

LEADER IN **ENERGY TRANSITION**

Integrated Sustainability Report 2021

Bangchak Corporation Public Company Limited



Bangchak

100X



Sustainability Award
Silver Class 2022

S&P Global

MSCI
ESG RATINGS



CCC	B	BB	BBB	A	AA	AAA
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Vision



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

Mission

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

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

Core Values

i
Innovation

AM
Agility & Mobility

B
Beyond Expectation

C
Continuous Development

P
Pursuit of Sustainability

Corporate Culture

Sustainable Innovative Business Development in Harmony with the Environment and Society

Employee Culture

To be virtuous, knowledgeable, and contributive to others

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**Refinery
Business Group**

(Capacity of 120,000 barrels
per day)



**Marketing
Business Group**

(More than 1,200
service stations)



**Green Power
Business Group**



**Bio Based Products
Business Group**



**Natural
Resources and
New Business Group**



Bangchak operates its refinery and trading business, marketing business, bio-based products business, green power business, and natural resources and business developing business around 15 countries, which are Thailand, Lao PDR, Malaysia, Singapore, Indonesia, Philippines, Brunei, Japan, South Korea, Taiwan, Hong Kong, China, Netherland, Russia and Norway. (Disclosure 102-4)

About this Report

Report Content

Bangchak Corporation Public Company Limited has prepared an Integrated Sustainability Report to disclose the Company's annual sustainability performance (Disclosure 102–52) for the 17th year. The reporting period of this report is from January 1 to December 31, 2021 (Disclosure 102–50). This report has been prepared in accordance with the GRI Sustainability Reporting Standards (GRI Standards): Core option (Disclosure 102–54) and the Oil & Gas Sector Supplement (OGSS) and the United Nations Global Compact : Advance Level. In addition, the Company integrates Sustainable Development Goals (SDGs) into the corporate strategy and business operations of the organization in order to demonstrate the commitment towards the SDGs adopted by the company and the needs and expectations of various groups of stakeholders.

Reporting Boundary (Disclosure 102–45, 102–46, 103–1)

This report discloses 2021 sustainability performance data of businesses under Bangchak Corporation Public Company Limited (BCP) operating in Thailand. For energy and GHG emissions performance data in 2021, Company set the target to Carbon Neutral in 2030 and for transparency in scope of report, Company adjusted the scope of report for energy and GHG emissions performance data to cover specified only Bangchak Corporation Public Company Limited in 3 scopes as 1) Refinery business 2) Marketing business consist of Bangchak Green Net Co., Ltd (BGN) which is a service station business and Bangchak Retail Co., Ltd. (BCR) which operates a retail and Inthanin coffee shop business and 3) Office building scope which included M-Tower building and Regional offices in North, Northeast and Southern business offices (Disclosure 102–49).

Data regarding water withdrawal, water discharge and water consumption was for the operations at the office and refinery located in Sukhumvit 64 and Bangchak's head office at M Tower. Water discharge data of Bangchak's head office at M Tower was reported additionally in 2021 (Disclose 102–49).

Data regarding water management, air pollutions, significant oil and chemical spills, and waste management was only for the office and refinery located in Sukhumvit 64 as it is the important operating site of the Company.

For occupational health and safety data, the Company has reported on occupational health and safety data of the office and refinery located in Sukhumvit 64 and M Tower Headquarters only. The Company has improved the occupational health and safety performance table to be consistent with corporate sustainability assessments by reporting on holistic occupational health and safety performance and the performance by genders for both employees and contractors (Disclosure 102–48). For 2021. There was no significant change in relation to the organization or any supply chains (Disclosure 102–10).

In terms of human rights, the Company has disclosed 'Ratio of basic salary and remuneration of women to men (female: male) of employees of Bangchak Corporation Public Company Limited. (Disclosure 405–2)

Report Assurance

This report has been reviewed by executives from each business unit and functions (Disclosure 102–32) to ensure the completeness, accuracy, and cover stakeholders' expectations. In addition, the report is subjected to an independence third party, who has a professional experience and provides confidence to our business performances in oil and gas industry, leading to gain credibility and transparency align with GRI Standards. In 2021, Company expanded the verification scope of energy performance and GHG emission scope 1 scope 2 and GHG emission reduction according to GRI 302–1, GRI 305–1, GRI 305–2, GRI 305–4, GRI 305–5 in the Reasonable level of assurance. For GHG emission scope 3 is accordant with GRI 305–3 and GRI 305–7 in the Limited level of assurance as stated in the Assurance Statement page 189 (Disclosure 102–49)

Contact Information (Disclosure 102–53)

For more information or suggestion, please contact

- **Corporate Sustainability Development and Standards**

Bangchak Corporation Public Company Limited

E-mail: nintira@bangchak.co.th Tel: 0 2335 4383

Companies within report (Disclosure 102–45, 102–46, 103–1)

No.	Company	% equity	Production	Energy	GHG Emissions	GHG Reduction	Water use	Waste water	Air Emissions	Waste	OHS
Refinery and Trading Business											
1	Bangchak Corporation Plc.	100	/	/	/	/	/	/	/	/	/
2	BCP Trading Pte. Ltd.	100									
3	Bongkot Marine Service Co., Ltd.	30	NR	NR	NR		NR	NR	NR	NR	NR
4	Fuel Pipeline Transportation Co., Ltd.	4.95	NR	NR	NR		NR	NR	NR	NR	NR
Marketing Business											
1	Bangchak Retail Co., Ltd.	100	NR	/	/	/	NR	NR	NR	NR	NR
2	Bangchak Green Net Co., Ltd.	49	NR	/	/	/	NR	NR	NR	NR	NR
3	Oam Suk Social Enterprise Co., Ltd.	40	NR	NR	NR		NR	NR	NR	NR	NR
Green-Power Business											
1	BCPG Plc.	60.36	NR	NR	NR	NR	NR	NR	NR	NR	NR
2	Bangchak Solar Energy Co., Ltd.	100							NR	NR	NR
3	Bangchak Solar Energy (Chaiyaphum 1) Co., Ltd.	100							NR	NR	NR
4	Bangchak Solar Energy (Buriram) Co., Ltd.	100							NR	NR	NR
5	• Huang Ming Japan Co., Ltd.	100									
6	Bangchak Solar Energy (Buriram 1) Co., Ltd.	100							NR	NR	NR
7	Bangchak Solar Energy (Nakhonratchasima) Co., Ltd.	100							NR	NR	NR
8	Bangchak Solar Energy (Prachinburi) Co., Ltd.	100							NR	NR	NR
9	BSE Energy Holdings Pte Ltd.	100									
10	• BCPG Japan Corporation Ltd.	100									
11	• BCPG Engineering Co., Ltd.	100									
12	BCPG Investment Holding Pte Ltd.	100									
13	• Greenery Holdings Pte Ltd.	100									
14	• Greenery Power Pte Ltd.	100									
15	• BCPG Wind Cooperatief U.A.	100									
16	• Petro Wind Energy Inc.	40									
17	Thai Digital Energy Development Co.,Ltd	75									
18	Lomligor Co., Ltd.	100							NR	NR	NR
19	Star Energy Group Holdings Pte Ltd.	33.33									
20	Impact Energy Asia Development Limited	45									
21	BCPG Indochina Co., Ltd	100									
22	• Nam Sam 3A Sole Co., Ltd	100									
23	• Nam Sam 3B Sole Co., Ltd	100									
24	BSE Power Holdings (Thailand) Company Limited	99.99									
25	• RPV Energy Co., Ltd.	99.99							NR	NR	NR
26	• JRK Energy CO., Ltd.	99.99							NR	NR	NR
27	• Aquatist Energy Co., Ltd.	99.99									
28	• Lopburi Solar Co., Ltd.	99.99							NR	NR	NR
29	• Prachin Solar Company Limited	99.99							NR	NR	NR
Bio-Based Product Business											
1	BBGI Plc.	60	NR	NR	NR	NR	NR	NR	NR	NR	NR
2	BBGI Utility and Power Co., Ltd.	100									
3	WIN Ingredients Co., Ltd.	100									
4	KSL Green Innovation Plc.	100									
5	Bangchak Bioethanol (Chachoengsao) Co., Ltd.	85									
6	Bangchak Biofuel Co., Ltd.	70									
7	Ubon Bio Ethanol Plc.	21.28									
8	• Ubon Bio Agricultural Energy Co., Ltd.	100									
9	• Ubon Biogas Co., Ltd.	100									
10	• Ubon Sunflower Co., Ltd.	100									
Natural Resource Business and Business Development											
1	BCP Energy International Pte. Ltd.	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
2	• Nido Petroleum Pty Ltd.	100									
3	• Nido Petroleum Indonesia (Holding) Pty Ltd.	100									
4	• Nido Petroleum Indonesia (Gurita) Pty Ltd.	100									
5	• Nido Petroleum Indonesia (Cakalang) Pty Ltd.	100									
6	• Nido Petroleum Indonesia (Baronang) Pty Ltd.	100									
7	• Nido Petroleum Philippines Pty Ltd.	100									
8	• Nido Production (Holding) Pty Ltd	100									
9	BCPR Co., Ltd.	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
10	• BCPR Pte. Ltd.	100									
11	• OKEA AS	46.32									
12	BCP Innovation Pte. Ltd.	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
13	• Lithium Americas Corp.	15.86									
14	• Minera Exar S.A	50									
15	• Lithium Nevada Corp.	100									
16	• Rheo Minerals Inc.	100									
17	• Bonumose LLC.	5.45									
18	• Eneavate Corporation	1.15									
19	• Geltor, Inc	0.97									
20	• Manus Bio Inc.	0.75									
21	BCV Bio Based Co., Ltd.	100									
22	BCV Energy Co., Ltd.	100									
23	BCV Innovation Co., Ltd.	100									
24	BCV Partnership Co., Ltd.	100									

☐ : Companies which their sustainability performance data was disclosed in the Integrated Sustainability Report 2021 in accordance with the GRI Standards. These were the companies operating in Thailand with Bangchak had >42% shares and have significant environmental and safety data (Disclosure 103–1)

☐ : Office buildings, did not collect environmental and safety data

• Non Relevance (NR) : Data was not significant to business and did not provide impact to Bangchak's overall performance.

• / : Data was disclosed in the report

• x : Data was not collected

The font color indicates the status of companies

Blue: Subsidiaries with Bangchak holding >42% shares

Green: Joint venture means Bangchak holds 20–42% shares

Orange: Other companies



Message from the President and Group Chief Executive Officer, Bangchak Group

The COVID-19 pandemic, which began in 2020, continued to force businesses around the world to adapt to various challenges, while continuing to prioritize business operations and to balance sustainable organizational development in 3 dimensions, namely Environment, Governance, and Social (ESG). 2021 was also the year of global awareness and call for tangible climate action following the 26th United Nations Climate Change Conference or COP26 in Glasgow, Scotland in November, which resulted in various related policies and measures, as well as an awakening of sustainability consciousness across all sectors.

With regards to the business overview Bangchak Group in 2021, along with the improvement of the COVID-19 situation in many countries and increased global vaccination rates stimulating overall economic recovery, the Group has closely monitored and analyzed the situation, allowing it to adapt in times of crisis, and resulting in outstanding performance for all business groups, namely, Refinery and Oil Trading Business, Marketing Business, Green Power Business, Bio-based Products Business, and Natural Resources Business and new businesses. The Group had a record-breaking annual performance, with revenue from the sales and rendering of services at THB 199,417 million, an EBITDA of THB 25,818 million, benefitting from investments in upstream businesses such as in natural resources in Norway through OKEA, as well as Business Process Redesign (BPR) to improve internal process efficiencies and reduce costs which began in 2020 and increased Group's EBITDA in 2021 by more than THB 1,600 million.

In parallel with business operations, Bangchak Group accentuates employee care and its role in providing social and community assistance throughout times of normality and crisis. During the COVID-19 crisis of 2021, various campaigns were organized to support governmental, public, and private agencies in delivering social assistance, including health protection and economic recovery programs in Bangchak refinery communities and across the country.

For instance, “Bangchak and Thais Combat COVID-19 The Series” (to support people in Samut Songkhram), providing fuel cash cards, sponsoring meals for public health personnel, high-flow oxygen tanks, providing space in service stations for food sellers who were affected by mall lockdown, distributing food and essential supplies etc. In 2021, Bangchak received a community engagement score of 86 from the Refinery communities, the highest score since 2014, when evaluations began.

Bangchak Group operations adhere to the 3S Strategy (Security, Stability, Sustainability) and the 4G Sustainability Strategy (Green Business, Green Production, Greenovative Experience, Green Society) conducting business while taking in to consideration performance and social impact, and a balancing sustainable growth targets in 3 dimensions, namely, Environmental – Social – Governance (ESG) with the goal of “Bangchak 100X” and committed to addressing climate change by setting critical goals; to be Carbon Neutral by 2030, and Net Zero GHG Emissions by 2050. Critical importance is given to increasing investments in green businesses, enhancing productivity and efficiency, improving production processes, studying technologies that minimize greenhouse gas emissions and highly efficient carbon capture and storage technology, while planning to offset remaining carbon emissions through natural sequestration.

In 2021, in addition to continually improving productivity and processes to reduce greenhouse gas emissions, Bangchak Group also embarked on three critical missions towards the carbon neutral and net zero targets, as follow;

1. Establishing Carbon Markets Club with other leading organizations in Thailand to promote carbon credit trading and to raise awareness of the importance of carbon credit trading in a smooth transition to clean energy, which is required to minimize the environmental impact of the existing energy management, while accelerating the development of green energy efficiency and stability that is accessible.

2. Jointly establishing the Syn Bio Consortium, which is an important green innovation, comparable to farming in a laboratory, aiding various industries, especially the food industry to reduce land-use for livestock production, and directly affects greenhouse gas emissions into the atmosphere.
3. Business expansion into fuel pipeline transport and logistic businesses through Bangkok Fuel Pipeline and Logistics Company Limited (BFPL) which will reduce greenhouse gas emission from vehicular transport by 10,000 tons of carbon dioxide equivalent annually

Amidst the COVID-19 pandemic in 2021, Bangchak Group emphasizes the care of its employees and their families, as well as business partners, procuring COVID-19 vaccines, and strictly enforcing various preventative measures. Administering viral screening for employees in offices, Bangchak refinery and operational areas, service stations, and Inthanin coffee shops. Adapting appropriate working habits to restrict the occupancy of office space and maximize safety, while encouraging employees to creatively innovate to develop new products or business models, emphasizing process improvement by incorporating digital technology and foster the development of new skills to be prepared for future business expansion.

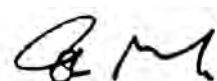
In the service businesses, through clear strategy and commitment to improve process efficiency, Bangchak service station was able to retain its number 1 Net Promoter Score (NPS) which is an international metric that measures customer engagement word of mouth, while Inthanin is widely-accepted as the leading Eco Brand, being environmentally-friendly and committed to businesses that are responsible for the environment, society, and community.

As a Leader in Energy Transition committed to developing business innovation in harmony with the environment and society, guided by good corporate governance, management that prioritizes individual and organizational development,

Bangchak was assessed by S&P Global, the assessor of the Dow Jones Sustainability Indices (DJSI) and awarded to S&P Global Sustainability Award 2022 – Silver Class, Global Top 3, and received the MSCI ESG Rating of AA, which is the highest for the Energy Sector in Thailand, consecutively since 2018.

Lastly, in 2021, Bangchak was recognized with more than 40 various awards for management, innovation, sustainability, corporate image, social responsibility etc. at the national level, such as, HRH Princess Maha Chakri Sirindhorn Trophy at the Thailand Corporate Excellence Awards 2021 for Corporate Improvement Excellence and Product/Service Excellence, and at the international level, such as First Runner Up for the UN Women 2021 Thailand WEPs Awards for Gender Inclusive Workplace. These awards and accolades are the collaborative work of Bangchak executives, employees, business partners and all stakeholders.

On behalf of Bangchak Group, I would like to extend our sincere gratitude to our shareholders and stakeholders for their constant trust, confidence, and support. We remain committed to ensuring continued business growth through good corporate governance, towards an sustainable organization, generating returns for our investors, creating value for our stakeholders, and nurturing sustainability for the world by prioritizing sustainable business innovation in harmony with the environment and society; an enduring concept that has guided us through the years.



(Chaiwat Kovavisarach)

**President and Group Chief Executive Officer,
Bangchak Group**

Bangchak Overview

Company name (Disclosure 102-1)

Bangchak Corporation Public Company Limited

Stock Market Name: BCP

Bangchak Corporation Public Company Limited is in the petroleum and renewable energy business. The five core businesses include refinery and trading business, marketing business, bio-based product business, green power business, and natural resources business. The Company invests in the core businesses domestically and internationally with the aim to create energy stability for the nation, to drive business with innovation, and to ensure business continuity and sustainability for both the organization and Thai society. (Disclosure 102-2)

Date of establishment: 8 November 1984

Headquarters (Disclosure 102-3): No. 2098 M Tower, 8th Floor, Sukhumvit Road, Phra Khanong Tai, Phra Khanong, Bangkok 10260, Thailand

Chief Executive Officer:

Mr. Chaiwat Kovavisarach Chief Executive Officer and President

Paid-Up registered capital: THB 1,376,923,157

Number of permanent employees (Disclosure 102-7) : 1,103 employees (as of December 31, 2021)

Business type: Oil & Gas Refining & Marketing.

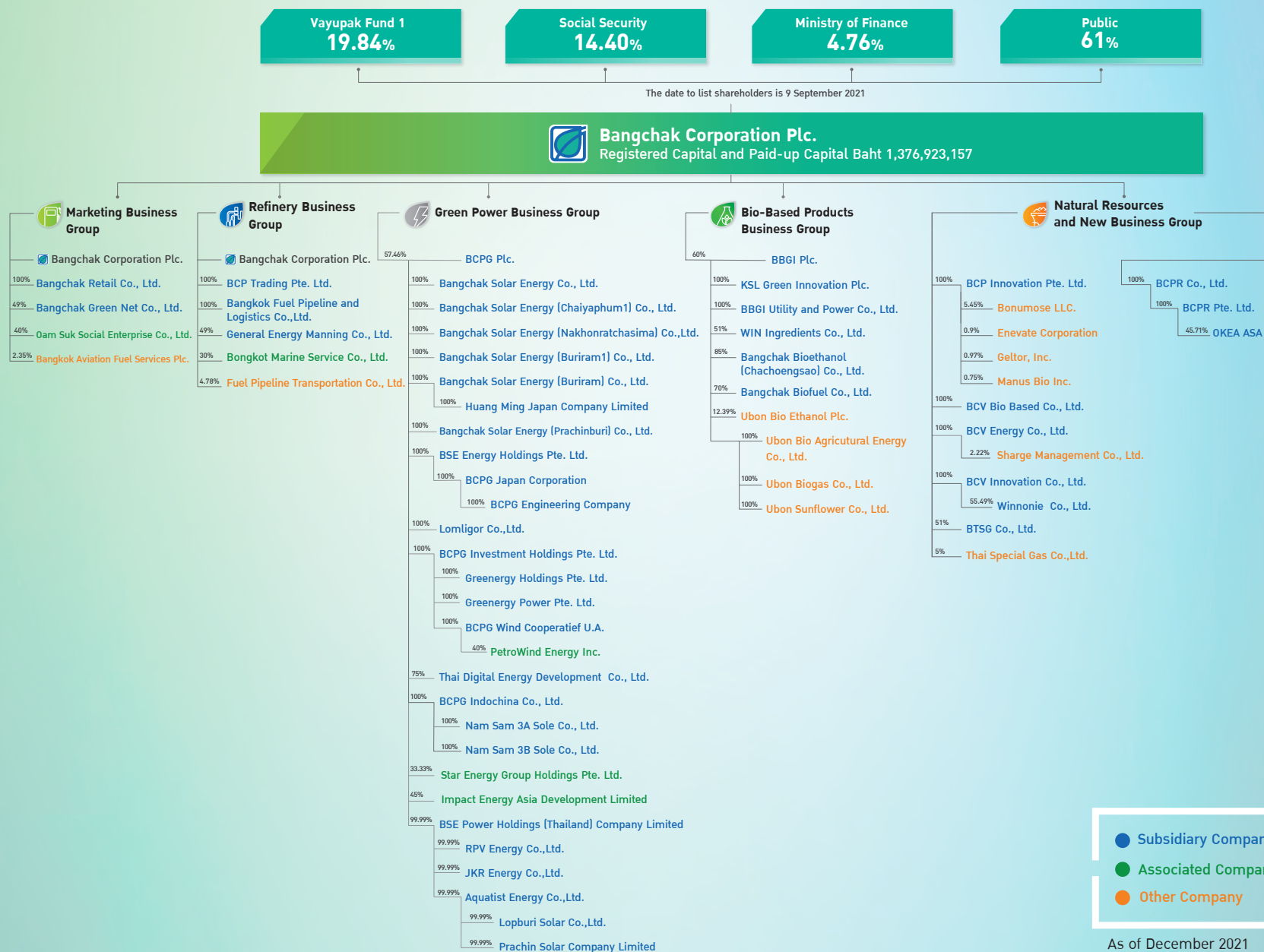
Membership of association (Disclosure 102-13) :



Global Compact
Network Thailand

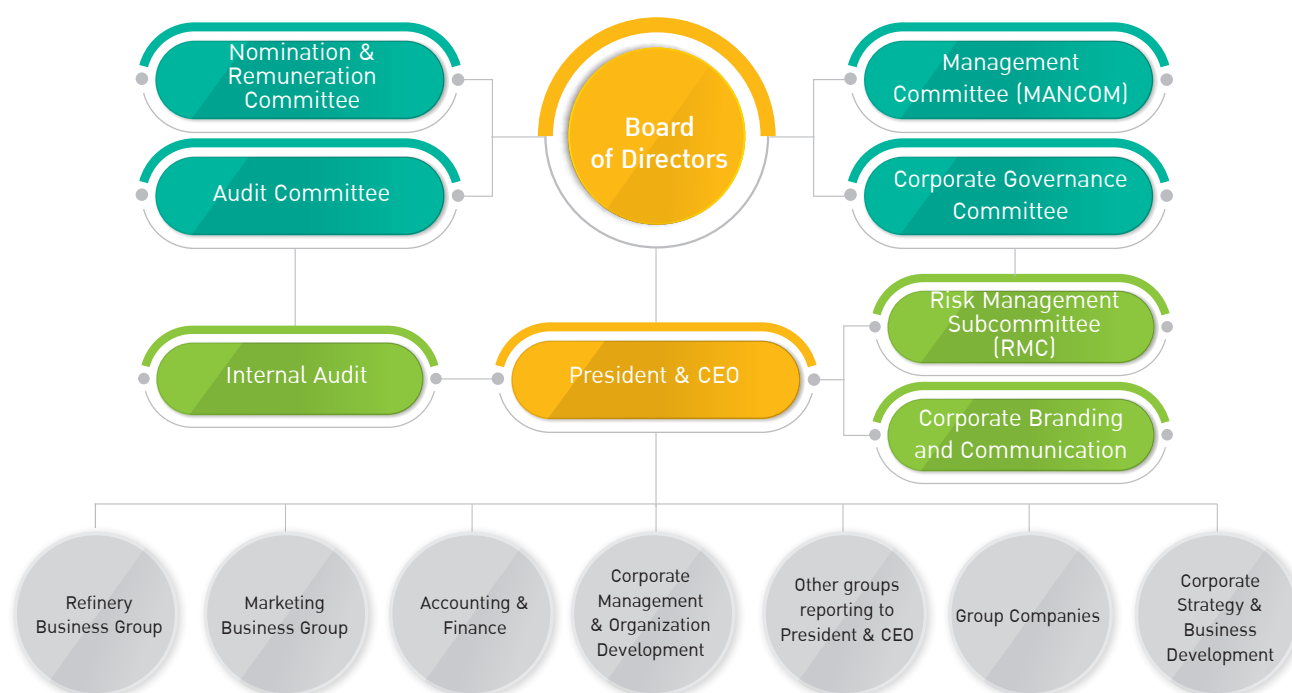


Shareholding Structure



Management Structure (Disclosure 102-18, 102-20, 102-22, 102-23)

The Board of Directors and the management perform in the best interests of Bangchak and its shareholders under a clear, balanced, and accountable management structure. The Board monitors and ensures that the management implements its policies, plans and strategies, and that there is clear distinction of roles and responsibilities between the Board and the management. The Board appoints sub-committees to consider significant matters, consist of the Audit Committee, Corporate Governance Committee, Nomination and Remuneration Committee and Enterprise-wide Risk Management Committee. The President & CEO is the top executive.



Bangchak's Value Chain (Disclosure 102-9)

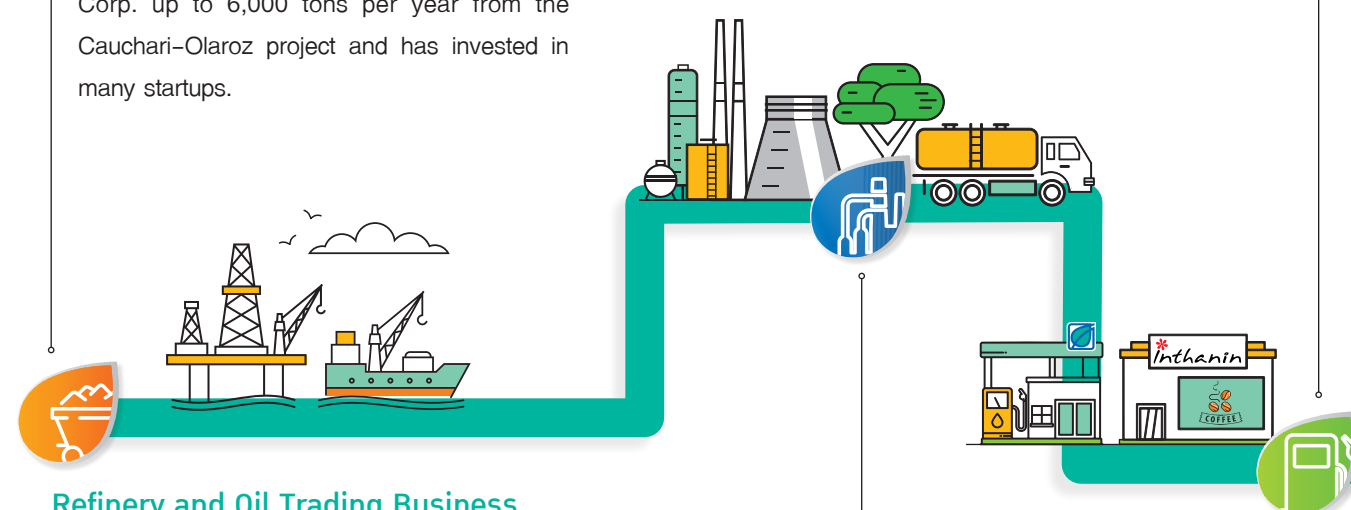
Natural Resources Business

Exploration and Production Business: Bangchak formed BCPR Pte. Ltd., in Singapore to invest in OKEA ASA, which holds rights in Draugen, Gjøa, Ivar Aasen, Yme, and Grevling oil fields in Norway (started production in Q4/2021) and holds development rights or is developing in the Grevling, Aurora, and Falk crude and natural gas fields, and in several concession plots in Norway. In addition, OKEA ASA is an operator in multiple fields. The Natural Resources Business and New Business Development has registered BCP Innovation Pte. Ltd. in Singapore to operate and invest in lithium minerals business and innovation-related businesses abroad. BCPI currently has the right to purchase lithium under the Lithium Purchase Agreement with Lithium Americas Corp. up to 6,000 tons per year from the Cauchari-Olaroz project and has invested in many startups.

Marketing Business Group

Bangchak sells finished products from the refining process to customers directly through Bangchak's service stations networks. In Thailand, there are 1,277 Bangchak service stations which are comprised of 662 standard service stations and 615 agriculture cooperative service stations (as of 31 December 2021). Bangchak service stations focus on green, renewable fuels with high performance, embracing the gasohol and diesel groups. In addition, the company created business partnerships to develop EV chargers applied to 70 Bangchak gas stations on the main route to support the increase of electric vehicles (EV) (as of December 31, 2021).

In addition, Bangchak has extended the business 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. In year 2021, the Company had over 817 branches of "Inthanin Coffee Shop" located in



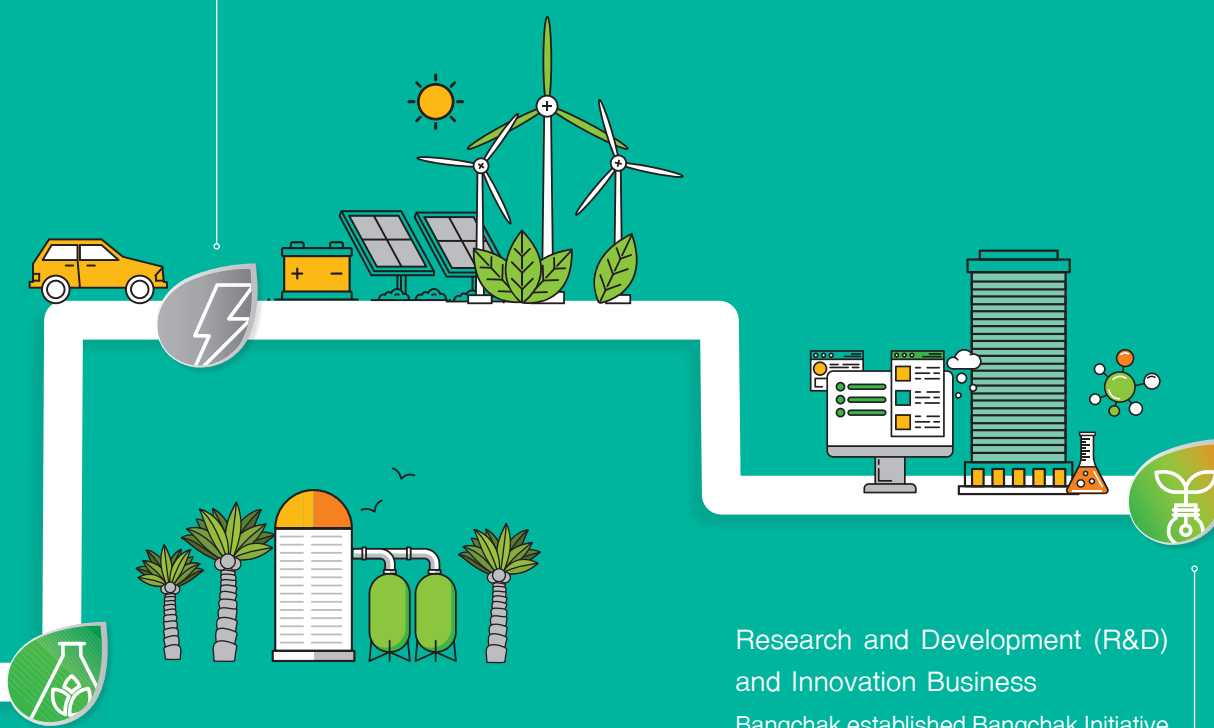
Refinery and Oil Trading Business

Bangchak Refinery is a modern complex refinery with a maximum production 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. Finished products are sold through Bangchak service stations which are under the marketing business group.

Furthermore, Bangchak develops international oil trading continuously through BCP Trading Pte. Ltd. (BCPT), focusing on the strategic expansion of out-out trading (procuring oil from oversea producers for sale to customers in foreign countries), whose main products are crude oil, gasoline, diesel, fuel oil, naphtha and solvent products. The Company has expanded the oil trading market to new partner companies and new countries of which new business partners have been reached in new countries including Taiwan, the Philippines, Pakistan, Qatar, and UAE. BCPT, moreover, was able to trade new products, such as MTBE, and was able to generate more income from developing low-sulfur fuel oil for IMO bunkers. Cordial relationship with partners and favorable market conditions have raised trading volumes for BCPT.

Green Power Business

Bangchak invests in the green power business via BCPG Public Company Limited (BCPG), a subsidiary established to engage in the generation and distribution of green electricity from renewables and new forms of clean energy in Thailand and overseas. In the end of year 2021, BCPG had the total production capacity of 504.7 MW which comprised electricity generation and distribution from solar power in Thailand and Japan, wind power in Nakhon Si Thammarat province, Thailand and in Philippines, Geothermal power in Indonesia, and hydropower in Laos. In addition, the company invested in VRB Energy's convertible bonds, which operates the business of manufacturing and distributing utility-scale energy storage system using Vanadium Redox Flow technology in the amount of USD 24 million and signed a 25-year power purchase agreement with Vietnam Electricity for the purchase of electricity under contractual capacity of 600 megawatts at the Lao PDR-Vietnam border.



Bio Based Products Business

Bangchak conducts bio-based products business through the business operation of BBGI Co., Ltd., which engages in the production and sale of biofuels as the largest player in Thailand. The subsidiary and associated companies of BBGI have a total production capacity of 1,600,000 liters per day, divided into 600,000 liters of ethanol per day and 1,000,000 liters of biodiesel per day. The objective is to lower trade deficits due to fuel imports, contribute to national energy security, support farmers, and preserve the environment. The Company also promotes the blending of ethanol with gasoline and biodiesel with diesel to yield gasohol 91, gasohol 95, gasohol E20, gasohol E85, and Hi-Diesel.

Research and Development (R&D) and Innovation Business

Bangchak established Bangchak Initiative and Innovation Center (BiIC) in order to create a Green Ecosystem to drive innovation by focusing on green energy and bio-based products to extend businesses both domestic and overseas through 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

Business Model

Key Inputs

Financial Capital

- Cost of sale of goods and rendering of services THB 175,744 million
- Investment in subsidiaries THB 13,669 million
- Total shareholders' equity, only the parent company 41,694 million baht

Manufactured Capital

- Property, plant and equipment THB 69,233 million
- Investment in projects for efficiency improvement
- Strategic Sourcing

Natural Capital

- Raw materials used in the refinery and Renewable raw materials
- Prevention and other environmental management costs THB 16.87 million
- Total water withdrawal: 2.10 million m3
- Process energy 12,417.58 (MWh)

Human Capital

- 1,103 employees
- Training hour 30,869.65 hrs.
- Training and development costs 15.93 million THB

Social and Relationship Capital

- Community and social development and philanthropy: THB 34.68 million
- Total voluntary working hours of employees: 1,716 hours
- Numbers of community relation activities: 216 activities
- Green procurement

Intellectual Capital

- Technology and innovation R&D expenditure in 2020: THB 10.50 million
- Business Process Redesign (BPR) projects to improve working processes, reduce working time, and increase efficiency
- Promote new business development through Design Thinking project



Outcomes for Bangchak

Financial Capital

- Revenue from sales and services 199,417 million baht
- EBITDA 25,818 million baht
- Net profit of the parent company 7,624 million baht
- Earnings per share 5.25 baht

Manufactured Capital

- The average production rate is 99.0 thousand barrels per day.
- Total Gross Refining Margin: GRM 8.96 US dollars per barrel
- Total sales volume of oil products 7,086 million liters
- Save budget 10% on procurement process in 2021

Natural Capital

- GHG reduction (scope 1 and scope 2) of the refinery was 9.64 % compared with base year 2015
- Implement the 3Rs (Reduce, Reuse & Recycle) principle to increase efficiency of water management through water reduction, water reuse and water recycling, reduced water consumption in production process 1.47 million cubic meter or 41.13% comparing with water consumption in production process.
- Waste to landfill 0 ton
- Waste diverted from disposal by reused and recycling 47.16%
- Waste direct to disposal with energy recovery (alternative fuel / fuel blending) 43.77%

Human Capital

- Saving cost expense from Business Process Redesign
1,600 million baht
- New business as Startup
- Employee Engagement 70%

Social and relationship Capital

- Percentage of community satisfaction to community relation activities: 94.4%.
- Community Engagement Score: 86%.
- Percentage of environmentally friendly products: 83%.

Intellectual Capital

- Introducing Astaxanthin from algae – a new healthy product with high added value.
- Introduction of a new innovation start-up: the sales petrol station project called "Krathing" for remote communities.

Outcomes for stakeholders

- Stock dividend paid to shareholders 1.00 baht
- Taxes paid to governments and local authorities
- Market Capitalization 34,767.31 million baht (as of December 30, 2021)
- Income tax (paid out) 111 million baht

- Safe production system. No air pollution and chemical spills complaints.
- Received excellent score from Supplier Satisfaction Assessment.
- Net Promoter Score (NPS) score 1st joint

- Reduce greenhouse gas emissions from filling
- Fuel through Bangchak membership card 190,716 ton CO₂e
- Reduction of water consumption in production process which economically equal to the water used by 4,171 households.
- Bangchak Hi Premium Diesel S B7 Euro 5 can help to reduce 2.5 PM Pollution.

- Average hours of Employee training and development per year per employee 27.99 hours
- Cost of training employee 14,447.45 per person.
- 0 Employee's Lost Time Injury Rate (LTIFR) and 1 contractor's LTIFR

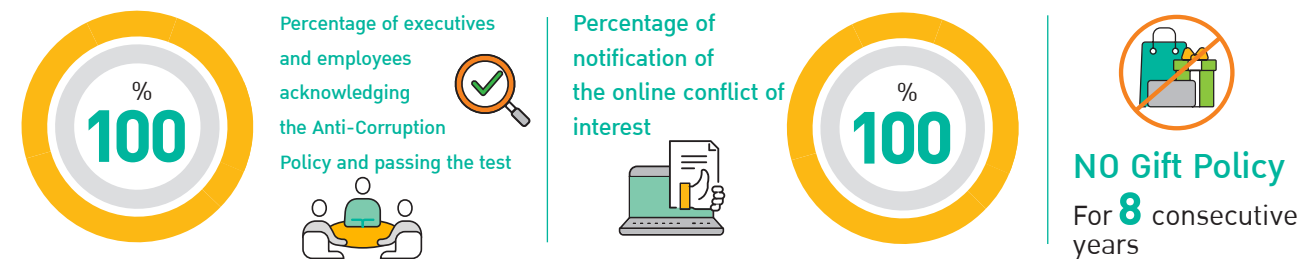
- Numbers of community relation activities: 216 activities,
- which benefited to 108,196 people in communities.
- Benefit from “Bangchak Cares – Fight COVID-19”
- Pan Kan Im Project– Supported 60 small restaurant operators around the refinery by purchasing 27,691 food boxes, valued at 1,245,930 THB and sent food boxes to support 50 organizations
- Provided Bangchak petrol card valued about 3,200,000 THB to 100 organizations, such as hospitals, field hospitals, waiting centers, temples, foundations, volunteer teams.

Economic, social and environment challenges and opportunities.



Bangchak at a glance in 2021

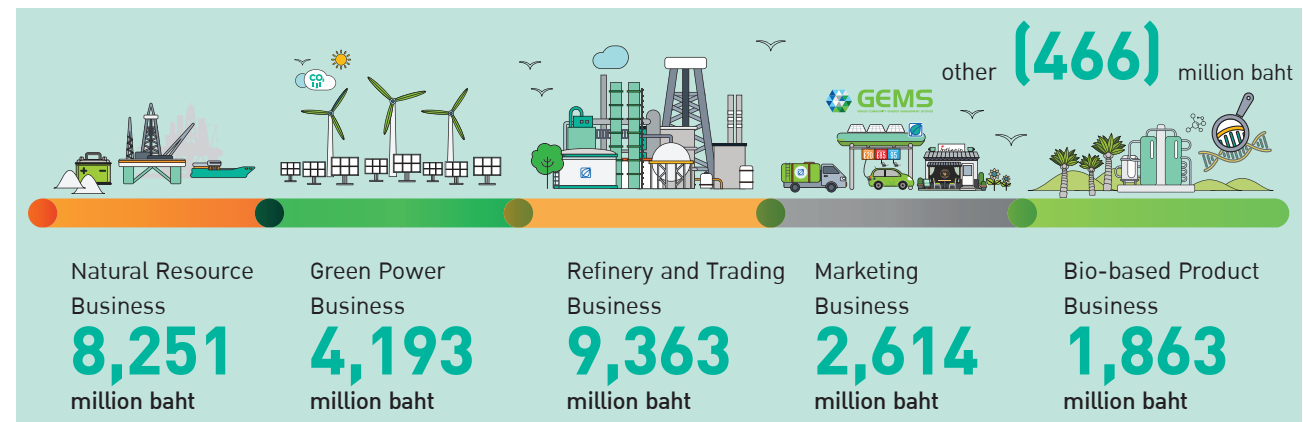
Corporate Governance



Economic Growth



EBITDA by business group



Local purchases of goods and services (Thailand)*



* Local purchasing in Thailand, exclude raw materials and crude oil

Percentage of cost saving from strategic sourcing procurement



Percentage of tier 1 suppliers and critical non-tier 1 suppliers participating in ESG risks assessment



In Harmony with the Environment

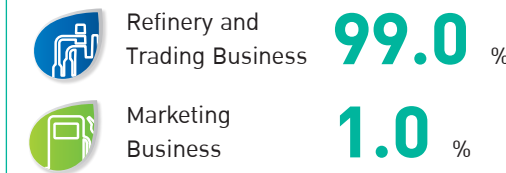
Total GHG emissions

(Equity share approach)

1.06

Million tCO₂e

Percentage of GHG emissions by business group (equity share approach)



Net energy consumption with in the organization

12,229.66 Terajoules

Energy Intensity Index (Refinery Business)

EII = 98.6

Total water withdrawal*

2.44 Million m³

*Surface water, groundwater, produced water from crude oil extraction/processing, and third-party water of the refinery and the headquarter office

Water recycled and reused of the refinery

1.47 Million m³

Effluent

0.83 Million m³

3Rs waste management

99.78 of total waste

Number of significant oil and chemicals spills (more than 100 barrels/time)

0 case

Environmentally friendly products

Low Carbon Product

Avoid emission for third-parties

Numbers of accidents from product transportation (financial loss more than THB 1 million/accident)

0 case

Greenovative Experience

Bangchak service stations

1,277 stations

standard service **662** stations

COOP service **615** stations

branches of the Inthanin coffee shop **817** shops

Creating Values for Society

Safety

Loss-time Injury Frequency Rate: (LTI)

Employees

Male **0** Female **0**

Contractors

Male **0.45** Female **0**

High-Consequence Work-Related Injuries

Employees **0** case

Contractors **0** case

Customers

Percentage of customer satisfaction

87.45%

NPS Score 1st rank (joint)

The return of service **95%**

Employees

Employee engagement score

70%

Average training hours of employees

27.99 hours/person/year

Society

Voluntary hours of employees

1,762 hours

Circular Economy Delivered plastic water bottles collected through "Rak Pan Sook" project.

80,160 bottles For producing bags and sanitary masks

Accumulated number of Bio cup for drinks at Inthanin coffee shops **98,000,000** cups

Leader in Energy Transition

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

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

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

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

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

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



www.bangchak.co.th



Bangchak & Sustainability

Bangchak is committed responses to needs and expectations of all stakeholders and sustainable development goals (SDGs). The Company also considers corporate sustainability assessments at national and international levels, which include sustainability topics in the areas of corporate governance and economic dimension, environmental dimension, and social dimension, to mitigate risks and their impacts on business and to seek for opportunities for improvement of business operations in all aspects of sustainability in accordance with targets and guidelines of international standards of sustainable development. As a result, the Company is able to conduct proactive business operations and to cope with global changes and emerging risks with immunity.

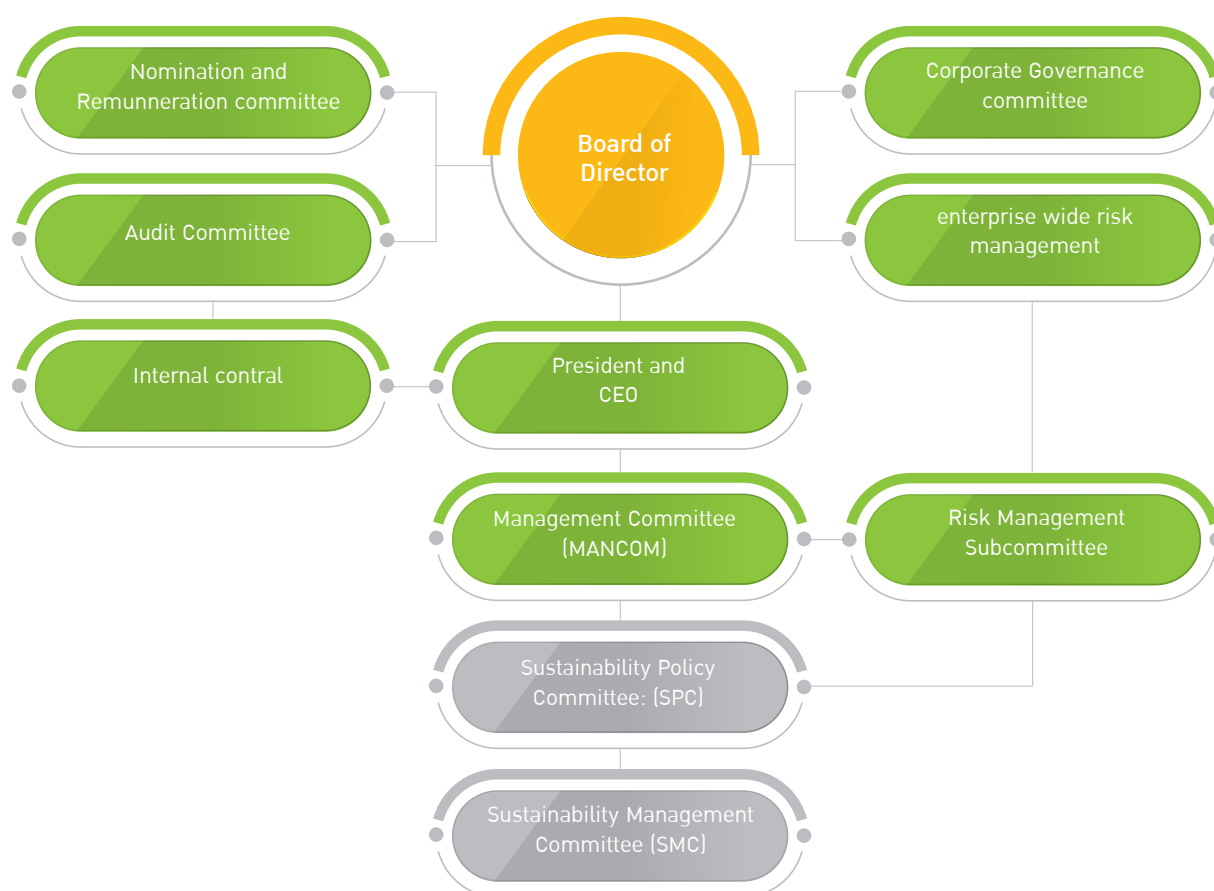
Bangchak operates its businesses in the aspect of sustainability through the Sustainability Policy Committee (SPC). the President and CEO is the chairman of the SPC, and executives of each business units and functions are the committee members (Disclosure 102-19, 102-20, 102-22).

The SPC sets directions, policies and corporate strategies for sustainable business development for Bangchak and its

subsidiaries in response to the SDGs goal, materiality, corporate sustainability assessments as well as needs and expectations of stakeholders.

Policies and targets from the SPC are executed through business functions and committees associated with sustainability. The Sustainability Management Committee acts as the main coordinator to monitor, collect, evaluate, and report on progress and performance to the Sustainability Policy Committee. The Sustainability Policy Committee then reports on sustainability performance to the Risk Management Subcommittee, Corporate Risk Management Committee, and the Corporate Governance Committee, respectively.

The Sustainability Management Committee consists of executives from Bangchak Group. In 2021, the committee focused on developing strategies on climate change which is an issue of global interest in which the company has joined the Global Campaign Race to Zero.



Sustainability Frameworks and Principles (Disclosure 102–16)

Bangchak has the Sustainability Policy that integrates international Sustainability guidelines, criteria and standards, such as United Nation Global Compact (UNGC), Dow Jones Sustainability Indices (DJSI), International Organization for Standardization (ISO) as well as stakeholders' expectation to Company's vision, direction and business strategy as the corporate sustainability framework. The Company monitors and reports on sustainability performance in accordance with the GRI Sustainability Reporting Standards (GRI Standards). This policy is a framework that demonstrates Bangchak's sustainability commitments along the business value chain.

Since 2020, Bangchak revised its Sustainability Policy to cover current and future sustainability issues by assessing issues, emerging risks, and global sustainability trends from Bangchak Group's businesses in Thailand and international.

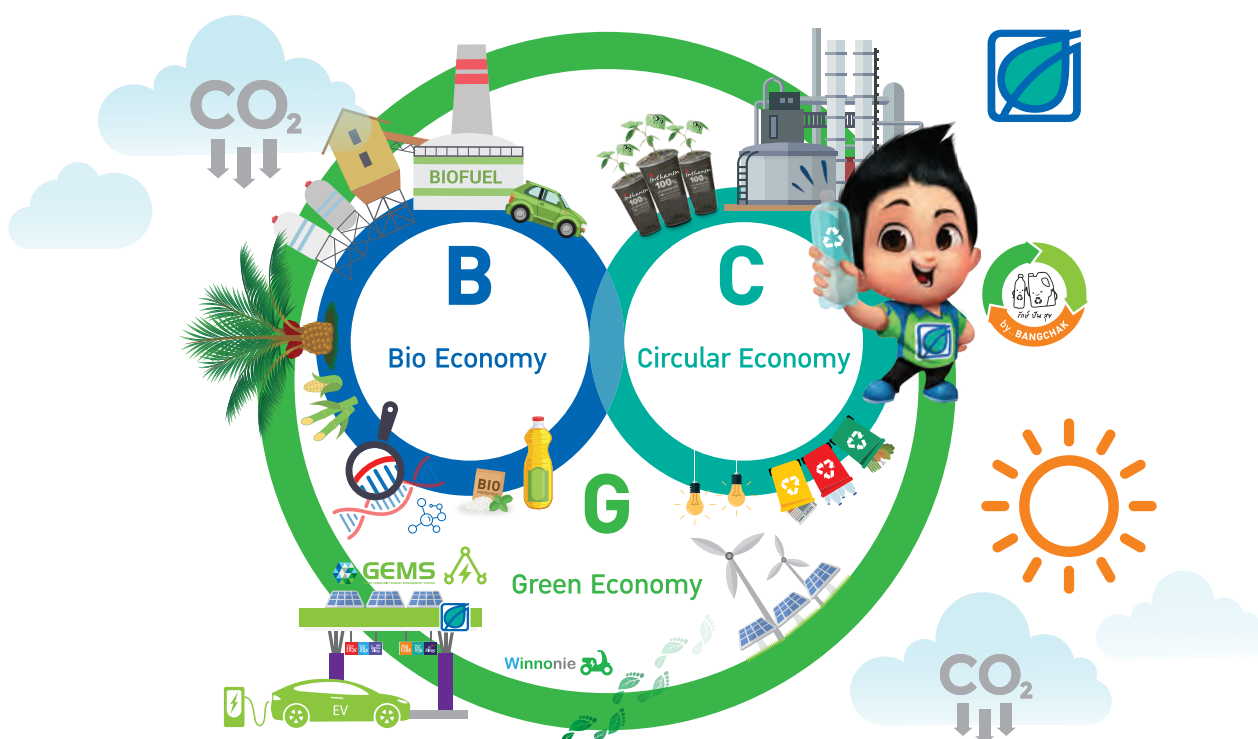
8 aspects covered under the Sustainability policy includes:

1. Good corporate governance
2. Fair business conduct
3. Responsible production and services and promoting sustainable society
4. Sustainability due-diligence assessment for new businesses
5. New innovative business investment for sustainability
6. Worthwhile resources and environmental management
7. Human rights support for sustainable economic prosperity
8. Sustainable social development

For further details of eight sustainability issues of Sustainability Policy, please refer to



Furthermore, Bangchak has adopted the “BCG Economy Model” which comprises 3 key economies: Bio-Economy focusing on the productive use of biological resource through the use of technology and innovation to transform agricultural products to high-valued biological products, Circular Economy emphasizing the worthwhile use of resources, raw materials, and products, and Green Economy focusing on overcoming environmental issues and mitigating their impacts sustainably. The model has been adopted to create profits, values and sustainability for the Company and stakeholders.



Bangchak and Stakeholders

Stakeholder Engagement

From the company's vision of "Evolving Greenovation – pursuing to be the Leading Green Innovation Companies in Asia that has good corporate governance and conducts business with a participatory and sustainable approach". Working with stakeholders is an important matter that the Company has consistently implemented in accordance with the vision. Incorporating the information gained from working with stakeholders into strategic planning of the Company is the way of doing it in addition to the framework and other strategic planning tools, such as Business Environment Scanning, BIG Data, Scenario Assessment, and Risk Assessment Intelligent Risks in order to respond to the needs and expectations of all stakeholder groups. It is also to be able to create a balance between profit and values in doing business for all

Stakeholders Engagement Processes

1

Stakeholder identification and prioritization by considering the 3 following criteria

- What groups of stakeholders are related to the Company's business operations?
- Does the Company make a lasting impact on the stakeholders?
- Do stakeholders have an influence that will have a lasting impact on the Company

2

Working with Stakeholders, there are important steps as follows:

- Specifying the department responsible for the stakeholder groups
- Systematically determine methods for surveying the needs, expectations and stakeholder' expectations and operating frequencies.
- Gather information about the needs and expectations of stakeholders

3

Analysis and Selection of Materiality



- Consider the importance of the needs and expectations of the stakeholders in accordance with the context related to the impact, risk, opportunity and conformity with the organization's policies and goals, including the importance to stakeholders and to the organization.



