evolving
Greenovation

มุ่งสู่กลุ่มบริษัทนวัตกรรมสีเขียวชั้นนำในเอเชีย ที่มีบรรษัทภิบาลที่ดี
และดำเนินธุรกิจด้วยแนวทางแบบมีส่วนร่วมและยั่งยืน

Sustainability Report 2017

Bangchak Corporation Public Company Limited

บริษัท บางจากปิโตรเลียม จำกัด (มหาชน)" เปลี่ยนชื่อเป็น

"บริษัท บางจาก คอร์ปอเรชั่น จำกัด (มหาชน)"

เพื่อยกระดับภาพลักษณ์ขององค์กรและสร้างความชัดเจนในการดำเนินธุรกิจ
เนื่องจากไม่เพียงดำเนินธุรกิจโรงกลั่นน้ำมันและค้าปลีกน้ำมันสำเร็จรูปเท่านั้น
แต่ในอนาคตจะขยายธุรกิจออกไปครอบคลุมทั้งธุรกิจต่อเนื่องและธุรกิจที่สนับสนุนธุรกิจหลัก
ที่มีการใช้เทคโนโลยีหรือนวัตกรรมขั้นสูง ธุรกิจชีวภาพ ธุรกิจสีเขียว ซึ่งจะขยายธุรกิจทั้งในและต่างประเทศ
ตลอดจนการพัฒนาด้านสังคมและสิ่งแวดล้อมและด้านอื่นๆ อย่างไม่รู้จบ

"มุ่งสู่กลุ่มบริษัทนวัตกรรมสีเขียวชั้นนำในเอเชีย ที่มีบรรษัทภิบาลที่ดี
และดำเนินธุรกิจด้วยแนวทางแบบมีส่วนร่วมและยั่งยืน

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วิสัยทัศน์ :
Vision

มุ่งสู่กลุ่มบริษัทนวัตกรรมสีเขียวชั้นนำในเอเชีย ที่มีบรรษัทภิบาลที่ดี และดำเนินธุรกิจด้วยแนวทางแบบมีส่วนร่วมและยั่งยืน

พันธกิจ :
Mission

สร้างสรรค์นวัตกรรมสีเขียวที่ก้าวล้ำและเข้าถึงได้ทุกคน เพื่อสร้างความพึงพอใจสูงสุดให้กับลูกค้า พร้อมเป็นพันธมิตรทางธุรกิจที่ได้รับการไว้วางใจและสร้างคุณค่าให้กับผู้มีส่วนได้ส่วนเสีย และส่งเสริมการพัฒนาของสังคมอย่างยั่งยืน

เรามุ่งเน้นการดำเนินธุรกิจด้วยแนวทางแบบมีส่วนร่วมและยั่งยืน ขยายการเติบโตทั้งในและต่างประเทศ ยึดหลักการกำกับดูแลกิจการที่ดีและพัฒนาวัฒนธรรมแห่งการเรียนรู้สู่ความเป็นเลิศ บนบรรยากาศการทำงานที่มีความสุข

ค่านิยมหลัก :
Core Value

i	AM	B	C	P
Innovation	Agility & Mobility	Beyond Expectation	Continuous Development	Pursuit of Sustainability
ร่วมสร้างสรรค์ สิ่งใหม่	พร้อมใจ เปลี่ยนแปลง	แสวงหา ความเป็นเลิศ	ก่อเกิด การพัฒนา	นำพา สู่ความยั่งยืน

วัฒนธรรมองค์กร : พัฒนานวัตกรรมธุรกิจอย่างยั่งยืนไปกับสิ่งแวดล้อมและสังคม

วัฒนธรรมพนักงาน : เป็นคนดี มีความรู้ เป็นประโยชน์ต่อผู้อื่น

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Message from the President & CEO (Disclosure 102-14)

This past year, Thai people were united in honoring the late King, His Majesty King Bhumibol Adulyadej. His Majesty King Bhumibol's kindness, generosity, and teaching will always be remember. The Self-Sufficiency Philosophy has been a guiding light for Thais to strive to improve their lives and create a sustainable society. Bangchak Corporation is humbled to be following in his Majesty's footsteps and continue to adhere to His teaching in everything we do.

