangchak.co.th)
- **Happiness Sharing Foundation**  
2098 M Tower Building, 18<sup>th</sup> 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, 18<sup>th</sup> Floor, Sukhumvit Rd., Phra Khanong  
Tai, Phra Khanong, Bangkok 10260  
Tel.0 2335 4600, Fax.0 2016 3969



- Information on Reference Persons**

Securities Registrar	Thailand Securities Depository Co., Ltd. 93 Ratchadaphisek Road, Dindaeng, Dindaeng, Bangkok 10400 Thailand Tel. 0 2009 9000 Fax. 0 2009 9991
Auditor	KPMG Phoomchai Audit Limited 48 <sup>th</sup> - 51 <sup>st</sup> Floors, Empire Tower 195 South Sathorn Road, Yannawa, Sathorn, Bangkok 10120 Thailand Tel. 0 2677 2000 Fax. 0 2677 2222
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: <a href="http://www.bangkokbank.com">www.bangkokbank.com</a>
Debenture Registrar and Payment Agent (for BCP214A, and 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: <a href="http://www.krungsri.com">www.krungsri.com</a>
Debenture Registrar, Payment Agent and Debenture Holders' Representative (for BCP208A, BCP238A, BCP258A, and BCP28DA)	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: <a href="http://www.krungsri.com">www.krungsri.com</a>



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

Krung Thai Bank Public Company  
Limited  
35 Sukhumvit Road, Klong Toey Nua,  
Wattana, Bangkok 10110  
Tel. 0 2298 0830 Ext. 129  
Website: [www.ktb.co.th](http://www.ktb.co.th)

Legal Counsel

**Baker & McKenzie Ltd.**  
25<sup>th</sup> Floor, Abdulrahim Place, 990  
Rama IV Road, Silom, Bangrak,  
Bangkok 10500 Thailand  
Tel. 0 2636 2000 Fax. 0 2636 2111

**LS Horizon Limited**  
14<sup>th</sup> 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, 7<sup>th</sup>-9<sup>th</sup> Floor, North  
Sathorn Road, Silom, Bangrak,  
Bangkok 10500 Thailand  
Tel. 0 2266 6485 Fax. 0 2266 6483