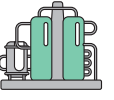
4



Results Processing


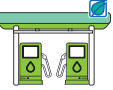

- Propose the analysis results to the Corporate Sustainability Policy Committee (SPC) in order to determine the direction of the sustainability operations and create organizational strategies.



The company has classified 10 groups of stakeholders, namely employees, suppliers, business partners, customers, shareholders, society and the community, media, creditors, government agencies and competitors (Disclosure 102-40) and has different ways to respond to their needs and expectations.




Stakeholder (Disclosure 102-40)	Engagement Approaches in 2021 (Disclosure 102-43)	Needs & Expectations in 2021 (Disclosure 102-44)	Responses by the company in 2021	2021 Targets	Results 2021	Next Year Plan
1. Employees 	1. Engagement survey 1.1 Conduct Engagement survey 2 times/year 1.2 Use 3 models to design survey questions , 1) kincentric (Best Employer) 2) based on current situation 3) open-ended questions 1.3 The survey report is divided into 2 types which are Corporate report and Business Group & Business Unit report 2. Focus Group 3. HR Visit 4. Leadership Activities	1. Talent Development & Attraction to manage turn over rate. 2. Career opportunities (Employees want to know their career path and continuous development plan) 3. Employee performance evaluation 4. Recognition and two-ways communication from top management. 5. Listen the employee's comment and feedback, increase communication channels to communicate directly to the responsible department.	1. Talent Development --> Develop IDPs for high potential or Successor, rotation program, innovation and design thinking project (Mini MBA), Change position name, 360 degree performance evaluation for manager up, Congrates day 2. Career opportunities --> Communicate the growth path and allow employees to define their career paths, rotation program 3. Employee performance evaluation--> review job family and the criteria Performance appraisal, improve the criteria Performance appraisal, improve KPI studies 4. Recognition --> more new activities such as Tea Time , Congrates day , Birthday, Build Trust – (Welcome back massage and gift), Gift box , Special box, Townhall (BU/BG) 5. Epidemic – The company maintains engagement between management and employees such communicated BCM Plan to employees, updated in response to the on-going crisis and new information through online communication channels: In Brief from President, Townhall. Moreover, the company has also arranged for vaccinations, ATK examinations etc.	1. Engagement Score > 67% 2. Talent Focus Score > 51% 3. Average Turnover Rate < 5% 4. High Performer Turnover Rate < 5% 5. Job Rotation for Development > 15%	1. Engagement Score 70% 2. Talent Focus Score 60% 3. Average Turnover Rate = 4.86% 4. High Performer Turnover Rate = 5.75% 5. Job Rotation for Development = 19.91%	Create activity : 100 x Happiness such as – Skill talent – More effective internal communication – Improve HR System – Culture Recognition
2. supplier 2.1 Supplier, Contractors, Vendors 	1. Annual Trade Partner seminar 2. Satisfaction, need & expectation survey 3. Supplier site visit	1. Speed of purchasing / procurement process 2. Digital Transformation 3. Effective communications during the COVID-19 crisis	1. Set common products in standard TOR , to speed up the process procurement 2. Used Electronic Signature technology in procurement documents 3. Used Online meeting 4. Support alternative vaccines for supplier and weekly ATK check 5. Revised SCOC announcement 6. Got supplier feedback from the annual seminar , website and buyer.	1. supplier adopt Electronic Signature 80% 2. Change Bank Guarantee to e-Guarantee (Blockchain BG) 3. Revise SCOC (Supplier Code of Conduct) and announce to suppliers 4. Get supplier feedback from the annual seminar	1. Set common products in standard TOR 2. supplier adopt Electronic Signature 95 % 3. Changed all Bank Guarantee to e-Guarantee 4. Online the supplier annual seminar focusing on Greenhouse Gas , Supplier Code of Conduct (SCOC) , Human Right, Anti-Corruption and No Gift for any occasions. The satisfaction on the operations of suppliers was 80%.	1. Set up the annual seminar 2. Conduct satisfaction, need & expectation survey 3. job inspection process standardization 4. Common products TOR standardization 5. Site visit

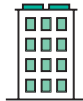


Stakeholder (Disclosure 102-40)	Engagement Approaches in 2021 (Disclosure 102-43)	Needs & Expectations in 2021 (Disclosure 102-44)	Responses by the company in 2021	2021 Targets	Results 2021	Next Year Plan
2.2 Oil transportation suppliers 	1. Communicate both directly and online by using Microsoft Team conducts monthly performance meeting during COVID-19 2. Send information Measures during COVID 3. Satisfaction, need & expectation survey	1) Fair allocation of work during the sale volume decreases 2) Temporary permit to pick up work from other employers during the COVID-19 3) Follow up after meeting 4) Clearly work system and communication.	1. Making understanding and working together between supplier and dealer 2. Coordinate customers to work step by step description of a receiving oil process 3. Revised TOR and reduce costs such as do not reserve trucks, extend Vehicle Age. 4. job assignment to contractors is considered on performance and KPI 5. Facilitates parking at depot. 6. Allowance to utilize the vehicle to pick up temporary employment from other employers during the delivery period was reduced. 7. Distributed alcohol gel and medical masks to drivers and contractors. In addition, alcohol gels are provided throughout the office and operational areas. 8. Support alternative vaccines for drivers	1. Making understanding and working together between supplier and dealer 2. Help suppliers safe cost 3. Allocate jobs fairly	1. Product delivered smoothly in COVID-19 epidemic situation and customers and contractors understood and cooperated to prevent COVID-19 2. Suppliers had additional job (Transfer depot) and got income to replace oil transportation income during the COVID-19 3. Fair allocation of work during the sale volume decreases	1. Expand the use of semi-trailer transport to 45%. 2. Improve work efficiency by holding meetings to track KPIs with business partners.
2.3 Ship Transportation suppliers 	1. Meeting with suppliers 2. Quarterly KPI and fleet management meeting	1. Long term contact 2. Competitive shipping cost 3. Controlling quantity of oil loss during the course of transportation by the targets 4. Zero accident and Zero oil spills 5. Improve the oil delivery management system together	1. Implemented Smart Logistic & Inventory Management (SLIM) to reduce transportation time 2. Used Tanker Management and Self Assessment (TMSA) to assess performance 3. Quarterly KPI and fleet management meeting	1. Controlling quantity of oil loss during the course of transportation by the targets as follows: <ul style="list-style-type: none"> Intransit Loss : Product < 0.12% on B/L Intransit Loss : Crude < 0.16% on B/L 2. Number of times in the occurrence of oil spill is zero. 3. Number of accident occurred during the course of transportation is zero	1. Controlling quantity of oil loss during the course of transportation by the targets as follows: <ul style="list-style-type: none"> Intransit Loss : Product – 0.09% Intransit Loss : Crude – 0.13% 2. Number of times in the occurrence of oil spill is zero. 3. Number of accident occurred during the course of transportation is zero	1. Quarterly KPI and fleet management meeting 2. Continuously assess performance
2.4 Raw materials suppliers (Oil/Biofuel) 	1. Satisfaction survey 2. Monthly Meeting 3. Regular meeting to communicate about work and solve problem together	1. Consistent procurement 2. Fair and transparent procurement 3. Providing useful information related to crude oil procurement 4. Flexible and smooth operation on the reception of raw materials 5. Paying bills on time (by the due date) 6. Accurate and complete financial document regarding receiving-paying	1. Consistent and fair procurement 2. Share useful information together 3. Flexibility material receiving operations 4. Paying bills on time (by the due date) 5. Accurate and complete financial document regarding receiving-paying	Satisfaction survey score = 3 points from Full score 5 points	Got satisfaction survey score = 4.9 points from Full score 5 points	Monthly Meeting

Stakeholder (Disclosure 102-40)	Engagement Approaches in 2021 (Disclosure 102-43)	Needs & Expectations in 2021 (Disclosure 102-44)	Responses by the company in 2021	2021 Targets	Results 2021	Next Year Plan
3. Users 3.1 End users 	1. NPS Customer Survey 2. Marketing research 3. Customer behavior data from POS and CRM systems 4. Department of Energy Business Information 5. BCP Call Center	1. Location of service stations. 2. Fast service 3. Service staff delivers their service politely. 4. new products to serve the needs of customer 5. Sufficient and clean restrooms. 6. Convenient to travel in and out, and has parking area enough 7. Adopted and applied risk management and business continuity management plan 8. Adjusted marketing strategy in response or support to customer the crisis	1. Develop and extend Unique Design service stations, and variety of non-oil services 2. Speed up service 3. implement Bangchak Digital Payment and collect points by using mobile number to reduce the time of service 4. Develop online training for service station employees and operators to enable them to access important information anytime and anywhere 5. Launch new products to serve the needs of customers such E20S Evo which is premium quality, but sell at saving price 6. Use Mobile Application Survey to in order to be able to solve customer problems timely 7. Expand Non oil business partners to response customer need such as EV Charger, Bangchak Food Truck 8. Analyzed customer data to create the sales promotional campaigns such as Cross sell , redeeming membership points for gold, discount fuel costs or discount Grab and Food Panda delivery cost. 9. Increase preventive measures and maintain cleanliness inside the service station (7 Safe), and supported COVID-19 mobile test service for dealer and employees to reduce risk 10. Project “Bangchak Invite Thai people to fight against COVID-19 The Series”, “Fuel Up and Share Drinking Water” project providing drinking water to field hospitals and nursing homes in critical areas; the “Fuel... Sharing Kindness” Project where Bangchak contributed fuel expenses for volunteer groups for transportation of COVID-19 patients; and projects to support agricultural products from farmers who have been affected by declining demand due to COVID-19. 11. Special privileges for Bangchak member card Redeem points for COVID-19 insurance	1. Market share of refined oil through service station increased to 16.0% 2. No. 1 of the Net Promoter Score	1. Market share of refined oil through service station increased to 16.2% 2. NPS Score 77.5%, 1st place joint 3. Card member 93.7% satisfied with the speed of service via the mobile application	1. Develop and extend Unique Design service stations, and variety of non-oil services 2. Renovate the old service station 3. Use Digital to improve customer experience such as Personalized Offerings 4. Expand Non oil business partners to response customer
3.2 Industrial Customers 	1. Sale representative 2. Technical Service engineers 3. Boots activities with government sector and various associations 4. Satisfaction Survey 5. Customer complaint	1. Need a quick response of market representative 2. Extend payment time or credit term 3. On time product and service delivery 4. Reasonable price and good quality products	1. Extend payment time or credit term for customers who buy all product from the company, good financial discipline and no outstanding debt. 2. Give a special credit For good financial discipline retail customers 3. Encouraged the use of E-Tax invoice system to improve customers' ability to access data via online system 4. Monthly meeting with a logistics team for summarizing the delivery demand and solving customer complaints 5. evaluate the industrial customer satisfaction after receiving the services from the company such as technical services and Transportation services 6. Increase the transport cycle during the press sugar canes period 7. Launched new products to serve the needs of customers such as BCP White Spirit – 3040, whose application is in the production of paint, 8. Increase number of oil depot to provide better coverage and faster delivery 9. Improve lubricants database so customers can select appropriate lubricant products through www.bangchaklubricants.com	1. Special credit line customers buy continuously 2. Customer Satisfaction score not less than 85% 3. Launched new products to serve the needs 4. Customer Satisfaction score for technical service team during the COVID-19 not less than 80%	1. Special credit line customers buy continuously 2. Customer Satisfaction score not less than 91.8 % 3. Launched new products to serve the needs 4. Customer Satisfaction score for technical service team during the COVID-19 = 80%	1. Develop new products to serve the needs 2. Improve product transportation management 3. Improve technical consulting services quality

Stakeholder (Disclosure 102-40)	Engagement Approaches in 2021 (Disclosure 102-43)	Needs & Expectations in 2021 (Disclosure 102-44)	Responses by the company in 2021	2021 Targets	Results 2021	Next Year Plan
3.3 Wholesale customers 	1. Sale representative 2. Technical Service engineers 3. Boots activities with government sector and various associations 4. Satisfaction Survey 5. Customer complaint	1. Need a quick response of market representative 2. Extend payment time or credit term 3. On time product and service delivery 4. Promotion activities and competitive prices 5. flexible both the payment and transfer money	1. Approved additional credit from the credit guaranteed 2. Launched promotion programs as discussed with the customer, and also giving the quarterly and annual discount	1. Increase wholesales volume 2. Expand market share	1. Increased wholesales volume 2. Expanded market share as targeted	1. Organize a small group seminar for the wholesale customers to ensure quality and product standards 2. Provide discounts
4. Business Partner : Service stations 4.1 BGN 4.2 Dealer 4.3 COOP 	1. Marketing representative 2. Group meeting on a monthly or quarterly basis 3. BCP Link system 4. Mystery Shopper 5. call center 6. Information from Department of Energy Business	1. Better performance, more profit, more income 2. Marketing representative 3. Supporting and supervising on the service station standards to be ready for competition with modern management 4. Efficient repair of equipment 5. Sale promotion program and high impact advertisement 6. High quality product development 7. The on-time, complete, no loss oil delivery service 8. adopted and applied risk management and business continuity management plan 9. Able to provide service during crisis situation 10. Support the remedial measures after the crisis situation. 11. focus on building strategy cooperation	1. Developed new high margin and high quality product matching with customer demand 2. Organizing training for station manager and campaign for service warm up before taking shift 3. Support renovate, Bright and Clean project to boost up sale volume 4. Sale promotion program and high impact advertisement such as Free drinking water or Point redemption 5. More value incentive to motivated all group business partners to keep high quality of services 6. Developed a data link from the closed-circuit camera in the truck via application on the smart phone, helping the service station dealers track the transportation in real-time information and check location of the truck since leaving the Bangchak oil depot 7. Applied E-Training system (BOA: Bangchak Online Academy) for service station staff training during Covid- 19 8. Increase preventive measures and maintain cleanliness inside the service station (7 Safe) 9. Deliver "Care Box" to dealer. Inside the box contains firing temperature gauge Oxygen meter, Andrographis paniculate, alcohol gel, mask 10. Support alternative vaccines for service station employees 11. COVID-19 mobile test service for dealer and employees in risk areas 12. Supported service station employees who were infected 13. promotional campaigns during COVID-19	1. Market share of refined oil through service station increased to 16.0% 2. No. 1 of the Net Promoter Score 3. Mystery Shopper score (BGN 90%, Dealer 75%)	1. Market share of refined oil through service station increased to 16.2% 2. NPS Score 1st place joint 3. Mystery Shopper score (BGN 99%, Dealer 87%)	1. Develop and expand new Non-Oil business models with partners to increase revenue and utilize of leased space 2. Provide support to uplift service standard of the service stations through award recognition and value incentive program in a kind of good image 3. Promotion campaigns 4. More Incentive for high sales volumes
5. Competitors (other energy and oil trading companies) 	1. Follow up on market performance and information from the Department of Energy Business 2. Study competitors' information through financial reports and present to relevant parties 3. Follow up marketing activities and movements 4. Cooperate and collaborate with competitors in matters requested by government agency or promoting corporate sustainability organization for cooperation 5. Provide marketing information that is not affecting competitors 6. Knowledge Sharing and site visit 7. Relation activity such as the refinery sport day	1. Operate business with transparency under fair trade and competition 2. Support in critical emergencies such as an emergency shutdown.	Continuously transparent business operation under competition and free trade mechanisms, also complied with all laws and regulations	1. No complaints or negative news when competing with competitors 2. No complaints from competitors regarding unfair trading practices	1. No complaints or negative news when competing with competitors 2. No complaints from competitors regarding unfair trading practices	Continuously transparent business operation under competition and free trade mechanisms, also complied with all laws and regulations

Stakeholder (Disclosure 102–40)	Engagement Approaches in 2021 (Disclosure 102–43)	Needs & Expectations in 2021 (Disclosure 102–44)	Responses by the company in 2021	2021 Targets	Results 2021	Next Year Plan
6. Creditor (Financial institution, Debenture Holders) 	1. Telephone feedback 2. Feedback from questionnaire 3. Feedback from email 4. Feedback from analyst meeting , Conference call, Roadshow	1. Business stability in unusual situations and the company can implement risk mitigation plans 2. To see good business performance with secured and steady growth 3. Have clear goals and directions of the company for expanding future business and invest in business providing appropriate return 4. Higher returns (Capital Gain) 5. Reporting progress of projects as planned 6. Conducting business in accordance with sustainable development guideline (Sustainability) and corporate governance 7. Providing the importance of data and information, which could direct impact on business operations 8. Site visit	1. Follow the terms of the loan agreement 2. Follow the rules of the Finance institution issued by a government agency strictly 3. Provide timely, accurate, and clear information to creditors. 4. Meeting with new financial institutions, who offer to provide financial services	1. The financial ratio of loan/debenture agreement not more than the specified in agreement 2. Provide timely, accurate, and clear information to creditors	1. The financial ratio of loan/debenture agreement are not more than the specified in the agreements 2. Provided timely, accurate, and clear information to creditors	1. Organize the meetings to update company performance and business development direction for creditors and Financial institutions 2. Join the financial institutions' seminars 3. Provide timely, accurate, and clear information to creditors
7. Investors (Major Shareholders, Funds, Institutions and Minor Shareholders and ESG Rating Agencies) 	1. Feedback from analyst meeting , Conference call, Roadshow 2. Feedback from phone 3. Feedback from email 4. Feedback from survey 5. ESG Assessment	1. Business stability in unusual situations and the company can implement risk mitigation plans 2. To see good business performance with secured and steady growth 3. Have clear goals and directions of the company for expanding future business and invest in business providing appropriate return 4. Higher returns (Capital Gain) 5. Dividend payment of the company is in satisfactory level and regular payment 6. Reporting progress of projects as planned 7. Conducting business in accordance with sustainable development guideline (Sustainability) and corporate governance 8. Providing the importance of data and information, which could direct impact on business operations 9. Site visit 10. ESG Assessment	1. Dividend payment to shareholders is appropriate to the operating results. And company policy and the rate of payment in the same direction as other companies in the same business. 2. Used online meeting / video conferences to communicate with investors during the COVID-19 situation 3. Joined the Opportunity Day activity at the Stock Exchange of Thailand, where the executives can give corporate information to the investors 4. Improve the investor relation website to be up-to-date and complete information, easy access and improve on-line communication through Chatbot program to be more accurate and comprehensive. 5. Provides Investor Kits such as MD&A / Factsheet / Company Profile as primary information to shareholders and investors for sharing up to date company business, quarterly business performance, investment plan and project progression of Bangchak group 6. Communicate executives to be informed opinions and questions from shareholders. 7. Answered ESG assessment	1. Invited to Roadshow. 2. Invited as a speaker to join the conference call 3. Received IR reward	1. & 2. Investor relations had adjusted to cope with COVID-19 situation and invited from stock market to join in Roadshow and Online conference call both domestic and abroad. 3. Received 3 IR rewards from Asian Excellence Award : – Asia's Best CEO (Investor Relations) Asia's Best CFO (Investor Relations) Best Investor Relations Company (Thailand)	1. Translate quarterly analyst meeting into English and upload to the BCP investor relations website 2. Post COVID-19, plan to set up onsite meetings and shareholder site visits 3. Join Roadshow and conference both online and on-site 4. Join the Opportunity Day activity at the Stock Exchange of Thailand 5. Improve the investor relation website and update content 6. Provide Investor Kits such as MD&A / Factsheet / Company Profile as primary information to shareholders and investors for sharing up to date company business, quarterly business performance, investment plan and project progression of Bangchak group 7. Communicate executives to be informed opinions and questions from shareholders.

Stakeholder (Disclosure 102-40)	Engagement Approaches in 2021 (Disclosure 102-43)	Needs & Expectations in 2021 (Disclosure 102-44)	Responses by the company in 2021	2021 Targets	Results 2021	Next Year Plan
8. Bangchak's neighbors 8.1 .1 community within a radius of 1.5 kms around the refinery 8 communities in Phra Khanong and Bangna District , and 11 villages in Bang Nam Phueng 	<ul style="list-style-type: none"> - Community relation staff and community visit - Direct communication or direct line for communities to contact with the refinery Shift Supervisor - Feed back from line groups social media ,call center, poster, banner - Community relation activity assessment/ evaluation - Need & community engagement assessment by Third Party - Community relation staff and community visit - LINE - leaflets/Bobrochures/banners - Community relation activity assessment/ evaluation - Need & School engagement assessment by Third Party 	<ol style="list-style-type: none"> 1. Safety business operation 2. Notification to community in advance of the Company' activity 3. support community relation activity <ol style="list-style-type: none"> 3.1 Education 3.2 Quality of life improvement 3.3 Community environmental development 4. Supports epidemic prevention/ mitigation equipment during the pandemic 	<ol style="list-style-type: none"> 1. community Safety survey : Conducted community safety equipment inspection and support preparation safety readiness in the community 2. Notification to community in advance of the Company' activity via channels various such as banner, line, voice over. 3. Community relation activities to respond to Bangchak's neighbors expectations : <ul style="list-style-type: none"> - Project "Bangchak Cares - Fight COVID-19" - Distributed masks, sanitizing alcohol , sanitizing alcohol gel and andrographis paniculata extracts - Pan Kan Im and Meal Box Pansuk Project- bough food from community small restaurant operators and gave that food to people in the communities 4. Organize activities to generate income for the community during COVID-19 (Meal Box Pansuk Project 5. Participated in community activities such as Children's Day, Songkran Day activities 	<ol style="list-style-type: none"> 1. Satisfaction score in community relations activities >90% 2. All community engagement score >84 % 	<ol style="list-style-type: none"> 1. Satisfaction score in community relations activities 93.18% 2. All community engagement score 86 % 	
8.2 School 	<ul style="list-style-type: none"> - Community relation staff and community visit - Community relation activity assessment/ evaluation - Need & School engagement assessment by Third Party 	<ol style="list-style-type: none"> 1. Educational development and potentials development for teachers and students 2. support safety training and safety equipment to schools 3. Provide environmental knowledge to teachers-students 4. Supports epidemic prevention/ mitigation equipment during the pandemic 	<ol style="list-style-type: none"> 1. Held ECO School and BCP Knowledge Tube project in YouTube channel 2. supported online safety (New Normal) 3. Supported fire fighting equipment for schools 4. community relation activities to respond to Bangchak's neighbors expectations : <ul style="list-style-type: none"> - Project "Bangchak Cares - Fight COVID-19" : distributed masks, sanitizing alcohol , sanitizing alcohol gel and andrographis paniculata extracts - Pan Kan Im and Meal Box Pansuk Project- bough food from community small restaurant operators and gave that food to people in the communities - participated in community activities such as Children's Day, Songkran Day activities 	<ol style="list-style-type: none"> 1. Satisfaction score in community relations activities 90% 2. All community engagement score 84 % 	<ol style="list-style-type: none"> 1. Satisfaction score in community relations activities 93.18% 2. All community engagement score 86 % 	Community relation activity in 7 dimensions <ul style="list-style-type: none"> - Quality of life improvement - Education - Community environmental development - Safety - Economic - Relation - Common area in community
8.3 Family Group (Single House Group) 	<ol style="list-style-type: none"> 1. Community relation staff and community visit 2. Community relation activity assessment/ evaluation 3. Baimai family Booklet 4. Facebook Baimai family Bangchak 5. Need & community engagement assessment by Third Party 	<ol style="list-style-type: none"> 1. Safety business operation 2. Provide environmental knowledge and activities to Family Group 3. support community relation activity such as provide knowledge of health and mental health 4. Supports epidemic prevention/ mitigation equipment during the pandemic 	<ol style="list-style-type: none"> 1. Organizing activities continuously and Re-designed s activities to match with community demands/needs such as <ul style="list-style-type: none"> - Bag + epidemic prevention kit (Bangchak Cares - Fight COVID-19) - D.I.Y mask strap - D.I.Y happy bag - Medical mask 2. Communicated through online channels, such as Facebook of Bangchak Bai Mai Family 3. Project "Bangchak Cares - Fight COVID-19" : <ul style="list-style-type: none"> - distributed masks, sanitizing alcohol , sanitizing alcohol gel and andrographis paniculata extracts 	<ol style="list-style-type: none"> 1. Satisfaction score in community relations activities >90% 2. All community engagement score >84 % 	<ol style="list-style-type: none"> 1. Satisfaction score in community relations activities 96.50% 2. All community engagement score 86 % 	

Stakeholder (Disclosure 102–40)	Engagement Approaches in 2021 (Disclosure 102–43)	Needs & Expectations in 2021 (Disclosure 102–44)	Responses by the company in 2021	2021 Targets	Results 2021	Next Year Plan
8.4 Condominium 	1. Community relation staff and community visit 2. Providing knowledge and enhancing understanding about the prevention of environmental impact and the safety issues of the Company 3. Baimai family Booklet 4. Facebook Baimai family Bangchak 5. Need & Condominium community engagement assessment by Third Party	1. Safety business operation 2. Providing knowledge and enhancing understanding about the prevention of environmental impact and the safety issues of the Company 3. support community relation activity 4. Expand activities communication to cover more stakeholders 5. Supports epidemic prevention/mitigation equipment during the pandemic	1. Organizing activities continuously and Re-designed s activities to match with community demands/needs – Project “Bangchak Cares – Fight COVID-19” : distributed masks, sanitizing alcohol , sanitizing alcohol gel and andrographis paniculata extracts – Organize fire drills and fire evacuation training – Support condominiums’AGM meeting 2. Communicated through line group, poster and Baimai Family booklet	1. Satisfaction score in community relations activities >90% 2. All community engagement score >84 %	1. Satisfaction score in community relations activities 91.96% 2. All community engagement score 86 %	Community relation activity in 7 dimensions – Education – Quality of life improvement – Community environmental development – Safety – Economic – Relation – Common area in community
9. Mass Media and social media 	1. Survey need and expectation 2. Visit mass media in special occasions. 3. Set up special interview of executives in each division in occasions as mass media’s request. 4. Increase suitable content for on-line media and extend target group to new receiver of message	1. Progress information of business, overall picture of energy business and growth plan and related business extension. 2. Besides regular press conference, to get a specific issue as media seeking, interviewing high executive will make a special news scoop which will be a single news different from other media. 3. Giving interview by high ranking executive to present vision of business, place trust in news and to stimulate to follow news. 4. interesting photo release 5. Fact sheet about situation	1. Respond to media needs in issues to be useful to the company and public. 2. Set up regular press conference and press release. 3. Support mass media’s activities for public as well as media’s anniversary 4. Have a regular visit to media in energy business and join in their events as possible. 5. Supports epidemic prevention/mitigation equipment during the pandemic : distributed masks, sanitizing alcohol , sanitizing alcohol gel and andrographis paniculata extracts. and provided Bangchak Petrol Card to help those who suffering from floods during September 2021	1. Media value from print media and social media 2. Number of the media who come to join the press conference 3. Number of news release, which was public by the media	1. The content of the release which were published, is accurate and complete 2. Value of news disseminated through publication and on-line media are on target 3. The company release continuously picked up by mainstream and online media	1. Create media engagement activities to enhance relation 2. Extend to connect with international media in Thailand and Asia, and prior press release in English language for media, foreigners and those interested in business / activities
10. Central and Local Government Agencies 	1. Meeting, informing, explaining and discussing 2. Visiting government operations	1. Conducted business in compliance with law and regulations related to transparent business practices 2. Audited operations of each function in the company in accordance with legal assessment , SHEE Audit and communities around the refinery 3. Employee health care during COVID-19 4. International standard for safety and environmental management system 5. Good cooperation in providing accurate and rapid information to support government projects. 6. Recognise and willing to listen stakeholders’ opinions	1. Conducted business in compliance with law and regulations related to transparent business practices 2. Audited operations of each function in the company in accordance with legal assessment and SHEE Audit 3. Explained and presented accurate information to government agencies within specified period 4. Controlled quality of environment to be better than standard and legal requirements 5. Supported and cooperated with government sector to promote environmentally friendly projects 6. Has conducted weekly testing using Antigen Test Kit (ATK) for all contractors	1. Government agencies allowed continuous operations as requested by the company 2. Control air quality to meet standard without complaints from communities	Allowed by government agencies to continuously conduct activities or projects as requested	1. Meeting, informing, explaining and discussing 2. Visiting government operations 3. Supporting any information according to Regulations and beyond expectation of regulation requires.

Key Sustainability Issues

In 2020 – 2021, Thailand experienced the COVID-19 situation which all the country had to work from home and inadequate COVID-19 vaccines. The company had revised the needs and expectations of our stakeholders and considered the business impacts to our sustainability. Company found the new key issues for 2020 – 2021 which need to be responded.

Materiality Assessment Process

The materiality assessment process from requirements and expectations of shareholders and internal information and significant issues which impacts to company's business according to the materiality assessment process as follow,

1. Issues Identification

Bangchak assess both internal and external information sources to identify issues that may impact the governance, economic, environment and social performance of the company.

- Internal information sources include target and business direction, business plans and issues from executive's brainstorming workshop, business strategy, and enterprise risk management with short and long-term potential impacts
- External information includes global sustainability trends, global risks, Sustainable Development Goals (SDGs), Dow Jones Sustainability Index (DJSI), 10 principles of United Nation Global Compact (UN Global Compact), peer benchmarking with refinery and renewable energy businesses, and stakeholders' needs and expectations.

2. Issues Prioritization

Bangchak ranks and prioritizes identified material issues by considering the alignment with GRI indicators. In 2020–2021, 18 material issues were revised since 2020 in response to the COVID-19 pandemic crisis, which continues to have a severe impact. Issues are mapped onto materiality matrix using the criteria below:

2.1 Horizontal axis: these sustainability issues are considered to have potential significant positive and negative risks and impacts to Bangchak's business both in short and long-term.

2.2 Vertical axis: these sustainability issues are considered to have potential significant positive and negative influences and impacts to Bangchak's stakeholders.

In 2020–2021, Bangchak invited sustainability professionals and experts to provide feedbacks on the Company's materiality assessment process in order to ensure that the scope covered are adequate, identification and prioritization process are sound, and issues are fairly assessed from multiple perspectives.

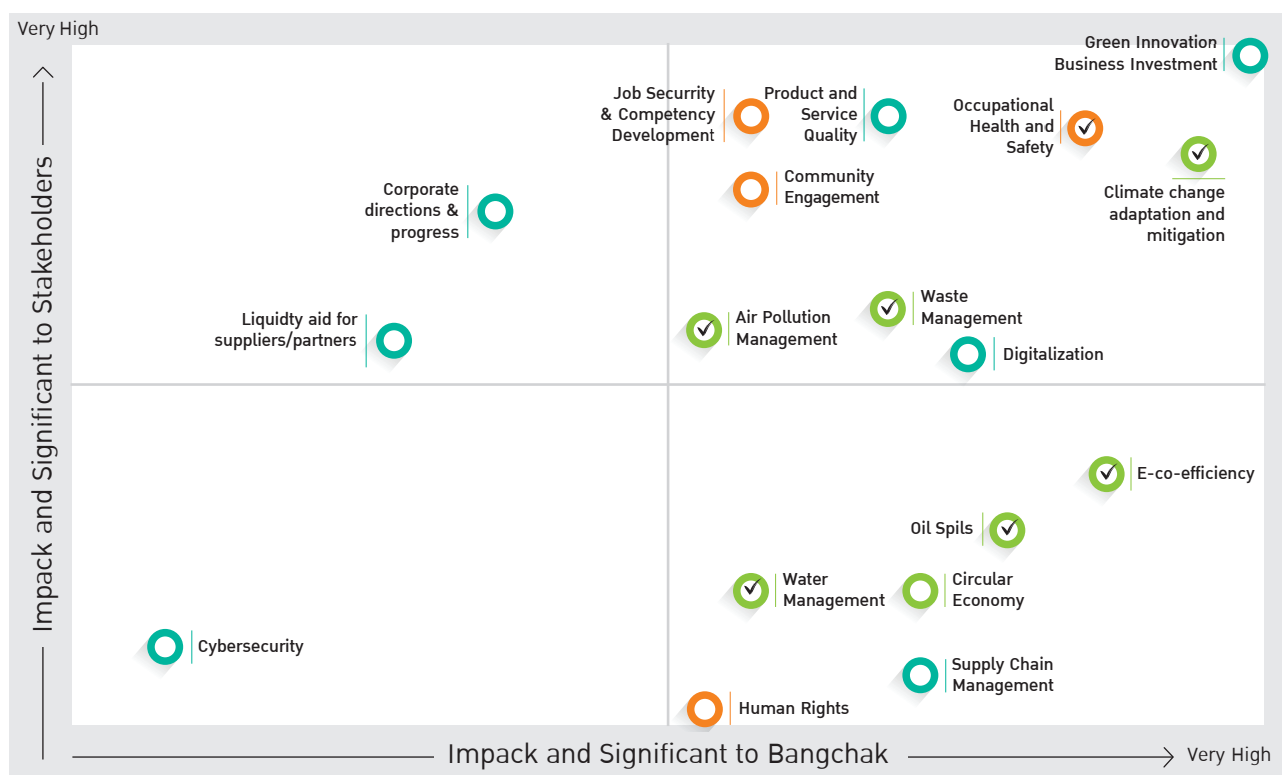
3. Validation

Result of materiality assessment were endorsed by the Sustainability Policy Committee (SPC) (Disclosure 102–32). In 2020–2021, material issues were green innovation investment, climate change adaptation and mitigation, occupational health and safety, products and service quality, job security and human capital development, community relations, and digitalization. The Company have set a framework to respond to the material issues using four levels of importance and appropriateness which are: Initiative Base, Strategic Focus, Mission Driven, and Sustainability Leader. In addition, Bangchak also defined performance indicators to evaluate results at corporate, divisions, and initiative levels. Indicators have also been integrated into employees' and management's performance evaluation in appropriate proportions (Disclosure 102–28) to foster a culture of sustainability. Due to COVID-19 crisis in 2020–2021, there were emerging issues that became more important including digitalization, job security and human capital development, disclosure of business direction and progress, cash flow assistance to suppliers and business partners, eco-efficiency and circular economy, and cyber security. Material issues for 2020–2021 are:

Prioritization Criteria

Bangchak's stakeholders	Bangchak
1. Impacts level to stakeholders	1. Opportunities to create impacts
2. Significant to stakeholders in the future	2. Severity impact level
3. Impacts to diverse stakeholders	3. Business risk level
4. Expectations level on issues management from the Company	4. Long-term impacts level
	5. Significant or opportunities for future issues
	6. Relevant to Bangchak's policies or targets

Materiality Matrix (Disclosure 102–47)



Remark: materiality assessment process was assured by third party

Data assured by 3rd party

☐ No ☒ Yes

2020 Materiality Issues

Governance and Economic Dimension	Environment Dimension	Social Dimension
<ol style="list-style-type: none"> GREEN INNOVATION BUSINESS INVESTMENT PRODUCT & SERVICE QUALITY DIGITALIZATION CORPORATE DIRECTIONS & PROGRESS DISCLOSURE SUPPLY CHAIN MANAGEMENT LIQUIDITY AID FOR SUPPLIERS/PARTNERS CYBERSECURITY 	<ol style="list-style-type: none"> CLIMATE CHANGE ADAPTATION AND MITIGATION WASTE MANAGEMENT AIR-POLLUTION MANAGEMENT ECO-EFFICIENCY OIL SPILLS WATER MANAGEMENT CIRCULAR ECONOMY 	<ol style="list-style-type: none"> OCCUPATIONAL HEALTH AND SAFETY JOB SECURITY & COMPETENCY DEVELOPMENT COMMUNITY RELATIONS HUMAN RIGHTS

GRI - Materiality topics (Materiality) (Disclosure 102–47)

Dimensions		Impacts		Significance	GRI topics	GRI topic-specific disclosure	Reporting contents	Pages
Materiality topics		Internal	External					
Governance & Economic	Green innovation business investment	BCP	<ul style="list-style-type: none">Investors	To develop and improve Company's operations and performance by using innovation and to prevent business disruption	201: Economic Performance (2016)	201–1 Direct economic value generated and distributed (2016)	<ul style="list-style-type: none">Innovation ManagementGreen business investment	84 48–49
	Product & service quality	BCP Group	<ul style="list-style-type: none">CustomersInvestors	To improve customers and business partners satisfaction and brand loyalty through Greenovative Experience Strategy	BCP: Product and Service Development	BCP Indicator – NPS Score and customer satisfaction	<ul style="list-style-type: none">Sustainable Product & Service DevelopmentSocial performance statistic	104 181
	Digitalization	BCP Group	<ul style="list-style-type: none">Customers	To improve Company's performance by integrating digitalization	201: Economic Performance (2016)	201–1 Direct economic value generated and distributed (2016)	<ul style="list-style-type: none">Information Technology (IT) for BusinessEconomic performance statistic	86 161
	Corporate directions and progress disclosure	BCP	<ul style="list-style-type: none">InvestorsMedia	To be transparency and attract more investors	201: Economic Performance (2016)	201–1 Direct economic value generated and distributed (2016)	<ul style="list-style-type: none">Stakeholders EngagementRisk managementEconomic performance statistic	25 66 161
	Supply chain management	BCP	<ul style="list-style-type: none">SuppliersBusiness partners	To develop sustainanbility prectices of suppliers to grow sustaianbly with the Company	204: Procurement Practice (2016) 308: Supplier Environmental Assessment (2016) 414: Supplier Social Assessment (2016)	204–1 Proportion of spending on local suppliers (2016) 308–2 Negative environmental impacts in the supply chain and actions taken (2016) 414–2 Negative social impacts in the supply chain and actions taken (2016)	<ul style="list-style-type: none">Supply chain manangementEconomic performance statistic	79 161
	Liquidity aid for suppliers	BCP	<ul style="list-style-type: none">SuppliersBusiness partners	To maintain important suppliers and help reduce impacts from COVID–19 for suppliers	BCP: Supplier Satisfaction	BCP Indicator – Percentage of supplier satisfaction	<ul style="list-style-type: none">Supply chain Management	79
	Cybersecurity	BCP	<ul style="list-style-type: none">CustomersSuppliersBusiness partners	To prevent cybersecurity indicents and embed good practices of cybersecurity for the Company	BCP: Information Security Breaches /Cybersecurity Incidents	BCP Indicator – Number of information security breaches/cybersecurity incidents	<ul style="list-style-type: none">Information Technology (IT) and Cyber Security for Business	86
Environmental	Climate change adaptation and mitigation	BCP Group	<ul style="list-style-type: none">Government sectors	To be in line with the corporate target of being a carbon neutral company within 2030 and to respond to SDG7 and SDG13	305: Emissions (2016)	305–1 Direct Greenhouse Gas (GHG) Emissions (Scope1) (2016) 305–2 Indirect Greenhouse Gas (GHG) Emissions (Scope 2) (2016) 305–3 Other Indirect Greenhouse Gas (GHG) Emissions (Scope 3) (2016) 305–4 GHG Emissions Intensity (2016) 305–5 Reduction of GHG emissions (2016)	<ul style="list-style-type: none">Climate changeEnvironment performance statistic	93–94 166–169
	Waste management	BCP	<ul style="list-style-type: none">Government sectorsCommunities	To comply with relevant laws and regulation by using 3Rs principles	306: waste (2020)	306–3 Waste generated (2020) 306–4 Waste diverted from disposal (2020) 306–5 Waste diverted to disposal (2020)	<ul style="list-style-type: none">Waste managementEnvironment performance statistic	103 174–175
	Air pollutions	BCP	<ul style="list-style-type: none">Government sectorsCommunities	To pursue better quality of air emission and management control than regulatory limits	305: Emissions (2016)	305–7 NOx, SOx, and other significant air emissions (Fugitive VOCs and H2S) (2016)	<ul style="list-style-type: none">Air pollutions managementEnvironment performance statistic	101–102 172
	Eco–efficiency	BCP		To increase eco–efficiency reflecting high efficiency in the production with low environmental impacts	BCP: Eco–Efficiency	BCP Indicator – Eco–efficiency (EBITDA/Total GHG emissions of RFBG and MKBG)	<ul style="list-style-type: none">Eco–efficiency	90–92 162–165
	Oil spills	BCP	<ul style="list-style-type: none">SuppliersGovernment sectors	To prevent oil spill incident	306: Effluent and Waste (2016)	306–3 Significant Spills (2016)	<ul style="list-style-type: none">Oil and Chemical Spill Management	99–100 176
	Water management	BCP	<ul style="list-style-type: none">Government sectorsCommunities	To manage water withdrawal, consumption and discharge effectively using new initiatives and water management tools	303: Water and Effluents (2018)	303–3 Water withdrawal (2018) 303–4 Water discharge (2018) 303–5 Water consumption (2018)	<ul style="list-style-type: none">Water managementEnvironment performance statistic	95–98 172–174
	Circular economy	BCP	<ul style="list-style-type: none">Government sectors	To respond to the national policy and new business opportunities	201: Economic Performance (2016) BCP: Plastic waste reduction	201–1 Direct economic value generated and distributed (2016) BCP Indicator – Plastic waste reduction	<ul style="list-style-type: none">Community and social development	147

Dimensions		Impacts		Significance	GRI topics	GRI topic-specific disclosure	Reporting contents	Pages
Materiality topics		Internal	External					
Social	SHE	BCP	<ul style="list-style-type: none">SuppliersGovernment sectorsCommunities	To achieve zero incidents and manage safety operations of the Company effectively to reduce business risks and complaints from stakeholders	403: Occupational Health and Safety (2018)	403-9 Work-related injuries 403-10 Work-related ill health	<ul style="list-style-type: none">Occupational Health & SafetySocial performance statistic	116 180
	Job security and competency development	BCP		To retain talents and develop potential employees as important workforce of the Company	401: Employment (2016) 404: Training and Education (2016)	401-1 New employee hires and employee turnover (2016) 404-1 Average hours of training per year per employee	<ul style="list-style-type: none">Employee stewardshipSocial performance statistic	135 179
	Community relation	BCP	<ul style="list-style-type: none">Communities	To build good relationship with communities and obtain social license to operations	201: Economic Performance BCP: Community Engagement	201-1 Direct economic value generated and distributed (2016) BCP Indicator – Community engagement score	<ul style="list-style-type: none">Community and social developmentSocial performance statistic	147 161
	Human rights	BCP	<ul style="list-style-type: none">SuppliersBusiness partnersCommunities	<ul style="list-style-type: none">To conduct Human Rights Due Diligence systematically to assess human rights risks and provide mitigation measure in placeTo ensure equal treatment of employees.	405: Diversity and Equal Opportunity 412: Human Rights Assessment (2016)	GRI 405-2: Diversity and Equal Opportunity 412-1 Operations that have been subjected to human rights review or impact assessment (2016)	<ul style="list-style-type: none">Social performance statisticHuman right	179 129

Note

1. Good corporate governance and anti-corruption, corporate risk management, change management, innovation management, product transportation, and customer relationship management are the normal sustainability practices which are continuously conducted by Bangchak. The contents of these operations and performance are reported in this Integrated Sustainability Report 2020.



Sustainability Strategy

Bangchak is committed to develop and innovate our business sustainably with the environment and society using 3S Corporate Strategy (Security, Stability, Sustainability) to achieve short and long term targets.

S1

Security

Security: Ensure energy security through upstream investments

Focusing on the building of energy security for the country through the joint operation of business strategy consisting of refinery and trading business, marketing business, natural resource business and bio-based product business in procuring, producing and distributing oil together with biofuels to meet the demands of the business and people.

S2

Stability

Stability: Manage portfolio to create growth and diversify risk to achieve stable returns

Focusing on the investment in businesses with consistent incomes and returns with low risks from external factors, both in Thailand and overseas, such as the green power businesses which have stable income through the management of production chain in other businesses to cope with business fluctuations.

S3

Sustainability

Sustainability: Grow new businesses and expand core businesses sustainably

Develop related businesses or expand core businesses so that they grow sustainably and to prepare for technological disruption and any future changes such as growth of electric vehicles or the development of high value bio-based products, including bio-plastics and bio-materials.



In addition, Bangchak also has “4 Green Sustainability Strategy” that is in line with 3S Corporate Strategy, especially S3: Sustainability; Sustainability Policy, and Sustainable Development Goals (SDGs)

Sustainability Strategy 4 GREEN



1 Green Business

Focus on the investment in new business and green innovation that can add long term value to increase share of revenue from new businesses and businesses that are environmentally friendly. Implement innovations from green initiatives in business operations such as high value biological products made from agricultural products based on bio-technology innovations extended from the original biofuel business. Moreover, the company places importance to green energy business and energy management through the Institute of Innovation and Business Incubation (BiIC), as a way leading to the emerging of startup business that can be developed further for the company's business.

2 Green Production

Improve production processes and operations to become more environmentally friendly and safe by using resources efficiently, especially water and energy resources. Implement the environment and energy management systems in compliance with ISO 14001 and ISO 50001, respectively, including the occupational health and safety management system (ISO 45001) as well as the Process Safety Management (PSM) to raise the level of safety management. Safety Management (PSM)

3 Your Greenovative Destination

Create new green experiences and innovation through products and services offered in Bangchak's service stations under Evolving Greenovative Experience framework to respond to the expectations of customers and stakeholders as well as new lifestyles where everyone can take part in protecting the environment using 3 main strategies:

- **Green Experience** provide products and services that are beyond customers' expectations and are environmentally friendly
- **Green Innovation** seek and develop innovation that can add value to customers and business
- **Green Sustainability** build sustainable business while taking care of the environment and the society

4 Green Society

Bangchak continues to care for the environment and contribute to improving the quality of lives and well-being of Thai society through projects that promote better society as a whole by introducing the late King's Sufficiency Economy Philosophy and innovation through projects that promote and expand community development under CSR in Process, CSR after Process, and CSR as Process framework. The aim is to create positive change in Thai society and the development of the country as well as responding to stakeholders' expectations and supporting SDGs.

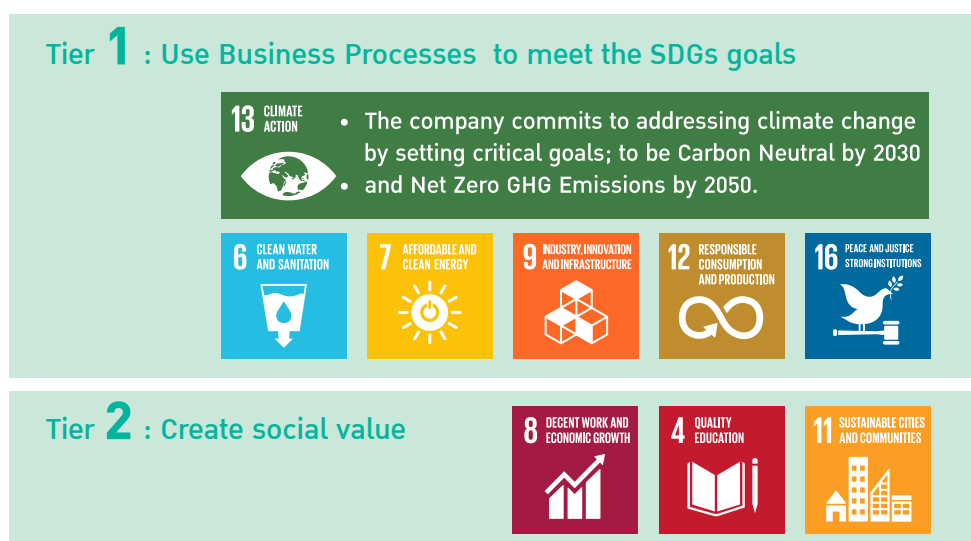
Integrating Sustainable Development Goals

Bangchak has integrated sustainable development goals (SDGs) into its business, focusing on the 9 SDGs related to its business operations and the competency of the company as well as global and domestic sustainability trends. Bangchak's efforts to support SDGs are driven by the company's sustainability management structure.

The Company has reviewed the target response to the SDGs targeted by the Company by 2050 as follows:

- 1) Environment dimension: UN SDG goal 13 (Climate Action) is the leading environmental target. The company commits to addressing climate change by setting critical goals; to be Carbon Neutral by 2030 and Net Zero GHG Emissions by 2050. In its implementation, the Company has integrated 4 SDG goals, namely, to expand clean energy business (Goal 7), bring innovation and biotechnology to business and social development (Goal 9), promote sustainable consumption (Goal 12), and supervise the management of water for maximum benefit (Goal 6) to achieve that goal.
- 2) Governance dimension: conducting business with transparency by continuous corporate governance (Goal 16)
- 3) Social dimension: focusing on the economy of communities and farmers (Target 8), youth education (Target 4), and sustainability of cities and communities (Target 11).

The company has set a strategy and different response plans for each goal, including follow-ups.



Progress in Sustainable Development and Business

Green Business : Focusing on the investment and value creation to the sustainable and responsible business



Plan	Performance	2025 Target
1. Develop power generation businesses from solar, wind, geothermal and hydropower, and expanding the businesses to be an Asian renewable energy producer	<ul style="list-style-type: none"> Generated and distributed power from renewable and clean energy, domestically and internationally, totaling 504.7 MW, consisting of: <ul style="list-style-type: none"> Solar farms in Thailand, with 175.1 MW produced (operating solar rooftops included) Solar farms in Japan, with 34.7 MW in operation Lom Ligor Wind Power Plant in Nakhon Si Thammarat, with 9.0 MW in operation Wind farm in the Philippines, with 14.4 MW in operation (equity capacity) Geothermal plants in Indonesia, with 157.5 MW in operation (equity capacity) 	<ul style="list-style-type: none"> Organic and inorganic growth through the M&A of brownfield and greenfield projects focusing on domestic and ASEAN markets while balancing returns, risks, and portfolio mix Efficiency improvement of existing projects (owned and JV) through technological improvements and financial engineering. Move toward digital and innovative business to create new revenue streams under digital energy and infrastructure business.