2017 was a year of change for Bangchak. We changed our name from Bangchak Petroleum Public Company Ltd. to **Bangchak Corporation Public Company Ltd.** to better reflect our diverse businesses that focus on creating Evolving Greenovation to be the **"Leading Asian Greenovative Group, founded on Good Corporate Governance, through Inclusiveness and Sustainability"** with **I AM BCP** value. Our 3S strategy includes: Security, Stability, and Sustainability. Our 4G business directions are: Green Business, Green Production, Greenovative Experience, and Green Society. The relocation of our Head Office to M Tower on Sukhumvit Road, a much closer location to our refinery, will ease the management and administration of the business.

Our efforts to achieve our vision in accordance with our values under the 4G directions are:

1. Green Business : Invest in clean energy businesses and reduce our greenhouse gas emissions

- **Green power business** Our subsidiary BCPG increased cumulativeinstalled capacity of solar power from projects in Japan and Thailand. We also invested in wind projects in Philippines and geothermal projects in Indonesia.

- **Bio-based product business** We created BBGI Company Ltd., the largest producer and seller of bioenergy in Thailand, from the amalgamation of BBP Holdings Ltd. and KSL Green Innovation Ltd.
- **Bangchak Initiative and Innovation Center (BiiC)** We established the center to focus on innovations related to our green energy and bio-based businesses in line with our vision and 5 year strategic direction

2. Green Production: Improve the environmental and safety performance of our production process. We achieved new high for our refining operations while setting more aggressive target for energy, water, and chemical use efficiency. In 2017, we started a 12 MW co-generation power plant, a part of our 3E project, that helps to improve the power stability within the refinery. We continued to improve our refinery's Process Safety Management (PSM) while expanding our environment and safety awareness raising efforts to surrounding communities. Our dedication and on-going efforts have earned us Best Workplace for Safety, Occupational Health, and Work Environment Award from the Ministry of Labour for the year 2017 and the Green Industry Award (Level 5) from the Department of Industrial Works, Ministry of Industry.

In addition, our new Head Office at M Tower is a Platinum LEED certified building (LEED Certification Commercial Interior (CI) 2009 : Platinum Level).

3. Greenovative Experience : Provide green experience and innovation. Bangchak has developed and expanded our service stations to become customer centric by continuously improving customers experience and satisfaction. The results of our effort are reflected by an increase in Net Promoter Score (NPS) over 2016. In addition, we have developed "Hi Premium Diesel S", a new diesel premium fuel that reduced emissions and meet the demand of our customers.

4. Green Society : Develop business and activities that create value of the society, the environment, and our stakeholders. Bangchak continues to conduct businesses with our suppliers in accordance with our Supplier Code of Conduct (SCOC) and employed disabled people. We promote activities that raise awareness on the environment and impacts of climate change to the public. This year we set target for cumulative greenhouse gas reduction for Bangchak Group to achieve at least 550,000 ton carbon dioxide equivalent to ensure that we do our parts in limiting the temperature increase to less than 2 degrees Celsius. The achievement of this target is directly tied to the KPI of our top executives. In addition, we established **Baimai Punsook Foundation** to promote youth education and improve the economic conditions of farmers in Pa Sak River Basin through water management under the King's Philosophy. In addition, in order to increase the value of local products we establish Aom Sook Social Enterprise to help alleviate oversupply of agricultural products by providing shelf spaces in our retail outlets.

Bangchak has integrated the United Nations Sustainable Development Goals (UN SDGs) into our operations. We focus on 9 SDGs that are relevant to our core competencies, our policies, and Thailand's development plan. Our efforts to address SDGs are divided into three categories: continuous improvement (continue), leveraging existing projects (leverage), and seeking new opportunities (onward).