Plan	Performance	2025 Target
	<ul style="list-style-type: none"> Hydro power plant in Laos, with 114 MW in operation. <p>Remark : Generation capacity is based on Power Purchase Agreement (PPA)</p>	<ul style="list-style-type: none"> Sound and effective management of capital and balance sheet to support the company's goals. Human capital improvement and recruitment plans in line with business direction.
<p>1.2 Develop biofuel business and expanding the high value bio-based product businesses</p>	<ul style="list-style-type: none"> Operated bio-based product business through BBGI Company Limited with a total production capacity of more than 1,600,000 million liters per day, consisting of: <ul style="list-style-type: none"> 1,000,000 liters per day bio-diesel production unit including a project to improve production and the construction of pure glycerin plant with a capacity of 80 tons/day to grow the values of BBF's product. (Bangchak Bio-fuel Co. Ltd) 550,000 liters per day combine capacity: 150,000 liters per day production unit of ethanol from cassava with average utilization rate of 93% (Bangchak Bio-Ethanol) and 400,000 liters per day production unit of ethanol with average utilization rate of 93% (JV with Ubon Ethanol) Ethanol production unit using molasses: consisting of KGI-BP project with 300,000 liters per day and has an average utilization rate of 82% capacity of 150,000 liters per day and an average utilization rate of 98% Increase investment in biotechnology by creating a joint venture with Manus Bio Inc. to set up WIN Ingredients, a company that focuses on biotechnology Sales of dietary supplements under the brand B Nature Plus, the first product to be sold is ASTA-IMMU, which is an antioxidant, nourishing skin, extracted from red algae (astaxanthin) and began selling pharmaceutical standards with safe production from GMP-HACCP alcohol gel for hands sanitation. 	<ul style="list-style-type: none"> Develop a bio-business in order to expand the bio-fuel business into a high value bio product that increases business opportunities as well as promoting research and development of commercial energy crops such as sugarcane, cassava, palm oil and algae, which help increase the amount and value of agricultural products for farmers
<p>1.3 Develop innovative business to add value and expand opportunities</p>	<ul style="list-style-type: none"> BCP Innovation Pte. Ltd. in Singapore operates and invests in lithium minerals business and innovation-related businesses abroad. BCPI currently has the right to purchase lithium under the Lithium Purchase Agreement with Lithium Americas Corp. up to 6,000 tons per year from the Cauchari-Olaroz project and has invested in many startups Institute of Innovation and Business Cultivation (IiC) has operated a startup business under the name "Winnonie" (Motorcycle Taxi No Debt) by bringing innovative green energy to electric motorcycles with battery swapping station, as the first in Thailand. The service was rolled out to motorcycle taxis where they can rent electric motorcycles to service the public around the refinery and Bangchak Head Office. The service help to reduce greenhouse gas emissions, air pollution, as well as reduce the burden for motorcycle taxis. The startup fully reinforces Bangchak's leadership in green energy innovation. The company has developed a coin-operated gas station called "Krating" with the aim of bringing innovation to communities located far away from gas stations. In addition to oil there are also other services such as mobile recharge and electricity and water bill payments. In the future, there will be additional financial services as well. Establish academic cooperation and develop projects with institutes, agencies and universities. 	<ul style="list-style-type: none"> Seek investment opportunities to increase business opportunities, including trading lithium ore from Lithium purchase agreements and expanding liquefied natural gas (LNG) business through BTSG Co., Ltd. Investing in incubators and startups focusing on green energy innovations such as energy storage and bio based- innovations that are beneficial to society and the environment

Green Production : Focusing on the improvement of environment and safety management



Plan	Performance	2025 Target
1. Investing in the renewable energy Businesses (same as 1.1-1.2)	<ul style="list-style-type: none"> Same as 1.1-1.2 Defined the organization's success indicators for carbon offset by the carbon offset of the company and the companies in the group which is tied to the key performance indicators of senior management. 	<ul style="list-style-type: none"> Aim to become a Carbon-Neutral Organization by 2030 and a Net-Zero GHG Emission company by 2050
2.2 Improve operations to increase efficiency and stability of energy consumption in production process	<ul style="list-style-type: none"> Level of third-party assurance for energy consumption and GHG emission of the Company and subsidiaries scope1 and Scope 2 have improved from "Limited Level of Assurance" to "Reasonable Level of Assurance. The Company also received Carbon Footprint Organization (CFO) certification for Bangchak Refinery from Thailand Greenhouse Gas Management Organization (Public Organization) Implement YES-R+ Project to improve Yield Energy Efficiency Safety and Reliability Improve energy consumption efficiency in the refinery: Energy Intensity Index (EII) was 98.6 in 2021 Year 2021, the Continuous Catalyst Regeneration Unit (CCR) began to be operated. 	<ul style="list-style-type: none"> Implemented YES-R+ Project to improve Yield Energy Efficiency Safety and Reliability Continuously implement projects to improve energy efficiency from refinery development projects. <ul style="list-style-type: none"> Project to stop using the catalyst reformer at the 2nd Refinery Unit. Gas engine generator installation project to replace the gas turbine generator
2.3 Increase the efficiency of tap water consumption in production process through water reduction, reuse and recycle	<ul style="list-style-type: none"> Reduced the use of tap water by 3.09%, cumulative reduction of 20.17% (compared to the baseline year 2015) Controlled efficiency of water consumption per production unit to 63 million cubic meter per thousand barrel equivalent (2021 target was 65 million cubic meter per thousand barrel equivalent) 	<ul style="list-style-type: none"> Reduce the use of tap water by 30% (cumulative) compared to base year 2015 Improve water consumption efficiency to achieve 54 million cubic meter per barrel equivalent.
2.4 Conduct Water Footprint in support of water management throughout the product life cycle	<ul style="list-style-type: none"> Continue to study water management in the refinery by applying the water footprint of products to optimize water efficiency of each product. 	<ul style="list-style-type: none"> Continue to conduct water footprint of products in the refinery
2.5 Monitor air quality at stack, in operation area, and in areas surrounding the refinery to ensure better air quality than required by regulations	<ul style="list-style-type: none"> No complaints related to air pollution Third party monitoring of air quality is within limit 100% of the time 	<ul style="list-style-type: none"> No complaints related to air pollution every year

Plan	Performance	2025 Target
2.6 Manage waste using 3Rs (Reduce, Reuse & Recycle)	<ul style="list-style-type: none"> Manage 99.78% of waste from refinery using 3Rs The amount of waste disposed of by non-energy recovery incineration (excluding recycle, reused or energy recovery incineration) is 6.6 tons. 	<ul style="list-style-type: none"> Zero waste send to incineration process that does not have energy recovery (not including waste that are recycled or reused)
2.7 Lay the foundation for Process Safety Management (PSM) in the workplace and expanding the scope of security promotion on the Occupational Health and Environment to cover the surrounding communities	<ul style="list-style-type: none"> Established the PSM Governance Committee (PSM GC) to drive implementation Initiated 2 new PSM elements: Mechanical Integrity: MI and Quality Assurance: QA In 2021, Company has organized the Fire Fighting and Evacuation Fire Drills and the training to provide the basic knowledge of using firefighting equipment to 4 schools and 22 condominiums around the refinery which located in Phra Khanong-Bangna district. For Teachers students and staff in school and condo residents have knowledge, understanding and ready to handle with various disasters that may occur. Community safety trust score = 84.5% 	<ul style="list-style-type: none"> Developing safety activities to continuously build trust and commitment among stakeholders Developing security management systems (PSM) in all 14 elements. In 2021, Mechanical Integrity (MI), Quality Assurance (QA), and Safety Auditing (SA) will be added. Communities around the refinery have participated in emergency response and evacuation drills No incidents that lead to widespread complain

Greenovative Destination : Create new green experiences and innovation through products and services offered in Bangchak's service stations



Plan	Performance	2025 Target
3.1 Develop service station to become customer centric by bringing in new concepts and image, improving services, and offering additional services to create new experiences for customers.	<ul style="list-style-type: none"> Bangchak service station brand was able to maintain number 1 position from Net Promoter Score (NPS) ★ <p>Green Experience</p> <ul style="list-style-type: none"> Offering 2 Euro 5 standards product type which are E20S EVO gasohol and Hi-Premium Diesel S which have lower sulfur contents than Euro 4 standard product Offering diesel fuel which have sulfur level lower than 10 parts per million (PPM) and 5 times lower sulfur content in service station serving the Bangkok metropolitan area to help alleviate PM 2.5 problems Supporting the use of alternative energy that helps to reduce CO2 compared to traditional fuels Develop Unique Design Service Station that uses 4Rs process: Renewable, Recycle, Reuse, and Reduce. The stations have installed solar roof top, rainwater collection system and wastewater recycling to water the garden, energy efficient equipment as well as green space. In addition, the restrooms are redesigned to accommodate the needs to the elderly and handicapped 	<ul style="list-style-type: none"> Maintaining the 1st place in Service Station brand, as measured by Net Promoter Score (NPS) Increase revenue from service stations and increase market share to 20% Develop service offering, service stations, and non-oil business under "Evolving Greenovative Experience" concept Use more than 10 million bioplastics cups instead of plastic per year

Plan	Performance	2025 Target
	<ul style="list-style-type: none"> • Ensure highest standard of cleanliness. All employees are required to wear masks. Alcohol gel were given to customers to clean their hands during the COVID-19 crisis. <p>Green Innovation</p> <ul style="list-style-type: none"> • Improve the responsiveness and effectiveness of service through the use of IT technology such as the development of customer database, development of Smart Digital Payment in service stations to maintain social distancing and reduce service time. • Develop an online training system for courtyard service personnel and owners to provide access to critical workflow information anytime, anywhere. Develop more projects to expand customer base, for example, a project with AIS to exchange points “The more you can transfer”, and a project with the Krungsriyudhya Card Company, the project “Transferable, easier to exchange” to give special privileges to card members. Bangchak customers can convert points from Krungsri credit card to Bangchak member points. <p>Green Sustainability</p> <ul style="list-style-type: none"> • Inthanin Coffee was one of the first businesses to promote plastic waste reduction through “Bring your own cup” campaign. In addition, we were a pioneer in using BIO packaging which include lids and cups that are made with 100% plant-based material and biodegradable as well as use ready to drink lids to reduce the use of plastic straws. In 2021, more than 20 million sets of bio-plastic cups and lids were used, including 500,000 o-leaf cups in Inthanin Coffee Shop as “cup cultivating seedlings” of the Royal Forest Department. • Participate in plastic waste management with the concept of a circular economy in the Rak Pun Suk project, accept donations of PET drinking water bottles where donated bottles are sent to be recycled to produce fibers. In 2021, more than 80,160 plastic bottles, weighing 400.8 kg, collected through the project, were recycled into fibers to produce 3 types of souvenirs (staff polo shirts and cloth bags) as gifts to employees of the Group and partners. 	

Green Society : Developing businesses/activities for environmental and social benefits



Plan	Performance	2025 Target
4.1 Developing social activities and business that benefit the society and the environment	<ul style="list-style-type: none"> Improved communities' quality of life economically, socially and environmentally, to promote healthy, livable and sustainable communities in the areas around Bangchak refinery on all 8 aspects which are safety, education, sports, quality of life, environment, cultural safeguards and preservation, economic, and commonwealth through activities organized with community groups, family group, school groups and condominium groups. These activities contributed benefits to over 71,083 participants. Community engagement score for 2020 was 86%. ★ Established a new business, "Winnonie", that helps to improve the quality of life of motorcycle taxis by reducing gasoline and maintenance costs. There are 40 drivers who are members and 3 battery swapping stations. By 2021, the startup "Winnonie" has 200 electric motorcycles for servicing. The COVID-19 crisis has impacted Bangchak's used cooking oil collection program in 2020 due to social distancing measures and lockdowns. Although the volume collected declined in 2020, Bangchak continues to put efforts into the development of collection process as well as seek out new networks for expansion 	<ul style="list-style-type: none"> Community engagement score: 87% Continuously expanding projects or businesses to benefit the people.
4.2 Developing social activities that are more responsive to national challenges	<p>In the second year of Bangchak invites Thais to fight COVID-19</p> <p>The Series, the company has adjusted its model according to the changing situation of the new wave of Covid-19 pandemic. In 2021, there are activities under the concept of "Bangchak invites Thai people to fight COVID-19. The Series" by operating in accordance with 3 purposes as follows:</p> <ol style="list-style-type: none"> 1) Strengthening public health and proactive prevention in the community, such as activities to support the Biosafety Mobile Unit for medical use for COVID-19 testing including equipment, necessary items, drinking water, basic medical equipment, alcohol gel. 	<ul style="list-style-type: none"> Respond to the COVID-19 pandemic through a variety of activities Help at least 800 children to become literate every year Maintain 8 partnership schools in the network Develop at least 10 rais of forest per year Hold at least 1 environmental seminar annually with at least 300 attendants

Plan	Performance	2025 Target
	<p>2) Support the local economic communities through various projects including:</p> <ul style="list-style-type: none"> • “#save Samut Sakhon” with the “one baht per vehicle” project where every time you fill up Bangchak petrol or drink Inthanin beverages, the Company will give 1 baht to the “People of Samut Sakhon join together to fight the danger of COVID-19” fund • SAVE “women salt farmers” by handing out 1 bag of salt to Inthanin customers • “Egg pan suk” by handing out 1 egg to each car that come to fill up at the gas station • “Bangchak Pan Kan Im” supports the mission of the Department of Social Development and Welfare, Ministry of Social Development Provide food boxes to 57 communities in 9 districts in Bangkok to alleviate economic suffering of disadvantaged people and continually support food from small restaurant operators and partner shops in Bangchak gas stations. The “Pan Kan Im” project also operates in Phra Khanong and Bangna area as well as for construction workers camp and sharing around the Bangchak Refinery which helped support business owners and help ease the burden on recipients affected by COVID-19 by delivering a total of more than 40,000 full meals. <p>3) Provided assistance during quarantine period.</p> <ul style="list-style-type: none"> • Delivered rice from agricultural cooperatives in the co-op gas station network to construction camps. • “Pan Nam Jai Hai Nam Duam” by joining with Bangchak customers to delivered drinking water bottles to field hospital and health centers in critical areas. • Delivered ready to eat meals through the “Bangchak Pan Kan Im” project to healthcare workers, volunteers, patients, and communities including vulnerable groups and construction workers. <p>4) Raised funds to support agencies/ temples/ foundations/ volunteer groups during the crisis through the X2 Oil Sharing Project. The project raised funds from the public and the Company matched the amount to support fuel cards for volunteer groups and agencies.</p>	

Plan	Performance	2025 Target
	<p>Education</p> <ul style="list-style-type: none"> Partnership School Project – Bangchak, Agricultural Cooperative Project, and the Mechai Viravaidya Foundation have partnered with 5 schools in Khon Kaen, Lampang and Surin provinces to establish “Agricultural business in school”. The project teaches students to learn about agriculture management, saving and budgeting under the guidance of teachers. The project also lends money to families who wish to develop their own business. To date, 19 loans have been given and the fund has increase to over 850,000 baht from the 440,000 baht in the previous year. “Pun Dek Jew Pen Dek Jaew” (turn small children into exceptional children) Project promotes reading comprehension and writing through Happiness Sharing Foundation. There are 58 participating schools from 35 provinces with over 1,000 first grade students. In addition, the project has expanded to schools that have participated in past years. The project published 2 editions of textbooks to pilot the test material to over 800 first grade students. In addition, the project also develops an environmental project called “Rak Pun Sook Junior” to create awareness on waste management in accordance with circular economy principles. Additional information <p>Development and development/rehabilitation of forests</p> <ul style="list-style-type: none"> Wet Forest Development Project in the Phu Long forest area, the last dry evergreen forest upstream of Lampa Thao, Chaiphum Province. Although the project has been in operation for 16 years, but with a long drought condition forest fires damaged more than 3,000 rais. The company proposed guidelines adjustment to help and pilot planting forests to fight forest fires with the Royal Initiative “Wet Forest” amounting to 10 rais. The reservoir was collected in the form of a “Kok Nong Na” model, and more than 2,000 trees were planted. The survival rate of the trees in the project look promising with a high survival rate because there is a water system to support as well as bananas to serve as nanny plants for seedlings. In addition, there were no problems with forest fires and heavy rainfall in the area Annual Environmental Seminar <p>“Exponential Path to Net Zero”</p> <ul style="list-style-type: none"> under the Bangchak 100x approach: 100 ideas for a sustainable world. The seminar was held as Hybrid Conference, inviting interested parties to find answers and solutions on how we can reach net zero goal. Participants 	

Remarks: ★ Refers to the organizational sustainability performance in consistent with the performance evaluation of the Chief Executive Officer and the President in 2020

Value Creation from Operations that Support UN Sustainable Development Goals (SDGs)	For Bangchak	For the Environment and Stakeholders
	<ul style="list-style-type: none"> • Increase income stability from renewable energy and green businesses • Increase effectiveness of energy consumption to reduce operating costs 	<ul style="list-style-type: none"> • Increase share of renewable energy for the country • Reduce Thailand's overall GHG emissions
	<ul style="list-style-type: none"> • Reduce risks and impacts from climate change both from physical risks and transition risks related to policies and technologies • Increase business opportunities from climate change mechanisms, green energy businesses, and bio-based businesses 	<ul style="list-style-type: none"> • Reduce risks and impacts of climate change • Contribute to the efforts to limit temperature rise to within 1.5 C • Support Thailand's GHG reduction goals according to NDC Roadmap
	<ul style="list-style-type: none"> • Improve water management in production process to reduce operating costs 	<ul style="list-style-type: none"> • Stakeholders are not negatively impacted by the company's water consumption • Help to alleviate the impacts of floods and droughts
	<ul style="list-style-type: none"> • Reduce costs from waste management • Add value to waste 	<ul style="list-style-type: none"> • Reduce waste and associated GHG from waste management process • Promote and support Thailand BCG (Bio, Circular, Green) economic model
	<ul style="list-style-type: none"> • Promote transparency in business operation as well as brand image • Maintain good relationships with anti-corruption network • Protect from risks of anti-compliance and corruption 	<ul style="list-style-type: none"> • Reduce corruption in business and society • Build a strong business network to combat corruption
	<ul style="list-style-type: none"> • Support government's policy on disable people employment (section 33) 	<ul style="list-style-type: none"> • Help create more equal career opportunities
	<ul style="list-style-type: none"> • Reflect the company's engagement in community and society development 	<ul style="list-style-type: none"> • Contribute to the development of youth education
	<ul style="list-style-type: none"> • Expand business opportunities through innovation • Create innovation culture in the organization • Create partnerships with research organization 	<ul style="list-style-type: none"> • Support science and technology research and development that will help improve the country's competitiveness and quality of life
	<ul style="list-style-type: none"> • Maintain good relations with surrounding communities to maintain trust in the company's operations 	<ul style="list-style-type: none"> • Improve career opportunities, surrounding environment, and safety of communities

Economic, Environment, and Social Situations

Global Economy in 2021

The global economy in 2021 began its recovery since the start of the year, supported by the progress of vaccine production and distribution in many countries. However, the economic recovery was gradual due to the COVID-19 variants, which caused infection rate to return to severe level in some countries as well as disrupted economic activities, especially supply chain. Aside from COVID-19 pandemic, US-China relations remain strained. In addition, geopolitical factors still affected the overall global economy. The International Monetary Fund (IMF) forecasted global economy to expand at 5.9% in 2021, up from a contraction of 3.1% in 2020. However, due to rising inflation in many countries because of labor shortages and rising energy prices lead the US Federal Reserve (FED) and the European Central Bank (ECB) to reduce their asset purchases in the fourth quarter of 2021 as the economy gradually recovered and inflation stayed above the target range. The US Federal Reserve announced plans to gradually tighten QE tempering in November with further tightening in December. The European Central Bank (ECB) reduced its asset purchases under the Pandemic Emergency Purchase Programmed (PEPP) in the fourth quarter. Policy rate, including the Bank of Japan, are expected to remain low due to the uncertain economic conditions.

For 2022, the IMF forecasts the global economy to expand at the rate of 4.9%, continuing the recovery at a slower rate than 2021, with good prospects from narrower economic recovery gaps among regions due to the economic recovery in developing economies. However, on-going risk factors include supply chain disruption stemming from both labor and raw material shortages which will further fuel inflation in many countries, impacts from Omicron variant as well as future variants, household debt, government fiscal conditions, and geopolitical tensions

Environmental and Social Conditions in 2021

In 2021, the world and Thailand still face familiar challenges aside from the ongoing COVID-19 pandemic, climate change crises, pollution, waste, and biodiversity loss remain major challenges. The situation can be summarized as follows:

In 2021, the world turned its attention back to climate change issue. The United Nations Conference on Climate Change (COP26) from 31 October to 12 November 2021 in Glasgow, Scotland, United Kingdom. Many countries are visibly more engaged and focused on climate change as they realize that the impact of global warming has resulted in climate volatility and catastrophic events in many countries. Meanwhile, developed economies have revised their stance on contributing to the mid-century Net Zero Emission Target of the Paris Agreement (NDCs), which aims to reduce 53 billion tons of greenhouse gas emissions by 2030, with the world aiming to reduce greenhouse gas emissions by 25 billion tons to keep global temperatures rise to within 1.5 degrees Celsius.

In addition to trying to control and reduce greenhouse gas emissions, environmental issues related to climate change were also highlighted and measures are being considered with mechanism to help slow the increase in global temperature, including:

Air Pollution : At the COP 26 meeting, representatives from more than 100 countries signed the “Global Methane Pledge” to cut methane emissions by 30% by 2030 because it is found that reducing man-made methane could reduce emissions by 45% this decade. For Thailand, another important pollution is PM 2.5, but in 2021, due to La Niña phenomenon rainfall spread throughout the region, thus, reducing the accumulation of particulate, especially Bangkok and its vicinities which suffer from PM 2.5 pollution every year during December to February.

Biodiversity Forestry and Land Use The Glasgow Declaration of Leaders in Forestry and Land : Use was

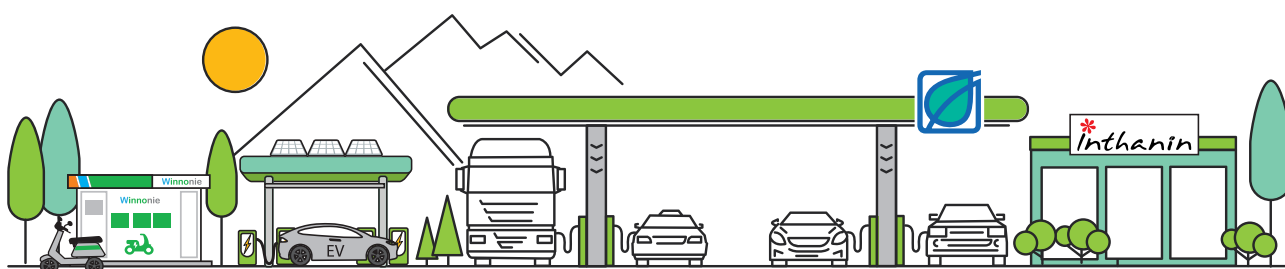
signed to demonstrate the commitment of leaders to jointly halt forest loss and land degradation by 2030 to protect biodiversity. Parties to the Convention on Biological Diversity (CBD) were formed for the first time in December 2021 for the protection of natural systems including forests and halting the rapid decline in biodiversity which is another key to combating climate change.

In addition to the environmental impacts of climate change and the global effort to push all countries to cooperate in controlling the global temperature to within 1.5 degrees Celsius is the case of the International Labor Union (ILO) which represents 200 million union members worldwide. The ILO calls for dialogue with workers and communities to begin immediately after the COP26 meeting with the aim of creating “just transition” plans¹.

For Thailand, His Excellency General Prayut Chan-o-cha, Prime Minister, announced that Thailand will achieve carbon neutrality by 2050 and achieve net zero greenhouse gas emission (net zero carbon) by or before 2065, the goals which require coordination with all parties to achieve.

Plastic waste and food waste: According to a report, plastic accounts for 85% of marine waste and warned that by 2040, the amount of plastic pollution flowing into the oceans will almost triple. As for food waste, it is a problem in almost every country including middle- and low-income countries, by 2021 the world was wasting nearly a billion tons of food each year or about 17% of all food meant for human consumption.

Thailand has driven the energy to achieve its goals towards a low-carbon economy and society. This requires adjustment and new guidelines to promote investment in green energy in the energy sector, consisting of increasing the proportion of new electricity generation where renewable energy makes up no less than 50% of generation mix, changing the energy use of transportation sector to green electricity through the electric vehicle (EV) to reduce greenhouse gas emissions and help alleviate PM2.5 problem, improving energy efficiency by more than 30% by applying technology and energy management innovations, modernization and restructuring of the energy sector to support the energy transition according to the 4D1E approach, Decarbonization: reducing carbon dioxide in the energy sector; Digitalization: implementing digital transformation in Energy System Management; Decentralization: decentralized energy generation and infrastructure; Deregulation: updating regulations to support modern energy policy; and Electrification: transformation of energy to electricity, which must be done in tandem with forest maintenance and reduction of deforestation including promoting the planting of mangroves. The UNEP supports mangrove planting calling mangroves Blue Forests where mangrove planting projects can receive Blue Carbon. Currently, over 30 countries have joined in promoting Blue Forests as another important mechanism for increasing carbon storage and mitigate the overall environment impact.



¹ World Economic Forum, “These are the climate change trends to look out for in 2022”, [online], <https://www.weforum.org/agenda/2022/01/climate-change-action-trends-2022-un/>

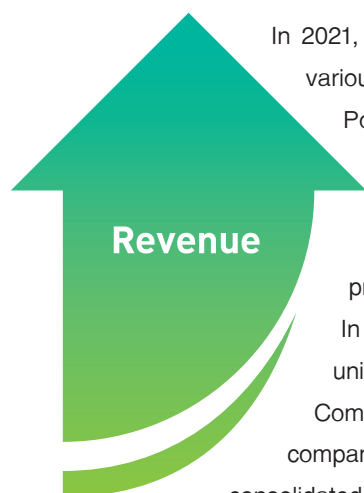
² Ph.D. Mr. Wijarn-Simachaya, “Thailand’s opportunities and carbon-free economy”, https://www.tei.or.th/th/blog_detail.php?

It was **'fun'**
” to receive different
complimentary gifts
from Bangchak,
but on learning of
how it was conceived,
it became
'happiness'.



–Supachat Piyamada–
Business Owner





In 2021, Bangchak and its subsidiaries (“Company Group”) has sales and services revenue from various business groups which consists of: Refinery and Trading Businesses. Marketing Business, Power Business, Bio-based Business, and Natural Resources Business totaling 199,417 million baht, an increase of 46% from the previous year. This was driven by higher crude oil prices and higher refined oil prices following the economic recovery and the expansion of oil demand after progress in global COVID-19 vaccination effort. The Company’s total oil product sales volume increased by 4% YoY, mainly from low-sulfur fuel oil exports and UCO. In addition, BCPT realized increased sales revenue mainly from the average selling price per unit and sales volume with external parties outside of the Company Group. In addition, the Company Group changed the recording method of investment in OKEA from an associated company to a subsidiary. As a result, revenue from sales of crude oil and gas is included in the consolidated financial statements from 1 July 2021.

The Company Group’s operating expenses in 2021 increased by 43,622 million baht, mainly due to an increase in cost of sales from oil prices and sales volume corresponding to the increase in sales and service income. In addition, the merger of OKEA ASA during the year contributed to expenses.

Other expenses of the Company are social care expenses to support schools and communities, including in-kind donations and monetary donations of approximately 34.68 million baht

In 2021, wages and expenses related to employee welfare and benefits increased from 2020 by approximately 1,170 million baht due to the merger of OKEA ASA. During the year, interest expenses on loans and debentures increased by approximately 345 million baht from the previous year. As for the payment of taxes to the government and local authorities in 2021 was approximately 20 million baht, in line with the Company’s operating results in 2020 where it realized a net loss in 2020. The Group Company carried over the net loss in 2021; thus, did not have to pay corporate tax. In 2021, the Group Company paid dividend of 2,672 million baht.



Corporate Governance

The Board of Directors has an intention to encourage the Company to be an organization that operates business under the principles of good corporate governance with standardized management system that focuses on creating maximum benefits for shareholders while taking into account all stakeholders interests. The Company must operate business with integrity, transparency, and accountability. Therefore, Bangchack established the Good Corporate Governance Policy (Disclosure 102–16) since 2003, partly as a result of a workshop that all employees participated in and formulated as a guideline for performing work. Since then, the company aims to create knowledge and understanding of the principles of good corporate governance and create awareness of applying good corporate governance principles in daily work until it is embedded into the corporate culture. In addition, the development of good corporate governance system has been improved by studying good corporate governance practices both domestically and internationally.

Significant changes and developments related to the review of policies, practices, and the corporate governance system in the past year.

In 2021, the Board of Directors approved the 18th revision of the good corporate governance policy to be in line with the Corporate Governance Report (CGR) criteria of the Thai Private Sector Collective Action Against Corruption (CAC), DJSI criteria for assessing the organization's sustainability, and performance standards for good corporate governance of leading companies as well as the suitability for the current business model. Salient changes are as follows:

1. Changed the name of the Corporate Governance Committee to the Sustainability and Corporate Governance Committee and amending roles and responsibilities to cover sustainability operations to be in line with the vision, mission and goals of the Company.
2. Amended the relevant definitions and guidelines on anti-money laundering and revolving door in the Anti-Corruption Policy.

With the determination and purpose to operate based on good corporate governance, the Company has been consistently ranked and awarded in area of good corporate governance, such as being at an excellent level or 5 symbols in the Corporate Governance Report (CGR) project for the year 2021 and is one of the highest-rated listed companies in Thailand, ranked by IOD and the SET.



Board of Directors

- Board Diversity – with skills in line with the company's business strategy through the preparation of a Board Skills Matrix and a variety of educational backgrounds and experiences without limiting any other differences
- No fewer than 5 Directors and no more than 15 Directors without gender discrimination. As of December 31, 2021, there are 13 Directors, 2 of which are female and one Executive Director.
- More than one-third of Directors are independent. Currently there are more than 8 independent Directors in according to good corporate governance principles.
- The Chairman of the Board is not the same person as the President and Chief Executive Officer and does not hold any position in the subcommittee to ensure clear separation of duties and operations.

Board Skills Matrix

Name/ Specific Expertise	Knowledge of company business	International business	Accounting and finance	Management	Compliance	Organizational development and innovation	Information and digital technology	Society, environment, and safety	Risk and crisis management
1. Mr. Pichai Chunhavajira	X	X	X	X		X		X	X
2. Mr. Suthep Wongvorazathe	X	X	X	X					X
3. Gen. Vitch Devahasdin	X			X	X	X		X	X
4. Adm. Sucheep Whoungmaitree	X			X	X	X		X	X
5. Gen. Songwit Noonpackdee	X			X		X		X	X
6. Pol.Lt.Gen. Chaiwat Chotima	X			X				X	X
7. Mrs. Prisana Prahmkhasuk	X	X	X	X		X	X		X
8. Dr. Poramettee Vimolsiri	X	X	X	X		X		X	X
9. Mr. Prasong Poontaneat	X	X	X	X	X	X			X
10. Mr. Chamroen Phothiyod	X	X	X	X	X				X
11. Dr. Kulaya Tantitemit	X	X	X	X			X		X
12. Mr. Boonchob Suthamanuswong	X			X	X	X		X	X
13. Mr. Chaiwat Kovavisarach	X	X	X	X		X	X	X	X
Total	13	8	8	13	5	9	3	8	13

Assessment of directors' performances

To ensure the effectiveness of the Board, the directors complete business performance assessment forms at least once a year the results are used to assess and improve performance. There are 3 types of assessments as follows:



94.7%

1. Individual Self-assessment

The assessment findings showed an average score of 94.7%, regarded as excellent.



95.5%

2. Individual Cross-assessment by group (3-4 unnamed directors assessing one director) The assessment findings showed an average of 95.5%, regarded as excellent.



95.8%



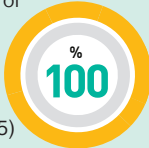

3. Entire Board

The assessment findings showed an average score of 95.8%, regarded as excellent.

Anti-Corruption

Bangchak Anti-Corruption Policy applies to the Board of Directors, executives and all employees of the company and its affiliates including the implementation of related measures to operate with subsidiaries, associated companies or other companies that the company has the power to control and have business representatives of the Company.

In addition, Bangchak has joined the anti-corruption related coalition, the United Nations' UN Global Compact, and in 2013 was one of the first 22 companies to be certified as a member of the Thai Private Sector Collective Action Coalition Against Corruption (CAC). As a result of its continued transparency in business operations, in 2019, the company received CAC membership renewal for the second time after the first renewal in 2016.

Anti-Corruption Action Goals	Performance										
1. All executives and employees of the Bangchak Group acknowledge the anti-corruption policy and use it as a framework for business operation	<div><div>Acknowledgement of the policy and pass learning (Disclosure 205-2)</div><div><div></div><div>Acknowledgement of policy 100%</div></div><div><div></div><div>Knowledge test test performance average 100% 95%</div></div><div><div>Online notification of conflict of Interest through HR-Services (Disclosure 102-25)</div><div></div></div><div><div>Complaints related to corruption (Disclosure 205-3)</div><div><table><tr><th>2017</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr></table></div></div></div>	2017	2018	2019	2020	2021	0	0	0	1	1
2017	2018	2019	2020	2021							
0	0	0	1	1							
2. Encourage business partners to participate and become certified members of the CAC.	Bangchak encourages its business partners to become members of the CAC. This year the company has publicized and communicated to trading partners to attend CAC training every quarter by organizing online seminars via WebEx system from continuous support from partners since 2013. Currently, there are 96 partners who have announced their intentions.										

Communication about Anti-Corruption Policies and Procedures

Bangchak promote anti-corruption as follows:

- Developed communication of good deeds, morality and ethics, and anti-corruption, as well as guidelines of corporate governance policy through Tone from the Top, prepared as the executive's CG Motto, on the Company's Intranet
- Developed the Good Corporate Governance Policy Manual (CG Policy (Booklet) in the form of eBook so that readers can easily learn and can apply them more accurately.
- Prepared a CG Lesson Learned about Good Corporate Governance Policy (once per quarter) to present the relevant case studies concretely in the BCP KMS system for employees to acknowledge.
- Chief Executive Officer and President gave an interview with the Thai Private Sector Collective Action Against Corruption (CAC) project on the topic of CAC Change Agent Success Story to promote the success of companies that have joined the CAC

program as a change agent and to focus on supporting businesses to combat corruption in a concrete way with measures to prevent bribery of government officials.

- On November 22, 2021, the Company organized a CG Day activity (16th year) with Group Company to raise awareness of the importance of complying with good corporate governance principles in the current environment. In 2021, BCPG Public Company Limited hosted an online event “CG DAY 2021: Technology & Corporate Governance, promote or challenge” with a special lecture from Professor Dr. Suchatwee



Suwansawat. In addition, Bangchak Group employees took part in the essay writing and video contests to raise awareness, to develop employee potential, and to communicate knowledge and understanding on good corporate governance.

Action to Combat Anti-Corruption:

- Communicate the “No Gift Policy” during festive seasons and other occasions to employees, subsidiaries and concerned external parties in order to reinforce the determination of the company in establishing good norms and fair deals in doing business with all relevant parties
- Decline to receive all gifts at any opportunities, and do not take or provide any entertainment and any expenses which are not necessary or not proper to government officers or business partners. If gifts received are highly valuable, employees must refuse to take them and report their supervisors.
- Goods and monetary donations must be for charitable purpose only. The donation cannot be used as an excuse for the corruption. The donation for charity requires documentation and comply with the company’s regulations.
- Maintain political neutrality and have no guideline for providing political aids for any political parties directly and indirectly.



- **Ideas Sharing :** Due to the COVID-19 pandemic and social distancing measures, the Company continues to support its partners in inviting and giving advice on the preparation of manuals and anti-corruption policy including providing advice to be a role model and encouraging partners to join the alliance and be certified members of CAC through various online channels. Since 2018, the company has provided benefits to partners who are CAC certified members as follows:

- Earning plus 1 -2% technical points
- If multiple vendors have the same lowest prices, vendor with CAC certification is selected.

With unwavering determination to operate on the basis of good corporate governance, the Company has consistently received ratings and awards for good corporate governance including:



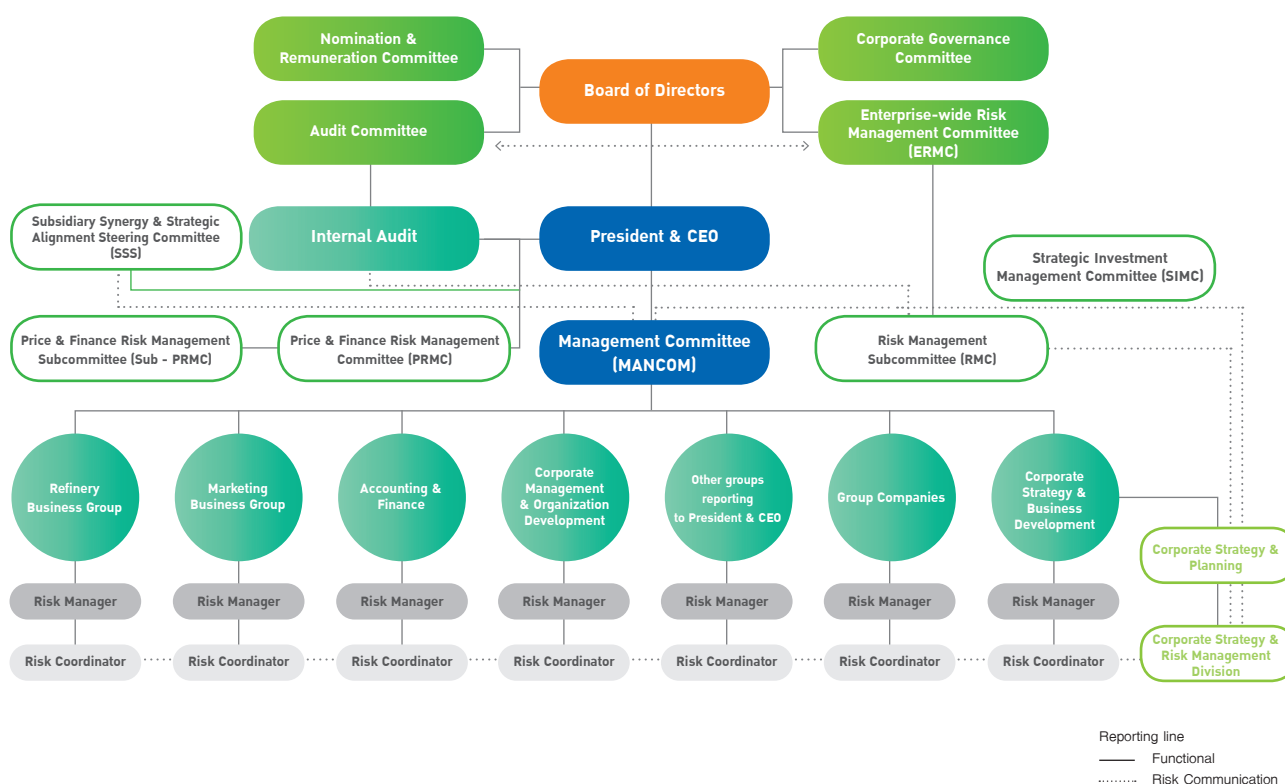
Outstanding Code of Conduct Award from the Thai Chamber of Commerce for the year 2021, organized by the Thai Chamber of Commerce and the Board of Trade of Thailand. Demonstrating ethical business practices and is recognized and trusted by society.



The 10th NACC Integrity Awards, organized by the National Anti-Corruption Commission (NACC), demonstrating the commitment of executives and employees to jointly develop an anti-corruption system all around the Company and create a culture in the organization that is transparent and against all forms of corruption.

Risk Management Policy and Plans

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



Remark: – Risk Manager – Vice President / Designated person

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

Risk Management Results

In 2021 almost every country worldwide, including Thailand, suffered economic contraction caused by the COVID-19 pandemic. Because of the Delta variance, governments in several countries had no choice but to enforce the lockdown measure, which affected economic activities and disrupted supply chains. Businesses shut down their factories and trading partner countries in supply chains halted production. Demand for goods and commodity prices increased especially crude oil prices. It affected the economy, inflation rate and the company's performance.

However, Bangchak, including joint-venture companies, had prepared an enterprise-wide risk management plan to mitigate the impact on the business. It monitored and tracked the overall effect to keep risk levels acceptable and prepare for a volatile future business landscape. Bangchak developed a risk management plan in parallel with the operating strategy. It planned 2 scenarios in response to potential situations to ensure adaptability to changing circumstances.

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

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



1. Corporate Risk Management

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

Strategies

Risks of the global economic downturn and lower demand

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

- In 2021 demand for jet fuel remained affected by the national lockdown measures due to the COVID-19 outbreak. Bangchak reduced its capacity and adjusted the processes. It switched from jet fuel production to diesel production to meet market demand.
- The Refinery and Trading Business Group modified Bangchak into a niche products refinery to present new, more diverse products to the market, going from a variety of fuels into production of UCO (unconverted oil) for feedstock of lube base oil and paraffin wax along with modifications for greater diversity. An instance is solvents, which are key industrial components, including paint, thinner, and resin. Bangchak still plans to sell more diverse array of products in the future.
- Marketing Business Group successfully maintained its status as the No. 2 market share leader (according to the Department of Energy Business) by achieving the goal of unique design for each station in combination with the Bangchak brand identity. Bangchak had 1,277 service stations (as of December 31, 2021) and remained focused on the continued expansion of non-oil businesses. The year 2021 marked Inthanin's 15th anniversary and the Company aimed to keep expanding branches

inside and outside service stations. In addition, Bangchak added a small-store format to access communities. Due to continued branch expansion, Bangchak had 817 branches as of 2021. The online sales revenue also increased thanks to wider coverage in several areas. Furthermore, the Company partnered with more food delivery service providers, such as Robinhood. The Group has been developing new businesses to turn service stations into Greenovative Destinations that fulfilled customers' needs and meet their changing lifestyles. It installed EV chargers at 70 Bangchak service stations in 36 provinces nationwide. Also, it developed a business model of "Bangchak Food Truck" by collaborating with many leading brands to offer lifestyle products under the Grab & Go concept in service stations.

Risks of energy innovation transformation (Emerging Risk)

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

- Established a green ecosystem to drive Bangchak Group's innovations with an emphasis on green energy and bio-based products through Bangchak Initiative and Innovation Center (BiIC)
- Carved investment opportunities in businesses related to electric vehicles (EVs) and batteries of the future with a springboard in the lithium purchase agreement of up to 6,000 tons a year under the Cauchari-Olaroz Project of Lithium Americas Corp.

- Expanded business to high value bioproducts through BBGI Public Company Limited invested in Manus Bio Inc., a world leader in the biotechnology business. It also invested in joint-venture WIN Ingredients and received a recipe registration certificate for the sweetener Neotame to be distributed in Thailand and ASEAN. Furthermore, it started selling dietary supplements under the B Nature Plus brand. The brand's first product was the ASTA-IMMU antioxidant food supplement for skincare derived from astaxanthin red algae and a pharmaceutical-grade hand sanitizer manufactured under the GMP-HACCP manufacturing standard.
- Promote the initiation of business opportunities from energy innovation through regular campaigns among staff and subsidiaries, through introduction of Design Thinking to help develop new products and services to cope with future changes. To this end, BiiC can act like a business incubator and eventually commercialize selected initiatives.
- Continued to expand the startup service “Winnonie”. Bangchak introduced and rented out electric motorcycles to motorcycle taxi riders and riders who delivered food or parcels. They can swap batteries at swapping stations located in Bangchak service stations. This effort scaled up green energy innovation and improved the riders’ quality of life.
- Launched the “Smart Digital Fuel Dispenser Project: Krathing”. Bangchak, in collaboration with Micro Oil and Retail Co., Ltd. and DTAC TriNet Co., Ltd., installed and managed digital fuel dispensers. It also established a communication system for the installation of Krathing dispensers nationwide. As a result, Krathing, serving as a platform providing quality fuel, could reach small communities. This project aimed to promote their access to quality energy that met the required standard. In the future, Bangchak would scale up services other than oil services to improve local people’s quality of life in all aspects.



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.

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

Strategies

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

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

Pandemic risk

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



the Group provided COVID-19 vaccines. That was why 99% of the employees were vaccinated in August 2021 and a high percentage of employees received two shots. It also prepared to procure the third dose to boost immunity. Moreover, it sanitized offices with disinfectant spray regularly. Its antigen test mobile unit provided weekly COVID-19 testing for Bangchak's and Bangchak Group's employees, including employees of service stations and Inthanin Café, to ensure safety and foster confidence among customers. However, due to the pandemic and the volatility of global oil prices in 2021, Bangchak emphasized a lean, agile work process adjustable to different situations. Furthermore, Bangchak was ready to restructure the organization for sustainability, including managing its working capital to ensure a sufficient amount for planned business operations and investment plans.

Risks of digital technology transformation and cybersecurity (Emerging Risk)

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

- Establish a digital technology unit in charge of planning, monitoring, and procuring proper digital technologies for Bangchak to cope with changes in consumer behavior, work process improvement toward increasing competitive advantages, and adding value and efficiency to its services. The following additional technologies were applied in 2020.



- The Digital Payment Project, in which digital payment is made in the Mobile EDC (electronic data capture) form to avoid physical contact at service stations by scanning the QR Code to pay through all banks' applications and PromptPay or simply touch and pay with contactless credit cards while accruing Bangchak membership points.
- Develop personalized marketing by applying data analytics to examine individual consumer behavior to develop tailor-made service patterns specific to each consumer and hence increase customer satisfaction.
- Promoted the digitalization of working processes to increase efficiency and reduce work time. Bangchak chose digital tools, including Robotic Process Automation (RPA), Power BI or Power App, in work improvement. Enhanced work processes included due diligence of business partners, service station maintenance planning, and issuance of product purchase documents.
- Set up a cybersecurity function, responsible for planning, monitoring, surveillance, testing, and procuring tools to prevent cyber threats, which tended to keep increasing each year. In 2021 the Enterprise-wide Risk Management Committee

focused on surveillance and provided risk management in case cyber-attacks disrupted the business process support system. It provided tools to enhance the security of the computer center. Moreover, it designed more secure information infrastructure systems and conducted vulnerability assessments to promptly close gaps. Bangchak kept monitoring key risk indicators through the Security System Alert System. Furthermore, it formulated an incident response plan, created awareness of cyber threats among employees, and regularly conducted testing. Finally, it implemented a secure work system that received ISO 27001 certification for data security management, ISO 27032 for cybersecurity management, and ISO 27018 for personal data security management.

- In addition, Bangchak develop a refinery cybersecurity system program to safeguard work systems from cyber-attacks or interruptions which might affect refining processes. Since 2020, Bangchak has won ISO/IEC 27001 certification (Information Security Management), covering the refinery's Distributed Control System, thus ensuring that its refining processes will continue uninterrupted despite cyber-attacks.

Risks to reputation from social media

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

Finance (Disclosure 102–29)

Risks of volatile prices of oil and feedstock

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

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

Risks of volatility of exchange rates and interest rates

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

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

Regulations

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

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

Risks from the stabilization of domestic retail fuel prices

The average prices of petroleum products and biodiesel products (B100) increased. To mitigate the impact on consumers and spur economic recovery, the Ministry of Energy asked businesses for cooperation in monitoring oil marketing margins and stabilizing domestic fuel retail prices to avoid excessive volatility. As a result, Bangchak could not adjust retail prices at service stations in line with the rising costs of petroleum products under the global market situation, leading to the lower net marketing margins per unit. Yet, the Company had measures to reduce such impact. According to the Department



of Energy Business, it could maintain its status as the 2nd market share leader (according to the Department of Energy Business) by achieving the goal of unique design for each station in combination with the Bangchak brand identity. To mitigate the impact on the oil business, the Company installed EV chargers at 70 Bangchak service stations in 37 provinces across the country to turn Bangchak service stations into a Greenovative Destination that fulfilled customers' needs and meet their changing lifestyles. Moreover, it developed a business model of "Bangchak Food Truck" by collaborating with many leading brands to offer lifestyle products under the Grab & Go concept in service stations.

Societal and Environmental Risks

Risks of impacts on communities and society (Emerging Risk)

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

- Constantly developed a system for occupational health and safety of international standard to upgrade health and safety in the workplace while systematizing work processes with due regard for risks, opportunities, and legal requirements. Bangchak was certified with ISO 45001, ISO 14001, and ISO 50001.
- Prevented oil spills into the river by specifying double-hulled transport vessels for crude oil and refined products; implemented preparedness measures for emergency gear and oil slick equipment; tested oil-pumping pipes every six months; deployed two layers of oil-slick booms during oil-pumping periods; constantly developed personnel and improved safety technology for port/jetty equipment, systems, and instruments in line with the Oil Company International Marine Forum Institute's standard.
- Bangchak has a vessel to tackle oil slicks that are mobilized immediately without having to wait for other vessels, thus ensuring that it can collect oil

slicks efficiently and rapidly. Bangchak stays ready to extend support to the public sector and the Oil Industry Environmental Safety Group Association (IESG) and other incidents upon request.

- 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.

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

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

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

- Invested through BCPG Public Company Limited in VRB Energy, which researched, developed, produced, and distributed an energy storage system called Vanadium Redox Flow battery suitable for a utility scale, such as connection to the transmission system, decentralized generation support or a virtual power plant because of a large-scale, long-term power storage capacity. This is a future business guideline for renewable energy. Moreover, the Company had the rooftop solar power plant project implemented by Chiang Mai University under the CMU Smart City Project, Chiang Mai.
- Showed commitment to conducting a low-carbon business and leading energy transition. Bangchak has been increasing the proportion of green companies to lower carbon emissions. It also founded the Carbon Markets Club to promote carbon credit trading and set a carbon-neutral target by 2030 and a zero GHG emission target by 2050. By improving the efficiency of processes and using low-emission products, Bangchak would reduce emissions by 30% by 2030. Additionally, it applied other mechanisms, such as investing in green energy businesses and trading of the remaining carbon credits. Bangchak was one of 14 organizations receiving the Low Carbon and Sustainable Business Awards from Thailand Greenhouse Gas Management Organization (TGO). The evaluation was based on good governance, sustainability reports and business size based on economic, environmental and social indicators in line with the country's sustainable development goals.
- Replace fuel oil with natural gas to generate power and steam in the combined-cycle plant and deploy it as a primary energy source for the distillation units, resulting in higher energy efficiency and reduction of carbon dioxide emissions.



- Bangchak took part in easing pollution in the form of PM 2.5 particulates and smog by selling diesel containing five times less sulfur (lower than 10 ppm), as less sulfur can lower dust problems resulting from combustion along with sulfur dioxide. Such diesel was sold in Bangkok Metropolis during such critical periods.
- Remodel resource consumption with the 3Rs strategy of Reduce, Reuse and Recycle to achieve sustainable and environmentally friendly business success. This includes collection of plastic bottles from customers voluntarily to produce recycled products for society, collection of depleted plastic lubricant containers for recycling to produce polymers and eventually reproduce such containers. These programs are aimed to reduce public waste and sustain the values of resources through reuse and recycling to optimize their values to the environment, society and communities in a sustainable way.
- Lowered plastics in non-oil activities as well as plastic containers by designing lids of cold beverages that eliminates straws, in addition to continually modifying plastic containers (Bio-cups).

Water Shortage Risks

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

- Assess the worst possible effect and establish an underlying plan. The worst possible case of water shortage is when the Metropolitan Waterworks Authority is unable to deliver enough water to the company and has to rely on groundwater instead. This can cause limitation in the manufacturing process according to how much water is available with the maximum of 16 percent of the designed capacity. And in the case that the flooding is at its maximum, if the Bangkok and the company's flood prevention measure is not sufficient enough, the water from the Chao Phraya River will overflow to the distillation area. This could cause problems with the continuity of the distillation process.
- Monitored risks from climate change, such as drought, by monitoring and staying vigilant over daily water situations of the Metropolitan Waterworks Authority to assess the water shortage risk affecting refining processes, to ensure emergency water source availability, and to define proactive measures in case of risk arising from lower Chao Phraya River water levels, which may affect navigation, while ensuring minimal effects on stakeholders. Monitored flood situations and took proactive steps, for example, monitoring the levels of water in the major rivers during the rainy season, inspecting the readiness of flood prevention equipment by establishing a risk management plan in response to flood possibility and severity in order to ensure continuous business operation.
- In 2021 it reduced water consumption by improving tap water quality with a micro-filtration system and a reverse osmosis system, it reduced 0.10 million cubic meters per year of water consumption. The condensate water and stripped water in processes was reused and returned into process and it saved water 0.83 million cubic meters per year. Furthermore, Bangchak recycled 0.19 million cubic meters per year from treated water by improving its quality with the reverse osmosis system. Following the 3Rs measure, it saved water equivalent to the total water consumption of 4,171 households.
- In 2021 Bangchak conducted water stress assessment through the AQUEDUCT program to find that the location of Bangchak Refinery was a medium-high (20–40%) risk area, which by definition is not a significant area for water stress.
- Promote the reduction of water consumption in all production processes with all affiliates and business units, led by the water recycling program by the Bio-based Product Business Group. Moreover, a project of drilling for groundwater was initiated for water storage and supply for the facilities.

2. Project Investment Risks

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

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

3. Business Continuity Management (BCM)

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

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

Safety

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

Marketing

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

Finance

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

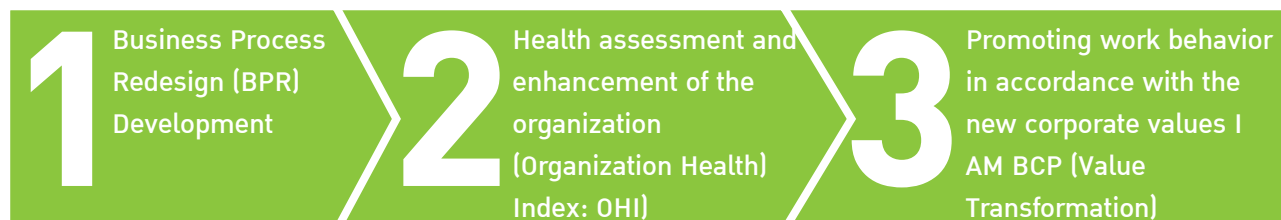
4. Promoting a culture of risk management within the organization and companies within the group

The company promotes a culture of risk management in the organization and extends it to companies in the group by allowing all departments in the Bangchak Group of Companies to create a risk plan every year. In 2021, company revised the Crisis Management Plan (CMP) and Business Continuity (BCP) including with identifying the indicators and reviewing resources in process continuously. There were 3 times of practical emergency drills plus Table top and 1 time particularly a rehearsal situation online of Business Continuity (BCP) in total 4 times as follows,

- First : 19 October 2021 – Annual emergency drills tier 3 in 2021, in the case of the emergency simulation at Plant-4. The Flange Bottom 4C-110 was on fire at Naphtha refinery. All external parties as Prakanong police station, Prakanong Fire and Rescue department, Bangkok Fire and Rescue Department and 3 hospitals had participated and observed in this emergency simulation online and recorded.
- Second : 24 September 2021–Annual emergency drills tier 2 in 2021, in the case of the emergency simulation at Plant-4. The Flange Bottom 4C-110 was leaked and on fire.
- Third : 03 December 2021–Annual emergency drills tier 2 in 2021, Fuel tank overflow T-985 resulting a full surface fire–organized by SFD.
- Forth : 24 November 2021–The rehearsal situation online of Business Continuity (BCP) annually in 2021, in the case of the Flange Bottom 4C-110 was on fire at Plant 4 Refinery and Command Center, floor 22 at M-Tower and Refinery. This rehearsal situation of Business Continuity (BCP) was covered the communication between related executives and employees. Also, the recording of 19 Oct. 2021, was used to assemble this rehearsal situation of Business Continuity. The result of the rehearsal situation will be applied to improve the operation procedure, to support the Business Continuity for more effectively and to ensure in the crisis situation, company could handle the crisis situation and conducts business continuously.

Change Management

Bangchak has always been committed to the effective change management. To align with our vision, the company has established 3 main ways to handle and prepare for changes:



Change Management Department is responsible for planning, coordination, providing recommendations, monitoring and reporting the progress, the opportunities and various operational barriers directly to management executives.

2021 Performance

1. Business Process Redesign (BPR) Development

The BPR focused on process improvements in order to maximize efficiency, reduce costs, and better meet the needs of our customers. In 2020, Bangchak extended the BPR to cover more subsidiaries and associated companies. This resulted in new projects which have opportunities to create added values, reduce operating costs, and increase operational efficiency for over THB 1,300 million during 12 months of the project. Example projects under the BPR are as the followings:

- 1) Project to manage oil reserve and transportation during major turnaround leading to cost saving of THB 102 million
- 2) Project to increase energy efficiency for refinery production unit leading to cost saving of THB 73 million
- 3) Project to supply new type crude oil and expand market to new customers who are interested in premium oil program leading to value added from refinery and product sales of THB 103 million.
- 4) Project to enhance marketing promotion for customers and business partners leading to cost saving of THB 34 Million
- 5) Digital transformation project to improve operational process by reducing work flow and developing process automation. This program helps to reduce redundancy and more than 24,000 work hours.

In addition, the company defines digital transformation to be one of the five years strategic direction for driving business, people and organizational culture to create value

added and the new business model (new s-curve) which focus on Lean & Six Sigma customer.

2. High Performance Organization (HPO)

The company have been participating in Thailand Quality Award – TQA assessment. The company adopted the criteria of the national quality award as a guideline for developing management competence process improvement and produce results through a system of development and assessment of organizations in various categories to become an organization with sustainable growth and shows excellence in the management of the organization to be standardized and accepted.

3. Drive New Organizational Values to Improve Work Behavior I AM BCP (Value Transformation)

Due to COVID-19 Situation, the company adjusted to working from home and hybrid working model which have been very challenging. The company has helped employees to adapt mindset about working culture and process; therefore, the company uses digital system such as Line Official: I am BCP Everywhere with You to support our employees. The digital system collects relevant and necessary online systems to employee on mobile system that helps employees to adjust to new working condition and enhance online employee engagement. In addition, the system encourages cross functional working among the employee in line with Bangchak's value "Agility & Mobility" and builds innovation under Business Process Redesign project and Mini MBA and intrapreneur.

Supply Chain Management

The past year situation remained mired by COVID-19 as new variants brought back the surge in cases. As a result, the economy once again became stagnate. It outbreaks also affected the business sector due to shortage of shipping containers, higher raw material prices as well as changing consumer behavior. Therefore, the company had to adjust to adapt to new situations both internal and external management such as supply chain management including relationship management and the process of working with all stakeholders to make the operation go smoothly, sourcing of quality products and services that are environmentally friendly and can meet the needs of consumers and adhere to the principles of good corporate governance as well as conduct business in a participative and sustainable approach.

In addition to efficient management of supply chain, the Company has also adopted a sustainable development approach that considers environmental, social and governance (ESG) issues as part of its implementation and integration into the supply chain.

Supply chain management for effectiveness

5 Year Targets (2018-2022)

1. Reduce suppliers sustainable-related risks aligned with target
2. Reduce procurement spending through cost management by 10% of annual budget per year
3. Enhance green procurement for products and services
4. Develop and manage supplier and business partner relationships

2021 Strategy

1. Improve the work processes of employees by using technology
2. Enhance knowledge and knowhow of Bangchak Group's procurement process to pursue international standard for procurement
3. Maximize company's benefit in terms of quality and spending through process improvement
4. Develop suppliers' capability through Supplier Code of Conduct



2021 Performance

Supply Chain Management Digital Transformation:

Due to the COVID-19 pandemic that caused the business sector to implement work from home policy for a long time in 2021, the company has taken the experience from the said situation in 2020 to review and encourage employees and work function to apply technology to help smooth workflow as follows:

- **Electronic Signature** The company studied and initiated electronic signature technology in 2020 to reduce document preparation time, reduce paper use, and act as a channel for submitting work orders/hire documents or various employment contracts both inside and outside the organization. In 2021, Electronic Signature has been fully adopted. The company chose a reliable, easy to use with a simple signing process providing convenience for partners to access signing at no additional cost. This results in a faster contract signing process due to the adoption of the technology. Benefits include time reduction for the document submission process both for Bangchak and its partners. Electronic Signature also helped to save the environment by reducing paper use, reducing waste from the document preparation process, saving energy from reducing the document delivery process including saving space in document storage and from reducing

the time for signing documents. It also results in a better way for partners to place bills faster as signing process is shortened.

- **Electronic BG** The Company studied blockchain technology and found that there are guidelines that can be applied to the contract preparation process in the event that documents secured contracts are required. This is a change in the form of bank guarantee preparation from paper to electronic using blockchain. In addition to reducing the use of paper, the technology is also more convenient for partners to prepare. This makes the management of contract collateral documents more efficient as well as reliable.
- **E - Catalog** In the past, the company has applied the E-catalog technology system to the product group of office equipment, consumer products, equipment parts products. and general tools in the refinery. The result of the E-catalog adoption has been good. The company can reduce processing time for procurement and payments as well as increasing the convenience for users. Due to the success of the rollout, Bangchak is expanding the scope of E-catalog and expanding the use of E-catalog to affiliated companies for office equipment product group and consumer products.
- **Robotic Process Automation** In the past Robotic Process Automation, “bot” for short, to reduce employee routine work processes, such as process of issuing contract numbers and process of bringing the signed contract and storing it into the SAP system, etc.

Execute strategic purchasing through Bangchak Group

Because of market changing, the Purchasing department and the users had applied the category strategy, purchasing strategies, the current scope of work and user's technical knowledge to analyze the point of efficiency improvement and cost-effective in each group of goods and services. Enhancement resulting from this project, including:

- Hire a local supervisor to oversee the installation of the equipment rather than hiring a team of international experts.
- Reduce product cost by adjusting the material of the equipment
- Change in scope of work to meet utilization needs and current state.
- The correct quantity of common chemicals used in the Bangchak group, to increase the ability to supply the products at a lower price.
- Standardize specifications to reduce bidding time, such as for chemicals.

- Results**
- Possibility of purchase within a mean time of 31 days.
 - Save up to 10% off the cost of procurement in Budget 2021.

Supplier Relationship Development by Supplier Seminars

Bangchak held supplier seminars to clarify the company's operating guidelines and provide knowledge of procurement standards and procedures. The seminars allow for two-way communications so suppliers can ask questions, provide suggestions and comment on procurement-related issues. Some issues are clarified and understood in the meeting, for example, one partner wants to know the project information and the direction of Bangchak's operations in the future in order to be able to adjust operations including to be able to offer solutions for new operations to Bangchak. During the annual seminar the company's direction is usually clarified for partners who are very interested. For some issues, the procurement function advised partners to collaborate to increase effectiveness, such as using bidding system and signatory process. In addition, a manual has been prepared for partners to inform them about issues to ensure convenience in traveling to hear the work statement or meeting. Further, Bangchak implanted measures to prevent COVID-19 therefore, face-to-face meeting may not be appropriated; hence online channels are provided. During the seminar, in addition to communicating the direction of the organization and procurement of supplies Bangchak also provided knowledge about climate change and greenhouse gases as well as introduced project co-founded by Bangchak Group, Carbon Market Club, to promote carbon trading and help reduce greenhouse gas for the first time in Thailand.

This year, the Quality, Standards, Safety, Occupational Health and Environment Function together with the Procurement Function revise the Supplier Code of Conduct

to cover current issues such as human rights, anti-corruption, privacy protection, etc. The SCOC revision has been communicated to key suppliers during the seminar.

Due to the continuity of the seminars, relationships with partners in the trading partner register have been improved which in turn enhance the confidence in the quality of partners for users.

- Results**
- Supplier satisfaction with the work of procurement officers in 2021 was very good (93%).
 - User satisfaction with partner's work is good (80%)

products and services that are environmentally friendly. In 2021, the Company has set a new framework for supplying such products. Bangchak refers to the product list to cover the product group under the Green Label Thailand certification in 2021, the implementation not only apply to products but also includes the employment of various services such as construction work, repair work of service stations or offices where the company requires the use of environmentally friendly products as well.

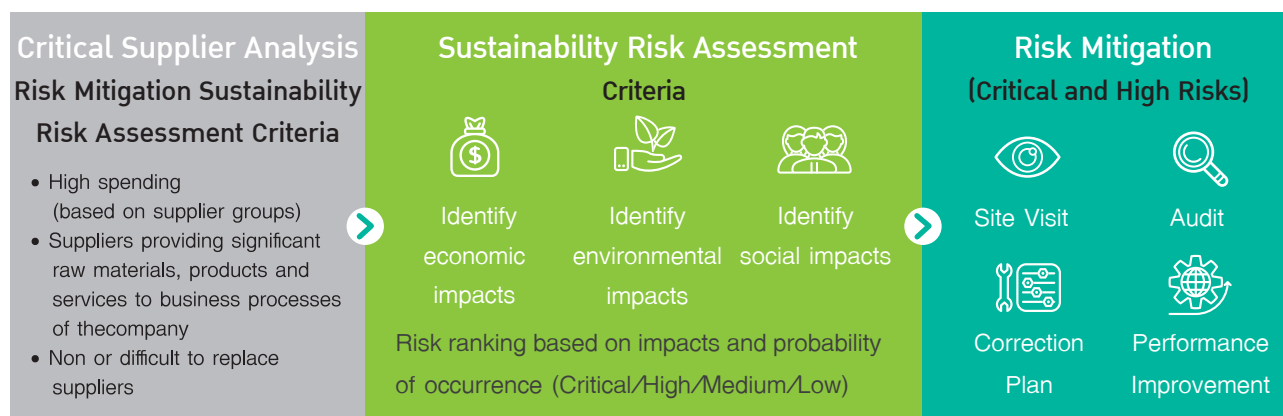
- Results**
- Number of products and services that are environmentally friendly 20 product groups out of 24 product groups representing 83% (target 80%).

Green Products and Services

Bangchak has always placed importance on providing

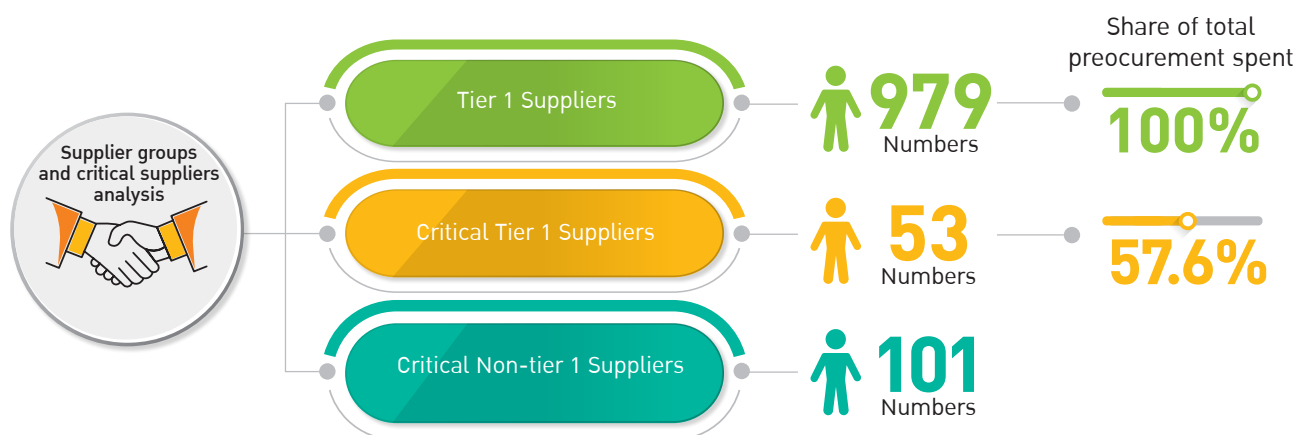
Sustainable Supply Chain

To reduce risk in supply chain and enhance business competitiveness, the Company emphasizes on supplier group development by integrating UN Global Compact into our framework for working with suppliers as follows:



Sustainable Supply Chain Management Process





1. Developed BCP Supplier Code of Conduct (SCOC) that integrates environment, social and governance (ESG).

SCOC includes 5 aspects:

- Business Ethics
- Labor Practices and Human Rights
- Safety and Occupational Health
- Environment
- Community Engagement and Development

2. Classified and analyzed critical tier 1 suppliers by using the following criteria:

- High spending supplier (classified by supplier groups)
- Suppliers of critical raw material, products, and services
- Suppliers that cannot be easily replaced as there are few in the market



4. Conduct analysis and closing gaps related to economic, social and environmental risks of raw material suppliers, logistics and goods and services.

The Company has a goal to conduct an ESG risk assessment with tier 1 suppliers for a 3-year assessment cycle, which is between 2019-2021. Since 2019, the Company has conducted assessments of economic, social and environmental risks of 979 tier 1 suppliers and 101 critical non-tier 1 suppliers. The assessments found that 5 tier 1 suppliers and 22 important suppliers that do not directly do business with the Company have critically high level of operational risks in all aspects including: economic aspect (risk of delayed deliveries/deliveries, poor product quality that could cause business interruption), social aspect (risk of being complained by the community due to improper operation), and environment aspect (risks associated with chemical and oil spills). The Company has jointly developed various risk mitigation measures with business partners (100%) who have been assessed for risks. In order to prevent the impact and the likelihood of that risk being and there is no termination of operations with the partner for which the risk was assessed (0%). [Disclosure 308-2, Disclosure 414-2]

Encouragement Suppliers to Develop Corrective Action Plans



Supply Chain Transparency & Reporting

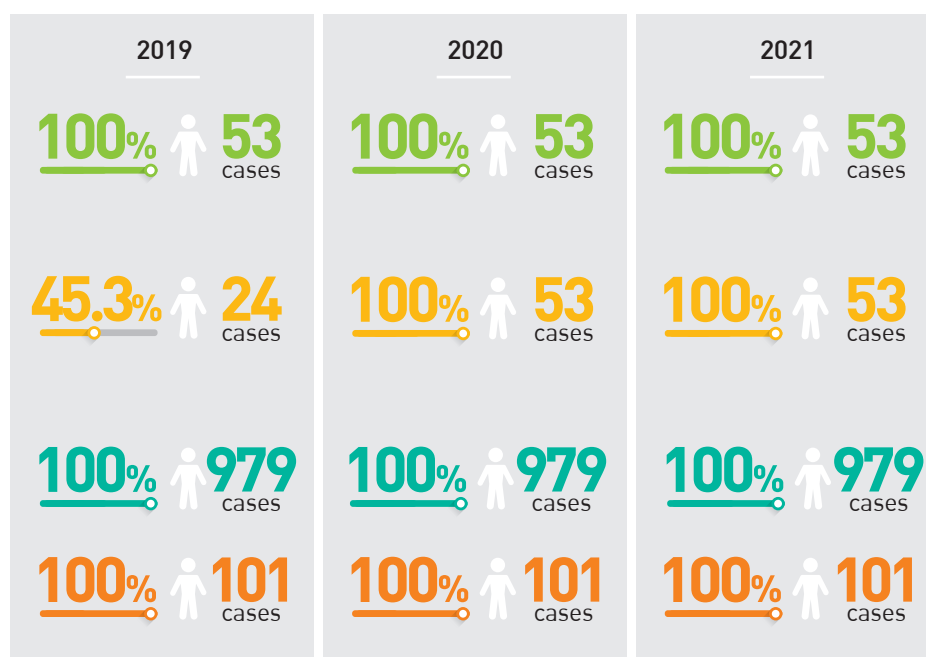
Percentage of suppliers

Percentage of critical suppliers who accepted BCP supplier code of conduct (SCOC) assessment invitation

Percentage of critical suppliers who achieved the BCP supplier code of conduct (SCOC) assessment

Percentage of sustainability risk assessment of tier 1 suppliers

Percentage of sustainability risk assessment of critical non-tier 1 suppliers



Innovation Management

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

1. Research & Development : (R&D)

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

Bangchak's Expenditure for R&D and Innovation

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

Remarks

In 2019 Bangchak won Baht 2.8 million in tax privileges from TISTR along with Baht 2.3 million in supporting research fund from the Thailand Research Fund (TRF)

In 2020 Bangchak won about Baht 1 million in tax privileges from TISTR.



2. Corporate Venture Capital (CVC)

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

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



innovation to remote communities. Apart from serving fuels, services currently include mobile phone top-ups and payment of electricity and water bills, with financial services soon to follow. In addition, E&I drives the establishment of a Thailand Synthetic Biology Consortium in conjunction with

3. Ecosystem and Incubation (E&I)

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

In 2020 Bangchak launched the Winnonie internal startup, a word plays from win (Thai term for motorcycle queue), no (without), and nie (Thai Term for debt). The project arose from applied business thinking with Design Thinking under BiiC's sponsorship through The Intrapreneur project. This is therefore an innovation push from inside Bangchak, from ideas to a viable business that can extend itself through Bangchak's business. So, 2020 was the first year of development from ideas to the incubation process in the form of an internal startup. In 2021 Bangchak developed a vending service station project called "Krathing" to introduce



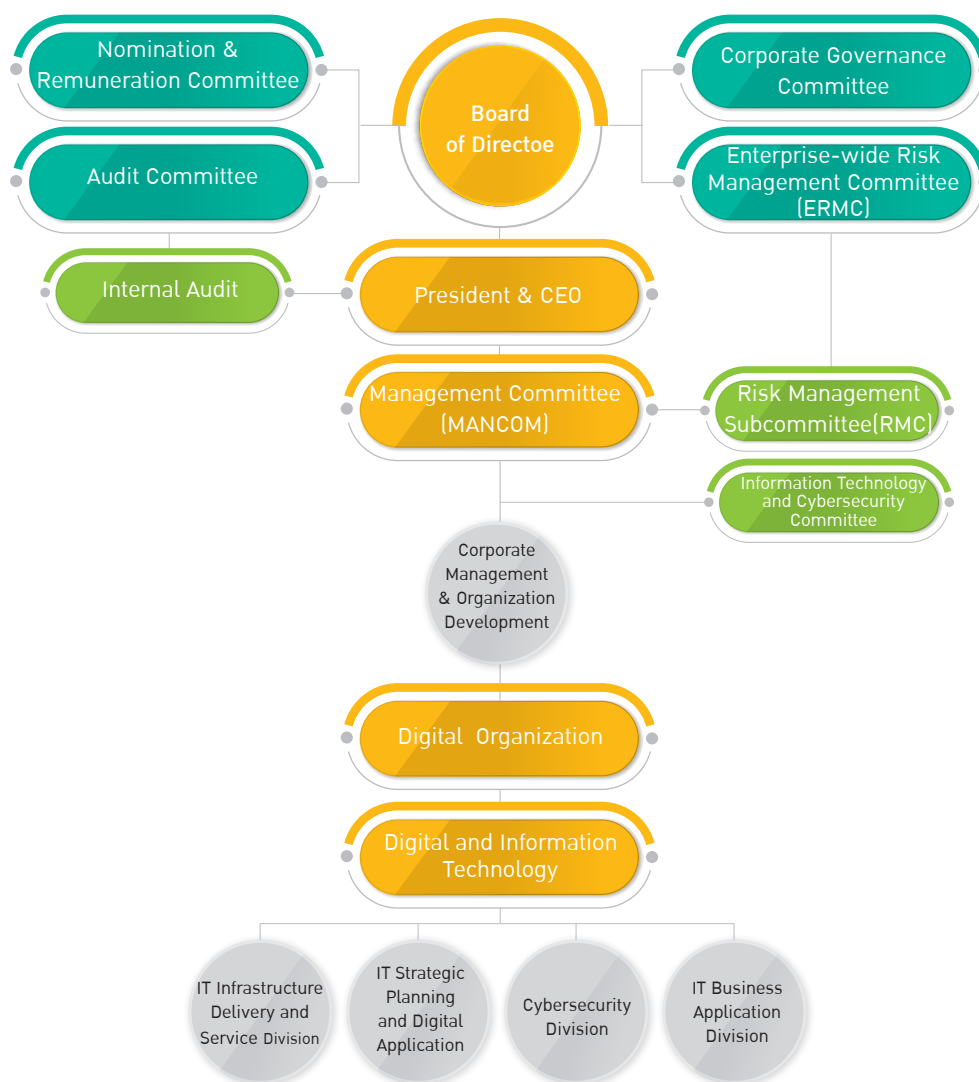
17 agencies as a network of cooperation in driving innovation and the domestic synthetic biotechnology industry and linking cooperation and sharing of experience among operators and researchers worldwide. The aim is commercial innovation, which is in line with the national strategic plan on upgrading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

Information Technology (IT) and Cyber Security for Business

Bangchak promotes the use of information technology as an important tool to manage stakeholders' expectations. The Company ensure that guidelines, framework, tools, and standards used are in accordance with international safety and security standards and government regulations such as Thailand's Cybersecurity Act of 2019 and Personal Data Protection Act of 2019 in order to support business expansion according to the Company's strategic plan.

Information Technology and Cyber Security Management Structure

The Company has appointed The Information Technology and Cybersecurity Digital and Information Technology Department is responsible for the management of the Committee and report performance to the Management Committee (MANCOM), and they also report IT risk management and cybersecurity to the sub-committees and the Enterprise-wide Risk Management Committee (ERMC).



The Cybersecurity Division was established in 2018 to be responsible for cybersecurity management following the ISO/ IES 27001: 2013 ISO/IES 27032: 2012 and NIST Cyber Security Framework.

Information Security Management in accordance with International Standards

ISO/IES27001:2013 Bangchak has received certification for ISO/IES27001:2013, an Information Security Management Systems standard, since 2012. The Company implemented the standard in risk management, design of security system, and in operations to create resiliency in control and development.

ISO/IES 27032: 2012 In 2018, Bangchak received ISO/IES 27032: 2012 which focuses on the confidentiality, integrity and availability in the cyberspace to protect hardware and software assets as well as information and virtual assets such as brand and reputation.

Protection of assets, information, and systems

Bangchak has implemented the Information Technology and Cyber Security Policy to ensure protection coverage through:

1. Conduct risk assessment of important IT systems and develop backup system and emergency management plan in an event where operations cannot be conducted electronically. The backup system and emergency plan are frequency tested for readiness.
2. Information technology management shall have measures to control and protect assets and equipment to ensure operational readiness and deterrent against unauthorized access from both onsite and offsite usage.
3. Control access to information and information technology usage based on level of importance as part of data management and confidentiality. This includes control of electronic messaging as well as providing a written contract on confidentiality and information protection with external entities.
4. The Company provided advanced security information and event management (SIEM) systems that can help analyze new attacks quickly and accurately. In addition, the Company conducts awareness raising activities with relevant users. Technical vulnerabilities are managed through:
 - Testing of procedures and processes to manage security incidents at least once a year including conducting a cyber security drill.
 - Conducting a penetration test on important operation systems to analyze risks and impacts to the business at least once every year.
 - Conducting vulnerability assessment of the operating system and network/ security equipment to determine whether there are any vulnerability and impact level so system operators/managers can determine the likelihood of attacks and develop corrective actions.

Internal communication to raise awareness and increase effectiveness of IT system usage.

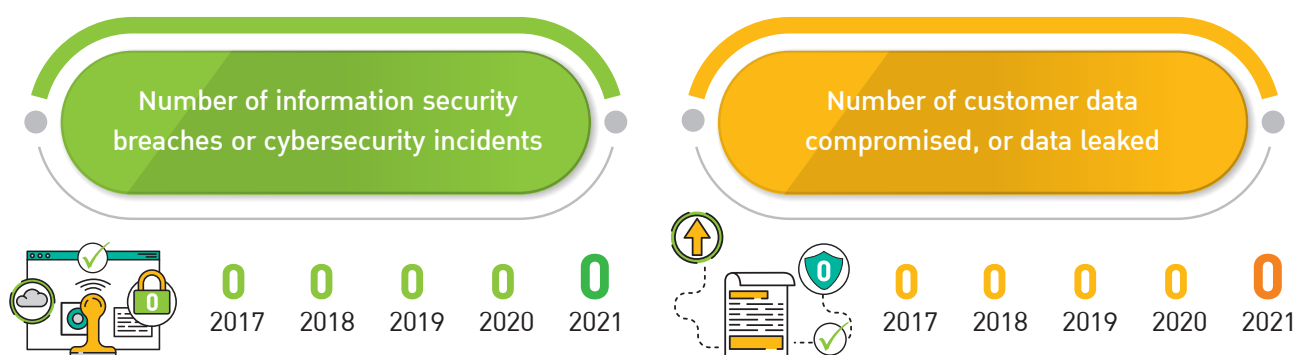
Internal communication has been increasingly implemented in internal operations and businesses. Therefore, Bangchak has provided communications and training for employees which included:

- Orientation for new employees through the use of operational training and measure understanding of cybersecurity awareness as well as requirements for the use of corporate information systems and regulatory compliance such as the Computer Crime Act of 2017 and Personal Data protection Act of 2019.
- Communicate potential cyber risks to create knowledge and security awareness through Company's e-mails.

- Conducted Cybersecurity Awareness Improvement Program annually through phishing mail assessment understanding assessment which includes conducting phishing simulation in order to determine the level of risk to the Company. To assess users' awareness, the Security Awareness Assessment is conducted. Results are documented, analyze, and use to develop further training plans as well as to improve phishing mail prevention measures. In 2021, 4 scenarios were conducted along with the assessment of errors from the test to employees immediately to create awareness and awareness (rapid improvement program). In addition, the various scenarios revealed some weaknesses in which Bangchak used the information to conduct analysis to close the vulnerabilities by communicating with employees to learn, be aware, and know how to deal with the threat of Phishing Mail better.

Security Awareness Assessment	Testing #1	Testing #2	Testing #3	Testing #4
2021	1.8%	6.1%	1.1%	2.79%
2020	3.4%	1.3%	-	-
2019	6.2%	2.1%	-	-

- Cyber Security Response for Bangchak Group is another measure implemented to improve cyber security. The Company educated employees, executives, and subsidiaries through cyber security incident case studies such as business email compromise (e.g. fake invoice). The Company also implemented Strictly Process Confirming as follow:
 1. Requests: Register or change to important information especially bank account information
 2. Use the company form to verify and confirm the change of information
 3. Must be signed by responsible person of the counter party
 4. Must have relevant, formal, and legal documents or issued by a government agency
 5. Re-Check with requester by telephone
 6. Add these steps into the operation manual
- Emergency drill and business continuity plan : The company has instituted plans and procedures for Incident Response Plans which are considered as a high-risk, to be able to prevent and recover effectively and rapidly in order to operate the business continuously and minimize the impacts. In operation, the company set up an IT Service Management System using BMC Remedy system named MyIT, which has procedures for managing information security incidents. Employees can report to the Information Technology Service in 3 channels:
 - 1) MyIT system
 - 2) email
 - 3) Call : 4336



We consider multiple environmental dimensions.

“Water management”

is an important issue.

Bangchak Refinery is

the first refinery in Thailand to receive the

Water Footprint

Footprint Certification

for the its entire product lifecycle.



–Dr. Anekpracha Kaewmanee –

Manager, Environmental Policy Planning and Compliance Division
Bangchak Corporation Public Company Limited



Operational Eco-Efficiency

In 2021, Refinery and trading business group had an average refining capacity of 99,040 barrels per day, representing 83% of the total refining capacity. This was due to the effects of the oil price volatility and the level of Gross Refinery Margin coinciding the global demand for fuel consumption. During the COVID-19 pandemic, Bangchak has upgraded the refinery to be the niche product refinery to produce new products, such as the solvent product group under the name “BCP White Spirit 3040”. Furthermore, the Company has extended its refinery to become the sole producer of UCO (unconverted oil) in Thailand, which helped improve the Gross Refinery Margin.

The Company adopts environmental management system which is in accordance with ISO 14001:2015 regarding the use of natural resources and pollution control to drive

continuous development under proactive policies in compliance with the Green Industry Level 5: Green Network, which is the highest level of green industry from the Department of Industrial Works. The Green Industry Level 5 covers environmental management of business operations and the expansion and promotion of environmental management practices for stakeholders in the supply chain, communities, and consumers in order to create a green network and to demonstrate the company’s commitment to environmental development to become the corporate culture in business operation with social responsibility. (Disclosure 102-12)

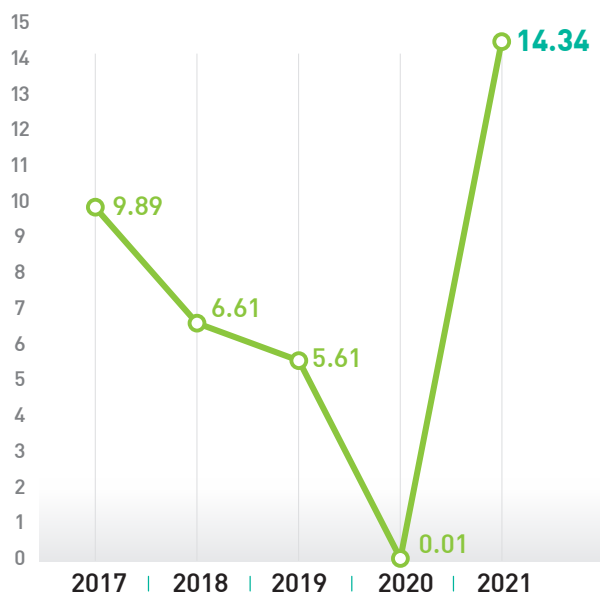
Eco-efficiency

Bangchak aims to create economic growth of its businesses, together with considering impact minimization of business operations, particularly environmental impacts, in order to pursuing sustainable business development. Because of this, the Company uses eco-efficiency as a indicator

reflecting production efficiency and environmental impacts from the production. The Earning Before Interest, Tax, Depreciation and Amortization (EBITDA) is applied to reflect economic growth, and the amount of GHG emissions, which is a significant environmental aspect if the petroleum industry, is used to reflect the environmental impact. A high eco-efficiency value indicates high efficiency in production and low environmental impacts.

Eco-efficiency

(Thousand THB / tCO₂e)



Eco-efficiency in 2021 was higher compared to 2020 due to the impact of oil price and higher refining margins in line with high demand for oil. In addition, COVID-19 outbreaks improved compared to 2020 which drove up domestic oil demand resulting in increase revenue for refinery business as well as the company. However, in 2021 greenhouse gas emission declined compared to the previous year due to energy efficiency improvements at the refinery. This demonstrated Bangchak’s commitment to doing business while reducing environmental impacts.

Note : EBITDA, scope 1 GHG emissions, and scope 2 GHG emissions (tCO₂e) of the refinery and trading business, and marketing business.

Energy Consumption

As a company in industry with high energy intensity in the form of heat, electricity, and steam, Bangchak ensures that its management of energy efficiency is integral to its performance. The Company's energy efficiency management has been ISO 50001 certified since 2014. The Company defined short, medium, and long-term targets and plans to improve energy efficiency for the refinery. The short-term plan is to set an energy consumption target and improve existing systems. Medium plan is to enhance the efficiency and effectiveness of production. In addition, the Company has plan to significantly reduce its energy consumption through the EII Improvement project.

2021 Energy Efficiency Target

The Company defined Energy Intensity Index (EII) as standard KPI for benchmarking. EII is an energy usage benchmark that compares energy performance of refineries within the same capacity ranges. Bangchak's energy consumption index (EII) is currently at level 1 (98.6), which improved from 2020 (102) improved COVID-19 situation compared to 2020, resulting in increase in oil demand domestically. The Company has tried to adjust to mitigate the impact of the situation by increasing production capacity according to increasing demand (in 2021 average utilization rate was approximately 83%), making the 2021 energy utilization target likely to decline compared to 2020, with the 2021 Energy Consumption Index (EII) at 98.6.

2021 Performance

The Company implemented Continuous Catalytic Regeneration Unit (CCRU) which is energy efficiency management measure, resulting in the decrease of energy consumption. In addition, the Company incorporated AI technology along with people development to increase work effectiveness and business performance.

Bangchak has implemented refinery improvement programs and followed the existing programs since 2019. The energy efficiency programs included:



- Catalysts replacement at the naphtha quality improvement unit 2 and 3 project
- Installation of coating material at the crude oil distillation unit 3 to reduce heat loss at the furnace wall project
- Project to stop using gas compressors in the crude oil distillation unit 3
- Project to stop using sulfur removable in fuel gas unit 3
- Heat exchanger improvement to reuse waste heat in crude oil distillation unit 2 project
- Project to reduce the use of high-pressure steam at the light naphtha oil improvement tower
- Project to reduce the use of medium-pressure steam at the product separation tower of the molecular splitting unit
- Project to reduce outlet temperature for the molecular splitting unit furnace

The completions of the energy management and energy efficiency projects resulted in Energy Consumption Index at (EII) of 98.6 in 2021, which is better than the 2020 target and equivalent to energy consumption at 5.24% FOEB.

Refinery Business Results

Energy Intensity Index (EII)

	2016*	2017	2018*	2019	2020	2021*
 Target	102.5	101.5	99.0	98.6	111.5	97.7
 Performance	103.1	103.1	100.5	97.9	105.4	98.6

Energy Consumption in Production Unit (% FOEB)

	2016*	2017	2018*	2019	2020	2021*
 Target	5.92	5.84	5.75	5.53	6.17	5.48
 Performance	5.69	5.43	5.46	5.07	5.68	5.24

* Annual major turnaround maintenance

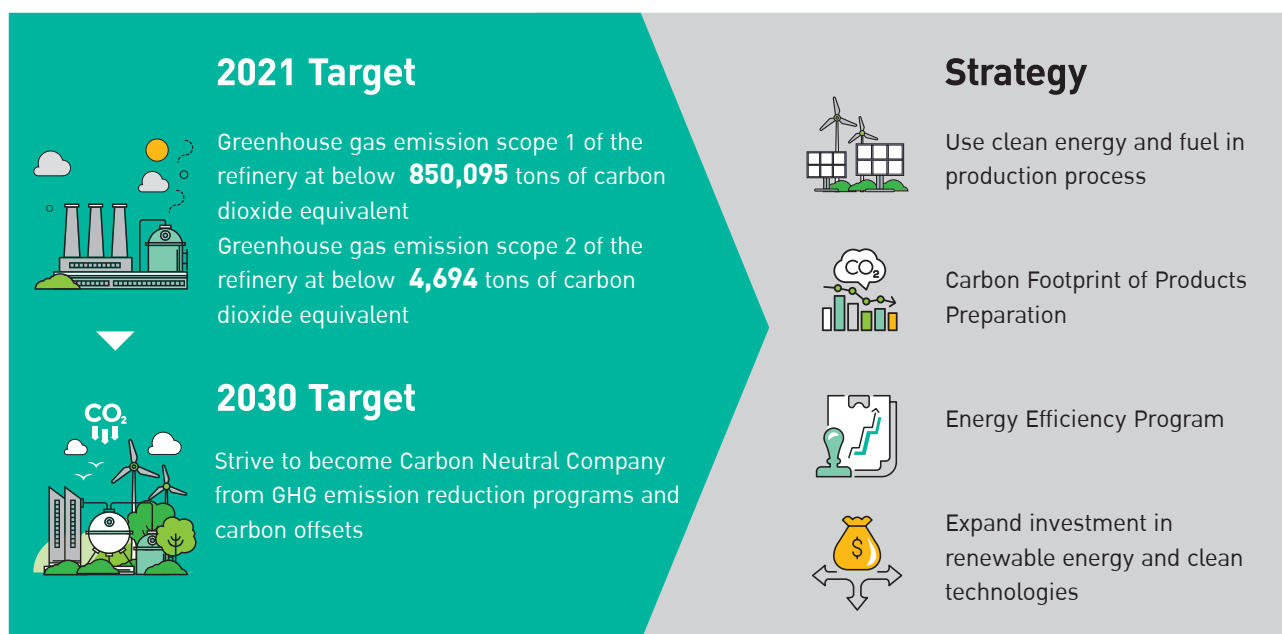
Future Plans

For the future energy reduction plan, Bangchak has collaborated with internal experts for technology and knowledge transfer as well as for future projects development. This collaboration ensures that the Company's energy consumption development plan will be effective. In 2021, the Company will have an annual major turnaround maintenance and install Continuous Catalytic Regeneration Unit (CCRC) in place of Catalytic Reforming in Unit 3, which should result in the reduction of energy consumption. In addition, energy reduction projects included:

- Stop using plant 2's Catalyst reforming unit.
- Install new gas engine generator to replace the gas turbine generator

Climate Change

Bangchak places great importance to the prevention and reduction of greenhouse gas emission from business operation that exacerbate climate change and impact the environment. The Company considers physical, regulatory, transition risks as well as potential impacts to stakeholders. Therefore, the Company defined net carbon dioxide emission as corporate KPI and CEO KPI to demonstrate our intention to limit and slow down climate change and to contribute to SDG13. The Company also set a target to be a Carbon Neutral Company as a long-term KPI in 2030 which will be achieved through GHG Emission Reduction and Carbon Offsets projects.



2021 Performance

Bangchak manages GHG emission by using clean energy and fuel in production process, increasing energy efficiency, and expanding renewable and clean energy investment programs. In 2021, total GHG emission was 839,910.54 tons of carbon dioxide equivalent, resulting from GHG emission scope 1 at 821,960.67 tons of carbon dioxide equivalent and GHG emission scope 2 at 17,949.87 tons of carbon dioxide equivalent. (Gross location-based scope 2 GHG emissions: 11,609.19 tons of carbon dioxide equivalent and Gross market-based 2 GHG emission: 1,408 tons of carbon dioxide equivalent)



*remark: The report consolidated GHG data according to the operation control approach



Refinery business emitted 826,650.86 tons of carbon dioxide equivalent of greenhouse gases, of which 820,901.52 tons of carbon dioxide equivalent was scope 1 GHG emission and 5,749.34 tons of carbon dioxide equivalent of scope 2 GHG emission.

In 2021, Bangchak started up the Continuous Catalytic Regeneration Unit which is more efficient than Reforming Unit 3. The Company also managed energy and implemented energy efficiency projects for GHGs emission reduction including project to install coating material at the crude oil distillation unit, project to improve heat exchangers, and project to reduce the use of steam.

In addition, the Company studied and assessed carbon dioxide emission through the Life Cycle Assessment (LCA) of products and certified Organization carbon footprint from Thailand Greenhouse Gas Management Organization (scope limited to Bangchak Refinery).

Future Plan

The Company plans to have major turnaround maintenance in 2022 and will implement energy reduction program to increase energy efficiency and reduce GHG emissions. The programs included:

- Stop using plant 2's Catalyst reforming unit.
- Install new gas engine generator to replace the gas turbine generator
- Increase UCO production



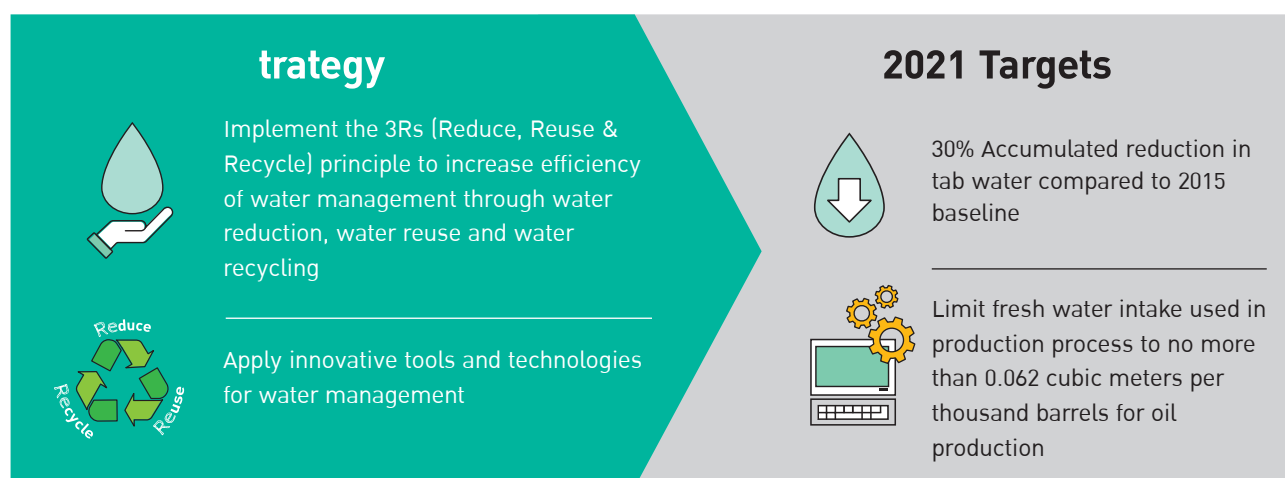
Water Management

Water is a precious resource. In recent years, water-related risks such as drought and low water quality have exacerbated in Thailand. As a result, sound and effective water management is crucial for the sustainability of the business and of society.

Energy business consumed lots of water; therefore, the Company realizes the importance of water resources and works to reduce water risk and impact from using water resources and wastewater in business activities and operations. Every year, Bangchak conducts risk assessment of the quality and quantity of water, risks related to regulatory changes and pricing structure, and risk of potential stakeholders' conflicts. In addition, Bangchak conducted water stress analysis for Chao Praya area around the refinery and Lum Lae water pumping station in Phathum

Thani province which is the source of tap water for the Metropolitan Waterworks Authority. Bangchak employs the World Resources Institute's Aqueduct Water Risk Atlas as a tool to manage water stress based on risk-level. The water stress analysis showed that areas around the refinery and Lum Lae water pumping station are not water stressed areas. In an effort to further reduce water consumption, Bangchak manages the water footprint of 6 main products to reduce the use of tap water in process operation, continually monitors drought, flood, and water level changes in the Chao Praya river, and use 3Rs principle (reduce, reuse, and recycle). In 2021, projects to increase water efficiency include:

- Project to install New Cooling tower for Plant no. 2
- Project to reduce steam stripping at Refinery unit



2021 Performance

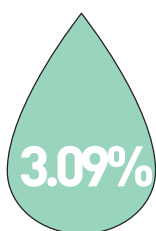
Bangchak used 2.10 million cubic meters of water from the Metropolitan Waterworks Authority. In addition, some groundwater was used according to the management plan, which is one of the measures to reduce the use of water supply during drought and maintain wells at 111,902 cubic meters. In 2021, the company receives water from various sources, totaling 2.44 million cubic meters if water extracted from crude oil is included. And 2.41 million cubic meters if water extracted from crude oil is excluded, which is 0.04 cubic meters per barrel of oil equivalent produced, an increased from the previous year by 0.05 cubic meters per

barrel of oil equivalent produced due to the deterioration in water quality from the use of groundwater. In addition, steam turbine generator was used more due to the malfunction of the gas turbine generator which resulted in the overall water volume increases. The company discharged water to surface water in the amount of 0.83 million cubic meters. When calculating the amount of water used for the production process, it is 1.68 million cubic meters or equivalent to 0.05 cubic meters per barrel of oil equivalent produced.

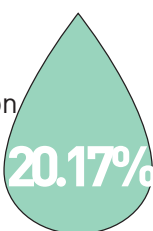
2021 Action Plans		2021 Results
Water Reduction		
1	Use the process to improve the quality of tap water by micron level fine filtering system. (Micro-filtration System) and Reverse Osmosis System together with water quality units with Reverse Osmosis System and Electro De-Ionization System) to improve raw water quality before entering into the demineralized water production system. (Demineralization System) at the Power Plant.	Reduced water consumption by 0.10 million m³/year* (0.05% of total water demand excluding water extracted from crude oil and equal to 2,897 m ³ /million barrels of oil equivalent)
Water Reuse		
2	Use good quality condensate water from the production process instead of water for steam boilers	Reduced water consumption by 0.71 million m³/year (0.34% of total water demand excluding water extracted from crude oil and equal to 21,326 m ³ /million barrels of oil equivalent)
3	Take the Stripped Water from the Sour Water Stripping Unit and the Stripping Steam wastewater of the 3rd distillation unit instead of water supply in the salt removal unit from crude oil (Desalter)	Reduced water consumption by 0.12 million m³/year (0.06% of total water demand excluding water extracted from crude oil and equal to 3,629 m ³ /million barrels of oil equivalent)
Water Recycling		
4	Use slightly contaminated condensate water from the refining unit plant 4 to improve the quality of condensate water for the reuse in Boiler Feed Water	Reduced water consumption by 0.35 million m³/year (0.17% of total water demand excluding water extracted from crude oil and equal to 10,572 m ³ /million barrels of oil equivalent)
5	Improve the quality of treated water from the wastewater treatment unit through the micro-filtration system and reverse osmosis system which are the very fine filtering systems to micro level for the reuse in cooling process	Reduced water consumption by 0.19 million m³/year (0.09% of total water demand excluding water extracted from crude oil and equal to 5,570 m ³ /million barrels of oil equivalent)

Performance Indicators

2021
Reduced
Water



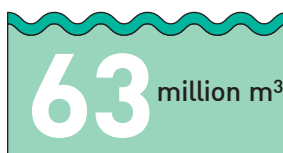
Water
consumption



(Compared to baseline year 2015)

Control the amount of water
consumption per production capacity

(63 m³/thousand barrels of oil
equivalent)(Target not more than
65 m³/thousand barrels of oil equivalent)



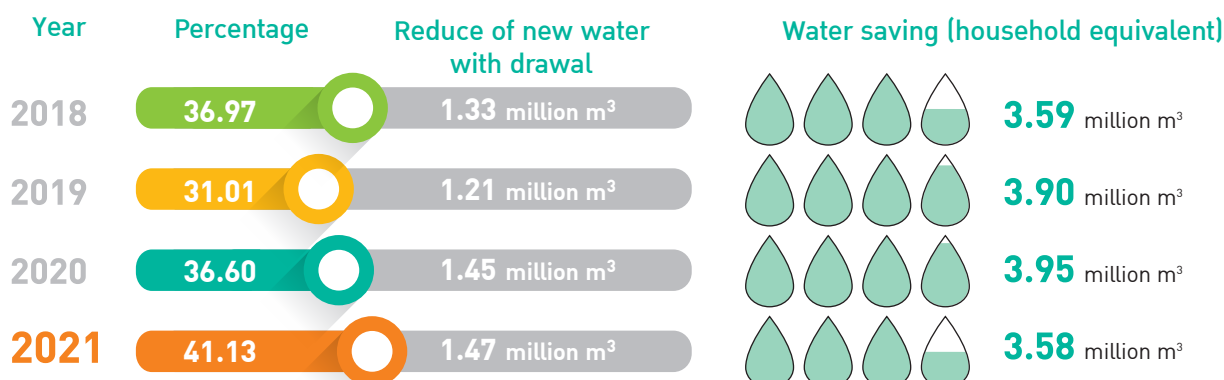
Water saving (household equivalent)



4,171
households*

* Water usage data in Bangkok Phra Khanong area, where the refinery is located. The average family member in each household is 1.85 people /household, the amount of water used is 0.56 cubic meters /person /day or 1.04 cubic meters / household / day. (Information from the Metropolitan Waterworks Authority: 2015)

Percentage and amount of new water withdrawal reduction



* Compared to baseline year 2015 from reusing condensate water in boilers and the 4 refinery unit plus treated water from oil treatment unit using RO, and include treated water from wastewater treatment units using RO for cooling towers

Cooperation with external agencies and stakeholders on water management

Cooperation between Bangchak, external agencies and stakeholders on water management projects are as follow:

- Garbage collection and tree planting along the Chao Phraya River with members of the community
- Cooperate with the Marine Department to purchase "Sri Taruk 8," an oil spill cleanup boat that will be stationed on the Chao Phraya River
- A project to buy used vegetable oil from households around the refinery ,Bang Nam Phueng Market ,Chulalongkorn university, Lak Si District and Phasi Charoen District to reduce cooking oil discharge into the Chao Phraya River and public water sources.
- Collaborated with Department of Environmental Quality Promotion Phra Khanong District Office and Bangna District Office on the ECO School project. The project supports administrators and science teachers in 11 schools around the refinery to learn how to create a curriculum and integrate environmental education systematically in the learning process. This year, Borphit Wittaya school initiated a project to reduce wastewater from its canteen in order to prevent and reduce wastewater from entering into the environment.

Wastewater Management

Refinery industry consumes high volume of water in the production process and create wastewater and water discharge. Therefore, Bangchak recognizes in this issue is important to the sustainability of the business and believes it is important to minimize water pollution and to take responsibility to reduce impacts on natural sources.

The Company has managed to establish a highly efficient water treatment system. This has resulted to a higher-than-standard quality of water based on the standards of the Department of Manufacturing. There was also a reduction in the wastewater volume caused by recycling. The water treatment process could be physicochemical and biological before it goes through the final treatment process to ensure it is safe for the environment and the community.

The refinery is equipped with a three-part wastewater treatment system. Physicochemical treatment reduces contamination from oil and heavy metals while biological treatment is for reducing dissolved organic matter. The final stage of treatment involves filtration through the filter tank system to remove small solid particles and absorb the remaining dissolved organic matter. All these steps are done to make sure of excellent water quality before the water gets recycled.

The Company places great importance

on water pollution management that is why a system to continuously develop the wastewater treatment system was set in place. In 2021, the refinery business had major annual turnarounds. Therefore, it was necessary to stop the wastewater recycling unit. However, due to the improvement of filter system where water is pre-treated before entering the recycle system and adjusting the operating conditions of the system the company was able to maintain the volume of recycled water within the set goals. Also during major turnaround the water cooldown method from decoking process was modified from using water to cool the temperature directly to using the process of using the air fin cooler device to reduce the temperature.

Bangchak implemented internal process to regularly manage quality of wastewater and analyze wastewater quality after treatment by the Company's laboratory. PH Meter and Dissolved Oxygen (DO) are used to enhance wastewater treatment. In addition, the Company establish COD Online for real-time monitoring and sending results to Department of Industrial Works and communities around the refinery. Furthermore, Bangchak uses 3Rs principle for wastewater management to reduce water discharge to the environment by using wastewater recycling system in production process.



R0 recycle unit from wastewater

treatment
system
recycled

186,191.83

2021 R0 recycle target



159,970
cubic meters

2021 Total amount of water recycle



1,470,528
cubic meters

(include all unit in the process)

2021 Total water discharge after treatment of sewage 1 and 3



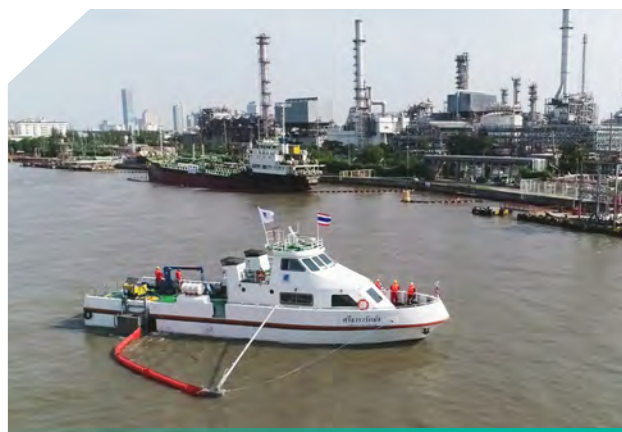
827,875
cubic meters



Oil and Chemical Spill Management

Bangchak gives the highest priorities to safety and the environmental in every work process and activity. The Company continually assesses and mitigates potential risks related to oil and chemical spills including marine transportation of crude oil using large tankers and smaller ships, in refining processes, transportation to oil terminal in Samut Sakorn and Surat Thani as well as transportation to customers to prevent any events that may cause negative impacts to environmental and safety as well as Bangchak's ability to effectively contain and manage spills.

- Select oil tanker ships with strict inspection system and evaluation of oil tankers based on standard used in the oil industry.
- Establish prevention and emergency plans in case of oil spills and conduct an annual emergency drill.
- Prepare emergency equipment and oil removal equipment, and give opportunities for communities to observe in order to build trust with the communities
- Continuously develop personnel who are responsible for emergency response team by joining training and drills conducted by government agencies and other experts in the industry.
- Develop and improve safety and management systems and tools in alignment with the Oil Company International Marine Forum (OCIMF), such as the improvement of fire suppression systems at the port and the installation of additional CCTV systems.
- Design oil tanks, pipelines and install equipment following international standards
- Establish clear work processes and ensure employees are properly trained.
- Follow plans for a system and equipment inspection (PM) at appropriate times
- Identify and assess potential risk points of spills (LOPC) in each area. This includes establishing prevention, management of risk and monitoring effectiveness of the systems in place through regular inspection. This should also cover regular analysis, improvement and preventive control of the production process.



- Commissioned an oil spill clean-up ship, "Sritaruk 8," which is equipped with side collecting boom and belt skimmer enabling it to clean up oil spill without any assistance from other ships (the operation usually requires 3 ships). On-board features include fire extinguisher system to increase safety and a meeting room so that personnel can better respond to the emergency. The Sritaruk 8 will be stationed at Bangchak's port, its presence will increase environmental and safety assurance around Chao Phaya bay area. In an event of an emergency, Bangchak will also be ready to assist the Oil Industry Environmental Safety Group Association (IESG), where it is a member, and any other emergencies as requested.

Current situations and performances are reported to Risk Management Working Group Committee to be reported to the Corporate Risk Management Committee on a monthly basis to ensure that effective and safe management process.