This past year marked the beginning of our new chapter. One important challenge facing us is the readiness of our workforce to adapt to these rapid changes both in our internal processes as well as our expansion into new businesses. Developing our human capabilities will remain one of our most important efforts as we strive toward our sustainability goals together.

(Chaiwat Kovavisarach)
President & CEO

"Bangchak is a small organization but we are committed to running a green business to protect our planet."

About Bangchak

Our Business (Disclosure 102-1)

Bangchak Corporation Public Company Limited

Ticker Symbol : BCP

Bangchak's core businesses consist of oil refining, marketing, bio-products, now expanding to solar farms (a clean, natural energy), oil and gas exploration and production, and downstream innovation. BCP's goals are to enhance national energy security while stepping into new business ventures for corporate continuity and sustainability.

(Disclosure 102-2)

Date of establishment :

November 8, 1984

Head office (Disclosure 102-3) :

2098 M Tower Building, 8th floor, Sukhumvit, Khwaeng Phra Khanang Tai, Khet Phra Khanong, Bangkok 10260

Chief Executive Officer :

Mr. Chaiwat Kovavisarach

~~ประธานเจ้าหน้าที่บริหาร และกรรมการผู้จัดการใหญ่~~ President & Chief Executive Officer

Paid-up registered capital :

Baht 1.376 billion

Employee headcount :

1,240 (as of December 31, 2017)

(Disclosure 102-7)

Type of business :

Petroleum and alternative energy

Membership of Associations

~~การเป็นสมาชิกองค์กรต่าง~~ :

(Disclosure 102-13)

1 operating site

1 Operation site (not been procesed)

1 under-developing site

1 Under Developingsite Concession

Marketing business group

Sell over 76% of refined petroleum products directly to consumers through its service station network across the country with a focus on alternative renewable, including Gasohol 91/95/ E20/E85 and Bio-Hi-Diesel, Hi Premium Diesel S

Engage in non-oil businesses at service stations, including distribution of consumer products at Bai Chak outlets, Lemon Green, Big C Mini, and SPAR Minimarts

(Disclosure 102-2 / 102-6)

Capacity

- **Oil business:** builds service station network with 499 standard and 615 community service stations
- **Expanding and Developing Service Station** under Greenovation Experience
- **Non-oil businesses :** cover prime locations with non-oil businesses, including 77 branches of Inthanin Coffee and 2 of Big C Mini, and introduce 27 SPAR Minimarts under a single -roof concept and Inthanin Garden, new-look organic coffee shop.

Thailand

~~สถานีบริการน้ำมันบางจาก 1,114 แห่ง~~

(Disclosure 102-4)

1,114 Bangchak service stations

Refining business group

: procure crude oil from domestic and overseas sources and refine it into various petroleum products

Capacity

120,000 barrels per day

Thailand 1 main operating site

~~ตั้งที่ปฏิบัติการหลัก 1 แห่ง~~

(Disclosure 102-4)

Natural Resources Business and New Business Development

Petroleum exploration and production business

For secure growth and business risk diversification, Bangchak founded BCP Energy International Pte. Ltd. (BCP Energy) in Singapore and invest in Nido Petroleum Co.Ld. to engage in the energy business and natural resources in Southeast Asia

Capacity

- Investment in Nido Petroleum Limited, a producer of 4,350 barrels per day of crude oil from the Galoc field

Australia
พื้นที่ปฏิบัติการ .... แห่ง

Philippines
พื้นที่ปฏิบัติการ .... แห่ง

Indonesia
พื้นที่ปฏิบัติการ .... แห่ง

(Disclosure 102-4)

Bio-based Product business

To enhance national energy security, cut trade deficit as a result of fuel imports, and to benefit farmers and the environment, Bangchak invests in renewable energy, biodiesel, and ethanol businesses