In 2021, there were no significant oil or chemical spills into the environment, thus, helping to build the confidence in Bangchak's ability to protect the environment and safety of communities around the refinery and port.

Hydrocarbon Spills

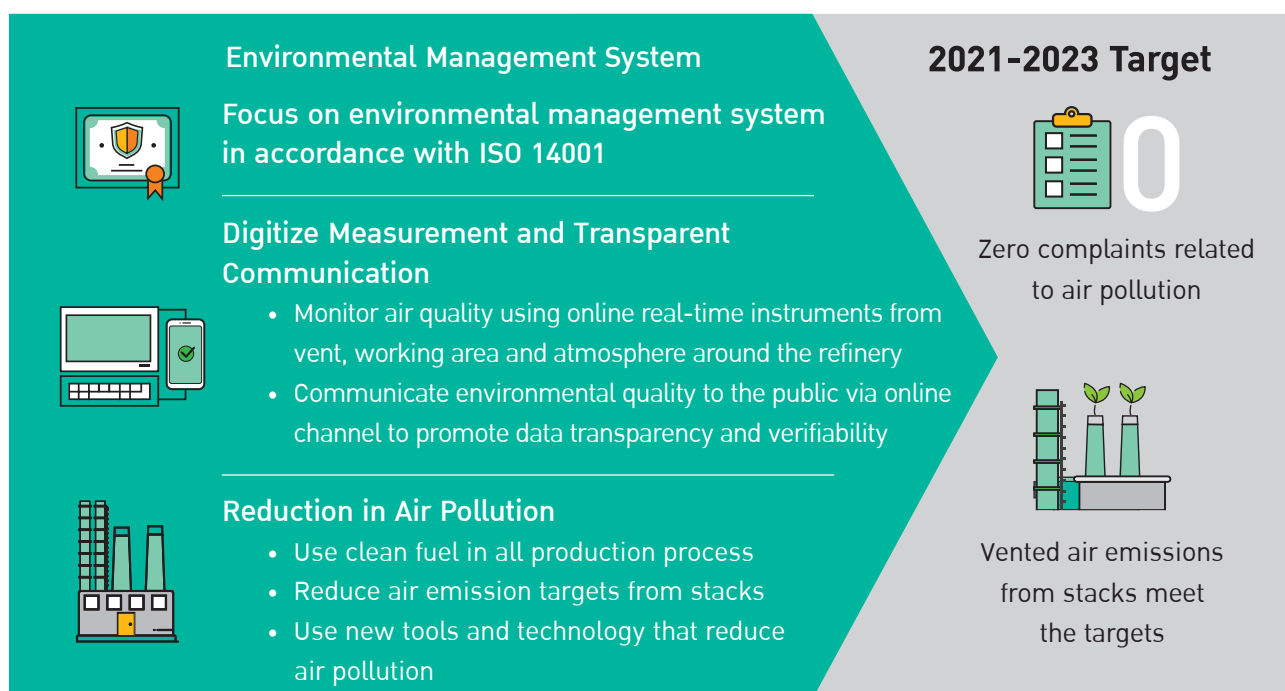
	2018	2019	2020	2021
• Number of case related to significant hydrocarbon spills (more than 100 Barrels)	0	0	0	0
• Volume of significant hydrocarbon spills with more than 100 Barrels/ time (Barrel)	0	0	0	0
• Number of case related to hydrocarbon spills (> 1 barrels / time/ case)	3	2	3	0
• Volume of significant hydrocarbon spills (> 1 barrels / time)	141.0	4.0	11.0	0.0
• Data coverage as percentage of Annual Production (MMBOE)	100	100	100	100

Air Pollution Management

Bangchak manages and monitors quality of air emissions beyond air emission laws and regulations. The Company also considers impacts from air pollution to stakeholders such as employees, contractors, and communities and environment around the refinery by emphasizing air pollution management from beginning. The Company uses clean fuel in production process and implements environmental management system in compliance with ISO 14001 for 24 consecutive years. According to proactive Environmental Management Policy, Bangchak continually sets air pollution emission target to be more challenging and continuously monitors quality of air emission by online instruments at vents, working area, and air around the refinery. Air quality has been verified by a third party. Fugitive Volatile Organic Compounds (VOCs) is also measured every day. In addition, the Company surveys fugitive VOCs by infrared camera to

improve monitoring equipment of raw material storage tanks and all products.

Moreover, during the annual major maintenance work in 2021, Bangchak took the opportunity to build an environmental network with contractors coming to work by requiring that every contractor must have an environmental officer to control the work of the workers so that they do not affect the environment, especially the management of air quality during working hours. Through new campaign activities that focus on encouraging everyone to help each other take care of the environment to form an outstanding environmental officer team that included big site visits to check the cleanliness of the work area every day, Big Cleaning to jointly clean areas within the refinery and Big green award for contractors who worked to ensure good environment.



2021 Performance

From 2021, the Company had zero complaint about air pollution from community. Bangchak continues to manage and control air quality before venting to the environment as follow:

Environmental Management System

1. Bangchak refinery was re-certified as Green Industry level 5 for environmental management by the Department of Industrial Works for the 5th consecutive year
2. The Company focuses on the implementation of environmental management system in accordance with ISO 14001 and has been ISO 14001 certified for 24 consecutive year.

Digitize Measurement and Transparent Communication

Bangchak monitors air quality through 7 Continuous Emission Monitoring System (CEMs) units. This system sends real-time data to Department of Industrial Works, helping the Company to monitor and report air quality real-time.

Indoor Air Quality (IAQ) Monitoring

In addition to maintaining and monitoring air quality in work areas inside and outside the refinery, Bangchak also monitor indoor air quality in its offices in accordance with the recommended standards of Singapore Standard SS 554: 2009 [Code of Practice for Indoor Air Quality for Air Conditioned buildings] (incorporating Erratum No.1, November 2009) since 2017. The company implemented air quality measurement parameters as follows: temperature, relative humidity, wind speed, carbon dioxide, carbon monoxide, particulate matter PM 10 and PM 2.5, all volatile organic compounds (VOCs), and formaldehyde. In addition, there are also measurements of airborne total bacteria count and airborne total fungi count. Measurement results showed that no measurements exceeded the standard between 2018 – 2021. Since Thailand has been facing the problem of PM 2.5, the company has measured the PM 2.5 count in buildings and workplaces. Communication to alert employees through internal communications are routine. The company also distributed N95 masks to employees and nearby residents when it is reported that the level of PM 2.5 outside the building exceeds the standard and is harmful to health (Refer to: Situation Report and Air Quality Thailand).

Air Pollution Reduction

1. Use natural gas which is cleaner fuel in production process.
2. Reduced air pollution ventilation from vent target to be more challenging.
3. Installed, tested, and commissioned the Enclosed Ground Flare type tower. The refinery worked in conjunction with the current Elevated Flare tower to support excess gas discharged from the production process in the event of a start-up, shutdown and emergencies. It is an important project that reinforces proactive measures in preventing impacts on communities in terms of noise, light and the environment.

2021 Air Pollution Reduction plan



Developed an integrated volatile organic compounds (VOCs) air quality management



Air quality measured by third party meet are within standards

2021 Action Plan



The Company plans to implement an integrated VOCs air quality management plan

Zero complaints associated with air pollutions (target : 0 complaint)



0

2020 = 0 complaint

2021 = 0 complaint

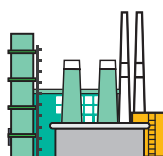
Control the release of fugitive VOCs at every measurement point to not exceed 200 ppm (Law requires not more than 500 ppm).



2020 = 2.5 Tons

2021 = 2.5 Tons

The new Enclosed Ground Flare installation progress



2020 = Test run

2021 = Enclosed Ground Flare Full test run

Waste Management

Bangchak recognizes the important of waste management and complies with law and regulations. The Company adheres to the 3Rs waste management principles which are reduce, reuse and recycle and follows local and international guidelines on waste management to mitigate environmental impacts from waste disposal and targeting to achieve the zero waste from the production process to landfill.

Bangchak focuses on reducing the amount of waste sent to the disposal to a minimum, therefore, the company has developed a waste management concept from 3Rs to 5Rs and 7Rs. The next phase is to refuse the use of materials or chemicals that are not environmentally friendly to (Reject), the use of valuable resources in waste (Recovery), a comprehensive rethinking for utilization before disposal or disposal (Rethink) and change used materials to be valuable

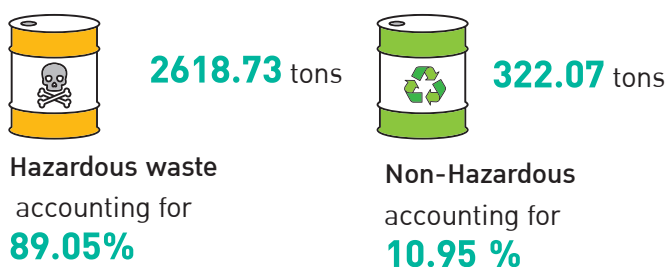
again through repurposing (Repurpose) as well as selecting good raw materials. As a result, the waste in the production process is reduced from the beginning and there are also by-products from the production process. In addition, procurement process for selecting disposal contractors and disposal methods for a circular economy has been established.

In 2021, due to a major annual turnaround of the refinery business, more waste was generated compared to the previous year. However, with effective 3R management, the amount of waste has been reduced compared to the previous major turnaround in 2018. Insulation sorting and storage processes have been improved for reuse. Efficient management of 3Rs resulted in 99.78% of total waste generated was able to be utilized.



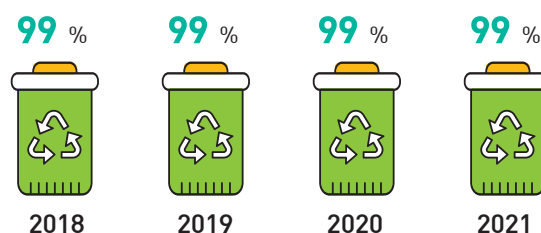
2021 Performance

Waste generated in 2021



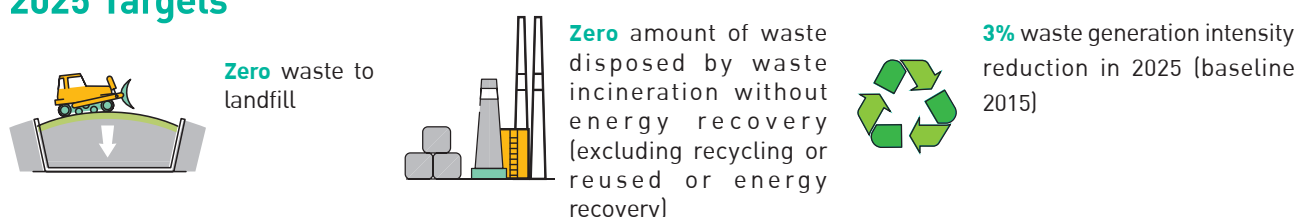
The Company managed waste aligned with 3Rs. The amount of waste that can be utilized was 99.78% of total waste generation.

Waste management aligned with 3Rs (%)



The amount of waste disposed by waste incineration without energy recovery (excluding recycling or reused or energy recovery) was 6.6 tons (waste incineration and landfill)

2025 Targets



Sustainable products and services development

Bangchak is committed to develop products and services based on inclusive and sustainable business practices for the betterment of the country. During the COVID-19 crisis, Bangchak lend a helping hand to the society through various products and services such as “Bangchak invites Thais to Fight COVID -19 the Series” which is a project that asks customers to participate in helping people who are impacted by COVID-19; “Fuel Up and Share Drinking Water” project providing drinking water to field hospitals and nursing homes in critical areas; the “Fuel... Sharing Kindness” Project where Bangchak contributed fuel expenses for volunteer groups for transportation of COVID-19 patients; “Thang Pun Sook” project to set up a sharing stations at Bangchak gas stations and more than 20 points in the community to promote the sharing of consumer goods; and projects to support agricultural products from farmers who have been affected by declining demand by giving to customers who come to fill up gas at Bangchak service stations. The Company also raises measures to prevent and maintain cleanliness in gas stations with 7 Safe standards, including proactive ATK testing for service personnel to reduce the risk of the spread of COVID-19 and create confidence for users.



In addition, Bangchak continually focuses on the development of business innovations with multiple partners to expand products and services including: expanding EV charging stations network at Bangchak gas stations with PEA, MG, and Sharge, developing “Bangchak Food Truck” business by joining hands with leading brands to provide Grab & Go food services in gas stations in respond to urban lifestyles in the New Normal, improving membership card system to be more versatile, such as exchanging points from the “The More You Can Transfer” project with AIS, and the “Transferable, Easier Exchange” project with Krungsri Credit Card. In addition, Bangchak continues to develop Unique Design gas stations that combine the needs

of customers with the unique design of gas station in each area to deliver new green experiences and innovations to customers.

In line with its goal to be the number one gas station brand in the minds of consumers, Bangchak has given importance to listening to the needs and expectations of our stakeholders, especially customer and business partners which consists of consumers (end users), B2B customers (business-to-business), gas station operators (dealer) and agricultural co-op gas station operators (COOP). In 2021, product and service quality were important sustainability issues of focus. Therefore, Bangchak developed a business strategy to respond to the needs and expectations of stakeholders especially the end users (customer centric) by using innovation and technology to develop high quality products and improving service quality at Bangchak gas stations that are environmentally and socially friendly to provide good experience under the concept of “Your Greenovative Destination.” In addition, the Company uses Net Promoter Score (NPS) – an international standard – together with customer satisfaction surveys as tools to track performance and to control service quality in accordance with Standard Service Procedure which is a measure of product delivery efficiency and good quality service to customers and business partners. Service audits are randomly conducted and mystery shoppers are used to check the service delivery process from the maintenance of the service station including using cars to check the quality of service and mobile fuel quality at Bangchak service stations nationwide (Mobile Training & Lab). Further, a mobile application survey system has also been developed that allows members to assess their satisfaction immediately after using the service. By improving the question of speed, which is one of the service factors that customers focus on Bangchak ensure that the company delivers quality products and services to stakeholders.



2025 Targets



Maintain the 1st place in Service Station brand, as measured by Net Promoter Score



Increase revenue from service stations and increase market share to 18%



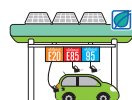
Continue to develop services, service stations, and non-oil businesses through products and services that are sustainable and responsive to customers' needs



Expand the number of service stations to 310 branches throughout the country and improve service station to be Unique Design to 71 branches from 44 branches currently



Develop and improve cooperative service stations to have the same quality and standards as Bangchak service stations



Develop high quality fuel products that keep with the changing automotive technologies while ensuring that all products are environmentally friendly



Develop brand and lubricant products



Provide high quality service experiences to customers through exceptional service standards



Develop Bangchak GreenMiles membership car toward The Best Loyalty Program that meet customers' expectations

Strategy

Bangchak's products, services, and experiences development are guided by "Your Greenovative Destination" framework to ensure that products and services delivered through our service stations are exceptional. The company aims to become the Most Admired Brand for service stations and response to any issues relating to product and service qualities from all stakeholders. The main strategy the company employs to are:



Green Experience

provide products and services that are beyond customers' expectations and are environmentally friendly



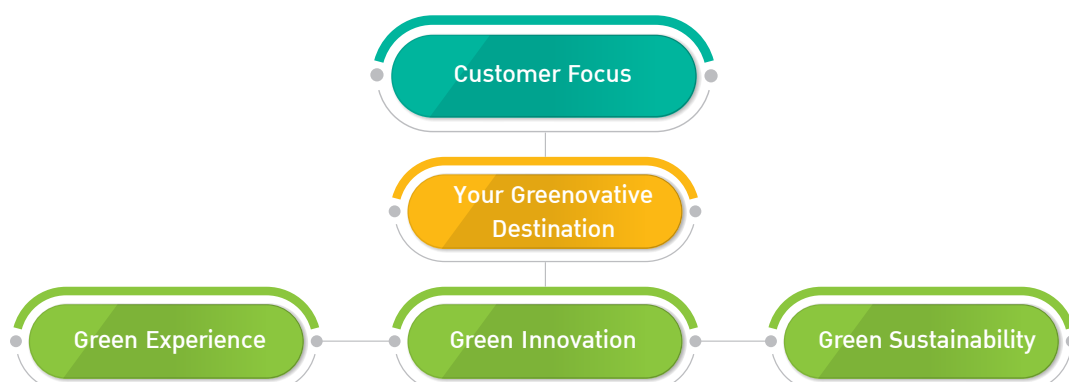
Green Innovation

seek and develop innovations that can add value to customers and business



Green Sustainability

build sustainable business while taking care of the environment and the society



2020 Operations

Green Experience - provide products and services that are beyond customers' expectations and are environmentally friendly

Green Products: The delivery of products that are with in specifications and environmentally friendly

- Bangchak is a leading supplier of fuel products that are Euro 5 certified in 2 types as Gasohol E20 S EVO and Hi-Premium Diesel S. The products is not only have a lower sulfur than Euro 4 standard but It is also a fuel designed for modern Euro 5 standard engines to run at full capacity.
- Bangchak promotes the sale of biofuel products that can continuously reduce greenhouse gas emissions compare with other fuels. By focusing on the promoting sales of Gasohol E20 S EVO, a new formula in premium quality at same price which have been launched in 2020 through branch expansion of service stations and sale promoting activities. The service stations that sale E20 are 873 stations and sale E85 are 349 stations. The company was able to maintain market share of E20 and E85 through service stations, ranked No. 2, 18.2% and 35.4%, respectively, and sales per service station for E85 oil products ranked No. 1 (as of Nov. 2021)
- Development of lubricant products according to international standard which has been certified ISO 9001 Quality Management System and ISO/TS16949 Quality Management System for automotive sector International Quality Management System and for supply product development Distribution and after-sales service for excellence in quality and efficiency of operations within the organization.



Innovative Service Stations: implement technology and innovation to improve service station, environment around service stations, and non-oil business

- Enhance brand image through Unique Design Service Stations that provide experiences in service stations through design and non-oil partnerships. At the end of 2021, there were 44 the Unique Design service stations branches
- Collaborate with business partners to develop EV charger in Bangchak gas stations along the main route to support the adoption of electric vehicles (EV) totaling 70 branches (as of Dec. 2021). Bangchak provide the most EV Charger service,



covering all regions throughout Thailand to become a companion traveling alongside EV users on every route.

- Develop 10 "Bangchak Food Truck" business in 2021 by partnering with leading brands to provide Grab & Go food services in gas stations in respond to urban lifestyles in the New Normal (as of December 2021)
- Develop service stations along the main highways to better serve customers
- Support and improve the standards and brand image of 10 service stations to increase competitiveness both in terms of infrastructure and service quality
- Expand customer network for Fleet Card and Pre-Paid Card to improve revenue contribution from service stations
- Collaborate with Thailand Environment Institute (TEI) to develop guidelines for designing service

stations under Inno-Green Station framework that take environmental factors into considerations, use innovation, safe, and aim to improve all groups of customers' qualities of life through better design

- Expand non-oil business such as Inthanin Coffee in service stations. There are now Inthanin Coffee in 817 service stations. Bubble tea shop DAKASI, which Bangchak Retail holds the rights to expand business and manage branches in Bangchak gas stations nationwide with 15 branches (as of December 2021) and business alliances. The convenience stores under the brands "Tops Daily", "Family Mart", "Mini Big C" and "Lawson" are 14 branches, 22 branches, 134 branches and 1 branch, respectively (at December 2021).
- Better management of service station areas to optimize benefits under the new business framework to provide end-to-end services such as car care services under "Wash Pro", "FURIO Care" "Green Wash," "Trye Care" brands; food kiosks and food trucks, laundry services, logistics and delivery services, and vending machines.

BCP Mind: Develop attentive services and use IT technology to manage customer data to provide quick and effective services

- Due to the spread of the COVID-19 virus, the Company has improved Bangchak gas stations and developed measures to prevent and maintain cleanliness inside the gas station (7 Safe), implemented proactive ATK examination for service personnel to reduce the risk of the spread of COVID-19 and create confidence for users to use the services.



- Expand the number of service stations that support digital payment to 500 branches in total (as of Dec. 2021). Members can collect membership points at gas stations, at all branches of Inthanin coffee, and convenience stores in service stations to help reduce exposure to cash and maintain social distance between customers and service personnel to increase the confidence of those who will use the service station. In addition, customers can use QR code for payment so that they don't need to lower car window to pay.
- Improve the standards of service stations at are in prime areas to have good infrastructure to serve customers such as Point of Sale system (POS) and automatic tire inflator to emphasize quick service. In addition, restrooms standard was improved to ensure the highest customer satisfaction.
- Expand "Lost and Found at Bangchak" project to instill the importance of keeping lost or forgotten objects such as wallets, necklaces, and mobile phone safe in order to contact the owners and return to customers. Bangchak also plans to expand Road Side Assistant project to help drivers on basic emergencies such as changing spare tires and jump start their cars.
- Control service quality through service audits which are conducted randomly using Mystery Shopper

Green Innovation - seek and develop innovations that can add value to customers and business



- Develop the Bangchak membership card system to include the benefits “More use, more return” and support Bangchak members to help the environment through initiatives such as “Your Tree”, Takra Boon” (merit basket) where members can donate points to various charities at any time, and also develop more projects to expand customer base such as the project with AIS to exchange points “The more you transfer, the more you get”, and the project with Krungsri Ayudhya Card Company, the project “Transfer, easier to exchange” to give special privileges to Bangchak card members who transfer points from Krungsri credit cards to Bangchak membership points.
- Use digital payment system for payment and membership points collection at all Bangchak service stations, Inthanin Coffee branches, and convenient

stores in service stations by using QR code that can be paid with any mobile banking application to reduce contacts and maintain social distancing between customers and employees in order to increase customers’ trust in Bangchak service station.

- Developed BCP Link Application to facilitate dealers to access important information in real-time such as the Auto Ordering System (AOS) and work effectively through system such as Smart P&L which helps service station owners to monitor and manage the effectiveness of their operations.
- Develop online training for service station employees and operators to enable them to access important information anytime and anywhere.
- Develop and sell new products with various organizations such as product development with the Refinery Business such as odorless LPG, “BCP LPG TREATED” and solvent “BCP WHITE SPIRIT-3040”, product that was co-developed with Bangchak Biofuel. including Glycerin, Glycerin, as well as the development of new products in the lubricant group, such as lubricants for hybrid vehicles that have been upgraded to API SP standards, named “FURIO FULLY SYNTHETIC HYBRID SP 0W20”, and the release of an environmentally friendly radiator coolant named “Coolant OAT”.

Green Sustainability – build sustainable business while taking care of the environment and the society

Bangchak continues to drive projects and engage our customers and stakeholders in the development of society. Examples of projects are:

- Fuel Up and Share Project – Bangchak provides sales opportunities for innovative small and medium enterprises (SMEs) by providing agriculture products, OTOP products, or innovative products to service station customers. Proceeds are used to support SMEs. The company also supports farmers who are affected by market oversupply conditions by purchasing agricultural products to distribute as gifts to customers, which the company has been doing since 1997.



- Employment of Disabled and Elderly Project – Support quality of life and self-value for disabled and elderly people as well as promoting the engagement of society in supporting products that are made by disable groups

- **Garden Vegetables in Service Station Project** – Bangchak converted unused areas behind service stations into vegetable gardens to help reduce food cost for service station employees as well as to give away to customer as a thank you gift for using Bangchak service station. The gardens also serve to provide educational opportunities about growing garden vegetables to surrounding communities and schools
- **Rak Pan Sook” Project** – Using circular economy principles, the project take PET bottles and empty lubricant bottles donated by customers and put them through an upcycling process to produce new products, helping to reduce resources consumption and plastics waste.



- **Inthanin Coffee**, a leader in environmentally friendly coffee business – Inthanin Coffee was one of the first coffee shops to promote plastic reduction through “Bring Your Own Cup” campaign. In addition, Inthanin Coffee was a leader in using BIO Packaging including lids and cups that are made from plants and are fully biodegradable as well as ready to drink lids that reduce the need for straws; thus, reducing plastic waste.
- **“Kaew Phaw Kla” activity** invited Bangchak Group’s employees and Inthanin customers nationwide to return Inthanin bioplastic cups. Bangchak then gave these cups to the Forest Department to cultivate saplings in place of black plastic plant bags to reduce waste and increase green space.
- **Thai Culture Promotion Project** – Provide experiences that create good impressions to Thai cultures to customers such as promotional events during major holidays, giving krathong to customers on Loi Krathong Day including a dedicated area for worshipping and watering buddha statues.

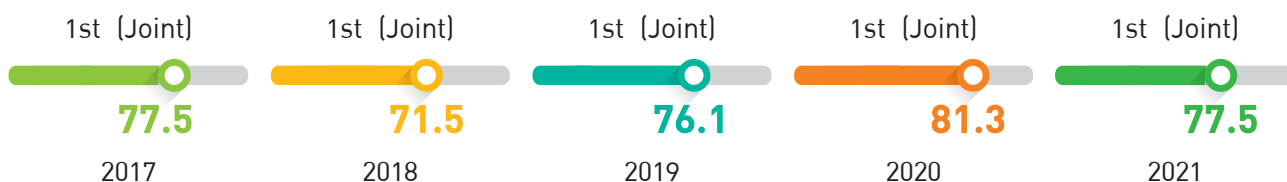


- **Lost and Found at Bangchak Project** – to create a trustworthy image and good impression for service stations customers by providing lost and found service.
- **Roadside Assistant Project** – instill a helpful mindset and culture to service station employees by providing basic services to drivers such as tires change and jump start.
- **Bangchak’s Members Collective Giving Project** – create engagement between customers who are Bangchak’s members and the society; Bangchak members can donate points from using Bangchak’s products and services to convert into cash donations to partner non-profits and foundations such as Princess Maha Chakri Sirindhorn Medical Volunteer Foundation, Ramathibodi Foundation, and the Thai Red Cross Society.
- **Other projects** to alleviate the COVID-19 crisis in various forms throughout the country to prevent the spread of the disease and supporting the implementation of public health missions and reduce the economic impact covering all groups of stakeholders as well as the general public. In addition, Bangchak developed company’s own projects as well as support government agencies, charitable organizations, religious group, volunteer teams, etc., such as the project “Bangchak Invite Thai people to fight against COVID-19 The Series”, “Fuel Up and Share Drinking Water” project providing drinking water to field hospitals and nursing homes in critical areas; the “Fuel... Sharing Kindness” Project where Bangchak contributed fuel expenses for volunteer groups for transportation of COVID-19 patients; and projects to support agricultural products from farmers who have been affected by declining demand due to COVID-19.

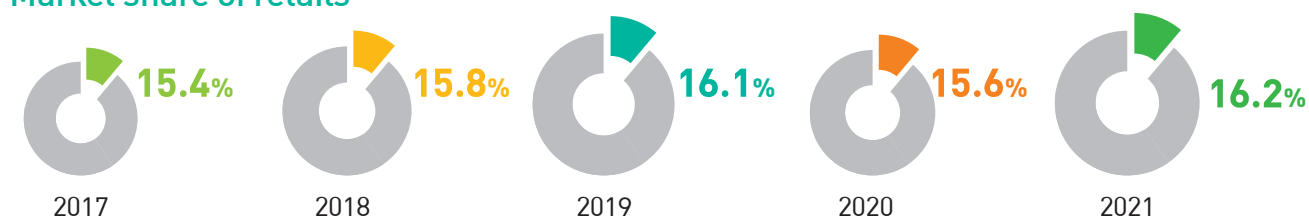
Results

Bangchak service stations maintained the co-number one position as measured by Net Promoter Score (NPS) for the year 2017 – 2020 (based on a survey of 2,000 customers conducted by a third party)

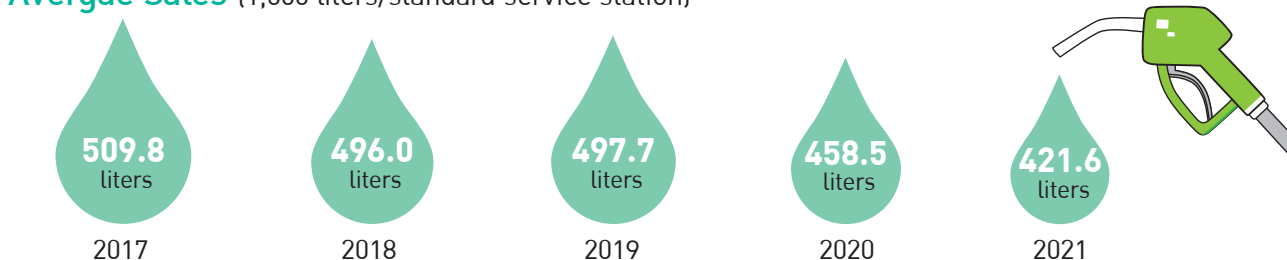
NPS Score [%]



Market share of retails



Average Sales (1,000 liters/standard service station)

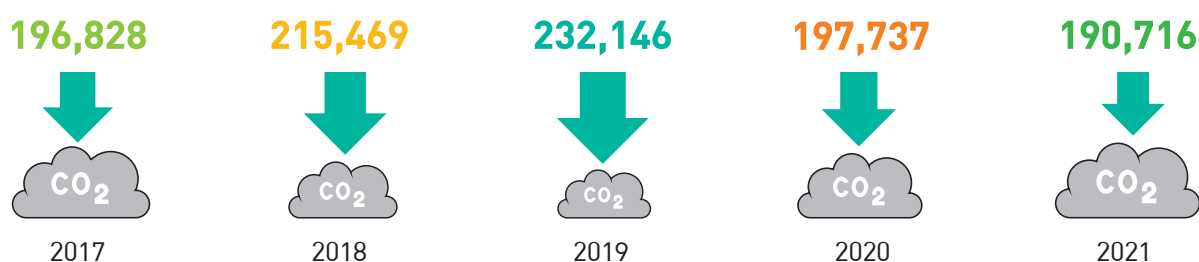


Service Station Expansion



Amount of decreasing CO₂ from oil filling with Bangchak membership card

(Unit :Ton CO₂ equivalent)

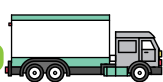


Product Transportation

Bangchak emphasizes supplier product transportation aligned with company's standard to enhance efficient, accurate and punctuality of product transportation process, to strengthen sustainable partnership and uplift working environment. In addition, Bangchak also takes care of business partners and drivers who are responsible for delivering refined oil from refineries to gas stations on time. The transportation process improvement can be done through seminar, training, and supplier relationships activities with helping them to maximize their capability and for the safety of employees and related persons.

2022 Target

45%



To deliver products by semi-trailers at 45% of total volume of shipments

0

Case

Zero Accident in product transport

330

Station



To deliver oil to customers by future sales plan (calculating from service station expansion rate to 330 locations between 2018-2023)

3.5

เรื่อง

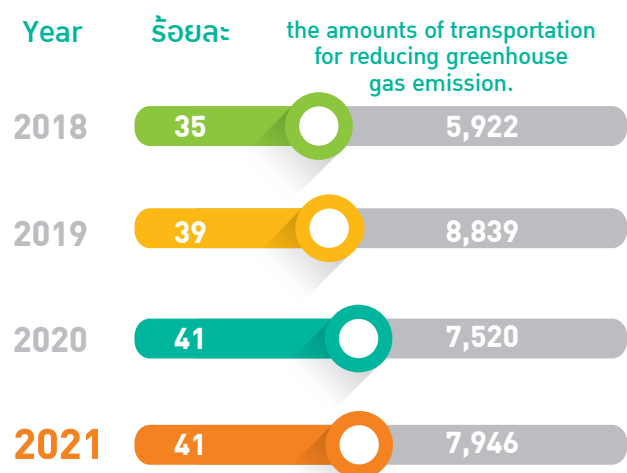


Transportation complaints are less 3.5 issues per one thousand runs

Key Success Indicators

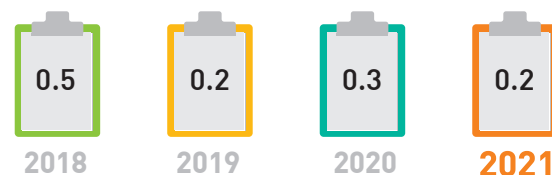
The proportion of refined oil transportation by trucks decrease the GHG emissions

(Target: Increase 2% per year and decrease



Number of complaints about transportation

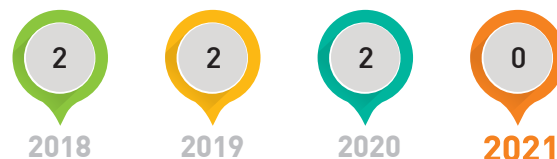
(Target: ≤ 3.5 issues per 1,000 transportation trips)



Accident Record in Transportation *

(Target: Zero accident)

*Financial loss more than 1 million THB/ accident)



Strategy



Develop an efficient oil transportation plan with cost, time, and highest safety considerations



Apply technology

2021 Key Activities

1. Project to Increase Proportion of Oil Transportation by

Bangchak manages transportation vehicles by changing from two single trucks to a semi-trailer (40,000 liters load). This process helps reduce transportation cost, GHG emissions per oil unit and accidental chances. Bangchak continually increased the number of semi-trailer trucks, resulting in the increase of share of large truck usage to 41% in 2021. The Company is driving this project through the following measures.

- Designing new service stations to support the delivery from semi-trailers.
- Driving semi-trailer delivery for multi-drop transportation to service station. This method can be delivered from one or combined order to increase transportation opportunities with semi-trailer.
- Providing discounts to other types of service stations such as agricultural co-operative service stations and dealer service station, especially oil transportation with semi-trailer

These measures contribute to the reduction of GHG emissions by 7,946 tCO₂e.



2. Development of Modern and Efficient of Transportation

Bangchak has implemented technology to improve oil delivery from ordering, delivery planning, delivery tracking, and online complaints system as follows:

- Auto Ordering System (AOS)

Bangchak developed an automatic oil ordering system for dealers to enhance efficiency of ordering system and be able to implement transportation plan. The service station can calculate oil sales and the amount of oil remaining in the tank each day, create automatic oil orders and deliver to the company regularly and to service stations operated by Bangchak Green Net Co., Ltd. of more than 200 stations nationwide, allowing service stations to manage sufficient oil reserves for sales together with transportation plans and vehicle volumes more efficiently

- Smart Transportation

Smart transportation is a project to improve the current transportation management system (TMS). Bangchak is able to track the transportation plan, driver behavior, speed and time of driving, by using CCTV and GPS system installed in oil tanker trucks. The information will be sent directly to the control room where there are staff on duty 24 hours to tracking the transportations through the notification system to prevent accidents and fraud doing. In addition, Bangchak has developed a data link from the closed-circuit camera in the truck via application on the smart phone, helping the service station dealers track the transportation in real-time information (in images) and check location of the truck since leaving the oil depot. In addition, it helps all parties learn about status of transportation at the same time, ensuring transparency in the tracking inspection, customer satisfaction and reduction of transportation complaints.

Bangchak also strengthened safety measures by planning to install the equipment to prevent drivers from dozing off in the trucks and develop the TMS to be able to plan for the use of semi-trailers by pairing up the service stations that have a demand

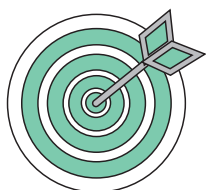
for oil at the same time, but their single order is not enough to get a delivery from the semi-trailer. In this case, a “Multiple Drop” can serve the purpose, increasing an opportunity for delivery by heavy truck.

- E-Complaint System

Bangchak developed an electronic complaint system which would enable the company to track the problem solving process and close the complaint effectively. In addition, this system is linking to the transportation payment system through SAP system to enable Bangchak to calculate the automatic fines in case the transportation contractors receive complaint on the incident affecting the Bangchak’s reputation. This is one of the measures to help maintain transportation service standards as there is a clear penalty for the offense.



Projects to take care of business partners and drivers



Business partners and drivers are integral to the efficiency of fuel delivery to service stations and meeting targets. Bangchak has goals and plans to respond to the needs and care for business partners and drivers as follows:

Target

- Customers and transport contractors have better understanding and cooperation.
- Reduce the cost for transport contractors.
- Transport contractors receive fair and efficient work assignments.

Response

Thailand was still facing the impact of COVID-19 pandemic in 2021. Bangchak communicated and implement measure to take care of business partners and drivers as follows:

- Conducted online meetings during the COVID-19 outbreaks to set and track performance KPI on a monthly basis
- Periodically communicate Bangchak’s measures and plans to respond to COVID-19 outbreak
- Due to the reduced sales volume as a result of COVID-19, Bangchak modified TOR to reduce transport contractors’ costs such as reducing the number of backup vehicles, extend the service life

of transport vehicles in the south, and issue temporary waivers to allow for the use of vehicles to service other customers when workloads are low.

- In addition, the Company also provided COVID-19 vaccines for fuel truck drivers. And continually use temperature checks before entering the warehouse and alcohol gel to be used at various points of the oil depot.

Future Plans

- Implement Artificial Intelligence (AI) to optimize the product transportation system by setting the delivery area, transport route and other conditions more quickly and efficiency in order to improve customer satisfaction.
- Expand the use of semi-trailer transport to 45%.
- Develop professional drivers by reviewing and adding knowledge about safe driving measures, correct firefighting techniques and oil depot operations.
- Improve work efficiency by holding meetings to track KPIs with business partners.

Environmental Cost Accounting

Total environmental expenses in 2021 increased from 2020 by approximately THB 28,344.23 million or 40.57 %. This was due to the increase of crude oil price of 47% compared to the previous year. This can be seen from the material cost of product output which increased by THB 28,035.97 million compared to 2020. In 2021, the refinery had the average production capacity 99 KBD. As a result, material costs of non-product outputs were raised by THB 33.26 million in accordance with the increase of low quality standard products about THB 32.71 million.

In addition, Bangchak's expenses for pollution control equipment increased by 275.84 million baht, from depreciation of pollution control equipment of 265.18 million baht and environmental equipment maintenance costs of 10.41 million baht, respectively. System management cost decreased (0.29) million baht and wastewater treatment & waste disposal costs increased by 0.25 million baht.

(Unit : THB million)

Environmental Cost Accounting	2019	2020	2021
Material costs of product outputs			
Crude Feed	89,112.83	54,827.42	81,445.69
Ethanol	7,127.70	6,124.10	5,980.37
Bio-Diesel (B100)	4,308.22	0.11	0.00
Bio-Diesel (B100)-Premium	36.36	0.00	0.00
Bio-Diesel (B100)_HI PURE TYPE2	582.10	7,131.39	8,371.91
Used cooking oil	0.76	0.32	0.01
Chemicals	171.83	162.17	160.35
Process water	28.35	18.77	27.65
Process energy	1,809.57	1,303.81	1,618.08
Material costs of non-product outputs			
Slop oil	57.60	25.36	58.07
Effluent	10.93	11.15	11.61
Excess chemicals from neutralizing pond	0.11	0.11	0.20
Waste and emission control costs			
Environmental equipment maintenance	24.29	12.62	23.03
Depreciation of pollution control equipment	301.02	234.88	500.07
Effluent treatment	9.71	6.34	6.12
Waste disposal	5.35	4.99	5.46
Prevention and other environmental management costs			
Monitoring and measurement	14.94	8.27	7.70
Depreciation of waste storage area	0.03	0.02	0.02
Management system operation	1.89	0.47	0.19
Environmental equipment maintenance	0.01	-	-
Benefits of by-products and recycling			
Liquid sulfur	(14.19)	(10.46)	(-17.16)
Iron and aluminum scrap	(4.17)	(1.64)	(3.12)

Being **'good'**
is more than
just a name embroidered
on the back of your shirt.
It is considering
the **common good**
over **individual interest**

–Ornpilin Latthi–
Bangchak Community Youth



Occupational Health & Safety

Occupational health, safety and security are the most important aspects of the petroleum business and its stakeholders, particularly employees, suppliers/contractors, and communities and society. Because of this, Bangchak has set in place a Safety, Security, Occupational Health, Environment, and Energy (SHEE) Policy which requires employees and contractors to perform safety duties and responsibilities for themselves and their colleagues in compliance with safety regulations and standards. For safety management, the company has SHEE management structure and safety management system – ISO 45001. In addition, Process Safety Management (PSM) has been implemented as the foundation of safety management system (Disclosure 403-1)

Targets



Zero work-related illness of employees and contractors



No significant oil and chemical spills to the environment



Zero occurrence of leakage of flammable substances or chemicals from primary containers or production processes leading to serious impacts in accordance with API 754

Occupational Health and Safety Management Guidelines

Bangchak continues to improve the implementation of Safety, Security, Occupational Health, Environment, and Energy (SHEE) management systems and ISO 45001 as well as Process Safety Management (PSM). The company continuously facilitates activities that promote safety both inside and outside the work area, which is known as Safety 24 hours. The Safety 24 hours programs encourages employees in all levels, including contractors to increase safety awareness and knowledge on safety practices and develop personal accountability.

Activities to promote safety culture in operations

- Safety Culture Transformation instills the safety mindset among employees through several activities, such as Line Walk of executives in operating areas to show the importance of safety awareness for workers, and Field Risk Assessment (FRA) which assigns employees to seek for hazards and risks to conduct proactive prevention.
- Regular monthly meeting and inspection with safety officers and contractors.

- PSM public praise and rewards are given to those who follow the process and act as a good role model for fellow employees and contractors.
- Safety promotion activities of the Safety Committee to promote employee participation in occupational health and safety, the company supports the activities of the employee's suggestion to be made in action.
- Promote prevention and self-care to reduce the spread of COVID-19.

Ongoing activities to promote safety culture outside the work such as safe driving promotion of employees by encouraging the use of helmet when riding a motorcycle and by promoting the use of safety belt before driving.

From conducting safety operations and activities continuously, Bangchak achieved safety target of 5,000,000 safety hours person without Lost Time Injury. Bangchak has given a memorabilia to every employee to celebrate the milestone achievement.

Work-related Hazards Identification, Risk Assessment, and Incident Investigation

(Disclosure 403-2)

Bangchak has procedures of hazard identification and risk assessment include improvement opportunity identification through “What if” and “HAZOP” measures covering activities operated by employees and contractors for all routine activities. These measures determined hazard, risk, and improvement opportunity identifications and assessments for all procedures to eliminate hazard and minimize risks by using “The hierarchy of control” method at acceptable levels and to review this process at least one time a year or any changes occur and to review this process at least one time a year or any changes occur. For non-routine activities, such as changes in operating procedures or equipment, changes in workers or workflow, results of surveillance of work environment and worker health including exposure monitoring hazardous situation and comprehensive risk assessment using the JSA (Job Safety Analysis) and electronic work permit (work permit online) are strictly required in every work process. Covered in the control and preventive measures are compliance on work permit, requirement to have a regular Safety Talk among employees before the start of a workday and the compliance checks on safety rules at work to enhance effectiveness of the process. Engineers and supervisor and above go through development programs on risk assessment procedures relevant to their work. After assessing risks and controlling measures, level up all results and recommendation must be compiled for the management team to review and sign off to. Everyone always has a duty to review and monitor implementation of the recommendations to control risks.

Due to the exacerbation of COVID-19 outbreaks in 2021, Bangchak raised various measures in order to prevent the spread of the virus within the workplace, for example, rigorous screening of employees and contractors who come to work in the area including body temperature check and complete health and travel history questionnaire for COVID-19 screening as well as rapid test screening for shift workers and other employees who may be at risk. The work areas were cleaned by spraying with disinfectant and UV light. The Company also established a waiting center for employees in high-risk groups who want to quarantine with air-conditioned rooms. The waiting center



was also equipped with thermometer for daily assessment of symptoms. Employees are provided full three meals and generic home remedies and doctors were available to give advice in case of symptoms. In addition, the Company also encourages at-risk employees to undergo RT-PCR testing at the hospital and coordinate to find a hospital for treatment in case of infection.

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

Results from risk assessment showed that work-related hazards that can lead to high-consequence work related injuries and work-related incidents with low probability of causing high-consequence injuries include fire, chemical spills, and falling equipment. The company has determined appropriate preventive and control measures on these incidents including levels of control (hierarchy of controls). A safety design process was set in place which includes risk assessments, a safety management system and simplicity. In addition, the company providing Personal Protective Equipment (PPE) to employees and contractors.

In addition, Bangchak encourage employees to file safety observation report focusing on unsafe acts and unsafe

conditions. The safety observation report filings are precautionary measures to prevent potential incidents that may impact operations, employees, and contractors. Anyone has the authority to stop work if he or she finds unsafe conditions or unsafe acts. Unsafe conditions and unsafe acts must be reported to manager and area supervisor in order to resolve the issues and ensure safe conditions before proceeding with the work. In addition, Bangchak conducts Field Risk Assessment (FRA) to encourage employees to be proactive on safety issues, minimize safety risk and ultimately promote a safety culture of the company.

Work-related risk and incident investigation process

The report and investigation process of work-related risks and incidents are vital in safety management system. The objective of such the process is to find the root cause and set up control and preventive measures to prevent reoccurrence. Bangchak has put in place a systematic reporting system to record unsafe acts, unsafe conditions, and near-miss incidents. When an incident happens, the person involved, or a witness must file a report to the area supervisor and other involved parties within 24 hours. A working team will be formed to investigate the incident to find root causes, determine corrective actions, and opportunity for improvement (OFIs). Incidents are investigated using the “Why Tree Analysis” tool to determine the root cause. There are periodic follow-ups to confirm alignment with the measures in place. Lessons learned from the incident are captured and shared to the employees via various communication channels. The company has developed access control by installing automatic barriers to improve safety and security.



Work-related health services

(Disclosure 403–3)

Bangchak places great emphasis on the protection and well-being of our employees and contractors, especially in the refinery areas where risk-level is highest. The company uses proactive occupational health measures by providing a Health Risk Assessment covering all areas of the refinery. This process is initiated to determine the proper measures for risk management including assessments and action steps to mitigate risks and to protect the health of employees and contractors. The risk assessment includes the regular surveillance of the work environment such as light, noise, heat levels and the presence of chemicals in the area. Assessment results are compared against the safety standards. If the assessment results exceed safety standards, the company will design and improve working areas to ensure safe working conditions. Bangchak also conducts improvement plan and systematic monitoring of the implementation. Safety officers and occupational health experts are available to provide advices and recommendations to employees and contractors on occupational health issues. Bangchak has provided employees and contractors health services as follows:

- Providing employee health check at the start of employment, during employment and at termination of employment
- Providing annual health check-up, which include general health checkup and checkup based on occupational risk factors. Occupational health experts are hired to determine check-up with special focus on risk factors. The team analyzes the test results based on internal and external factors in the workplace. If employees are found to be ill, they are advised to visit a doctor and receive ongoing health care. The company will also provide additional health checks recommended according to age. Some of these are prostate, pancreatic, and gastrointestinal cancer examination as part of the employee health program
- Monitoring of operational procedures in line with international standards and set clear criteria of people at occupational risk within 3 levels – low, medium, and high.



- Providing contractor occupational health measures, such as preparing work areas, procedures, prevention equipment, and knowledge
- Conducting medical emergency drills between Bangchak and hospitals' support teams. The contracted hospitals have participated in the drills to ensure that their staff are familiar with the process which increase communication and response effectiveness
- Hiring occupational health experts to assess and improve employee general and occupational risk-based health check programs

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

Participation, Consultation and Communication on Occupational Health and Safety (Disclosure 403-4)

Bangchak has appointed the Safety and Occupational Health Committee as the official working group in accordance with the regulation to facilitate the collaboration between management and employee representatives on safety, occupational health and work environment operations and to ensure continuous improvements in the areas. At least 50% of the committee members must come from representatives of operations staff where each function elects their own representative so that all functions are represented. The committee holds a monthly meeting where representatives share information from their functions,

updates on progress or operations, present future plans, and review safety performance and report results to management. In 2021, Bangchak established measures to protect workers from the spread of COVID-19 by providing medical masks to all employees and continually improve the safety and occupational health in work areas.

In addition, Bangchak facilitates activities that promote safety both inside and outside the work area, known as Safety 24 hours. The Safety 24 hours programs encourages employees in all levels, including contractors to increase safety awareness and knowledge on safety practices and develop personal accountability (OGSS: Emergency Preparedness).

- SHEE Excellence Day activity which includes a multimedia exhibit and games to promote safety practices
- Awareness raising through various channels such as email (Outlook), flyers, and Safety Radio Channel. Safety information are provided in the forms of news, tidbits, and warning signs such as a reminder to wear protective equipment.
- Life-Saving Rules Promotion activity is a brainstorming session of employee representatives from the safety committee that communicated the IOGP's life saving rules through a representative of the Safety Committee in a format that is easier to understand. In addition, quizzes were conducted and employees who participated can win prizes during the event as well. The activity was conducted via online communication to adapt to COVID-19 pandemic.





Occupational Health and Safety Training

(Disclosure 403–5)

Bangchak provides safety and occupational health training for all employees and contractors prior to starting work. In addition, there are guidelines to determine required trainings in occupational health and safety, prevention and fire prevention based on the employees' and contractors' job position. With the objective to develop knowledge, ability and behavior on safety practices, the company includes these in the training plan which covers delivery, evaluation of the results and documentation of training records. Part of the agenda is the prevention and management of hazards in the workplace to ensure that employees and contractors work safely. Bangchak has developed a system for training and issuing access cards to contractors to be more convenient and modern through the Express Safety Pass system, a system designed to make access card issuing process more efficient and faster. This is to record the contractor's information entering the area in the electronic system including sending documents and viewing safety videos online.

Promoting employees' health (Disclosure 403–6)

Bangchak also provides health services and access medical services outside of work-related activities.

- Provide primary care to employees and contractors who get sick. Medical staff are available during working hours. There is a full time nurse available during the work week and part time doctors visiting on a regular basis. This service is free of charge.
- Providing annual health check-up and flu vaccine for employees.

Bangchak organized a project to promote employee health with the aim of preventing the development of non-communicable diseases (NCDs), which are mostly behavioral diseases. The activities are divided into 3 aspects of care as follows:

- Exercise: Create monthly mission to help employees move by focusing on activities that everyone does on a regular basis but enhance it with additional challenges such as accumulating steps from walking and graduate to running and simple cardio exercise. Bangchak also provides access to fitness centers at the Bangchak refinery office building and M Tower headquarters building.
- Food: Set up weekly challenge to consume foods that contain vitamins that were advertise for the week such as vitamin D and switching from consuming sweets to vegetables to reduce sugar consumption.
- Maintaining sustainable healthy habit by creating missions to change daily behaviors such as earn scores for walking across a bridge, keep hydrating, and "Thai people aren't addicted to sweets" policy.

Because Bangchak believes that promoting better health cannot happen only by taking care of one specific area, the company has tried to incorporate healthy behaviors in all of the employees' daily activities.



Performance

Bangchak monitors the following safety indicators for employees' and contractors' safety performance: Injury Frequency Rate (IFR), Injury Severity Rate (ISR), Total Recordable Injury Rate (TRIR) and High-consequence work-related injuries rate of employees and contractors.

The results showed that:

- Sickness due to occupational disease for all personnel = 0
- Total employee injury rate = zero
- Contractor's total injury rate

Bangchak's performance with regards to the contractor

Zero Occupational Illness Frequency Rate (OIFR) of employees and contractors	2019		2020		2021	
	Male	Female	Male	Female	Male	Female
Lost Time Injury Frequency Rate (LTIFR) Employees	0	0	0	0	0	0
Injury Severity Rate (ISR) Employees	0	0	0	0	0	0
Total Recordable Injury Rate (TRIR) Employees	0	0	0.60	0	0	0
High-consequence work-related injuries rate* Employees	0	0	0	0	0	0

* High-consequence work-related injuries rate – severe injuries from work-related activities that result in recovery period of greater than 6 months after the incident

safety management was achieved through indicators which include declining Loss-time Injury Frequency. However, due to the drastically reduced work hours for both contractors and employee during COVID-19 outbreaks, the Loss-time Injury Frequency Rate (LTIFR) for employees and contractors increase compared to 2020. The company has investigated the incidents and implemented lessons learned to improve operations and control work process to prevent reoccurrence, established short-term and long-term corrective action plan, and ensure monitoring of the plan and communication of results to relevant parties along with the implementation of personal safety activities to create a sustainable safety culture.

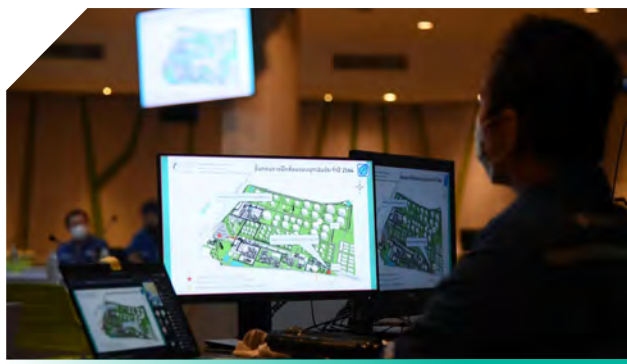
Zero Occupational Illness Frequency Rate (OIFR) of employees and contractors	2019		2020		2021	
	Male	Female	Male	Female	Male	Female
Lost Time Injury Frequency Rate (LTIFR) Employees	0.42	0	0.34	0	0.45	0
Injury Severity Rate (ISR) Employees	1.27	0	1.34	0	2.30	0
Total Recordable Injury Rate (TRIR) Employees	1.06	0	0.34	0.54	1.79	0
High-consequence work-related injuries rate* Employees	0	0	0	0	0	0

*High-consequence work-related injuries rate – severe injuries from work-related activities that result in recovery period of greater than 6 months after the incident

Process Safety Management

Bangchak has operated safety management in accordance with the Process Safety Management (PSM) system and has established the PSM Governance Committee (PSM GC) with continuous work plans since 2015. In addition, safety values 3E were set.





On-going Projects since 2015

- Felt Leadership (FL) program, presence and acting as a safety leader
- Field Risk Assessment (FRA) program to raise awareness and understanding of workers about potential hazards to prevent potential incidents
- Establishment of safety standards including LOTO (Lock Out Tag Out), LB (Line Break), and HW (Hot Work) standards
- Development of Process Safety Information (PSI), a collection of basic knowledge and necessary information for hazard identification in the production process
- Implementation of Process Hazard Analysis (PHA) tool to analyze hazards that exist in the production process which also helps in finding solutions and preventions
- Implementation of Incident Investigation (II), a procedure to analyze the root cause of an incident. Information gain from II is used to set up protection systems
- Implementation of Management of Change Technology-Facilities (MOC-T, F) which is a process to ensure effective change management process by evaluating the potential impacts and risks from proposed changes. Expert reviews are conducted for all relevant functions and communication process is in place to reduce risks from changes
- Use of Pre-Startup Safety Review (PSSR) to review equipment and operations related to the production process to ensure safe conditions prior to restarting the production process, after shutdown and major turnaround. The PSSR process helps to reduce potential risks of a restart process
- Emergency Planning & Response (EP&R)
- Management of Change Personnel (MOC-P) in production process
- Training and Performance (T&P)
- Contractor Safety Management (CSM)

In 2021, Bangchak initiated 2 new projects under the Process Safety Management (PSM) system and provided training for all involved to set up the system and continue to operate , including

- Mechanical Integrity (MI) to verify that equipment is working effectively, and controls are in place to prevent any hazards that may occur throughout the life the equipment. In addition, equipment maintenance, tools to measure designed objective and ready availability of equipment for use.
- Quality Assurance (QA) to verify that the equipment, various machines in the production process have been installed according to the design and are ready for use.

2022 plans to complete all 14 elements of PSM include:

- Start the development of Mechanical Integrity (MI) and Quality Assurance (QA) systems.
- Continuously develop safety systems in the production process.

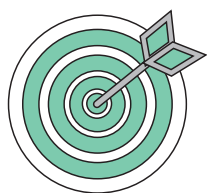
2021 Performance

Bangchak achieved all process safety targets. The leak of flammable substances from the container or production process with serious impacts (Tier 1 and 2) in accordance with the requirements of API 754 was reported to be zero.

Relationship Management and Customer Responsibility

The company has both proactive and reactive relationship management with various customer groups, as per our Marketing Business Group Strategy on Customer Focused and Customer Centric. It means responding to the needs of customers whether End Users, and Business Partner who are Service Station Dealers, Service Station Dealers operated by Cooperative (CO-OP) as well as Industrial Group Customers to develop a strong sense of loyalty between the company and the customers. The aim is to be the Most Admired Brand to enhance customer experience through product quality, service stations and service operations while increasing work process efficiency.

Target Y2020-2024



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

Performance 2021

1. Development of two-way communication mechanism between customers and the company



Service Station Customers

- Continuously develop for 4th year on customer contact channels both by phone and online media:



Call center 1651



Line Official



Facebook



Line@



Email



Live Chat



Website



Bangchak Mobile Application

- Optimized storage and processing to support customers in all communication channels.
- Call back service during high volume and long wait time
- System to search for information when customers mention Bangchak on social media such as Pantip and Facebook

Result Measurement

- Mobile Survey system to assess the satisfaction of Bangchak card members after using services at gas station both for refueling and non-oil businesses so that Bangchak can be informed of customer satisfaction and what needs to be improved immediately after using the service.
- Develop a call transfer system to assess customer satisfaction after receiving services
- Customer satisfactory assessment conducted by third-party
- Monthly report summary of complaints, inquiries, compliments, promotional information, and service improvement recommendation for relevant department for use to improve services
- Annual market research
- Conduct focus group with business owners to update market information
- Record customer compliments and reward employees who perform well

Complaints and Suggestions

Contacts



Call Center 1651
92 %



Mobile Application
6 %



Website
1 %



Major social media
and Posts
1 %

Total number of



Service provision

80 %Products and
promotions**18 %**

Others

2 %

Results

Satisfaction with response to
complaint and suggestion
(target 90%)

Assess the return of
service (target 95%)

2017

90%

2018

91%

2019

90%

2020

91%

2021

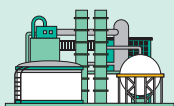
93%**96%****96%****95%****95%****95%**

There was no significant legal violation on marketing communications (Disclosure 417-3)



Service Station and Inthanin Coffee Operators

- Developed fuel ordering system through call center for service station operators to be able to place order at any hour through web ordering, mobile application, IVR system, and Line
- Call back system
- Feedback system after call
- Line Group for service station operators
- Develop a system for analyzing gas station operations through various E-Report systems so that operators and MRs can access important information in making decisions quickly.
- Develop a system for purchasing raw materials used in Inthanin through Point of Sale channels, with orders sent directly to distribution center which covers more products such as bakery products and frozen products



Industrial and Wholesale Customers

- Use of online communication channels
- Use of the online satisfaction survey
- Conduct after service online survey such as after technical services and delivery service

2. Development of systems and technology to support relationship



Service Station Customers

- Develop a new system that can support CRM for customers so that they can receive special privileges from refueling at Bangchak service stations
 - Customer segmentation such as truck drivers and food delivery
 - Promote repeat visits such as Re-Active, Re-Churn, Return Volume
- Ability to donate points through mobile application
- Compliance with PDPA

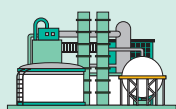
System development to response to the new normal

- Members can provide telephone number to collect points instead of handing over the physical membership card (reduce contacts)
- QR CODE payment
- Wireless credit card machines , which customers can manually swipe their credit card by themselves



Service Station and Inthanin Coffee Operators

- Develop CRM systems by phone to collect data of incoming calls, allowing employees to immediately know which customers contacted.
- Instituted call forwarding system for Call Center which allowed Call Center personnel to work from home during the crisis.
- Expand the reach of E-Training for partners and employees so that they can access training and development material anywhere at any time
- E-Report system to analyze the operational data of service stations through various E-Report systems accurately and quickly to cooperate in work improvement
- Point-of-sale system for raw material used in Inthanin Coffee to be sent directly to distribution center
- Add a variety of payment features like True Money Wallet, Dolfin Wallet, ShopeePay Wallet, and Rabbit Linepay.



Industrial and Wholesale Customers

- E-Tax invoice system
- Increase number of oil depot to provide better coverage and faster delivery
- Improve lubricants database so customers can select appropriate lubricant products through www.bangchaklubricants.com

3. Relationship management to maintain existing customers and obtain new customers



Service Station Customers

Customer privileges such as:

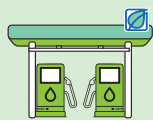
- New Bangchak card members receive 100 extra points from membership card registration
- Benefits – matching the price increase with equal amount of points on the days where fuel price increase
- Double points for all diesel purchases for Bangchak card members
- Birthday privileges – earn 50 extra points to redeem for special discounts at Inthanin Coffee or Furio Care car service center

Special privileges for Bangchak member card customers in line with new normal:

- Redeem 1,000 points for Krungthai COVID-19 insurance
- Redeem 350 points for a policy to protect against COVID vaccine side effects
- Redeem only 1 point, receive a 57% discount on the purchase of COVID-19 test kit or a 53% discount on a COVID-19 testing
- Redeem points for Andrographis paniculate pill, cloth mask, and alcohol gel hand sanitizer
- Playing games through Facebook and Line Official channels
- Promotional items “weekday travel, good return” where customer receive 50 points for 500 baht spending on refueling
- Able to order Inthanin drinks with special discount via Grab, Lineman, FoodPanda to reduce risk of contracting COVID-19 as well as enjoy special discounts
- Promotion: use 15 points plus 15 baht to buy Inthanin beverages
- Gas stations sell hand sanitizer gel in 5-liter size
- Bring the slip that has accumulated points or redeem points for a 10 baht discount.

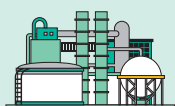
Additional benefits

- Expand customer base by adding privileges to SCG, AIS Serenade, The1Card member cardholders to receive instant discounts from refuelin at Bangchak gas stations
- Points transfer and redemption between Bangchak and:
 - AIS
 - Krungsri credit card In addition Bangchak members and transfer points to each other.
 - Create promotions with credit cards of various banks
- Promotional campaign with a variety of bank credit cards.
- Promotions with Inthanin drink



Service Station Customers

- Deliver high quality products such as Hi Premium Diesel S and E20S EVO as well as PM 2.5 reduction diesel fuel
- Implement an online communication system to increase the effectiveness of client communications.
- Develop “Program Bonding” to support investment in service station development to provide complete and value-added services as well as add products and improvements to service station
- Support alternative vaccines and deliver “Care Box” to dealers. Inside the box contains the thermometer, pulse oximeter, Andrographis paniculate, alcohol gel, mask for the entrepreneurs and the service station employees
- Increase consumer confidence through preventive measures and maintain cleanliness within the service station (7 safes).
- Expand the numbers of service stations that accept digital payment
- Develop a point redemption system to expand the customer base, for example, with AIS, exchanging points "The more you transfer, the more you get", and with Krungsri Ayudhya Card Company under the project "Transferable, easier to exchange"
- Expand partners in the online market to increase sales for Inthanin coffee shop operators with True Food, Shopee Food, and Air Asia Food and organizing promotional activities through food delivery partners
- Develop new beverages and bakery menus to better serve customers
- Provide delivery services through Kerry in Inthanin Coffee stores
- Joined the government's COVID-19 economic stimulus program “Ying Chai Ying Dai” for Inthanin Coffee
- Inthanin shop began to experiment with digital currency for payment of goods and services
- Develop Inthanin Mobile Application for customers to choose to pick up products at branches and buy monthly packages (Subscription)



Industrial and Wholesale Customers

- Provide knowledge on various topics such as products/emergency planning training /after-sales service/ support equipment/check equipment range and engine maintenance
- Provide total solution service in addition to selling products including equipment maintenance and quality assurance
- Meet with major customers monthly to jointly build a sales support tool and expand the sale network.

In the second year of COVID-19 pandemic, Bangchak has adjusted its marketing strategy to accommodate the situation as follows:



1

Develop Call Center system to support all communication channels from consumers and business partners to order fuel as well as ingredients for Inthanin coffee. Call Center employees were able to work from home and customers can provide satisfaction rating through the system.



2

System development to response to the new normal including upgrade where members can provide telephone number to collect points, QR Code payment and use of wireless credit card machines and ordering fuel refilling without having to lower car windows.



3

Modify promotions and special privileges including:

- 3.1. Redeem points from membership card for COVID insurance policy, COVID vaccine allergy protection policy, and exchange points for discount
- 3.2. Facebook and Line Official games
- 3.3. Promotional products to help farmers such as giving away longans, mangosteens, and chicken eggs
- 3.4. Customers can order Inthanin Coffee through various platforms such as Grab, Lineman, and Foodpanda to reduce risks as well as enjoy special discounts
- 3.5. Sale alcohol gel (5-liter size)
- 3.6. Collaboration with 11 well-known brands to offer food, beverages, and other products at Bangchak Food Truck 15 branches



Human Rights

Bangchak recognizes the importance of human rights management in systematic business operation. The Company conducts its businesses by adhering to the rights of all stakeholders including LGBTQ+ group and accepts differences of opinion as well as social equality such as religion, skin color, and ethnicity. To build confidence in doing business with respect to human rights, Bangchak's human rights policy has been established in accordance to the UN Global Compact, Universal Declaration of Human Right (UDHR), United Nation Guiding Principles on Business and Human Rights (UNGP), and Women's Empowerment Principles (WEPs). The Company set a framework on this by setting guidelines for the Board of Directors, management executives and employees at all levels, for the compliance of everyone.

The implementation of the Women Empowerment Principles (WEPs) is a guideline for gender equality under the concept "Diversified energy sources create energy security. Just as diversity and equality strengthens organizations. At Bangchak Group we recognize the importance of gender equality and create a workplace where everyone is truly engaged" and promote this issue, and the company has signed a contract accepting the principles of WEPs.

(<https://www.bangchak.co.th/storage/document/sustainability/2021/women-empowerment-principles.pdf>)

Awards for the promotion and activities related to human rights

In 2021, Bangchak received 2 awards from the UN Women 2021 Thailand Women's Empowerment Principles Awards (WEPs) as follow:



- 1st Runner Up in the Gender Inclusive and Workplace Category
- Honorable Mention Community Engagement and Partnerships

published on <https://www.weps.org/company/bangchak-corporation-plc>

Human Rights Due Diligence Process

2021 Key Operations

Policy Commitment	Human Rights Impact Self Assessment	Access to Remedy	Human Rights Due Diligence	Performance Tracking & Reporting
<ul style="list-style-type: none"> Develop a policy of Business Responsibilities on Human Rights Policy as a guideline for the Board of Directors and employees. Policy announcement* <p>Note :</p> <p>*The guidelines are in accordance with</p> <ul style="list-style-type: none"> UNGC UDHR WEPs annually reviewed ISO26000 UNGP Announcement via BCP Website 	<ul style="list-style-type: none"> Assess the impact of all business processes affecting human rights. Review processes to improve and minimize the likelihood of abuse. <p>Note :</p> <ul style="list-style-type: none"> annually reviewed 	<ul style="list-style-type: none"> Establish remedial mechanisms in the event of negative human rights impacts. Implement stakeholder engagement processes where remedies are needed. <p>Note :</p> <ul style="list-style-type: none"> annually assessment 	<ul style="list-style-type: none"> Human rights checklist (To ensure that there are no residual risks). 	<ul style="list-style-type: none"> Follow up on the performance Report to the management and disclose to stakeholders. <p>Note :</p> <ul style="list-style-type: none"> Announcement via BCP Website

2021 Key Operations

- Updated and announced the policy of business responsibility towards respect for human rights to include the principles of women empowerment (WEPs)
- Assessed relevant human rights risks Every year Bangchak conducts comprehensive human rights due diligence covering 8 main risk areas including construction and expansion of business operations, employees and contractors, surrounding communities, customers and consumers, business partners, foreign labors, and employment of LGBTQ group and temporary workers which include vulnerable groups such as women, children, minority groups, and people with disabilities. The scope includes refinery and oil trading business, marketing business, and suppliers.
- For contractors and suppliers, the Company uses Supplier Code of Conduct (SCOC) assessment tool for labor and human rights, safety, occupational health, and environment risk.
- Human rights risks that have been assessed are as follows:

Human Rights Risks

Employees

1. Equal opportunities in recruitment, employment, compensation, and career advancement
2. Equal treatment in the workplace (e.g. verbally, gestures) for all genders, ages, religions, and educational level
3. Equality in employee rights and basic welfare
4. Equal opportunities for training including knowledge and understanding of relevant safety issues
5. Freedom of collective action and negotiations related to work conditions
6. Violence, sexual harassment, and inappropriate conducts
7. Safe and hygienic work conditions
8. Whistleblower protection and confidentiality of victims

Contractors (partners who provide services/labor)

1. Equality in the contractor's selection process, temporary contractors migrant workers terms of employment wages and benefits not lower than that required by law
2. Equal treatment in the workplace (e.g. verbally, gestures) for all genders, ages, religions, and educational level
3. Equity in receiving relevant safety knowledge and training
4. Freedom of collective action and negotiations related to work conditions. And equal opportunities to provide inputs to improve collaboration
5. Violence, sexual harassment, and inappropriate conducts covering scope of workplace
6. Safe and hygienic work conditions
7. Whistleblower protection and confidentiality of victims

Suppliers (raw materials/products)

1. Production process uses hazardous materials or inputs come from areas where there are human right violations or are viewed as unsustainable
2. Use of child labor, forced women labor, or illegal labor in the production process
3. Treatment of employees, contractors, and migrant workers of business partners are not in compliance with labor, safety, and environmental regulations
4. Equal access to relevant safety trainings (including receiving appropriate PPEs per job requirement)
5. Safe and hygienic work conditions
6. Whistleblower protection and confidentiality of victims
7. Non-discrimination against organizations with business relationships

Communities

1. Current land management and land acquisition for future investments consider:
 - Rights of communities to access natural resources and water
 - Impact on community culture
2. Establish process to survey needs/expectations of communities around areas of operations and process to continually collect communities' concerns
3. In carry out community activities, ensure inclusive and equal treatment especially to women, disabled and other disadvantaged groups
4. Management supply chain to ensure that there are no negative impacts to communities on environmental, social, and economic aspects
5. Ensure systematic communication channel with the communities, including during emergency situations
6. Ensure channels for receiving complaints from the community as well as confidentiality of the complainant

Customers

1. Establish guideline for equal treatments of customers such as verbal expressions, gestures, as well as precautions on any physical contacts or other contacts
2. Establish process to prevent the following issues:
 - Sexual harassment or other serious incidents where customers are threatened
 - Protection of customer personal information including storage, access, and use
 - Violation of the rights of children or women through public relations, media, or activities

Human Rights Risk Assessment Results

	Employees	[Contractors & Tier 1 Suppliers]	Subsidiaries
Percentage of risk assessed for the last 3 years	100	100	100
Percentage of cases with identified risks	0	0	0
Percentage of risk identified with measures to reduce impact	0	0	0

Risk Mitigation

Land management during construction or expansion



Details:

- Impacts from noise, odor, dust, light, and vibration that could occur during construction

Mitigation measures:

- Verify that the acquisition of land is in accordance with the law and land acquisition does not affect the communities' way of life including resources and culture. Compliance with laws and regulations include:
 - Town Planning Act and Highway Act
 - Ministerial regulations, announcements, and ordinance specific to the area
 - Ministerial regulations on gas stations
- Establish measures to prevent noise, vibration, dust, smoke, odor, reflection, and wastewater treatment during construction of gas stations
- Establish measures for receiving communities' inputs, survey the needs and expectations of communities around the area before and during the project
- Establish channels for receiving complains through whistleblower channel and Hot Line 1651

Community relations activities do not cover vulnerable groups, women, disabled, or other disadvantaged groups in the community

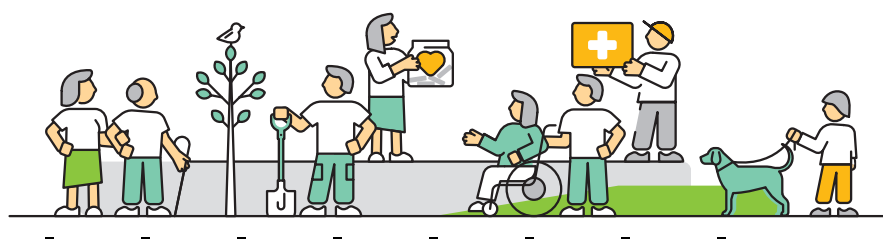


Details:

- There is a possibility that community relation activities may leave impressions that social cares do not cover vulnerable groups, children, women, disabled, or other disadvantage groups and are inconsistent with the needs to neighboring communities

Mitigation measures:

- Organize forums to hear communities' inputs, survey expectations, and use the information gathered to analyze and improve projects/activities to better align with communities' expectations and culture as well as inclusive of all at risk groups
- Take care of neighboring community to ensure that the management of safety and environment are up to standard in accordance with SHEE Policy
- Ensure advance communication before stop and start of refinery turnarounds
- Conduct evacuation drill with communities around the refinery
- Receive grievances, suggestions, and establish a remedial mechanism in case the community is affected by the Company's operations and ensure that complaints are protected and information is kept confidential
- 8.00 am.–5.00 am. 02 335 4102–5
- 5.01 pm.–7.59 pm. 02 335 4151



Customer service and gas station safety



Details:

- There is a possibility that customers leave cigarette butts at the stations which would impact safety at the station

Mitigation measures:

- Put up safety signs and raise safety awareness in service stations
- Establish measures to inspect areas and important equipment and to increase the installation of safety system to cover entire service station
- Conduct basic fire fighting drills for service station personnel at least once a year
- Establish rally point for customers and facilitate disabled customers to safety
- Establish screening process for business partners and trading partners in accordance with legal requirements
- Guarantee against damages from the Company's operations to customers, where cases are proven
- Receive customer complaints through Call Center 1651 or 02 335 4410 including conducting investigations, corrections, and follow-up of complaints
- Protection of personal information in accordance with international cybersecurity management standards – ISO/ IES 27001: 2013 ISO/IES 27032: 2012 and NIST Cyber Security Framework

Employment through recruitment companies not complying with legal requirements

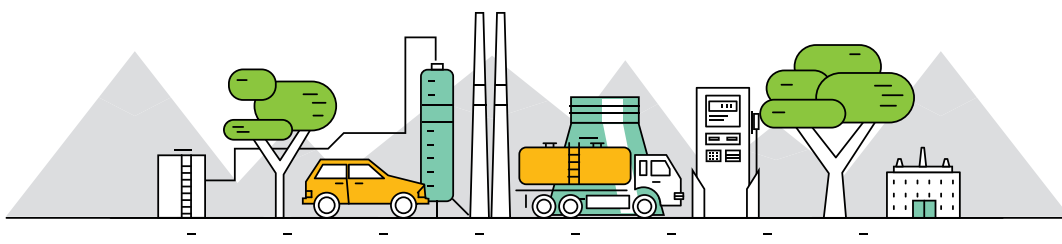


Details:

- The Company may be directly or indirectly involved when business partners do not comply with legal requirements.

Mitigation measures:

- Inform all important business partners to know and comply with the Code of Conduct for the manufacturers and procurement of goods, raw materials, and services
- Regularly assess business partners' performance on environment, safety, human rights, and good governance
- Track suppliers' performance through supplier annual self-assessment
- Establish a supply chain management system covering partners' selection process, performance monitoring, and evaluation
- Communicate the Company's expectations of performance to business partners to uphold company's standards
- Communicate potential impacts of operations to human rights to suppliers and business partners through the annual seminar
- Establish channels for receiving complains through whistleblower channel and Hot Line 1651



Discrimination in work areas



Details:

- There is a possibility that employees may receive discriminatory actions through words, gestures, touches and other inappropriate actions at work or during work hours due to differences in political views

Mitigation measures:

- Provide equal treatment to guard against discrimination in accordance with Business Responsibilities on Human Rights Policy
- Establish rules regarding behavior, verbal use, and unity in the employee handbook
- Communicate and provide training on how to appropriately express political opinions as to not affect collaboration at work
- Provide opportunities for management and employees to negotiate employees benefits through labor union
- Transparently receive complaints through the Whistleblower Channel
- Protect employees and whistleblowers by establishing a confidential database accessible only by those involved

Measures for Receiving Complaints and Tips

The Company provides channels for reporting complaints regarding human rights. For issues that violate legal ethics both from employees and other interested parties, there is a mechanism to protect employees and those who report the tips by creating a secret database system that can only be accessed by relevant parties. A committee will be established to handle the case. Committee members include representatives from different departments who have no vested interest in the case. Investigation proceeds in line with the regulations and will report results to those who filed the complaint. Channels of receiving complaints and tips are as follows:

- Information disclosure through Labor Unions or the Company's employee committee
- Hot line 1651
- e-mail to internal audit department

Collective Bargaining

The Company ensures open communication between management and employees for the negotiation of employee's benefits through Bangchak's Labor Union. The Labor Union has been registered in accordance with regulations and currently 27.76% of employees (304 of out 1095 employees) are members. All (100%) of employees are covered under the negotiate terms between the Labor Union and management. The Labor Union has the rights to appoint committee members (currently there are 13 members) who act as employees' representatives to work with management to improve employees benefits and response to employees' expectations. Meeting between Labor Union and management are held regularly in accordance with regulations. Accomplishments in 2021 included: project "Ruam Jai" was initiated for employees under 60 who wish to early retire, modification of special payment for shift workers level 8 and 9, and modifications on the supplier and business partner selections in case of employee resignation.

2021 Complaints and Disputes: There were no significant cases of complaints and disputes including labor disputes, human right violations, breach of regulations, and negative impacts to the community and society for the past 3 years.

Employees Stewardship and Development

Under the rapid changes of global situations associated with the economy, environment and society coupled with the changes in technology, there must be some influences to the operation of business. Bangchak is well aware of the impacts causing by such the changes and, therefore, stands strong on the stewardship and development of employees, the most important human capital of the company, to be high potential persons taking part in driving the organization according to the I AM BCP core values. The company also emphasizes the importance of employee retention, talent attraction and retention as well as career development and career path, with the following frameworks, goals and operations:

Target Y2020 - Y2025

The BEST Employer under the 100X Happiness (Be Well and Happy) management framework

The BEST Employer Framework



- The Company has set a strategic plan on employee stewardship and followed up the employee issues on a regular basis through the Management Development Sub Committee (Sub MDC) of each business group. The Company usually gathers employee feedback from the Employee Engagement Survey and screen various issue for discussions before passing them to the Management Development Committee (MDC) for consideration and approval for further improvement and development. Such the monitoring also helps the Company handle employee stewardship in each business group and working group in a closer manner and more effective. The samples are such as the issues of manpower planning that well synchronized with the business growth plan, learning and development, job rotation for development, and the promotion of learning for business development
- The Company has data analytics and an executive dashboard that enable the executives to consider proper employee care to be in line with the business direction quickly. This is an important strategy to drive the company's effectiveness in terms of agility.

Bangchak's employee management consists of four areas: 1. Planning and Recruitment 2. Employee Development 3. Employee Engagement and 4 . Employee Retention.

1. Planning and Recruitment

Manpower planning and recruitment of either internal or external personnel is an important task to get ready for an appropriate operation to achieve in the goal and vision of the Company. The Company aims to search for competent and good personnel with appropriate qualifications, knowledge and capabilities.

Recruitment Target in Y2025



of job succession rate
94%



Hiring the disabled
1% of the total employees
(in the number of 12 persons)



Ranked 1 of the top 8
companies in the survey of most
desirable organizations that new
generation in engineering want
to work with.



Reducing time
for recruitment to
40 Day

Recruitment Target in Y2020



job succession rate
92%



Hiring the disabled
1% of the total employees
(in the number of 11 persons)



Recruiting
50 new employees










Recruiting time in
42 Day

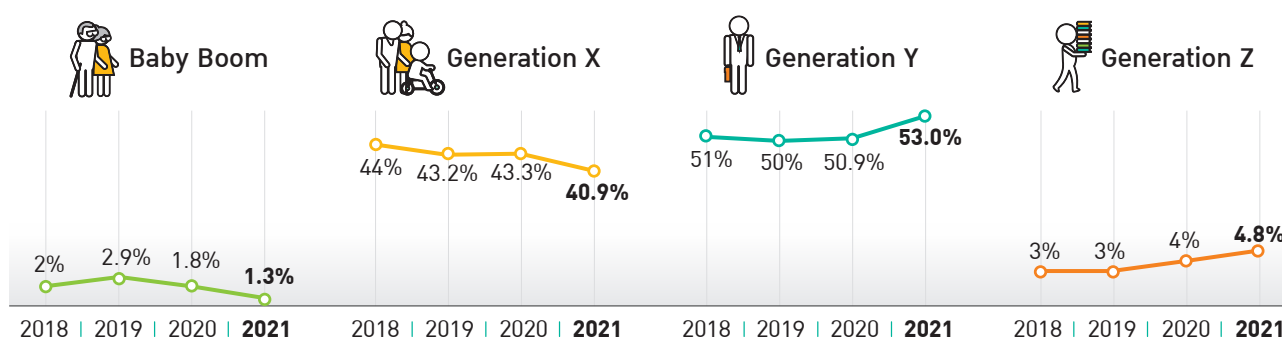
Strategy	Key Performance in 2021
<ul style="list-style-type: none"> Manpower and capability planning in line with the company's 3-year strategic plan (strategic medium-term plan?) 	<ul style="list-style-type: none"> Proactive recruitment by means of public relations in various universities (Roadshow) and job fair according to the target university. In addition, an online recruitment channel improvement by creating a Career Roadshow Online Session with the target university. To comply with the needs and strategic plans of the company. Who wants to create an Employer Branding Undergraduate Scholarship Program And high vocational certificate level (Diploma) in order to create a knowledgeable and capable personnel ready to support the company's growth, including companies in the group.
<ul style="list-style-type: none"> Employment with value and equality, providing opportunities for employment of disabled people to create sustainability for the society 	<ul style="list-style-type: none"> Employment of disabled persons who has potential to work in appropriate positions, a total of 11 persons, in proportion to 1 percent of all employees under Section 33 of the Promotion and Development of the Quality of Life of the Disabled Act 2007, as well as a response to Goal 8 of Sustainable Development Goals (SDGs)
<ul style="list-style-type: none"> Building good image of the organization through various kinds of online media to attract new generations to know Bangchak and want to work with. 	<ul style="list-style-type: none"> The BCP Talent Internship Program is open to accepting internships for both Thai and foreign students studying in Thailand. Participate in the annual internship program. Learn experience working with the company. And create opportunities to work together in the future. In the year 2021, there are 116 Thai and foreign students participating in the project with various internship periods due to COVID-19 pandemic situation. There was also the Dual Vocational System project with Attawit Commercial Technology College, Which had one student who participated for 1 year from November 2020 – October 2021.

Strategy	Key Performance in 2021
	<ul style="list-style-type: none"> Expanding channels for creating a good image of the company via Social Media channel as a means of reaching out to new generations including Facebook Page : Bangchak Career (25,656 followers) / Line Official Account : Bangchak Career (1,096 followers) To help communicate and extend reach for online followers, categorization on Career.bangchak.co.th was changed. News and events tab contains interesting information about benefits and working at Bangchak. There are 10 categories: 1) Career Development, 2) Lifestyle & Facilities, 3) New normal, 4) FAQs, 5) Greenovative Experience, 6) Bangchak Career Podcast, 7) Bangchak Scholarship, 8) How to introduce yourself, 9) BCP Career Event and 10) BCP Onboarding Program. In addition, Line Official Account : BCP Talent Intern for internship projects and also TikTok: Bangchak Career were established. Bangchak Career conducted public relations through external media related to recruitment, including WorkVenture, which has been promoted through articles and videos. The company also joined with JobTopGun and was voted and reviewed as "Dream Company" that takes care of employees in 4 balanced aspects: good life, good job, good money, and good society, above general standards, with a score of 3 "YOU SAY Flower of Hearts, which is the best for this vote and review. In addition, Bangchak Career participated in public relations through the media of "You Say, HR Say" to attract new recruits to apply for a job through the JobTopGun website and select Bangchak because it's the dream company that you want to work with. Survey the needs of job seekers in each generation by creating communication channels and public relations media content according to their needs to attract people to apply for jobs in the company Survey of the retention rate of employees who resigned in less than 2 years, found that the retention of new employees has improved due to benefits adjustments and working style to be more consistent with employees in each age group.
<ul style="list-style-type: none"> Shorten the time for recruitment 	<ul style="list-style-type: none"> Extending the Smart ME personnel management system to the staffing and recruitment system through computer systems. Also, the continuous development of the new Onboarding Program to create I AM BCP values and engagement with the organization from the beginning throughout the probation period. Increasing recruitment channel by using "Introduce Yourself" function in Smart Me so interested applicants can post the resume without a job opening offered. Cooperated with government sector to improve the competence in online pre-employment screening test. The company will also improve other online test and increase an accuracy rate of the test.

Performance on Recruitment Targets in 2021

 Target	2018	2019	2020	2021
 Employees (person)	1,254 persons	1,251 persons	1,230 persons	1,103 persons
 The ratio of successful employment as planned (Target)	94.44% (90%)	90.72% (90%)	94% (90%)	90% (90%)
 Employment of the disabled/ handicap (Target)	13 persons (13 persons)	13 persons (13 persons)	12 persons (12 persons)	11 persons (11 persons)
 Length of time for recruitment of new employees (Target)	40 day (43 day)	40 day (43 day)	40 day (43 day)	42 day (42 day)
 Rate of new employee	67 persons	74 persons	30 persons	50 persons
 Retention Rate (less than two years of service) (Target)	99% (85%)	99% (85%)	99% (85%)	97% (85%)

Generations Breakdown of Bangchak Employees



2. Employee Development

Bangchak considers employees as vital importance to the business as each of them is invested with variety of potential costs. Bangchak has prepared a development plan suitable for employees of all levels aiming to uplift their capability according to job standard as set. Required competency (job skills and qualifications) of the job in each career is defined and considered together with the potential of the employee (Talent Focus). This is in pursuance with the top goal to be the best employer based on the I AM BCP core values. The Company also encourages employee to

share new ideas, initiating innovations through agile and design thinking process in order to encounter with VUCA World: Volatility, Uncertainty, Complexity and Ambiguity).

Employee Development Target Y 2021 – Y2026

The Company has organized for the evaluation of the employee competency in order to get necessary data for individual development plan which is in line with career path development of the employees. By that, the Company has set targets as follows:

Goals Y2021-Y2026	Indicators	Strategy
<ul style="list-style-type: none"> Increasing people capability according to the competency standards and continuously manage career progress 	Competency gap attained from the Competency Assessment	<ul style="list-style-type: none"> Career Development Guideline Career path plan Individual Development Plan(IDP) to close competency gap
<ul style="list-style-type: none"> Having succession plan for the management/executive positions, critical positions and positions in new business 	Number of employees with high potential (Talent) under development plan in each year	<ul style="list-style-type: none"> Talent Development: Developing Program/ curriculum for employees with high potential Succession Plan: Developing the skilled experts and successors by their career path/plan
<ul style="list-style-type: none"> Developing basic courses for employees at each level (Mandatory Program) as well as building leadership in the organization. 	Number of employees passed Mandatory Program	<ul style="list-style-type: none"> Mandatory Program Model: Developing program/curriculum for employee of each level to match with the business growth and leadership development directions of the organization. Technology course/program to keep up with the changing world, focusing on agile learning and design thinking.
<ul style="list-style-type: none"> Developing learning systems through modern technology, easy to access and meet the needs of employees 	Number of employees learning through e-Learning and BCP-KMS	<ul style="list-style-type: none"> Technology & Innovation: Develop an in-house knowledge management (BCP-KMS) system for critical organization knowledge that is consistent with the long-term strategy and essential to today's business operations.

2021 Targets and Performance

Target	2021 Performance
Increasing competency according to the job position standards and managing career advancement	Develop career development guideline and competency assessment against standards by assessing skills and attributes required in each career path to develop Individual Development Plan (IDP)
Talent & Succession Plan for executives, critical positions and positions in new businesses	<ul style="list-style-type: none"> Talent Development: Develop IDP for high potential employees and provide them with mentoring program Develop Sustainable Growth Project for managers to prepare them for job function with specialized knowledge and skills
Mandatory Program : the fundamental courses for employees at each level including creating leadership in the organization	100% of employees complete training course to prepare and develop employees' potential according to the organization's core competency for employees at each level.
Developing a learning system through technology that is easy to access and responds to employees' needs	98% of target employees learn through e-Learning system and internal knowledge management system (BCP-KMS).

Employee Development Programs

The Company has developed learning programs and kept on developing employees so they can be professional in what they do, have knowledge and understanding in management, including skills necessary for efficiency improvement and changes. These development programs are as follows:

Leadership Development

Bangchak focused on the executive development, especially the BCP Leadership DNAs (5 Givings: Time, Opportunity, Direction, Value & Role Model). This is to reinforce the corporate culture which allows effectiveness and efficiency for team management, leading to the success of the Company.

Career Development Guideline

A Career Development Plan to uplift people capability according to job standards and the management of career advancement. The Company has developed a plan for competency development in accordance with job standards by initiating a competency model system since 2018. In the plan, there has been a determination of job family and technical competency required in each career which was designed to match with the operation model of the Company. This plan is to be used as the master plan for standard implementation of human resource development in the long run with the goal to let employees know about their diverse career paths as well as the development guidelines to close their competency gap.

Talent Development & Succession Plan: A development plan for the talents and successors by career path

In addition to the development of high potential employees to be ready for succession and the technical competency development at work that requires specific expertise, the Company also sees the importance in uplifting some other relevant skills and capability of the employees, especially communication skills capability building and aptitudes.

Assessment Center

Personal interest of the employees is also included. The Company believes these resources will help employees understand and get into their own potential through the tests, assessments and additional courses by analyzing and developing the potential of employees as follows:

- DISC Test : Analytical Tools for Personal Traits and Behavior used to know and understand own characteristics. It also analyzes the differences of

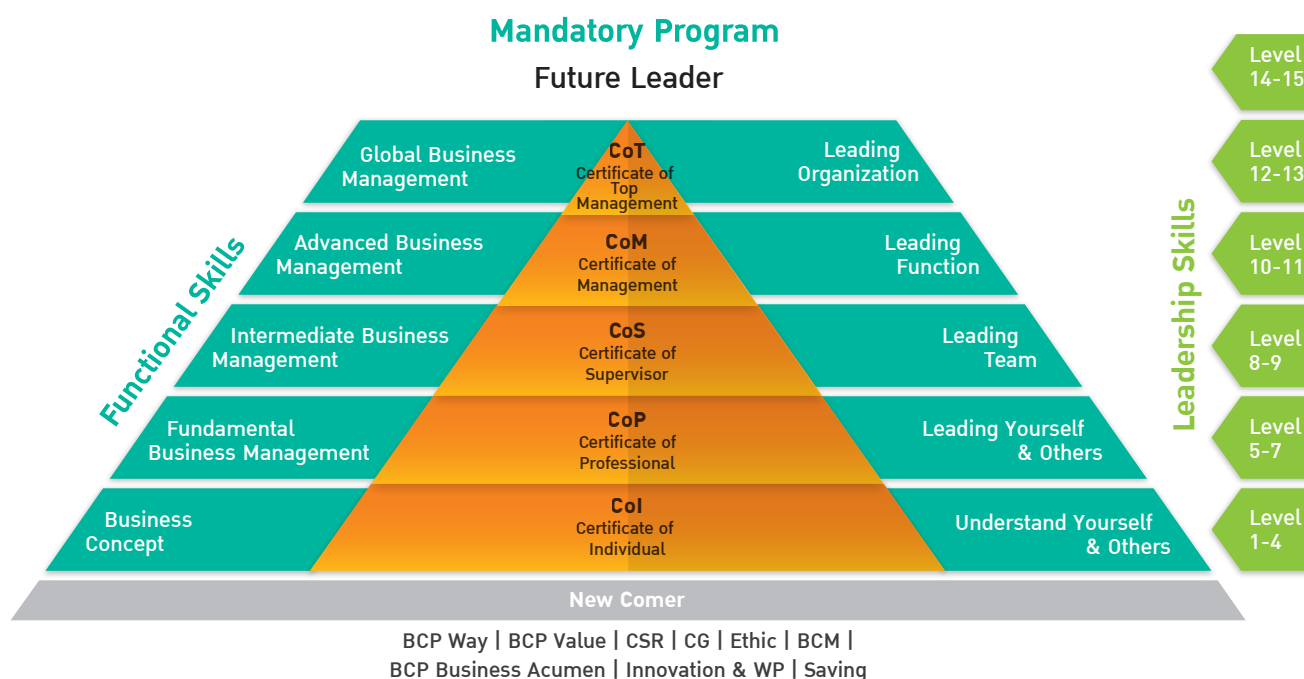


others which are useful for developing communication style suitable for people of different characters and socializing each other in the workplace.

- Strengths Finder Test : A test to help employees understand the individual talents and their potentials. The result of the test is often used as a basis for strength development and utilization of internal potential so that the employees can work more effectively with their full strength and potential.
- English Test :The test to assess English proficiency of the employees. The result of the test can be used to apply for learning courses or projects whereby English score is required. This is to increase an opportunity for the employees to improve their capabilities continuously.

Mandatory Program Model: A course to support business growth and leadership in the organization for employee of each level

The program is mandatory for employee development of all business groups in support of the new VMV (Vision Mission Value) of the organization and of being the Best Employer in the future. It is designed on grounds of the information gathered from the employee engagement survey, HR and Thailand 4.0 trends which will be brought about as factors for business administration and human resources management. This program should enable the employees to handle business growth in a timely and effective manner. It will also respond to the needs and expectations of employees. The program is divided into 5 groups according to the level of employees.



BCP-KMS

In 2021, the company has upgraded its internal knowledge management system (BCP-KMS) which is the center of sharing knowledge, work experience, lesson learned and tips or tricks for employees, so that the company can store important knowledge which is consistent with the long-term strategy and necessary for the current business operation.

BCP Library Weekly Development e-Journal

Since March 2020, during the Work from Home period, the Company wanted to keep the employees informed about the up-to-date knowledge and to enhance the reading habits. Thus, #StaySafeStaySmart by BCP Library, which is the weekly Development e-Journal, was developed so as to provide knowledge of English, interesting knowledge, and book recommendations available at the library and e-library system.

Reskill & Upskill

In 2021, the Company emphasized on the collaborations of the staff, changing the way of work and enhancing efficiency. Also, innovations and new business creations were highlighted to prepare the organization for the disruptive environment. The Company managed to reskill employees from across functions (such as engineers, analysts, chemists, and quality management staff) to be able to handle sales work, understanding the business operation to support the New Normal and company's policy and culture of I AM BCP.

Employee Scholarships

Striving to be the leading green innovative corporation in Asia with good governance, inclusivity and sustainable operations, Bangchak puts importance on the development and employee's education by setting up the criteria for BCP Group's employee scholarships to support the study in master's and doctoral degrees from both domestic and international institutions.

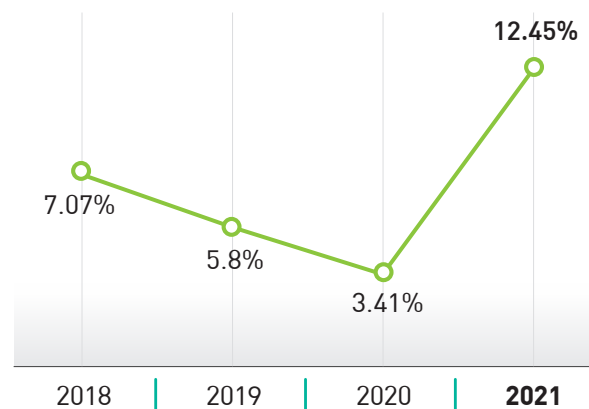
Preparation Program for Organizations in the Disruptive World

- In 2021, the company remains focused on adopting agile and design thinking to develop employees by requiring them to be available in training for employees at all levels including new employees, employees preparing for promotion, and employees in Talent & Successor group. Training is provided along with coaching and projects pitching during management meeting.



- Workshop to improve efficiency, reduce costs and create value added. In addition to training to provide knowledge at various levels according to plans, the company also promotes workshops to increase efficiency, reduce costs, create added value for core businesses and promote the adoption of innovations to develop new businesses.

Human Capital Return on Investment -HC ROI

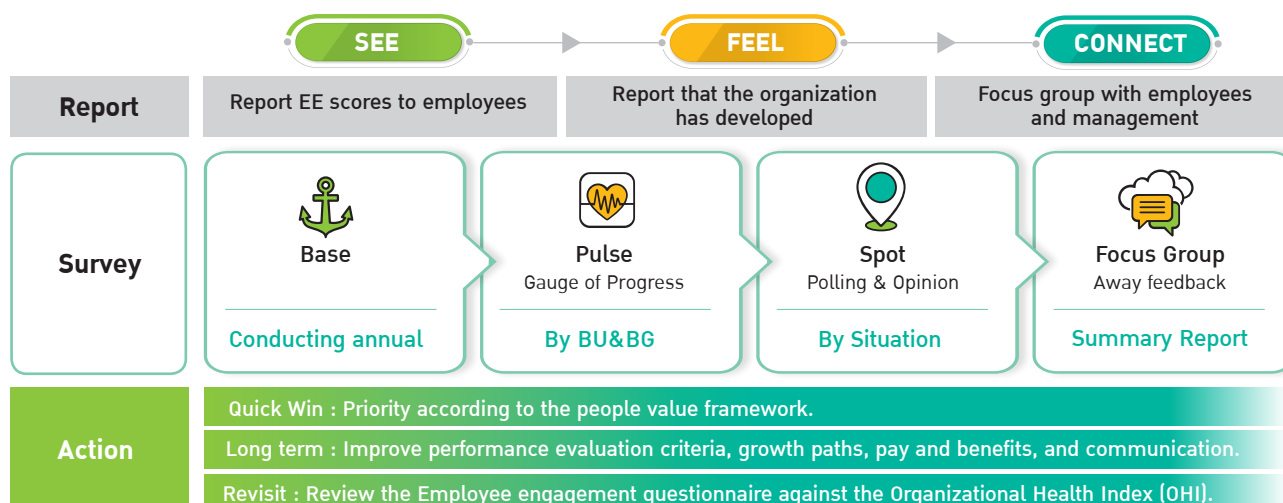


3. Employee Engagement

Bangchak conducts employee engagement survey annually to measure engagement and assess the employees' satisfaction and use survey results as a basis for care, develop and promote employees in various fields, to make employees happy at work, ready to dedicate themselves to developing their full potential in order to drive the organization to successes.

In 2021, Bangchak faced various challenges, especially COVID-19 pandemic. The company has adjusted strategy to build relationships within the organization by focusing on taking care of employees in terms of valuing employees (People Value) together with the Business Unit / Business Group to jointly formulate a plan to build employee engagement with the organization in accordance with the company's policy direction under the strategy 100Xhappiness (Be Well and Happy), approved by the Management Development Sub Committee (Sub MDC) of each business group with details as follows:

Employee engagement plan



Communication

In accordance with the company's Work from Home policy and encouraging employees to maintain social distancing; communication becomes critical. Hence, communication format had to be modified to maintain relationships between the company and employees as well as to ensure that employees are aware of the company's direction and position. Communication during the year were as follows:

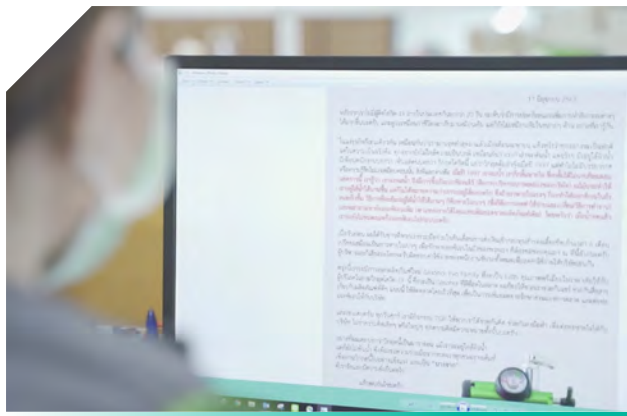
- Town Hall: In 2021, the company organized 3 "BCP Town Hall" and Town Hall activities under various business lines and groups. Town Hall activities were live streamed and acted as an official communication that give direction of business operations movement in the organization and news to employees directly from Chief Executive Officer and President (CEO) and Executive Vice President.
- Facebook Live, Teatime online activity from senior executives from the Executive Vice President upwards; "Manager meet staff" forums that allow employees and executives to hold discussions on various issues and informally exchange views. In addition to making employees understand the direction of the organization's business these activities help employees to understand the changes that need to happen and inspire employees to work toward common goal. The activities also help foster relationships between management and employees.
- Focus on reaching employees to listen to employees' opinions through HR Site Visit activities, not only within the head office and refinery but to sites in all regions. HR Site Visit aims to communicate, discuss, and exchange ideas on matters such as career growth, criteria for performance evaluation, level adjustment and review of the company's welfare criteria for employees to understand including what employees would like to HR to improve.
- Add channels and create new communication styles to improve relationship between employees and the organization including ensuring that employees receive news in a timely manner through Facebook group: Proud to be BCP#2, Line Official: I AM BCP Everywhere with you. Prepare encouragement cards from senior executives from the Vice President up. Conducted various activities to encourage employees to arrive at home and employees who must work at the office.

- The article "Short note from PS" is a short email message from CEO to employees that shows concern for employees along with the progress of the operation and communication about critical situations especially related to the organization and its employees at that time which is sent, on average, once a month.
- Opening a channel to listen to the voice of employees through the CEO Box where all employees can express their opinions or propose suggestions directly to the CEO anonymously. The CEO communicates back to employees directly if the staff wishes or communicate response during Townhall events.

Relationship Building

- Build recognition through various activities to promote expressing gratitude from both employees and management such as Congrats Day where high level management congratulate employees who are promoted and give direction and expectations to employees to motivate the employees in their new role
- Building relationships between senior management and employees through employee club activities and activities such as planting *Angrographis paniculate* trees in the refinery, sending care boxes, care kit boxes with medicine and COVID-19 prevention equipment, lunch boxes, special food in various activities directly to employees homes and at the desk during COVID-19 outbreaks





Bringing technology to work

- Support in digital channel for fast and versatile communication such as the MS-Outlook 365, Skype for Business, WebEx, and MS Team etc.
- A modern system to support the operations, easy to use anywhere, such as Smart ME, EZ-Pay, E-Procurement, E-Catering, Smart Meeting, and Smart Office etc.

Work Flexibility

- For employee safety, the company has encouraged employees to work from home and has established a Hybrid Workplace policy that allows employees to choose to go to the office or not as appropriate for each employee.
- Adopted flexible benefits for outpatient medical expenses, which can be used to reimburse the cost of prescription eyeglasses or fitness membership to promote physical health care. In 2021, the company added the right to reimburse medical expenses in clinics for father and mother, also adjusted the limit of medical expenses for children as well as adjusted the disbursement form in accordance with the situation for employees to receive money in a timely manner without having to wait for the documents to be disbursed.

Employee health care under normal circumstances and during COVID

The company emphasizes healthy lifestyle by encouraging employees to be aware of and control for body mass index and blood cholesterol level. Bangchak has supported employees' health activities for 3 consecutive years, starting in 2018. In 2021, the company still focuses on health care activities but having to adjust the model to be online and creating a mission to promote health with new challenges every month, through the Health Challenge activities to promote correct understanding and care. The result is that the average blood cholesterol level of most employees was at the same level. During COVID-19, Bangchak implemented measures and guidelines to take care and protect employees as follows:

1. Arrange preliminary screening through temperature measurement before entering the work area. Providing alcohol gel service at various locations around the office and conducted campaigns to remind employees to wear masks and wash their hands regularly.
2. Instituted work from home and hybrid workplace policies to reduce infection risks
3. Ensure timely communication of current situations to employees through public relations so that employees are informed of the latest news and awareness of health care in all channels along with surveys of employees traveling to risk areas to strictly prevent the spread of the virus in the office
4. Provided safe house for critical personnel to reduce risk of infection to employees who must work in the refinery area
5. Procured 1st, 2nd, and 3rd shots of vaccine for employees and their family and set policy that employees do not have to use their leave to go get vaccinated
6. Find hospital for infected employees and their families
7. Procured alcohol gel and masks and send them to employees at home
8. Provide access to mental health support during Work From Home
9. Provided waiting center including basic self-care equipment such as oximeter, thermometer, and basic medicine kit. As well as provide telemedicine access during quarantine and for screening for high-risk employees free of charge.
10. Conduct weekly testing using Antigen Test Kit (ATK)

Despite the company being affected by the economic crisis and the COVID-19 pandemic, overall Employee Engagement Score was at 70%, which is 7 percent higher than in 2020, with 89% employee participation in the employee engagement survey in 2021. This reflected those employees place great importance to engagement survey as channel to provide comments and development suggestions to the company.

The issues that employees are interested in are compensation and welfare, performance appraisal, opportunities for advancement and development. In 2021, all 3 issues were under development. In the meantime, the company encourages employee development through job rotation, with the rotation rate in 2021 at 19.91%.

Future Plans

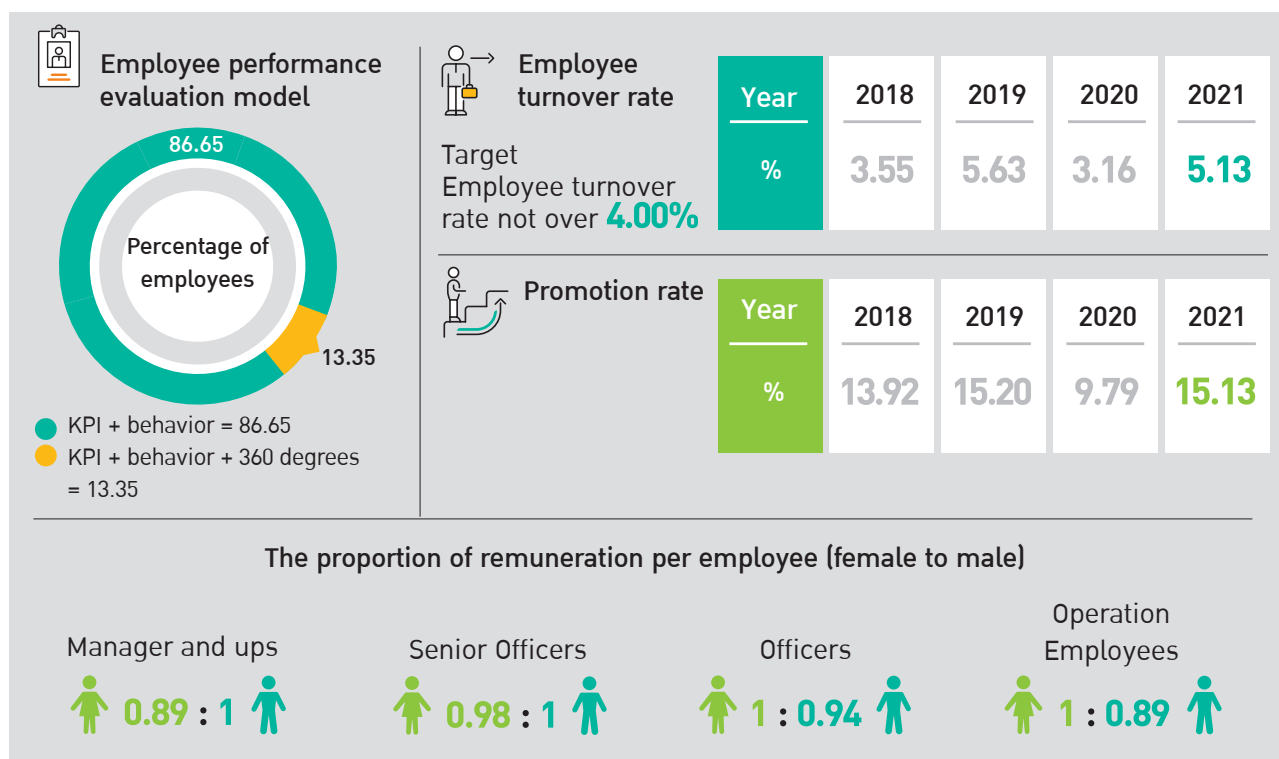
In 2021, the company will continue to focus on building engagement through the process of acknowledgment, understanding and participation to enhance employee engagement with the organization and create organizational culture as a basis for loyalty and continues to work continuously in terms of career growth, performance appraisal, competency development.

4. Employee Attraction and Retention

The company goes through many processes to get one employee to work with, starting from the process of recruitment, selection, interviewing and development. At each stage of processing, the company has invested resources onto it, both in the form of cash and non-cash. Thus, if there are high rate of turnover, the company will have to face with the loss of resource in recruiting the replacement. On the contrary, if the company can retain the competent employee to the business, they will be key factors to drive for the performance in achievement of the company's vision continuously.

2021 Goal and Performance

Bangchak has set a goal to take care of employees to have consistently good performance (High Performers) along with developing employees to meet the acceptable criteria (Meet Expectation), including monitoring and improving employees through the Performance Improvement Project (PIP).



Performance Appraisal and Compensation Management Key Operations

- **Performance Appraisal**

This year Bangchak started experimenting with a new performance appraisal system in conjunction with the old appraisal model for managers and above before considering adopting organization-wide next year. By evaluating this new model Bangchak will be able to measure results more clearly. In addition, the company has also begun to adjust employee KPIs to be more in line with the goals of the organization so that everyone can see the importance of their own work that is involved in driving the organization's goals. There is a plan that will be used to measure the results of all departments and levels in the next year and is an important part that will lead the organization to a High-Performance Organization (HPO).

- **Promotion under special criteria (High Potential & Fast Track)**

The company will consider past performance along with the potential for growth, the competency in strategic planning, leadership, and achievement level after attending mandatory courses. It will also consider the promotion under special criteria for the high potential and fast track. Moreover, the company will plan for employee development in accordance with their career paths.

- **Compensation Management**

Appropriate employee compensation management of each level is another important part for engagement and becoming a high-performance organization in accordance with the best employer guidelines. Each year, the Company will conduct a survey of compensation and welfare benchmark between the petroleum industry and the related industry, including the surrounding environment to review and improve the compensation criteria. There is an ongoing review and development of compensation scheme and criteria so the Company can manage compensation in consistent with the trend of needs from the new generation employees. However, there is no discrimination on gender in determining remuneration and promotion of employee.



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




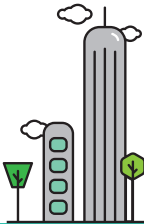
Community and Society Development

Bangchak operates its business according to its founding mission to continuously contribute to the well-being of Thai society both at the local level and national level by using the green society strategy to address social problems and respond to specific expectations of the community. In 2021, the company has actively driven this mission on both levels as follows:

1. Taking care of Bangchak's neighbors (Disclosure 413-1)

2020-2018 Goals and Strategies

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

	 Community	 Family	 School	 Condos
Population estimate	10 communities in Bang Na / Phra Khanong 1 military flats 1 Bang Nam Phueng Subdistrict, Phra Pradaeng District 17,885 people	5,098 households that are members of "Leaf Family" 5,098 people	19 schools in Bang Na District, Phra Khanong and Bang Nam Phueng sub-district 14,363 people	29 projects around the refinery 6,316 people
Participants of activity (amount/percentage*)	87,830 people 81.18 %	5,184 people 4.79 %	13,062 people 12.07 %	2,120 people 1.96 %
Social investment TH 9.386 M (Development Budget/Donation Budget)	Development Budget 64.88 % Donation Budget 17.40 %	Development Budget 6.19 %	Development Budget 11.12 % Donation Budget 3.59 %	Development Budget 1.83 %

*Percentage of all people participating in community relations activities from all groups in 2021 = 108,196 persons

Bangchak's community relation strategy comprises of eight areas: safety, education, sports, quality of life, environment, community relations and culture preservations, economic improvement, and corporate social responsibility. In 2021, more than 216 activities were organized and more than 108,196 beneficiaries from the activities.

2021 Target	Community Relations Strategy
<ol style="list-style-type: none"> 1. Evaluation of community engagement > 85 2. Evaluation of safety confidence > 85 3. Friendliness and helpfulness assessment > 85 4. Complaints from the wider community 0 case 5. Satisfaction rate of participants in the community > 90 	<ul style="list-style-type: none"> • Organize activities that consistently meet the needs of the community, creating friendliness, usefulness, and safety • Communication

2021 Performance



1. Community engagement score was **86.00** %



2. Safety confidence score **85.4** %



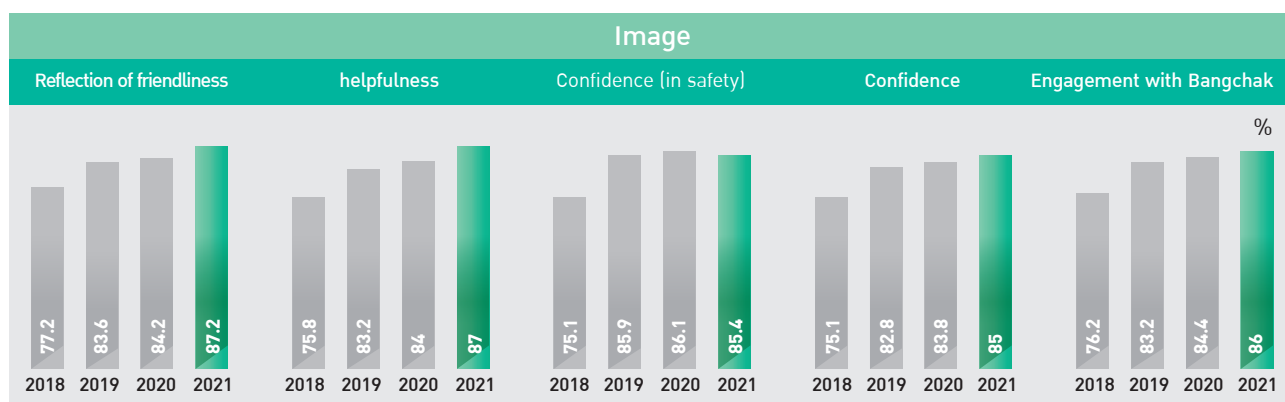
3. Friendliness helpfulness **87.2** %, **87** %



4. One complaints from the communities



5. Satisfaction rate of participants in the community **94.4** %



Communication:

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

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

2021 key operations to respond to Bangchak's neighbors expectations

Economic :

1. "Meal Box Pansuk" Project

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

The company has continuously encouraged community shops and contractors to use green containers since 2016. In 2021, "Meal Box Pan Suk" Project generated over 430,230 baht of income for 13 sellers

2. "Bangchak Dee Tor Jai" Project to support locally owned shops in communities

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

3. Project beekeeping of the large agricultural group at Bang Nam Phueng

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

Quality of Life :

Project "Bangchak Cares – Fight COVID-19"

The COVID-19 pandemic has impacted both the quality of life and the economy of many families in the communities. To lend a helping hand, Bangchak initiated projects and activities during COVID-19 to support the neighbors around the refinery as follow:

- **Distribute masks, sanitizing alcohol and sanitizing alcohol gel**

Distribute 10,000 cloth masks, 13,000 boxes of sanitizing masks, 2,000 liters of sanitizing alcohol and 7,764 bottles of alcohol gel for hand washing for people in the communities, condominiums, schools and government agencies around the refinery to reduce the risk of infection.

- **Provided 7,500 sets of andrographis paniculata extracts**

for Bangchak's neighbors

- **Provided Bangchak Petrol Card**

to hospitals, field hospitals, waiting centers, temples, foundations, volunteer teams, and schools.

- **Pan Kan Im Project**

Support 60 small restaurant operators around the refinery by purchasing 27,691 food boxes, valued at 1,245,930 THB to support medical personnel, staff, volunteers, patients, including

Safety :

Emergency Drills

Every year Bangchak organized emergency evacuation drill in the event of an accident as well as providing training to provide knowledge in the use of basic fire extinguishing equipment for teachers, students and personnel in the school and residents of condos around the refinery.

In 2021, Bangchak organized an emergency evacuation drill and provide training to provide knowledge in the use of basic firefighting equipment to 4 schools and 22 condos around the refinery in the Phra Khanong-Bangna area to ensure that teachers, students and staff in schools as well as condo residents have knowledge and understanding and are ready to deal with various emergencies that may occur.

Environment :

Bangchak Cares for the Community” project to reduce dust

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

Biodiversity Promotion “The Firefly Pathway of conservation” Project :

Bangchak Company is duly aware of environmental conservation, natural resources and promote biodiversity as a critical part of business. It initiated the establishment of a firefly conservation team in Khung Bang Kachao since



2014, consisting of representatives from 6 sub-districts in Khung Bang Kachao, academics from Kasetsart University and Chandrakasem Rajabhat University for jointly planning and implementation

Bangchak company started its social work in the Bang Kachao area since 2017 in order to create participation for residents in Khung Bang Kachao to take care of local natural resources. Bangchak coordinate to raise firefly survey teams in all 6 sub-districts to survey the number and species of fireflies found in each district based on monthly basis. Aiming



for collecting data on the increase/decrease, abundance and density of each area of fireflies. Moreover, the types of trees that there are found in the group of fireflies leading to the conservation of fireflies will lead to restoration of the ecosystem that is the habitat of fireflies. Encourage Khung Bang Kachao to be a firefly conservation center area and also further promote the way of ecotourism in the area

Education :

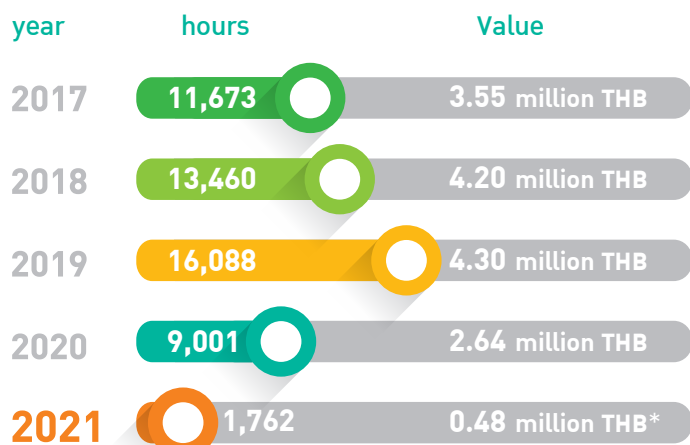
Eco-school project

The project is a partnership between Bangchak, Department of Environmental Quality, Phra Khanong District Office, and Bang Na District Office. The project aims to encourage school administrator and science teachers in 11 schools around the refineries to learn how to develop curriculums that include environmental issues in an integrated manner. The objectives of the project are

- Administrators and teachers are able to apply environmental knowledge into the curriculum and study material.
- The schools are able to continually develop personnel and students in environmental issues according to government policy and global trends
- Personnel, students, and schools learn, understand, and live in harmony with the environment, community and society in a sustainable and happier way.

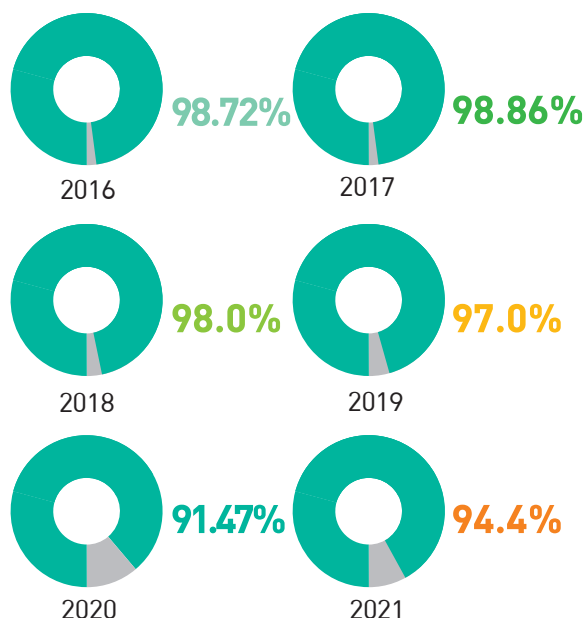
In 2021, the company continued to operate by conducting supervision and monitoring of school performance according to the New Normal project plan twice through an online form. Participating schools developed course outline and conducted teaching trails and activities with students as appropriate during COVID-19 pandemic.

Total hours of employees' volunteer work around the refinery (hours/THB)



*Due to COVID-19, the company had to adjust activity formats.

Community Satisfaction on CSR activities around the refinery



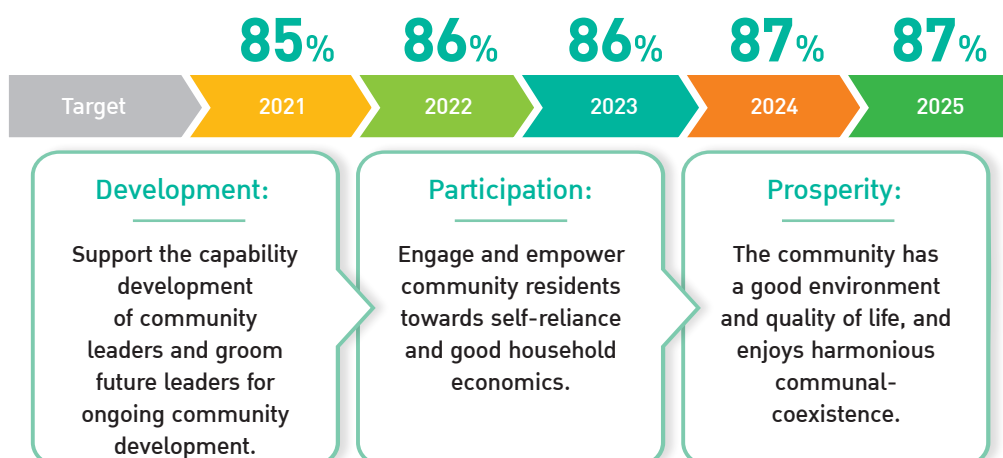
Receiving Complaints

In 2021, there was power failure at the refinery which cause temporarily stop to production in accordance with safety measures. As a result, there were flames and smoke from the incineration of excess gas from flaring, to reduce pressure in the distillation system. The event caused nearby communities to inquire about the cause of the flame and the smoke group. Officers coordinated the incident report through community leaders. The company is looking for ways to prevent and reduce the likelihood of such incidents in the future by constructing an Enclosed Ground Flare system to help prevent the burning of excess raw materials from the production process for maximum efficiency and the least impact on the environment. The construction was completed in 2021 and there is a project to request approval for the installation of additional power generation and management systems within the refinery including the installation of uninterruptible power supplies for the audio system to be able to notify the community during power outages to further increase the stability of the production process.

Future Plans

The company focuses on participation in caring for the communities around the refinery in parallel with its business operations. Part of the plan is identifying potential young leaders in the community and providing them with opportunities to further grow and become self-reliant and establish a better life.

Target 2021-2025 : Community Engagement Score 87%



On-going CSR Projects

Aspect	Commitment	On-going Project
Safety	<ul style="list-style-type: none"> Believe in the safety of the refinery Have safety immunity and able to deal with emergencies from situations or disasters 	<ul style="list-style-type: none"> Training for emergency plans and fire fighting for schools / communities / condominiums, Year 17 Provide equipment and fire extinguishers, Year 17
Economy	<ul style="list-style-type: none"> Making money and providing opportunities for people in the community using knowledge and ability to create work that is beneficial to oneself and family Promoting learning about financial management and investment 	<ul style="list-style-type: none"> Community enterprise make extra money, increase business potential, expand support and group integration to establish more professional groups (Community Enterprise Project Year 6) Supporting products and services from entrepreneurs in the community to use in the activities of the company to distribute income to the community (Year 17th) Opportunity for restaurants in the community to sell food in the headquarters canteen and in the Bangchak Green Stadium area, free of charge, to generate income Provided opportunity for community shops to sell meal boxes to contractors during major turnaround in 2021 free of charge to generate income for the community
Environment	<ul style="list-style-type: none"> Aware of environmental problems and make good use of resources 	<ul style="list-style-type: none"> Firefly Path Project Way of Conservation Year 8 Our Khung BangKachao Project Year 4
Quality of Life	<ul style="list-style-type: none"> Enhancing quality of life... Healthy Body...Healthy Mind 	<ul style="list-style-type: none"> "The One Family" Project, Year 29th "Bangchak Good Youth" Project, Year 7th Bangchak Cares Fight COVID-19 Project Year 2
Education	<ul style="list-style-type: none"> Age-appropriate learning development among children Proper grooming and behavior 	<ul style="list-style-type: none"> Bangchak Youth Scholarship Project, Year 17th the importance of developing teachers and students Project, Year 17th
Sport	<ul style="list-style-type: none"> Drug-free living among the youth Able to make money/income when there is opportunity Having opportunity for good education from sports 	<ul style="list-style-type: none"> Bangchak Youth Football Club, Year 14th
Relationships and preserving cultural traditions	<ul style="list-style-type: none"> Strengthen good relations between the distilleries and neighboring communities 	<ul style="list-style-type: none"> Leaf Family Journal, Year 15 Condo Neighbor Activity, Year 9th

2. Supporting the Society

Bangchak invites Thais to fight COVID-19

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

Target:

Activities	Outcome
Projects 1. Strengthening public health and proactive prevention in the community	
1.1 Supported Biosafety Mobile Unit for proactive COVID-19 testing	1.1 Provided a biosafety sample collection vehicle – by KMITL GO FIGHT COVID-19 Innovation Center, KMITL Research and Design Center, in collaboration with Doctor Lab Panda – was the latest innovation and the first vehicle in Thailand that can test 3 cases at a time
1.2 Provided equipment and supplies including drinking water, medical equipment, alcohol gel for field hospitals, waiting centers in communities in Khlong Toei, Phra Khanong, and Bangna	1.2 Provided medical equipment, alcohol gel for field hospitals, waiting centers, and more than 30 government agencies, worth more than 3.0 million baht
1.3 Provided Bangchak Petrol Card to hospitals, field hospitals, waiting centers, temples, foundations, volunteer teams, etc.	1.3 Supported more than 100 organizations with a total value of 3,200,000 baht.
1.4 Supported the work of the Department of Thai Traditional and Alternative Medicine by utilizing 6 Bangchak gas stations as delivery points for andrographis paniculata extracts to COVID-19 patients in areas with a lot of non-severe cases and patients receiving treatment at home	1.4 Reduced delivery time of andrographis paniculata extracts from 3 days to 2 day for more than 600 patients in Khlong Toei, Bang Na, Phra Khanong, Rat Burana, Rama 2, Rama 3, Sathorn, Yannawa and Mueang Samut Prakan districts
Projects 2. Stimulating the economy	
2.1 Pan Kan Im Project– Support small restaurant operators by purchasing food to support medical personnel, staff, volunteers, patients, including people in communities who were affected, the disabled, the socially disadvantaged. and 27 construction workers camps	2.1 Provided over 30,000 meals to more than 40 organizations and communities and generated over 2 million baht in income for over 200 small restaurants
2.2 Distributed and sold fleur de sel in Inthanin Coffee shops to help salt farmers in Samut Sakorn province who were impacted by factory closures and COVID-19 outbreaks which reduced the number of tourists resulting in oversupply and price drop	2.2 Distributed and sold over 100,000 packages of fleur de sel (over 5 ton), worth over 0.3 million baht thus, helping almost 100 family of salt farmers from 2 cooperatives
2.3 Pansuk eggs – due to the oversupply of chicken eggs in the market Bangchak organized the campaign "Punsuk Eggs" to distribute at "4 corner" Bangchak service stations at a lower price than the cost to help with people's daily expenses	2.3 Bought 8,000 cartons of eggs from farmers in Nakorn Pathom province to be sold at below cost to over 3,000 families in the Bangkok metropolitan area
2.4 Pineapple Punsuk Supported by purchasing Phu Lae pineapples from farmers in Chiang Rai province who faced the problem of not be able to export their produce to provide COVID-19 patient with good source of vitamin C. The fruits were delivered to patients in hospitals, field hospitals, and in communities through the provincial public health office including inmates in prisons in 14 provinces in both the northern and central regions through 27 departments	2.4 Donated 50 tons of Phu Lae pineapple worth 0.5 million baht to COVID-19 patients
Projects 3. Helping society / alleviating suffering during quarantine	
3.2 Delivered ready-to-eat meals to medical personnel, volunteers, patients, and people in communities that were impacted by the outbreaks including vulnerable groups such as disabled people and construction workers	3.2 Delivered over 30,000 meals, worth more than 2 million baht, to more than 40 agencies and communities and 27 construction worker camps throughout Bangkok metropolitan area and provinces with high cases
3.3 Delivered drinking water to field hospitals and hospitals in critical areas	3.3 Delivered over 152, 000 bottled water worth over 0.46 million baht
Projects 4. Raising funds to support agencies/ temples/ foundations/ volunteer groups during crisis	
4.1 Fuel Sharing Project X2 which raises funds from the public and the company will match the amount to support refueling cards for volunteer groups and various agencies to use in missions to pick-up and send COVID-19 patients to receive treatment or to return home. The project also included funds raised from Bangchak's executives	4.1 Raising funds from the public, employees and management to deliver fuel valued over 1.8 million baht to a network of over 60 volunteer organizations

Bangchak Group

Joins the Fight Against COVID-19

2021



Customers/The Public

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



Medical Personnel

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



Employees

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



Farmers

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



Business Partners

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



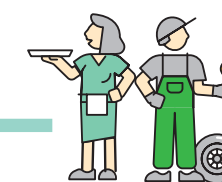
Volunteers

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



Shareholders

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



Neighboring Communities

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



Support of the Sustainable Development Goals (UN SDGs)



THE GLOBAL GOALS

This year in addition to handling COVID-19 outbreaks, Bangchak also placed high emphasis on climate change (Climate Action) which is an increasingly important global environmental issue. Bangchak's actions to support climate change efforts are:



SDG 13: Climate Action

In 2021, in addition to dealing with the COVID-19 outbreak, the company also gave importance to climate change, an environmental issue that has become increasingly important worldwide. The company commits to addressing climate change by setting critical goals; to be Carbon Neutral by 2030 and Net Zero GHG Emissions by 2050. The company conducted climate action activities in the social dimension view as follows:

- “Your Tree” Project a mobile application that encourage consumers to use cleaner fuel to reduce emission from combustion process which is like planting a tree to capture carbon.
- “Nam Man Rod Phoon” (dust reduction fuel) project – during PM2.5 crisis, Bangchak produced low sulfur (10 ppm) diesel fuel to be sold in greater Bangkok Area to help reduce PM2.5. As emission from vehicle contribute to 51% of the PM2.5 in Bangkok, it is important that Bangchak act to be part of the solutions to this health crisis. Even though low sulfur diesel cost higher, Bangchak did not pass these costs on to the customers
- Environmental Seminar titled “Exponential Path to Net Zero” under the Bangchak 100x approach: 100 ideas for a sustainable world. The seminar was held as Hybrid Conference, inviting interested parties to find answers and solutions on how we can reach net zero goal. Participants can update global trends and advanced technology from foreign experts who provide reflection of the preparations of countries, organizations and individuals following the 2021 United Nations Climate Change Conference (COP 26) of the United Nations in Scotland.
- Project to develop Wet Forest area in Phu Long forest– the last remaining forest in Lamphao, Chaiyaphum province. Although the project has been on-going for 16 years, dry conditions led to wildfires that damaged over 3,000 rai of the forest. Bangchak's proposed solution is to grow 10 rai of wet forest to capture water based on Koh Nong Na model. Over 2,000 trees were planted and the area is monitor every 3 months. In 2021, due to the COVID-19 crisis monitoring efforts for the project was disrupted. However, survival rate for trees in the project is expected to be high because of water management system that uses banana trees for shade. In addition, there were no wildfires and the area experienced heavy rainfall.
- Showed commitment to conducting a low-carbon business and leading energy transition. Bangchak and 13 organizations have founded the “Carbon Markets Club” to promote carbon credit trading for both the organizations and individuals who want to save the world by purchasing carbon credits to offset and support green energy business investment.





SDG 12:

Responsible Consumption and Production

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



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



SDG 8:

Decent Work and Economic Growth

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

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



SDG 4: (Quality Education)

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



Future Plan for Community and Social Development

Bangchak has set path toward being a Carbon Neutral Company by 2030 and Zero GHG Emission by 2050. This resulted in share of social projects related to reducing carbon emissions or increase carbon sequestration. Therefore, part of the budget was allocated to invest in reforestation projects, creation of green spaces for various stakeholder groups, and support of more relevant research including having specialist partners to work in line with the organization's goals.



CARBON NEUTRALITY

2030



NET ZERO GHG EMISSION

2050

Sustainability Performance Statistics

Economic Performance

Revenue							
Indicators	Material Aspects	Unit	2017	2018	2019	2020	2021
GRI 201-1	Revenue						
	- Sales and services	Million THB	172,138.24	192,025.32	190,488.59	136,450.29	199,417.00
	- Total Revenue	Million THB	173,378.94	193,340.41	190,983.67	136,982.82	200,695.74
	- Net profit	Million THB	6,163.00	3,234.70	2,488.49	5,769.98	9,844.72
	- EBITDA	Million THB	13,420.00	10,201.00	8,709.00	4,104.00	25,818.00
Expenditure for income distribution to stakeholders							
Indicators	Material Aspects	Unit	2017	2018	2019	2020	2021
GRI 201-1	Expenditure for income distribution to stakeholders						
	- Operating expenses	Million THB	158,595.55	180,594.37	180,256.90	132,122.13	175,744.43
	- Interest expenses paid to financial institution creditors and debentures	Million THB	1,502.30	1,559.06	1,839.24	2,050.58	2,395.39
	- Tax payment to government and local authorities	Million THB	544.16	194.45	258.46	20.44	20.13
	- Financial supports for membership of associations	Million THB	3.32	3.34	3.28	5.35	2.72
	- Community and social development	Million THB	32.98	36.00	34.00	21.67	27.74
	- Donation to society and schools	Million THB	73.61	62.94	64.60	22.62	16.00
	- Dividend payment to shareholders	Million THB	3,310.75	3,090.52	1,759.84	742.55	2,672.18
	- Dividend payment to shareholders (Baht/Share)	Million THB	2.15	1.35	0.80	0.40	2.00
	- Wages and employee benefits	Million THB	3,277.33	3,310.33	3,609.11	3,401.92	4,572.62
Supply chain management							
Indicators	Material Aspects	Unit	2017	2018	2019	2020	2021
GRI 204-1	Supply chain management						
	- Local purchases of goods and services*	Million THB	5,749	4,424	2,764	1,846	1,814
	- Percentage of Local purchases of goods and services*	Percentage	84	98	98	97	98

*Local purchasing in Thailand, exclude raw materials and crude oil

Corporate Income Tax (Bangchak Corporation Public Company Limited)																			
Tax Jurisdiction	Unit	Revenue									Profit / (Loss) before Income Tax			Income Tax Paid (on a Cash Basis)			Income Tax Accrued - Current Year		
		Related Party			Unrelated Party			Total											
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
- Thailand	Million THB	53,978.0	42,073	58,074	159,894	116,466	151,239	213,872	158,539	209,313	4,711	(7,330)	11,774	208	(14)	228	123	103	48
- Japan	Million THB	701.0	113	137	230	221	279	931	334	416	416	(156)	(63)	1,306	(6)	(71)	198	-	5
-Singapore	Million THB	23,999.0	24,418	29,459	31,289	19,225	42,641	55,288	43,643	72,100	(113)	(3,838)	1,766	17	21	23	35	27	47
-Philippines	Million THB	67.0	-	-	22	-	-	89	-	-	(1,189)	(378)	-	-	-	-	-	-	-
- Australia	Million THB	229.0	51	-	11	-	-	218	51	-	(91)	(133)	-	-	-	-	-	-	-
- Netherlands	Million THB	-	-	-	-	-	-	-	-	-	(2)	64	(3)	-	6	-	-	-	-
- British Virgin Islands	Million THB	59.0	346	-	3	-	-	62	346	-	(85)	-	-	-	-	-	-	-	-
- Laos	Million THB	-	-	5	550	907	1,125	550	907	1,130	109	323	418	-	-	5	-	4	34

Environmental Performance

[illegible]

Business units			Refinery Business					M-Tower and Reginal office					Marketing Business				
Energy consumption																	
3	Total energy sold (electricity, heating, cooling, and steam sold)	TJ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		MWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	- Non- Renewable Energy Sale	TJ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		MWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	- Renewable Energy: Electricity generated by solar power	TJ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		MWh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1+2)-3	Net energy consumption within the organization ^{/3} (Non- renewable + Renewable) - Energy sold)	TJ	13,903.00	13,116.77	13,182.00	12,845.84	12,229.66	-	-	-	-	11.53	60.59	94.11	99.92	96.40	91.12
		MWh	3,861,944.48	3,643,548.30	3,661,667.98	3,568,287.62	3,397,126.75	-	-	-	-	3,203.27	16,830.56	26,141.23	27,754.55	26,778.73	25,310.01
(1+2+3)	Total energy consumption within the organization (Non- renewable + Renewable)	TJ	13,903.00	13,116.77	13,182.00	12,845.84	12,229.66	-	-	-	-	11.53	60.59	94.11	99.92	96.40	91.12
		MWh	3,861,944.48	3,643,548.30	3,661,667.98	3,568,287.62	3,397,126.75	-	-	-	-	3,203.27	16,830.56	26,141.23	27,754.55	26,778.73	25,310.01
GRI 302-3	Energy Intensity Index (EII)																
	- Energy Intensity Index (EII)	EII	103.10	100.50	97.60	102.00	98.60										
*GRI 302-1	Net energy consumption within the organization ^{/3} ((Non- renewable + Renewable) - Energy sold)																
	- Refinery Business + M-Tower and Reginal office	TJ	13,903.00	13,116.77	13,182.00	12,845.84	12,241.19										
		MWh	3,861,944.48	3,643,548.30	3,661,667.98	3,568,287.62	3,400,330.02										
	- Refinery Business + M-Tower and Reginal office+ Marketing Business (*excluded Bio-based Product Business and Green Power Business)	TJ	13,963.59	13,210.88	13,281.92	12,942.24	12,332.30										
		MWh	3,878,775.04	3,669,689.53	3,689,422.53	3,595,066.35	3,425,640.03										
	- Refinery Business + M-Tower and Reginal office + Marketing Business + Bio-based Product Business + Green Power Business (2017-2020) * previous data from 2017-2020 which included Bio-based Product Business and green power business	TJ	14,708.70	13,417.66	14,512.59	14,112.52											
		MWh	4,085,749.43	3,727,128.09	4,031,275.40	3,920,144.20											

Remarks:

/1 Calculated by multiplying fuel volumes with the conversion factor provided by the Department of Alternative Energy Development and Efficiency

/2 Calculated energy consumption of biomass (rice husk and wood chip) by using wet weight multiply by Net Calorific Value (NCV) since percentages of moisture content of biomass are not available.

/3 Calculated from the difference of total energy consumption from every business and sold electricity and steam

Business units			Refinery Business					M-Tower and Reginal office					Marketing Business					
GHG emissions scope 1 & scope 2																		
Indicators	Material Aspects		Unit	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
GRI305-1 (scope 1)	Reports according to Operational Control Approach	Total Direct GHG emission (SCOPE 1)																
		Total Direct GHG emission (SCOPE 1)	tCO2e	972,926.23	900,682.85	898,292.02	885,619.47	820,901.52	-	-	-	-	478.63	-	-	-	509.72	580.53
		- CO2	tCO2e	972,011.56	899,954.62	897,562.70	883,796.95	819,065.76	-	-	-	-	468.15	-	-	-	499.21	485.38
		- Biogenic CO2	tCO2e	40.21	52.25	31.42	28.04	5.39	-	-	-	-	64.76	-	-	-	53.61	90.71
		- CH4 and Fugitive CH4	tCO2e	385.06	328.77	331.11	1,435.77	1,471.65	-	-	-	-	-	-	-	-	-	-
		- *CH4 and Fugitive CH4 emission (DJSI's disclosure requirements)	tons	15.40	13.15	13.24	57.43	58.87	-	-	-	-	-	-	-	-	-	-
		- CH4	tCO2e	385.06	328.77	331.11	322.84	307.50	-	-	-	-	0.68	-	-	-	0.67	86.12
		- *CH4 emission (DJSI's disclosure requirements)	tons	15.40	13.15	13.24	12.91	12.30	-	-	-	-	0.03	-	-	-	0.03	3.44
		- Fugitive CH4 * Fugitive CH4 had been reported with CH4 since 2020. In 2021, fugutive CH4 and CH4 are separatedly reported for data transparency.	tCO2e	-	-	-	1,112.93	1,164.15	-	-	-	-	-	-	-	-	-	-
		- N2O	tCO2e	529.61	399.46	398.10	386.66	364.08	-	-	-	-	9.80	-	-	-	9.65	9.04
		- Other Biogenic (CH4 & N2O)	tCO2e	-	-	0.11	0.10	0.02	-	-	-	-	-	-	-	-	0.19	-
GRI305-2 (scope 2)	Reports according to Operational Control Approach	Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2)																
		Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2)	tCO2e	14,838.00	14,129.37	10,750.41	6,816.96	5,749.34	-	-	-	-	591.33	8,716.48	13,070.61	13,655.24	11,927.39	11,609.19
		Total Indirect GHG emission from power and biogas purchased (SCOPE 2) (Gross location-based scope 2 GHG emissions)	tCO2e	14,838.00	14,129.37	10,750.41	6,816.96	5,749.34	-	-	-	-	591.33	8,716.48	13,070.61	13,655.24	11,927.39	11,609.19
		- CO2	tCO2e	14,838.00	14,129.37	10,750.41	6,816.96	5,749.34	-	-	-	-	585.86	8,716.48	13,070.61	13,655.24	11,927.39	11,501.83
		- Biogenic CO2	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- CH4	tCO2e	-	-	-	-	-	-	-	-	-	1.80	-	-	-	-	35.41
		- N2O	tCO2e	-	-	-	-	-	-	-	-	-	3.67	-	-	-	-	71.95
		- Other Biogenic (CH4 & N2O)	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Total Indirect GHG emission from power and biogas purchased (SCOPE 2) (Gross market-based scope 2 GHG emissions)	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- CO2	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- Biogenic CO2	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scope 1+2	Reports according to Operational Control Approach	Total GHG emissions (SCOPE 1+2)	tCO2e	987,764.23	914,812.22	909,042.43	892,436.44	826,650.86	-	-	-	-	1,069.96	8,716.48	13,070.61	13,655.24	12,437.11	12,189.72

GRI305-1 (scope 1)	Reports according to Equity Share Approach	Total Direct GHG emission (SCOPE 1)																
		Total Direct GHG emission (SCOPE 1)	tCO2e	972,926.23	900,682.85	898,291.91	885,619.37	820,901.50	-	-	-	-	478.63	-	-	-	312.51	327.85
		- CO2	tCO2e	972,011.56	899,954.62	897,562.70	883,796.95	819,065.76	-	-	-	-	468.15	-	-	-	305.74	280.09
		- Biogenic CO2	tCO2e	40.21	52.25	31.42	28.04	5.39	-	-	-	-	64.76	-	-	-	36.83	60.12
		- CH4 and Fugitive CH4	tCO2e	385.06	328.77	331.11	1,435.77	1,471.65	-	-	-	-	-	-	-	-	-	-
		- *CH4 and Fugitive CH4 emission (DJSI's disclosure requirements)	tons	15.40	13.15	13.24	57.43	58.87	-	-	-	-	-	-	-	-	-	-
		- CH4	tCO2e	385.06	328.77	331.11	322.84	307.50	-	-	-	-	0.68	-	-	-	0.41	42.27
		- *CH4 emission (DJSI's disclosure requirements)	tons	15.40	13.15	13.24	12.91	12.30	-	-	-	-	0.03	-	-	-	0.02	1.69
		- Fugitive CH4 * Fugitive CH4 had been reported with CH4 since 2020. In 2021, fugitive CH4 and CH4 are separately reported for data transparency.	tCO2e	-	-	-	1,112.93	1,164.15	-	-	-	-	-	-	-	-	-	-
		- N2O	tCO2e	529.61	399.46	398.10	386.66	364.08	-	-	-	-	9.80	-	-	-	6.23	5.49
		- Other Biogenic (CH4 & N2O)	tCO2e	-	-	0.11	0.10	0.02	-	-	-	-	-	-	-	-	0.13	-
GRI305-2 (scope 2)		Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2)																
		Total Indirect GHG emission from electricity, steam and biogas purchased (SCOPE 2)	tCO2e	14,838.00	14,129.37	10,750.41	6,816.96	5,749.34	-	-	-	-	591.33	4,271.07	8,802.72	9,141.05	7,701.59	7,044.31
		Total Indirect GHG emission from power and biogas purchased (SCOPE 2) (Gross location-based scope 2 GHG emissions)	tCO2e	14,838.00	14,129.37	10,750.41	6,816.96	5,749.34	-	-	-	-	591.33	4,271.07	8,802.72	9,141.05	7,701.59	7,044.31
		- CO2	tCO2e	14,838.00	14,129.37	10,750.41	6,816.96	5,749.34	-	-	-	-	585.86	4,271.07	8,802.72	9,141.05	7,701.59	6,979.16
		- Biogenic CO2	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- CH4	tCO2e	-	-	-	-	-	-	-	-	-	1.80	-	-	-	-	21.48
		- N2O	tCO2e	-	-	-	-	-	-	-	-	-	3.67	-	-	-	-	43.66
		- Other Biogenic (CH4 & N2O)	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Total Indirect GHG emission from power and biogas purchased (SCOPE 2) (Gross market-based scope 2 GHG emissions)	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- CO2	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		- Biogenic CO2	tCO2e	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scope 1+2		Total GHG emissions (SCOPE 1+2)	tCO2e	987,764.23	914,812.22	909,042.32	892,436.34	826,650.84	-	-	-	-	1,069.96	4,271.07	8,802.72	9,141.05	8,014.10	7,372.16
GRI305-4		GHGs Intensity	tCO2e / raw material	0.14	0.14	0.14	0.13	0.12										

Remarks:

- Bangchak Corporation Public Company Limited (Refinery Bussiness, M-Tower and Regional office and Marketing Business) firstly disclosed GHG emission scope 3 in 2021.

1. The report of GHG emissions scope 3 data are calculated by using the BCP GHGs calculation tool in accordance with IPCC 2006

2. The calculation of scope 3 GHG emissions from upstream and downstream uses emission factor values from Energy Policy and Planning Office, Ministry of Energy and Thailand Greenhouse Gas Management Organization's emission factors and Thai National LCI Database, TIIS-MTEC-NSTDA (with TGO electricity 2016-2018).

3. Conversion of fuel to energy by applying heating value provided by the Department of Alternative Energy Development and Efficiency.

4. Global Warming Potential (GWP) values are based on the Fourth Assessment Report (AR4) of the Greenhouse Gas Protocol.

5. The ratio of GHG emission scope 3 is compared with scope 1 and scope 2, and evaluated using the value at 0.5% which are considered on the borderline of statistical significance. The value which is not reach 0.5% will not be reported in GHG emission scope 3.

6. The production transportation reported from the refinery is the transport of finished petroleum products but exclude Heavy fuel oil, and lubricant products.

7. Upstream crude oil transportation does not include crude oil transportation from oversea.

8. Reduction of GHG emissions are calculated from Energy Saving activities which Implemented during year 2021.

Business units			Refinery Business					M-Tower and Reginal office					Marketing Business					
GHG emissions scope 3																		
Indicators	Material Aspects		Unit	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
GRI305-3 (scope 3)	Reports according to Operational Control Approach	Other relevant indirect GHG emission (SCOPE 3)																
		Other relevant indirect GHG emission (SCOPE 3)	tCO2e	-	-	-	-	424,801.41	-	-	-	-	0.00	-	-	-	-	2841463.00
		Upstream	tCO2e	-	-	-	-	396,265.56	-	-	-	-	0.00	-	-	-	-	423336.80
		- Purchased goods and services	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	423014.95
		- Crude oil transportation	tCO2e	-	-	-	-	394,544.45	-	-	-	-	0.00	-	-	-	-	0.00
		- Upstream transportation and distribution	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	53.13
		- Use of municipal water	tCO2e	-	-	-	-	1,672.72	-	-	-	-	0.00	-	-	-	-	268.73
		- Waste transportation	tCO2e	-	-	-	-	48.39	-	-	-	-	0.00	-	-	-	-	0.00
		- Business travel	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	0.00
		- Employee commuting	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	0.00
		Downstream	tCO2e	-	-	-	-	28,535.84	-	-	-	-	0.00	-	-	-	-	2,418,126.20
		- Product transportation	tCO2e	-	-	-	-	28,535.84	-	-	-	-	0.00	-	-	-	-	0.00
		- Processing of sold products	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	0.00
		- Use of sold products	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	2418126.20
		- End-of-life treatment of sold products	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	0.00
		- Franchises	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	0.00
GRI305-3 (scope 3)	Reports according to Equity Share Approach	Other relevant indirect GHG emission (SCOPE 3)																
		Other relevant indirect GHG emission (SCOPE 3)	tCO2e	-	-	-	-	424,801.41	-	-	-	-	0.00	-	-	-	-	1,393,711.17
		Upstream	tCO2e	-	-	-	-	396,265.56	-	-	-	-	0.00	-	-	-	-	208,829.33
		- Purchased goods and services	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	208,642.09
		- Crude oil transportation	tCO2e	-	-	-	-	394,544.45	-	-	-	-	0.00	-	-	-	-	-
		- Upstream transportation and distribution	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	53.13
		- Use of municipal water	tCO2e	-	-	-	-	1,672.72	-	-	-	-	0.00	-	-	-	-	134.11
		- Waste transportation	tCO2e	-	-	-	-	48.39	-	-	-	-	0.00	-	-	-	-	-
		- Business travel	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
		- Employee commuting	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
		Downstream	tCO2e	-	-	-	-	28,535.84	-	-	-	-	0.00	-	-	-	-	1,184,881.84
		- Product transportation	tCO2e	-	-	-	-	28,535.84	-	-	-	-	0.00	-	-	-	-	-
		- Processing of sold products	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
		- Use of sold products	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	1,184,881.84
		- End-of-life treatment of sold products	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
		- Franchises	tCO2e	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
GRI305-5	Reduction of GHG emissions																	
	Total estimated annual CO2 savings	tCO2e	-	-	-	-	8,308.62											

Remarks:

- Bangchak Corporation Public Company Limited (Refinery Bussiness, M-Tower and Regional office and Marketing Business) firstly disclosed GHG emission scope 3 in 2021.
- 1. The report of GHG emissions scope 3 data are calculated by using the BCP GHGs calculation tool in accordance with IPCC 2006
- 2. The calculation of scope 3 GHG emissions from upstream and downstream uses emission factor values from Energy Policy and Planning Office, Ministry of Energy and Thailand Greenhouse Gas Management Organization’s emission factors and Thai National LCI Database,TIIS-MTEC-NSTDA (with TGO electricity 2016-2018).
- 3. Conversion of fuel to energy by applying heating value provided by the Department of Alternative Energy Development and Efficiency.
- 4. Global Warming Potential (GWP) values are based on the Fourth Assessment Report (AR4) of the Greenhouse Gas Protocol
- 5. The ratio of GHG emission scope 3 is compared with scope 1 and scope 2, and evaluated using the value at 0.5% which are considered on the borderline of statistical significance. The value which is not reach 0.5% will not be reported in GHG emission scope 3.
- 6. The production transportation reported from the refinery is the transport of finished petroleum products but exclude Heavy fuel oil, and lubricant products.
- 7. Upstream crude oil transportation does not include crude oil transportation from oversea.

/1 Calculated from production capacity using a third-party entity

/2 Include VOC Inventory from combustion, flare, tank, marketing and terminal, and wastewater

/3 Use emission factors from AP 42-US EPA, for VOC inventory calculation from combustion, flare, and marketing and terminal. Tank 4 program and Water 9 program are used as tools for VOC inventory calculation from tank and wastewater respectively

/4 Calibrated measurement tools

/5 Including Flared hydrocarbon from Plant 2, 3, 4

Indicator	Material Aspects	Unit	2017	2018	2019	2020	2021
GRI 303-3 (2018)	Total water withdrawal by source (excluded brine water from Crude oil extraction)	Million cubic meters	2,539	2,381	2,697	2,495	2,411
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	N/A	N/A	N/A	2,395	2,294
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	N/A	N/A	N/A	0.100	0.117
	Total water withdrawal by source (Included brine water from Crude oil extraction)	Million cubic meters	2,539	2,381	2,697	21,325	2,444
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.008	0.030	2,395	2,294
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	18,930	0.150
	Total surface water withdrawal (From Chao Phraya River) ^{/1}	Million cubic meters	0.109	0.103	0.200	0.185	0.197
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/1,6}	Million cubic meters	N/A	N/A	N/A	0.085	0.080
	- Other water > 1000 mg/L Total Dissolved Solids ^{/1,6}	Million cubic meters	N/A	N/A	N/A	0.100	0.117
	Total groundwater withdrawal ^{/2}	Million cubic meters	0.0001	0.008	0.030	0.270	0.112
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/2,6}	Million cubic meters	0.0001	0.008	0.030	0.270	0.112
	- Other water > 1000 mg/L Total Dissolved Solids ^{/2,6}	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total seawater withdrawal	Million cubic meters	N/A	N/A	N/A	N/A	N/A
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	N/A	N/A	N/A	N/A	N/A
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	N/A	N/A	N/A	N/A	N/A

Waste management							
Indicator	Material Aspects	Unit	2017	2018	2019	2020	2021
GRI 303-3 (2018)	Total produced water withdrawal (from Crude oil extraction, processing or Raw material) ^{/3}	Million cubic meters	N/A	N/A	N/A	18.830	0.033
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/3 /6}	Million cubic meters	N/A	N/A	N/A	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids ^{/3 /6}	Million cubic meters	N/A	N/A	N/A	18.830	0.033
	Total third-party water withdrawal (municipal water supplies) ^{/4}	Million cubic meters	2.430	2.270	2.467	2.040	2.101
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/4 /6}	Million cubic meters	N/A	N/A	N/A	2.040	2.101
	- Other water > 1000 mg/L Total Dissolved Solids ^{/4 /6}	Million cubic meters	N/A	N/A	N/A	0.000	0.000
	Total water withdrawal in water stressed areas	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total surface water withdrawal (From Chao Phraya River)	Million cubic meters	0.000	0.000	0.000	0.000	0.000
GRI 303-3 (2018)	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total groundwater withdrawal	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total seawater withdrawal	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total produced water withdrawal (from Crude oil extraction, processing or Raw material)	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
GRI 303-3 (2018)	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total third-party water withdrawal	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
GRI 303-4 (2018)	Total volume of water discharge in all areas	Million cubic meters	0.900	0.900	0.772	0.727	0.828
	Total water discharge from Refinery ^{/5}	Million cubic meters	0.900	0.900	0.772	0.725	0.827
	Surface water	Million cubic meters	0.900	0.900	0.772	0.725	0.827
	Groundwater	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Seawater	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Third-party water	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	Total water discharge from M-Tower ^{/5}	Million cubic meters	0.000	0.000	0.000	0.002	0.001
	Surface water	Million cubic meters	N/A	N/A	N/A	0.000	0.000
	Groundwater	Million cubic meters	N/A	N/A	N/A	0.000	0.000
	Seawater	Million cubic meters	N/A	N/A	N/A	0.000	0.000
GRI 303-4 (2018)	Third-party water	Million cubic meters	N/A	N/A	N/A	0.002	0.001
	Water discharge by freshwater and other water (Refinery) ^{/5}						
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/5 /6}	Million cubic meters	N/A	N/A	N/A	0.176	0.206
	- Other water > 1000 mg/L Total Dissolved Solids ^{/5 /6}	Million cubic meters	N/A	N/A	N/A	0.551	0.621
	Water discharge by freshwater and other water (M-Tower) ^{/5}						
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids ^{/5 /6}	Million cubic meters	N/A	N/A	N/A	0.0005	0.0011
	- Other water > 1000 mg/L Total Dissolved Solids ^{/5 /6}	Million cubic meters	N/A	N/A	N/A	0.0014	0.0000
	Water discharge by freshwater and other water in water stressed areas	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Freshwater ≤ 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Other water > 1000 mg/L Total Dissolved Solids	Million cubic meters	0.000	0.000	0.000	0.000	0.000

Waste management							
Indicator	Material Aspects	Unit	2017	2018	2019	2020	2021
GRI 303-5 (2018)	Total water consumption (excluded brine water from Crude oil extraction) = Total water withdrawal (excluded brine water from Crude oil extraction) - Total volume of water discharged in all area						
	- Total water consumption (Excluded brine water from crude oil extraction)	Million cubic meters	1.639	1.481	1.926	1.768	1.582
	- Total water consumption in water stressed area.	Million cubic meters	0.000	0.000	0.000	0.000	0.000
	- Change in water storage, if water storage has been identified as having a significant water-related impact.	Million cubic meters	0.000	0.000	0.000	0.000	0.000
GRI 303-4d. (2018)	Effluents from the Refinery						
	COD ^{/6}	ton	39.23	39.02	53.31	33.22	28.98
	BOD ^{/6}	ton	4.43	4.76	7.32	6.53	4.85
	Oil and Grease ^{/6}	ton	1.36	4.52	2.22	2.17	2.48
	TSS ^{/6}	ton	9.04	11.15	8.23	4.54	4.87
	TDS ^{/6}	ton	1,105.00	791.03	1,125.09	973.23	1,100.98
	Sulfide ^{/6}	ton	0.180	0.904	0.341	0.094	0.261
	Mercury ^{/6}	ton	0.000	0.001	0.000	0.001	0.001
	Effluents from Bangchak Head Office at M Tower						
	COD (Ton) ^{/6}	ton	N/A	N/A	N/A	N/A	N/A
	BOD (Ton) ^{/6}	ton	N/A	N/A	N/A	0.007	0.003
	Oil and Grease (Ton) ^{/6}	ton	N/A	N/A	N/A	0.002	0.002
	TSS (Ton) ^{/6}	ton	N/A	N/A	N/A	0.017	0.017
	TDS (Ton) ^{/6}	ton	N/A	N/A	N/A	0.550	0.285
	Sulfide (Ton) ^{/6}	ton	N/A	N/A	N/A	0.002	0.001
	Mercury (Ton) ^{/6}	ton	N/A	N/A	N/A	N/A	N/A

- In 2020, Bangchak started to report water and effluents according to GRI 303 (2018). The previous data in 2017 -2019, were recategorized where possible to report as per new criteria. The data in 2017 - 2019 which not meet the new criteria will be replaced by N/A.

Remark:

/1 The volume of total surface water withdrawal is collected from pump capacity or tank volume.

/2 The volume of total groundwater withdrawal is collected from meter reading.

/3 The volume of total produced water withdrawal from Crude oil extraction, processing or Raw material is calculated from the ratio of oil / brine.

/4 The volume of total 3rd party water withdrawal is collected from invoices.

/5 The volume of total water discharged is collected from flowmeter reading.

/6 Characteristics of water is collected from analysis result from 3rd party laboratory which is licensed by department of Industry work.

Waste management							
Indicator	Material Aspects	Unit	2017	2018	2019	2020	2021
GRI306-3	Routine wastes						
	Total waste generated	Metric tons/year	1,946.74	15,609.00	5,984.27	3,157.79	2,940.80
	Hazardous waste ^{/1}	Metric tons/year	1,570.75	2,808.28	2,023.00	2,671.00	1,414.61
	Percentage of 'Hazardous waste	%	80.69%	17.99%	33.81%	84.58%	48.10%
	Non-hazardous waste ^{/1}	Metric tons/year	332.32	220.21	158.00	388.00	267.06
	Percentage of 'Non-hazardous waste	%	17.07%	1.41%	2.64%	12.29%	9.08%
	Non-routine wastes						
	Hazardous waste from oil and chemical spill clean-up ^{/2}	Metric tons/year	1.07	0.00	0.00	0.00	0.00
	Percentage of 'Hazardous waste from oil and chemical spill clean-up	%	0.05%	0.00%	0.00%	0.00%	0.00%
	Construction waste ^{/2}	Metric tons/year	42.60	10,582.61	3,696.27	97.00	0.00
	Percentage of Construction waste	%	2.19%	67.80%	61.77%	3.07%	0.00%
	Hazardous waste for Turnaround Maintenance ^{/2}	Metric tons/year	0.00	1,916.35	106.00	1.77	1,204.12
	Percentage of Hazardous waste for Turnaround Maintenance	%	0.00%	12.28%	1.77%	0.06%	40.95%
	Non-Hazardous waste for Turnaround Maintenance ^{/2}	Metric tons/year	0.00	81.55	1.00	0.02	55.01
	Percentage of Non-Hazardous waste for Turnaround Maintenance	%	0.00%	0.52%	0.02%	0.00%	1.87%

/1 Weight from waste manifest

/2 Estimate from volum of waste sent to disposal based on calculation of number of bags per container and average weight per bag /container

Waste management							
Indicator	Material Aspects	Unit	2017	2018	2019	2020	2021
GRI 306-3 (HW+NHW)	* HW - Hazardous waste, NHW - Non-hazardous waste						
	Total waste generated ^{/1}	Metric tons/year	1,903.07	15,609.37	5,984.87	3,161.27	2,940.80
	- Total Hazardous Waste	Metric tons/year	1,570.75	4,725.01	2,128.90	2,676.61	2,618.73
	- Total Non-hazardous Waste	Metric tons/year	332.32	10,884.37	3,855.97	484.66	322.07
	Total rate of Diversion from Landfill% (The amount of waste that is diverted away from landfills)	%	100.00%	100.00%	99.75%	100.00%	100.00%
	- Waste diverted from disposal by reused and recycling	%	31%	30%	10%	26%	47%
	- Waste divert from disposal by other operation methods	%	2%	68%	62%	2%	9%
	- Waste direct to disposal with energy recovery (alternative fuel / fuel blending)	%	65%	2%	28%	72%	43.77%
	- Waste direct to disposal without energy recovery	%	1.49%	0.28%	0.01%	0.04%	0.22%
	- Waste direct to disposal by other disposal operation	%	0.00%	0.00%	0.00%	0.00%	0.00%
	- Landfilling rate %	%	0.00%	0.00%	0.25%	0.00%	0.00%
GRI 306-3 (HW)	Total Hazardous waste -Diverted from disposal and Directed to Disposal off site ^{/1}	Metric tons/year	1,570.75	4,725.01	2,128.90	2,676.61	2,618.73
GRI 306-4 (HW)	Hazardous waste diverted from disposal - off site ^{/1}	Metric tons/year	564.26	4,320.73	570.54	484.94	1,462.86
	- Preparation for reuse	Metric tons/year	0.00	0.00	0.00	0.00	0.00
	- Recycling	Metric tons/year	564.26	4,320.73	570.54	484.94	1,220.57
	- Other recovery operation (Reclamation/regeneration of metal and metal compounds)	Metric tons/year	0.00	0.00	0.00	0.00	242.29
GRI 306-5 (HW)	Hazardous waste direct to disposal - off site ^{/1}	Metric tons/year	1,006.49	404.28	1,558.36	2,191.67	1,155.87
	- * DIW Incineration (with energy recovery: alternative fuel / fuel blending)	Metric tons/year	1,006.49	360.28	1,543.00	2,190.40	1,149.29
	- Incineration (without energy recovery)	Metric tons/year	0.00	44.00	0.40	1.27	6.58
	- Landfilling	Metric tons/year	0.00	0.00	14.96	0.00	0.00
	- Other disposal operations *	Metric tons/year	0.00	0.00	0.00	0.00	0.00
GRI 306-3 (NHW)	Total Non-Hazardous waste -Diverted from disposal and Directed to Disposal off site ^{/1}	Metric tons/year	332.32	10,884.37	3,855.97	484.66	322.07
GRI 306-4 (NHW)	Non-hazardous waste diverted from disposal - off site ^{/1}	Metric tons/year	70.69	10,884.37	3,701.82	395.72	184.26
	- Preparation for reuse	Metric tons/year	0.00	0.00	0.00	0.00	0.00
	- Recycling	Metric tons/year	28.09	301.76	5.55	321.96	166.28
	- Other recovery operation (other recovery unlisted materials)	Metric tons/year	0.00	0.00	0.00	0.00	17.98
	- Other recovery operation (Land reclamation: Using construction waste)	Metric tons/year	42.60	10,582.61	3,696.27	73.76	0.00
GRI 306-5 (NHW)	Non-hazardous waste direct to disposal - off site ^{/1}	Metric tons/year	261.63	0.00	154.15	88.94	137.81
	- Incineration (with energy recovery: alternative fuel / fuel blending)	Metric tons/year	233.35	0.00	154.15	88.94	137.81
	- Incineration (without energy recovery)	Metric tons/year	28.28	0.00	0.00	0.00	0.00
	- Landfilling	Metric tons/year	0.00	0.00	0.00	0.00	0.00
	- Other disposal operations	Metric tons/year	0.00	0.00	0.00	0.00	0.00
* Declaration for Hazardous waste direct to disposal							
According to Department of Industrial Works (DIW), Bangchak refinery have complied with DIW's Announcement of Waste processor B.E. 2550, Best Practice of Waste Management and Disposal B.E. 2551 and Hazardous Substance Act. 2535 and the waste management have been classified and managed according to Notification of Ministry of Industry Re: Industrial Waste Disposal B.E. 2548 (2005). Waste management can be classified into 8 methods as follows: Method 01 Sorting, Method 02 Storage, Method 03 Reuse, Method 04 Recycle, Method 05 Recovery, Method 06 Treatment, Method 07 Disposal and Method 08 Others.							
* DIW	Hazardous waste direct to disposal ^{/1}	Metric tons/year	1006.49	404.28	1543.40	2191.67	1155.87
04	- Recycle (042, 041, 044 and 049)						
	- 041: Use as fuel substitution or burn for energy recovery	Metric tons/year	1,006.49	360.28	1,543.00	2,190.40	1,149.29
	- 042: Fuel blending						
	- 044: Use as co-material in cement kiln or rotary kiln (specify product)						
07	- Disposal (075: Burn for destruction in hazardous waste incinerator)	Metric tons/year	0.00	44.00	0.40	1.27	6.58

^{/1} Disposal methods and quantity from DIW waste disposal permit documents and manifests

Hydrocarbon Spills

Indicator	Material Aspects	Unit	2017	2018	2019	2020	2021
GRI306-3 (2016) <small>Sector standard reference 11.8.2</small>	** 306-3: Significant spills (GRI additional sector recommendations) (**The effluents-related content of the GRI Standard GRI 306: Effluents and Waste 2016 has been superseded by GRI Standard GRI 303: Water and Effluents 2018, and the waste-related content has been superseded by GRI 306: Waste 2020. The spills-related content in GRI 306: Effluents and Waste 2016 remains in effect.)						
	Hydrocarbon Spills						
	Hydrocarbon spills > 100 barrels per time						
	- Number of case related to hydrocarbon spills (> 100 barrels / time)	cases	0	0	0	0	0
	- Volume of hydrocarbon spills (> 100 barrels / time)	barrels	0.00	0.00	0.00	0.00	0.00
		liters	0.00	0.00	0.00	0.00	0.00
	Hydrocarbon spills > 1 barrels per time (but not over 100 barrels)						
	- Number of case related to hydrocarbon spills (> 1 barrels / time)	cases	1	3	2	3	0
	- Volume of significant hydrocarbon spills (> 1 barrels / time)	barrels	3.00	141.00	4.00	11.00	0.00
		liters	480.00	22,560.00	640.00	1,760.00	0.00
	- Volume of hydrocarbon > 1 barrel spilled into the environment	barrels	3.00	74.00	0.00	0.00	0.00
		liters	480.00	11,840.00	0.00	0.00	0.00

Environment Compliance

GRI307-1	Environment Compliance						
	Number/Monetary Value of significant fines associated with environmental law violation	cases	0	0	0	0	0

Social Performance

Employment												
Indicators	Material Aspects	Unit	2017		2018		2019		2020		2021	
			Persons	%	Persons	%	Persons	%	Persons	%	Persons	%
GRI 102-8 GRI 401-1	Employment											
	Employee* (Persons) The Company has an exclusive full-time employment policy. There are no temporary, part-time, or self-employment and no seasonal difference in manpower											
	By gender											
	Total employees	persons/percentage	1,240.00	100.00	1,254.00	100.00	1,251.00	100.00	1,230.00	100.00	1,103.00	100.00
	Male	persons/percentage	866.00	69.84	881.00	70.26	868.00	69.38	854.00	69.43	759.00	68.81
	Female	persons/percentage	374.00	30.16	373.00	29.74	383.00	30.62	376.00	30.57	344.00	31.19
	By religion											
	Total	persons/percentage	1,240.00	100.00	1,254.00	100.00	1,251.00	100.00	1,230.00	100.00	1,103.00	100.00
	Buddhism	persons/percentage	1189.00	95.89	1205.00	96.09	1204.00	96.24	1182.00	96.10	1060.00	96.10
	Christian - Catholic	persons/percentage	23.00	1.85	27.00	2.16	22.00	1.76	24.00	1.95	19.00	1.72
	Islam	persons/percentage	27.00	2.18	21.00	1.67	23.00	1.84	22.00	1.79	20.00	1.82
	Others	persons/percentage	1.00	0.08	1.00	0.08	2.00	0.16	2.00	0.16	4.00	0.36
	By generation											
	Total	persons/percentage	1,240.00	100.00	1,254.00	100.00	1,251.00	100.00	1,230.00	100.00	1,103.00	100.00
	Baby Boom	persons/percentage	47.00	3.79	42.00	3.35	36.00	2.88	22.00	1.79	14.00	1.26
	Generation X	persons/percentage	546.00	44.03	550.00	43.86	541.00	43.25	533.00	43.33	451.00	40.89
	Generation Y	persons/percentage	627.00	50.56	632.00	50.40	625.00	49.96	626.00	50.89	585.00	53.04
	Generation Z	persons/percentage	20.00	1.61	30.00	2.39	49.00	3.92	49.00	3.98	53.00	4.81
	By level											
	Level 10-14: Executive up	persons/percentage	136.00	10.97	151.00	12.04	158.00	12.63	161.00	13.09	158.00	14.32
	Male	persons/percentage	91.00	7.34	103.00	8.21	103.00	8.23	103.00	8.37	97.00	8.79
	Female	persons/percentage	45.00	3.63	48.00	3.83	55.00	4.40	58.00	4.72	61.00	5.53
	Level 8-9: Senior Officer	persons/percentage	225.00	18.15	224.00	17.86	235.00	18.78	234.00	19.02	231.00	20.94
	Male	persons/percentage	142.00	11.45	138.00	11.00	147.00	11.75	150.00	12.20	148.00	13.42
	Female	persons/percentage	83.00	6.69	86.00	6.86	88.00	7.03	84.00	6.83	83.00	7.52
	Level 5-7: Manager up	persons/percentage	443.00	35.73	461.00	36.76	462.00	36.93	454.00	36.91	390.00	35.36
	Male	persons/percentage	257.00	20.73	278.00	22.17	270.00	21.58	263.00	21.38	227.00	20.58
	Female	persons/percentage	186.00	15.00	183.00	14.59	192.00	15.35	191.00	15.53	163.00	14.78
	Level 1-4 : Practitioner	persons/percentage	436.00	35.16	418.00	33.33	396.00	31.65	381.00	30.98	324.00	29.37
	Male	persons/percentage	376.00	30.32	362.00	28.87	348.00	27.82	338.00	27.48	287.00	26.02
	Female	persons/percentage	60.00	4.84	56.00	4.47	48.00	3.84	43.00	3.50	37.00	3.35
	By age group											
	Less than 30 years	persons/percentage	308.00	24.84	328.00	26.16	287.00	22.94	205.00	16.67	154.00	13.96
	Between 30-50 years	persons/percentage	811.00	65.40	810.00	64.59	827.00	66.11	875.00	71.14	809.00	73.35
	More than 50 years	persons/percentage	121.00	9.76	116.00	9.25	137.00	10.95	150.00	12.20	140.00	12.69
	By area											
	Head office	persons/percentage	530.00	42.74	544.00	43.38	545.00	43.57	533.00	43.33	476.00	43.16
	Refinery	persons/percentage	642.00	51.77	634.00	50.56	630.00	50.36	620.00	50.41	551.00	49.95
	North District	persons/percentage	10.00	0.81	9.00	0.72	10.00	0.80	9.00	0.73	10.00	0.91
	Central District	persons/percentage	41.00	3.31	49.00	3.91	49.00	3.92	49.00	3.98	46.00	4.17
	North-East District	persons/percentage	10.00	0.81	10.00	0.80	9.00	0.72	11.00	0.89	12.00	1.09
	South District	persons/percentage	7.00	0.56	8.00	0.64	8.00	0.64	8.00	0.65	8.00	0.73

Diversity												
Indicators	Material Aspects	Unit	2017		2018		2019		2020		2021	
GRI 405-1	Diversity											
	Percentage of female share of total workforce	percentage					30.62		30.57		31.19	
	Percentage of women in all management position (Junior,middle and Top management)	percentage					36.39		35.95		37.79	
	Percentage of females in junior management positions, i.e. first level of management (as % of total junior management positions)	percentage					37.47		35.90		35.93	
	Percentage of females in top management positions : Maximum two levels away from the CEO	percentage					39.13		41.67		36.36	
	Percentage of females in management positions in revenue generating functions (excluding support fuctions such as HR,IT,Legal etc.)	percentage					22.58		22.44		24.15	
	Science Technology Engineering and Mathematics (Women in STEM)	percentage					27.60		26.45		24.64	
	Percentage of workforce based on other minority group - people with disability	percentage					1.00		1.00		1.00	
Employees Turnover												
Indicators	Material Aspects	Unit	2017		2018		2019		2020		2021	
			Persons	%	Persons	%	Persons	%	Persons	%	Persons	%
GRI 401-1	Employees Turnover											
	Turnover rate	percentage	4.00		3.55		5.36		3.16		5.13	
	Turnover rate by gender											
	Male	persons/percentage	31	63.27	27	58.70	52	74.29	25	64.10	37	64.91
	Female	persons/percentage	18	36.73	19	41.30	18	25.71	14	35.90	20	35.09
	Turnover rate by age											
	Less than 30 years	persons/percentage	28	57.14	20	43.48	39	55.71	18	46.15	27	47.37
	Between 30-50 years	persons/percentage	21	42.86	25	54.35	27	38.57	17	43.59	28	49.12
	More than 50 years	persons/percentage	0	0.00	1	2.17	4	5.71	4	10.26	2	3.51
	New Employees											
	By gender											
	Male	persons/percentage	61	58.65	46	68.66	45	60.81	19	63.33	21	48.84
	Female	persons/percentage	43	41.35	21	31.34	29	39.19	11	36.67	22	51.16
	By age											
	Less than 30 years	persons/percentage	86	82.69	37	55.22	55	74.32	24	80.00	24	55.81
	Between 30-50 years	persons/percentage	18	17.31	27	40.30	16	21.62	6	20.00	17	39.53
	More than 50 years	persons/percentage	0	0.00	3	4.48	3	4.05	0	0	2	4.65
	Parental leave											
	Parental leave	persons/percentage	4	0.32	5	0.40	7	0.56	4	0.33	8	0.73
	Employees back to work after parental leave	persons/percentage	4	0.32	5	0.40	7	0.56	4	0.33	8	0.73
Employee development												
Indicators	Material Aspects	Unit	2017		2018		2019		2020		2021	
GRI 404-1	Employee development (training hours / person / year)											
	Total training hour	hours	55,926.00		57,487.00		56,448.50		28,650.27		30,869.65	
	Total average training hour	hours	45.10		45.88		45.12		23.29		27.99	
	Average amount spent on training and development per FTEs	THB	62,855.51		47,048.98		28,120.00		8,717.66		14,447.45	
	By gender											
	Male	hours	42.66		43.07		42.82		21.05		29.03	
	Female	hours	50.76		52.65		50.35		28.18		25.69	
	By level											
	Level 10-14: Executive up	hours	63.91		56.66		52.33		45.15		53.66	
	Level 5-9: Manager up	hours	56.31		58.09		56.35		24.03		24.87	
Level 1-4 : Practitioner	hours	22.39		22.34		22.48		12.53		21.46		

Employee development													
Indicators	Material Aspects	Unit	2017		2018		2019		2020		2021		
GRI 404-1	Employee development (training hours / person / year)												
	Total training hour	hours	55,926.00		57,487.00		56,448.50		28,650.27		30,869.65		
	Total average training hour	hours	45.10		45.88		45.12		23.29		27.99		
	Average amount spent on training and development per FTEs	THB	62,855.51		47,048.98		28,120.00		8,717.66		14,447.45		
	By gender												
	Male	hours	42.66		43.07		42.82		21.05		29.03		
	Female	hours	50.76		52.65		50.35		28.18		25.69		
	By level												
	Level 10-14: Executive up	hours	63.91		56.66		52.33		45.15		53.66		
	Level 5-9: Manager up	hours	56.31		58.09		56.35		24.03		24.87		
GRI 404-1	Level 1-4 : Practitioner	hours	22.39		22.34		22.48		12.53		21.46		
	By business category												
	President & Chief Executive Officer (PS)	hours	56.00		104.29		56.45		38.45		31.84		
	Corporate Strategic Planning and Sustainability Development Group (CG)	hours	-		73.56		102.23		46.99		-		
	Corporate Management and Organization Development Group (MD)	hours	53.45		73.22		71.68		37.00		23.47		
	Accounting and Finance Group (AF)	hours	64.28		71.06		67.65		18.85		27.00		
	GRI 404-1	Marketing Business Group (MKBG)	hours	43.53		43.83		44.35		15.58		29.56	
		Refinery Business Group (RFBG)	hours	39.23		30.47		30.63		21.82		28.09	
		Natural Resource and Business Development (BD)	hours	63.00		-		-		-		-	
		Bio Based Product Business Unit (BBPU)	hours	-		-		-		-		-	
Natural Resource (NT)		hours	-		86.00		-		-		-		
Best Employer Score		percentage	61.00		67.00		56.00		56.00		N/A		
Employee Engagement Score		percentage	61.00		69.00		62.00		63.00		70.00		
Labour and Human rights Complaints		cases	0.00		0.00		0.00		0.00		0.00		
Harassment and Discrimination Complaints		cases	0.00		0.00		0.00		0.00		0.00		
Ratio of basic salary and remuneration													
Indicators	Material Aspects	Unit	2017		2018		2019		2020		2021		
			Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	
GRI 405-2	Ratio of basic salary and remuneration of women to men												
	By gender												
	Gender	ratio									1.00	0.86	
	By age group												
	Less than 30 years	ratio									1.00	0.75	
	Between 30-50 years	ratio									1.00	0.83	
	More than 50 years	ratio									0.96	1.00	
	By religious												
	Buddhism	ratio									1.00	0.85	
	Others	ratio									0.78	1.00	
	By level												
	Level 10-14: Executive up	ratio									0.89	1.00	
	Level 8-9: Senior Officer	ratio									0.98	1.00	
	Level 5-7: Officer	ratio									0.94	1.00	
	Level 1-4 : Practitioner	ratio									1.00	0.89	
	By areas												
	Head office	ratio									0.79	1.00	
	Refinery	ratio									1.00	0.74	
	Others (North, Central, North-East and South)	ratio									0.78	1.00	
Indicators	Material Aspects	Unit	2017		2018		2019		2020		2021		
			Male : Female		Male : Female		Male : Female		Male : Female		Male : Female		
CSA	Gender pay gap (Male : Female)												
	Mean gender pay gap	percentage								-16.97		-15.66	
	Median gender pay gap	percentage								-20.29		-18.88	
	Mean bonus gap	percentage								-14.92		-14.47	
	Median bonus gap	percentage								-15.96		-17.83	

Occupational Health and Safety Performance

Indicators	Material Aspects	Unit	2017		2018		2019		2020		2021	
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
GRI 403-9	Workers covered by an occupational health and safety management system											
	Total Working Hours											
	- Employees	Hours	1,562,576.30		2,469,674.80		2,395,054.80		2,344,462.90		1,258,971	
		Hours	1,352,215.40	210,360.90	1,806,814.30	662,860.50	1,736,499.30	658,555.50	1,675,031.60	669,431.30	1,149,249.50	109,721.50
	- Contractors	Hours	5,509,197.90		5,459,788.80		6,564,583.52		7,815,554		2,810,960.50	
		Hours	4,253,591.00	1,255,606.90	4,250,297.90	1,209,490.90	4,714,105.12	1,850,478.40	5,959,383.00	1,856,171.00	2,238,417.50	572,543.00
	Absentee Rate											
	- Employees	Percentage	1.05		0.85	0.97	0.78	1.13	0.69	0.88	0.49	0.62
	Work-Related Injuries											
	GRI 403-9	Fatality (as a result of Work-Related Injury)										
- Employees		Case	0.00		0.00		0.00		0.00		0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Case / Million work hours	0.00		0.00		0.00		0.00		0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Data coverage (percentage of operations)	100		100		100		100		100	
		- Contractors	Case	0.00		0.00		0.00		0.00		0.00
0.00				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Case / Million work hours			0.00		0.00		0.00		0.00		0.00	
			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Data coverage (percentage of operations)			100		100		100		100		100	
Total Recordable Injury Frequency Rate (TRIFR)												
- Employees		Case	1.00		3.00		0.00		1.00		0.00	
			1.00	0.00	3.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
		Case / million work hours	0.64		1.21		0.00		0.43		0.00	
			0.74	0.00	1.66	0.00	0.00	0.00	0.60	0.00	0.00	0.00
	Data coverage (percentage of operations)	100		100		100		100		100		
	- Contractors	Case	0.00		6.00		5.00		4.00		4.00	
			0.00	0.00	6.00	0.00	5.00	0.00	2.00	2.00	4.00	0.00
		Case / million work hours	0.00		1.10		0.76		0.38		1.42	
0.00			0.00	1.41	0.00	1.06	0.00	0.34	0.54	1.79	0.00	
Data coverage (percentage of operations)	100		100		100		100		100			
GRI 403-9	Lost-Time Injury Frequency Rate : LTIFR)											
	- Employees	Case	0.00		1.00		0.00		0.00		0.00	
			0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Case / million hours worked	0.00		0.40		0.00		0.00		0.00	
			0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Data coverage (percentage of operations)	100		100		100		100		100	
		- Contractors	Case	0.00		3.00		2.00		2.00		1.00
	0.00			0.00	3.00	0.00	2.00	0.00	2.00	0.00	1.00	0.00
	Case / million hours worked		0.00		0.55		0.30		0.26		0.36	
			0.00	0.00	0.71	0.00	0.42	0.00	0.34	0.00	0.45	0.00
	Data coverage (percentage of operations)		100		100		100		100		100	
	High-Consequence Work-Related Injuries											
	- Employees	Case	N/A		N/A		0.00		0.00		0.00	
			N/A	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00
		Data coverage (percentage of operations)	N/A		N/A		100		100		100	
		- Contractors	Case	N/A		N/A		0.00		0.00		0.00
N/A				N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Data coverage (percentage of operations)			N/A		N/A		100		100		100	

Indicators	Material Aspects	Unit	2017		2018		2019		2020		2021	
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
GRI 403-9	Injury Severity Rate (ISR)											
	- Employees	Day per 1 million working hours	0.00	0.00	7.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Data coverage (percentage of operations)	100		100		100		100		100	
	- Contractors	Day per 1 million working hours	0.00	0.00	9.18	0.00	1.27	0.00	1.34	0.00	2.30	0.00
		Data coverage (percentage of operations)	100		100		100		100		100	
GRI 403-9	Near Miss											
	- Employees and Contractors	Case	28		17		35		101		24	
	- Employees	Case	25		15		19		12		21	
	- Contractors	Case	3		2		16		1		3	
	- Data coverage	(percentage of operations)	100		100		100		100		100	
GRI 403-10	Work-Related Illnesses											
	Occupational Illness Frequency Rate : OIFR											
	- Employees	Total case	N/A		N/A		0		0		0	
		Case by genders	N/A	N/A	N/A	N/A	0	0	0	0	0	0
		Case / Million work hours	N/A		N/A		0		0		0	
			N/A	N/A	N/A	N/A	0	0	0	0	0	0
		Fatality	0		0		0		0		0	
		Data coverage (percentage of operations)	N/A		N/A		100		100		100	
	Process Safety Events											
	Process Safety Events - Tier 1	Event	0		0		0		0		0	
		Event / Million work hours	0		0		0		0		0	
		Data coverage (percentage of operations)	100		100		100		100		100	
	Process Safety Events - Tier 2	Event	0		0		0		0		0	
		Event / Million work hours	0		0		0		0		0	
		Data coverage (percentage of operations)	100		100		100		100		100	
	PSM Assessment Score											
	PSM Assessment Score (2021 Target : 3.3)	score	2.3		2.7		3.1		3.3		3.5	

*Injuries are excluded first aid in the injury rate (IR) and lost days count begins the scheduled work day after the accident.Customer Responsibility Unit 2016 2017 2018

Customer Responsibility

Indicator	Material Aspects	Unit	2017	2018	2019	2020	2021
GRI102-43	Customer Satisfaction						
	End Users at Service Stations						
	Customer Satisfaction : End users	percentage	80.50	85.80	86.60	88.10	87.45
	Net Promoter ranking (NPS)	Ranking	Ranking 1st (Joint)	Ranking 1st (Joint)	Ranking 1st (Joint)	Ranking 1st (Joint)	Ranking 1st (Joint)
GRI102-44	Net Promoter Score (NPS)	percentage	77.50	71.50	76.10	81.30	77.50
	Industrial customers						
GRI417-3	- Industrial customers satisfaction score	percentage	88.87	82.00	87.00	83.30	91.50
	Incidents of non-compliance concerning marketing communications						
	Significant Case of customers data breach	cases	0	0	0	0	0
GRI419-1	Significant Case of Non compliance in marketing communication laws	cases	0	0	0	0	0
	Non-compliance with laws and regulations in the social and economic area						
GRI419-1	Number/Monetary Value of significant fines associated with economic and social law violation	cases	0	0	0	0	0

GRI Content Index

GRI Standard	Disclosure	Page number(s) and/or URL(s)	Omission	SDGs	External Assurance
GRI 101: Foundation 2016					
GRI 102 : General Disclosures 2016					
GRI 102 General Disclosure 2016	ORGANIZATIONAL PROFILE				
	102-1	Name of the organization	11		
	102-2	Activities, brands, products, and services	11		
	102-3	Location of headquarters	11		
	102-4	Location of operations	11-13		
	102-5	Ownership and legal form	14		
	102-6	Markets served	11		
	102-7	Scale of the organization	11		
	102-8	Information on employees and other workers	117-119	SDG 8 – Employment	
	102-9	Supply chain	16-17		
	102-10	Significant changes to the organization and its supply chain	6		
	102-11	Precautionary Principle or approach	66		
	102-12	External initiatives	61, 63, 90-93		
	102-13	Membership of associations	11		
	STRATEGY				
	102-14	Statement from senior decision-maker	9-10		
	102-15	Key impacts, risks, and opportunities	66		
	ETHICS AND INTEGRITY				
	102-16	Values, principles, standards, and norms of behavior	23, 61, 63, 101	SDG 16 – Ethical and lawful behavior	
	GOVERNANCE				
	102-18	Governance structure	11-13		
	102-19	Delegating authority	11-13		
	102-20	Executive-level responsibility for economic, environmental, and social topics	23		
	102-22	Composition of the highest governance body and its committees	23	SDG 5 – Women in leadership SDG 16 – Inclusive decision making SDG 16 – Effective, accountable and transparent governance	
	102-23	Chair of the highest governance body	11-13		
	102-24	Nominating and selecting the highest governance body	Annual Registration Statement / Annual Report 2021, 165	SDG 5 – Women in leadership SDG 16 – Inclusive decision making SDG 16 – Effective, accountable and transparent governance	
	102-25	Conflicts of interest	61, 63		
	102-26	Role of highest governance body in setting purpose, values, and strategy	23		
	102-28	Evaluating the highest governance body's performance	23		
	102-29	Identifying and managing economic, environmental, and social impacts	66-77	SDG 16 – Inclusive decision making	
	102-32	Highest governance body's role in sustainability reporting	40		
	102-33	Communicating critical concerns	40		
	STAKEHOLDER ENGAGEMENT				
	102-40	List of stakeholder groups	25		Yes
	102-41	Collective bargaining agreements	134	SDG 8 – Freedom of association and collective bargaining	
	102-42	Identifying and selecting stakeholders	25		Yes
	102-43	Approach to stakeholder engagement	26-39		Yes
	102-44	Key topics and concerns raised	26-39		Yes
	REPORTING PRACTICE				
	102-45	Entities included in the consolidated financial statements	11		Yes
	102-46	Defining report content and topic boundaries	6		Yes
	102-47	List of material topics	41		
	102-48	Restatements of information	6		
	102-49	Changes in reporting	6		
	102-50	Reporting period	6		
	102-51	Date of most recent report	6		
	102-52	Reporting cycle	6		
	102-53	Contact point for questions regarding the report	6		
	102-54	Claims of reporting in accordance with the GRI Standards	6		
	102-55	GRI content index	184-186		
	102-56	External assurance	189-191		

GRI Standard		Disclosure	Page number(s) and/or URL(s)	Part Omitted	Omission Reason	Explanation	SDGs	External Assurance
Material Topics								
GRI 200 Economic Standard Series								
ECONOMIC PERFORMANCE								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	60-88					
	103-2	The management approach and its components	60, 66-77					
	103-3	Evaluation of the management approach	60, 66-77					
GRI 201: Economic Performance 2016	201-1	Direct economic value generated and distributed	161				SDG 2 – Infrastructure investments SDG 5 – Infrastructure investments SDG 7 – Infrastructure investments SDG 8 – Economic performance SDG 9 – Infrastructure investments, Research and development	
PROCUREMENT PRACTICE								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 79-83					
	103-2	The management approach and its components	79-83					
	103-3	Evaluation of the management approach	79-83					
GRI 204: Procurement Practices 2016	204-1	Proportion of spending on local suppliers	161				SDG 12 – Procurement practices	
Sustainable Supplier Development	BCP Indicator	Percentage of supplier satisfaction	81					
ANTI-CORRUPTION								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 63-65					
	103-2	The management approach and its components	63-65					
	103-3	Evaluation of the management approach	63-65					
GRI 205: Anti-Corruption 2016	205-2	Communication and training about anti-corruption policies and procedures	60				SDG 16 – Anti-corruption	
	205-3	Confirmed incidents of corruption and actions taken	60				SDG 16 – Anti-corruption	
INFORMATION TECHNOLOGY & CYBERSECURITY								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 86-88					
	103-2	The management approach and its components	86-88					
	103-3	Evaluation of the management approach	86-88					
Information Technology & Cybersecurity	BCP Indicator	Number of information security breaches/cybersecurity incidents	88					
Material Topics								
GRI 300 Environmental Standard Series								
ENERGY								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 90-114					
	103-2	The management approach and its components	90					
	103-3	Evaluation of the management approach	90, 162-176					
GRI 302: Energy 2016	302-1	Energy consumption within the organization	91-92, 162-171				SDG 7 – Energy efficiency, Renewable energy SDG 8 – Energy efficiency SDG 12 – Energy efficiency, Transport SDG 13 – Energy efficiency	Yes
	302-3	Energy intensity	91-92, 168-169				SDG 7 – Energy efficiency SDG 8 – Energy efficiency SDG 12 – Energy efficiency SDG 13 – Energy efficiency	
WATER AND EFFLUENTS								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 95-97					
	103-2	The management approach and its components	95-97, 172-173					
	103-3	Evaluation of the management approach	95-97, 172-173					

GRI Standard		Disclosure	Page number(s) and/or URL(s)	Part Omitted	Omission Reason	Explanation	SDGs	External Assurance
	303-1	Interactions with water as a shared resource	95-97				SDG 6 – Interaction	Yes
GRI 303: Water and Effluents 2018	303-2	Management of water discharge-related impacts	98				with water SDG 12 – Interaction with water	Yes
	303-3	Water withdrawal	95				SDG 6 – Water management	Yes
	303-4	Water discharge	98, 174				SDG 6 – Water withdrawal	Yes
	303-5	Water consumption	95-97, 172-173				SDG 6 – Water discharge	Yes
							SDG 6 – Water consumption	
EMISSIONS								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 92-94, 101-102					
	103-2	The management approach and its components	92-94, 101-102					
	103-3	Evaluation of the management approach	92-94, 101-102, 172					
GRI 305: Emissions 2016	305-1	Direct (Scope 1) GHG emissions	93-94, 166-169				SDG 3 – Air quality SDG 12 – Air quality, Transport SDG 13 – GHG emissions SDG 14 – Ocean acidification SDG 15 – Forest degradation	Yes
	305-2	Energy indirect (Scope 2) GHG emissions	93-94, 166-169				SDG 3 – Air quality SDG 12 – Air quality, Transport SDG 13 – GHG emissions SDG 14 – Ocean acidification SDG 15 – Forest degradation	Yes
	305-5	Reduction of GHG emissions	171					Yes
	305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	172				SDG 3 – Air quality SDG 12 – Air quality SDG 13 – GHG emissions SDG 14 – Ocean acidification SDG 15 – Forest degradation	Yes
	OG6	Volume of flared and vented hydrocarbon	172				SDG 3 – Air quality SDG 7 – Energy efficiency SDG 8 – Energy efficiency SDG 12 – Air quality, Energy efficiency, Waste SDG 13 – Energy efficiency SDG 14 – Ocean acidification	Yes
EFFLUENTS AND WASTE								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 101-102, 103					
	103-2	The management approach and its components	101-102, 103					
	103-3	Evaluation of the management approach	101-102, 103, 174-175					
GRI 306: Effluents and Waste 2016	306-2	Waste by type and disposal method	103, 174-175				SDG 3 – Spills SDG 6 – Waste, Water-related ecosystems and biodiversity SDG 12 – Waste	Yes
	306-3	Significant spills	99-100, 176				SDG 3 – Spills SDG 6 – Spills SDG 12 – Spills SDG 14 – Spills SDG 15 – Spills	Yes
	BCP Indicator	Plastic waste reduction	51, 159					
ENVIRONMENTAL COMPLIANCE								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 90-114					
	103-2	The management approach and its components	90-114					
	103-3	Evaluation of the management approach	90-114					
GRI 307: Environmental Compliance 2016	307-1	Non-compliance with environmental laws and regulations	176				SDG 16 – Compliance with laws and regulations	

GRI Standard		Disclosure	Page number(s) and/or URL(s)	Part Omitted	Omission Reason	Explanation	SDGs	External Assurance
SUPPLIER ENVIRONMENTAL ASSESSMENT								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 82-83					
	103-2	The management approach and its components	82-83					
	103-3	Evaluation of the management approach	82-83					
GRI 308: Supplier Environmental Assessment 2016	308-1	New suppliers that were screened using environmental criteria	82-83					
	308-2	Negative environmental impacts in the supply chain and actions taken	82-83					
ENVIRONMENTAL PROTECTION EXPENDITURES AND INVESTMENT								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 114					
	103-2	The management approach and its components	114					
	103-3	Evaluation of the management approach	114					
Environmental protection expenditures and investment type	BCP Indicator	Total environmental protection expenditures and investment type	114					
PRODUCT TRANSPORTATION								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39					
	103-2	The management approach and its components	111-113					
	103-3	Evaluation of the management approach	111-113					
Product Transportation	BCP Indicator	Percentage of Efficiency in Transportation Contract Management	111					
	BCP Indicator	Significant environmental impacts of transporting products	104-113					
ECO-EFFICIENCY								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 90					
	103-2	The management approach and its components	90					
	103-3	Evaluation of the management approach	90					
Eco-Efficiency	BCP Indicator	Eco-efficiency (EBITDA/Total GHG emissions of RFBG and MKBG)	90					
Material Topics								
GRI 400 Social Standard Series								
EMPLOYMENT								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 136-146					
	103-2	The management approach and its components	136-146					
	103-3	Evaluation of the management approach	136-146, 177-179					
GRI 401: Employment	401-1	New employee hires and employee turnover	138, 145, 177-178				SDG 5 – Gender equity SDG 8 – Employment, Youth employment	
OCCUPATIONAL HEALTH AND SAFETY								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 116-122					
	103-2	The management approach and its components	116-122					
	103-3	Evaluation of the management approach	116-122, 180-181					
GRI 403: Management Approach Disclosure 2018	403-1	Occupational health and safety management system	116					Yes
	403-2	Hazard identification, risk assessment, and incident investigation	117					Yes
	403-3	Occupational health services	118					Yes
	403-4	Worker participation, consultation, and communication on occupational health and safety	119					Yes
	403-5	Worker training on occupational health and safety	120					Yes
	403-6	Promotion of worker health	120					Yes
	403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	120					Yes
GRI 403: Occupational Health and Safety 2018	403-9	Work-related injuries	120-121				SDG 3 – Occupational health and safety SDG 8 – Occupational health and safety SDG 16 – Occupational health and safety	Yes
	403-10	Worker-related ill health	120-121				SDG 3 – Occupational health and safety SDG 8 – Occupational health and safety SDG 16 – Occupational health and safety	Yes
	OGSS	Emergency Preparedness	119					Yes
TRAINING AND EDUCATION								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25-39, 139-142					
	103-2	The management approach and its components	139-142					
	103-3	Evaluation of the management approach	139-142					

GRI Standard		Disclosure	Page number(s) and/or URL(s)	Part Omitted	Omission Reason	Explanation	SDGs	External Assurance
	404-1	Average hours of training per year per employee	178				SDG 4 – Employee training & education	
GRI 404: Training and Education 2016	404-3	Percentage of employees receiving regular performance and career development reviews	178				SDG 5 – Gender equity SDG 8 – Employee training & education	
HUMAN RIGHTS ASSESSMENT								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25–39, 129–134					
	103-2	The management approach and its components	129–134					
	103-3	Evaluation of the management approach	129–134					
GRI 412: Human Rights Assessment 2016	412-1	Operations that have been subject to human rights review or impact assessments	130					
LOCAL COMMUNITIES								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25–39, 147–160					
	103-2	The management approach and its components	147–160					
	103-3	Evaluation of the management approach	147–160					
GRI 413: Local Communities 2016	413-1	Operations with local community engagement, impact assessments, and development programs	147					
	413-2	Operations with significant actual and potential negative impacts on local communities						
	BCP Indicator	Community engagement score	147					
SUPPLIER SOCIAL ASSESSMENT								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25–39, 82–83					
	103-2	The management approach and its components	82–83					
	103-3	Evaluation of the management approach	82–83					
GRI 414: Supplier Social Assessment 2016	414-2	Negative social impacts in the supply chain and actions taken	83				SDG 5 – Workplace violence and harassment SDG 8 – Labor practices in the supply chain SDG 16 – Workplace violence and harassment	
	BCP Indicator	Number of suppliers that were self-assessed using SCOC criteria	82					
MARKETING AND LABELING								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25–39, 104–110, 123–128					
	103-2	The management approach and its components	104–110, 123–128					
	103-3	Evaluation of the management approach	104–110, 123–128					
GRI 417 MARKETING AND LABELING	417-3	Incidents of non-compliance concerning marketing communications	110, 181					
Product and service Development	BCP Indicator	Net Promoter Score (NPS) / Customer satisfaction	104–110, 123–128, 181					
SOCIOECONOMIC COMPLIANCE								
GRI 103 Management Approach 2016	103-1	Explanation of the material topic and its Boundary	25–39					
	103-2	The management approach and its components	61–64					
	103-3	Evaluation of the management approach	63–65					
GRI 419: Socioeconomic Compliance 2016	419-1	Non-compliance with laws and regulations in the social and economic area	181				SDG 16 – Compliance with laws and regulations	

The Adherence of the Ten Principles of the UN Global Compact

GC Scope or Principle	Criteria of GC Advanced Level	Bangchak Approach	Disclose
Scope: Implementing the Ten Principles into Strategies & Operations	Strategy, Governance and Engagement		
	1. The COP describes mainstreaming into corporate functions and business units	<ul style="list-style-type: none"> Bangchak and Sustainability Sustainability Strategy 	21 38–44
	2. The COP describes value chain implementation	<ul style="list-style-type: none"> Bangchak Overview Bangchak Value Chain Supply Chain Management 	10–11 14–15 62–64
Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights	Human rights		
Principle 2: Businesses should make sure that they are not complicit in human rights abuses	3. The COP describes robust commitments, strategies or policies in the area of human rights	<ul style="list-style-type: none"> Human Rights 	107–110
	4. The COP describes effective management systems to integrate the human rights principles		
	5. The COP describes effective monitoring and evaluation mechanisms of human rights integration		
Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining	Labour		
Principle 4: The elimination of all forms of forced and compulsory labour	6. The COP describes robust commitments, strategies or policies in the area of labour	<ul style="list-style-type: none"> Bangchak and Sustainability / Sustainability Policy 	21
Principle 5: The effective abolition of child labour	7. The COP describes effective management systems to integrate the labour principles	<ul style="list-style-type: none"> Stakeholder Engagement (Employee) 	24–25
Principle 6: The elimination of discrimination in respect of employment and occupation	8. The COP describes effective monitoring and evaluation mechanisms of labour principles integration	<ul style="list-style-type: none"> Safety & Occupational Health Human Rights Employee Stewardship 	98–101 107–110 111–120
Principle 7: Businesses should support a precautionary approach to environmental challenges	Environment		
Principle 8: Businesses should undertake initiatives to promote greater environmental responsibility	9. The COP describes robust commitments, strategies or policies in the area of environmental stewardship	<ul style="list-style-type: none"> Bangchak and Sustainability / Sustainability Policy 	21
Principle 9: Businesses should encourage the development and diffusion of environmentally friendly technologies	10. The COP describes effective management systems to integrate the environmental principles	<ul style="list-style-type: none"> Environment Performance 	21 70–91
	11. The COP describes effective monitoring and evaluation mechanisms for environmental stewardship	<ul style="list-style-type: none"> Sustainable Product and Service Eco-Efficiency Environmental Cost Accounting 	82–88 70 91

GC Scope or Principle	Criteria of GC Advanced Level	Bangchak Approach	Disclose
Principle 10: Businesses should work against corruption in all its forms, including extortion and briber	Anticorruption		
	12. The COP describes robust commitments, strategies or policies in the area of anticorruption	<ul style="list-style-type: none"> Bangchak and Sustainability / Sustainability Policy 	21
	13. The COP describes effective management systems to integrate the anti-corruption principle	<ul style="list-style-type: none"> Good Corporate Governance and Anti-Corruption 	51-54
	14. The COP describes effective monitoring and evaluation mechanisms for the integration of anti-corruption	<ul style="list-style-type: none"> Supply Chain Management 	62-64
Scope: Taking Action in Support of Broader UN Goals and Issues	UN Goals and Issues		
	15. The COP describes core business contributions to UN goals and issues	<ul style="list-style-type: none"> Bangchak and Sustainability / Principle and conceptual framework of sustainability 	21
	16. The COP describes strategic social investments and philanthropy	<ul style="list-style-type: none"> Community & Social Engagement 	121-127
	17. The COP describes advocacy and public policy engagement	<ul style="list-style-type: none"> Bangchak and Sustainability / Sustainability Policy 	21
	18. The COP describes partnerships and collective action	<ul style="list-style-type: none"> Principle and conceptual framework of sustainability 	21
Scope: Corporate Sustainability Governance and Leadership	Governance		
	19. The COP describes CEO commitment and leadership)	<ul style="list-style-type: none"> Message from the President and CEO Principle and conceptual framework of sustainability 	8-9 38-44
	20. The COP describes Board adoption and oversight	<ul style="list-style-type: none"> Bangchak and Sustainability / Sustainability Corporate Structure Good Corporate Governance 	21 51-54
	21. The COP describes stakeholder engagement	<ul style="list-style-type: none"> Bangchak and its stakeholders 	23-31



LRQA Independent Assurance Statement

Relating to the Bangchak Corporation Public Company Limited's Integrated Sustainability Report for the calendar year 2021

This Assurance Statement has been prepared for the Bangchak Corporation Public Company Limited in accordance with our contract but is intended for the readers of this Report.

Terms of engagement

LRQA was commissioned by the Bangchak Corporation Public Company Limited (BCP) to provide independent assurance on its Integrated Sustainability Report ("the report") against the assurance criteria below to a limited level of assurance at the materiality of the professional judgement of the verifier using LRQA's verification procedure for all specific standard disclosures listed below except for Energy consumption within the organization, Scope 1 GHG emissions, Scope 2 GHG emissions, GHG emissions intensity and reduction of GHG emissions where a reasonable level of assurance and 5% materiality is applied. LRQA's verification procedure is based on current best practice, is in accordance with ISAE 3000 and uses the following principles of - inclusivity, materiality, responsiveness and reliability of performance data.

Our assurance engagement covered BCP's operations and activities in Thailand under its operational control⁽¹⁾ and specifically the following requirements:

- Confirming that the report is in accordance with:
 - GRI Standard and core option
 - GRI Oil & Gas Sector Disclosure
- Evaluating the reliability of data and information for only the selected indicators listed below:
 - GRI 303-3: Water withdrawal ⁽²⁾(2018)
 - GRI 303-4: Water discharge ⁽²⁾(2018)
 - GRI 303-5: Water consumption ⁽²⁾(2018)
 - GRI 305-3 Other indirect (Scope 3) GHG emissions ⁽³⁾(2016)
 - GRI 305-7: Nitrogen Oxides (NOx), Sulfur Oxides (SOx), and other significant air emissions (VOC and H2S)⁽⁴⁾(2016)
 - GRI 306- 3: Waste generated ⁽⁴⁾(2020)
 - GRI 306- 4: Waste diverted from disposal ⁽⁴⁾(2020)
 - GRI 306- 5: Waste directed to disposal ⁽⁴⁾(2020)
 - GRI 306-3: Significant spills ⁽⁴⁾(2016)
 - GRI 403-9: Work-related injuries ⁽²⁾(2018)
 - GRI 403-10: Work-related ill health ⁽²⁾(2018)
 - GRI 405-2: Ratio of basic salary and remuneration of women to men ⁽⁵⁾(2016)
 - OG6: Volume of Flared and Vented Hydrocarbon ⁽⁴⁾
 - OGSS Emergency Preparedness ⁽²⁾
- Evaluating the accuracy and reliability of data and information for only the selected indicators listed below:
 - GRI 302-1: Energy consumption within the organization⁽⁶⁾(2016)
 - GRI 305-1: Direct (Scope 1) GHG emissions⁽⁶⁾(2016)
 - GRI 305-2: Energy indirect(Scope 2) GHG emissions⁽⁶⁾(2016)
 - GRI 305-4 GHG emission intensity ⁽⁶⁾(2016)
 - GRI 305-5: Reduction of GHG emissions ⁽⁷⁾(2016)

Notes:

1. Excludes subsidiaries and related companies in Thailand and overseas unless stated otherwise.
2. Include BCP Refinery, refinery office at Sukhumvit Soi 64 and BCP Head office at M Tower
3. Reporting of Scope 3 GHG emissions include emissions from Upstream crude oil transportation, Downstream fuel products transportation (but exclude transportation of heavy fuel oil, lubricant oil), waste transportation and Municipal water consumption of refinery business and emission from purchased goods and services, upstream transportation, use of Municipal water and used of sold product for Marketing business. Remark: Upstream crude oil transportation does not include crude oil transportation from oversea.
4. Limited to a BCP refinery at Sukhumvit Soi 64 only.



5. Includes all units of BCP Refinery business, i.e. Head office, Refinery plant, and Regional oil terminals.
6. includes BCP and its subsidiaries and related company in Thailand in Marketing business. In conclusion, reporting scope for energy consumption and greenhouse gas emissions includes BCP (Refinery Business), Bangchak Green Net Co., Ltd. (BGN), and Bangchak Retail Co., Ltd. (BCR).
7. Limited to GHG reduction activities of BCP refinery only.

LRQA's responsibility is only to BCP. LRQA disclaims any liability or responsibility to others as explained in the end footnote. BCP's responsibility is for collecting, aggregating, analysing and presenting all the data and information within the report and for maintaining effective internal controls over the systems from which the report is derived. Ultimately, the report has been approved by, and remains the responsibility of BCP.

LRQA's Opinion

Based on LRQA's approach, we believe that BCP has, in all material respects disclosed accurate and reliable performance data and information related to the following selected indicators:

- GRI 302-1: Energy consumption within the organization⁽⁶⁾(2016)
- GRI 305-1: Direct (Scope 1) GHG emissions⁽⁶⁾(2016)
- GRI 305-2: Energy indirect(Scope 2) GHG emissions⁽⁶⁾(2016)
- GRI 305-4 GHG emission intensity⁽⁶⁾(2016)
- GRI 305-5: Reduction of GHG emissions⁽⁷⁾ (2016)

Notes:

6. Includes BCP and its subsidiaries and related company in Thailand in Marketing business. In conclusion, reporting scope for energy consumption and greenhouse gas emissions includes BCP (Refinery Business), Bangchak Green Net Co., Ltd. (BGN), and Bangchak Retail Co., Ltd. (BCR).
7. Limited to GHG reduction activities of BCP refinery only.

The above opinion expressed is formed on the basis of a reasonable level of assurance and at 5% materiality.

Also, nothing has come to our attention that would cause us to believe that BCP has not, in all material respects:

- Met the requirements above
- Disclosed reliable performance data and information for the selected indicators
- Covered all the issues that are important to the stakeholders and readers of this report.

The opinion expressed is formed on the basis of a limited level of assurance and at the materiality of the professional judgement of the verifier.

Note: The extent of evidence-gathering for a limited assurance engagement is less than for a reasonable assurance engagement. Limited assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

LRQA's approach

LRQA's assurance engagements are carried out in accordance with our verification procedure. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Assessing BCP's approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this through interviewing representatives of some BCP business units which have engaged directly with stakeholders and reviewing documents and associated records.
- Reviewing BCP's process for identifying and determining material issues to confirm that the right issues were included in their report. We did this by benchmarking reports written by BCP and its peers to ensure that sector specific issues were included for comparability. We also tested the filters used in determining material issues to evaluate whether BCP makes informed business decisions that may create opportunities that contribute towards sustainable development.
- Auditing BCP's data management systems to confirm that there were no significant errors, omissions or mis-statements in the report. We did this by reviewing the effectiveness of data handling processes, and systems. We also spoke with those key people responsible for compiling the data and drafting the report.
- Conducting the verification remotely through VDO conference in-order to:
 - interview people involved in reporting data of selected indicators within the reporting scope.
 - verify evidences made available for the selected indicators.

LRQA did not verify the data back to its original sources, nor did it assess the accuracy and completeness of the data reported by individual locations for all selected indicators, except for energy consumption within the



organization, Scope 1 GHG emissions, Scope 2 GHG emissions, GHG emissions intensity and reduction of GHG emission.

- Reviewing BCP's Integrated Sustainability Report 2021 based on the agreed criteria and term of engagement.

Observations


Further observations and findings, made during the assurance engagement, are:

- **Stakeholder inclusivity:**
We are not aware of any key stakeholder groups that have been excluded from BCP's stakeholder engagement process. Each BCP's business units has applied various methods and tools for engagement with their relevant stakeholders. These include usual communication during day-to-day operation and also specific engagement activities e.g. opinion survey, focus group, etc. Engagement results from each business unit are then consolidated to the corporate level. BCP's sustainability vision and strategy, and the content of this report, have been informed by the views and expectation of these stakeholders.
- **Materiality:**
We are not aware of any material issues concerning BCP's sustainability performance that have been excluded from the report. BCP has established extensive criteria for determining which issue/aspect is material by considering stakeholder engagement results as well as global trend and peers, etc. These material issues have then been prioritised, setting strategy, management approach and influenced BCP's performance disclosures.
- **Responsiveness:**
BCP has established and implemented processes for responding to concerns from various stakeholder groups. We believe that these communication processes are effective in explaining BCP's aim in contributing towards sustainable development. However, we believe that in future reports the scope of other performances in addition to energy and GHG should be expanded to regional oil terminals, other subsidiaries and related companies in Thailand to demonstrate responsiveness at a broader level.
- **Reliability:**
Data management systems are considered to be properly defined and implemented for collecting and calculating the data and information associated with the selected indicators. We believe that more vigorous internal verification of data will improve the uncertainty of reported data and information.

LRQA's standards, competence and independence

LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

The verification is the only work undertaken by LRQA for BCP and as such does not compromise our independence or impartiality.


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