Capacity

- We created BBGI Company Ltd., the largest producer and seller of bioenergy in Thailand, from the amalgamation of BBP Holdings Ltd. and KSL Green Innovation Ltd.
- Bangchak Biofuel Co., Ltd., is engaged in the biodiesel business with an 810,000 liter/day capacity
- Ubon Bio Ethanol Co., Ltd., produces 400,000 liters/day of ethanol
- Bangchak Bioethanol (Chachoengsao) Co., Ltd., has a capacity of 150,000 liters/day of ethanol
- KSL Green Innovation Ltd. has a capacity of 350,000 liters/day of ethanol

Thailand
พื้นที่ปฏิบัติการ 5 แห่ง

(Disclosure 102-4)

Green Power business

For green-energy diversity, Bangchak is engaged in solar power generation

Capacity

- BCPG Plc operates a solar power generation with a capacity of 585 megawatts

Thailand
พื้นที่ปฏิบัติการ 11 แห่ง

Japan
พื้นที่ปฏิบัติการ 5 แห่ง

Phillipines
พื้นที่ปฏิบัติการ 1 แห่ง

Indonesia
พื้นที่ปฏิบัติการ 3 แห่ง

(Disclosure 102-4)

Lithium Business

To prepare for change in vehicle technology, Bangchak founded BCP Innovation Pte. Ltd. in Singapore to engage in innovation-related businesses abroad

Capacity

Lithium Americas Corporation is a listed company in Toronto strock market in Canada and in New York strock market. Lithium Americas corporation has average production of 25,000 tons per year

Canada
พื้นที่ปฏิบัติการ .... แห่ง

Argentina
พื้นที่ปฏิบัติการ .... แห่ง

USA
พื้นที่ปฏิบัติการ .... แห่ง

(Disclosure 102-4)

Shareholding Structure (Disclosure 102-5)

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

As of December 2017

Value chain (Disclosure 102-9)

Exploration & Production (E&P) Business

Conduct petroleum exploration and production from sources that have been through feasibility study and environmental assessment in order to

Refinery and Trading Business Group

Operate modern Refinery Complex to produce high quality, high value, and environmentally responsible products and ensuring the integration between refinery and marketing business.

Green-Power Business

Generate electricity from renewable sources to develop alternative energy and satisfy growing demand for electricity while reducing impacts on climate change and generating steady revenue for the company.

Bio-based Product Business

Increase production of bio-diesel and ethanol to reduce reliance on imported oil, generate steady revenue, and increase income to farmers.

Marketing Business

Response to stakeholders and customers demands by offering quality fuels that meet international standards and environmentally responsible. Develop service stations in high traffic and convenient areas as well as offer non-oil services to satisfy customers' demands and generate steady income.

Innovation Business

Research and develop new products and clean energy to support the improvement and expansion of Bangchak's businesses.

สถิตในดวงใจตราบนิรันดร์

บางจากฯ สานต่อความดี "คิดดี ทำดี ตามรอยพ่อ"

26 ต.ค. 60 บางจากฯ ช่วยเหลือค่าน้ำมัน
ให้คนไทยเดินทางมาร่วมแสดงความอาลัย

เพื่อช่วยลดค่าใช้จ่ายสำหรับประชาชนผู้ที่เดินทางมาร่วมแสดงความอาลัยต่อพระราชพิธีถวายพระเพลิงพระบรมศพ พระบาทสมเด็จพระปรมินทรมหาภูมิพลอดุลยเดช บรมนาถบพิตร ซึ่งท่านเป็นที่รักยิ่งของพสกนิกรชาวไทย ในวันที่ 26 ตุลาคม 2560 บริษัท บางจากฯ จะจำหน่ายน้ำมัน ในราคาต่ำกว่าราคาขายปลีกหน้าสถานีบริการน้ำมันทั่วไปทุกผลิตภัณฑ์ 1.50 บาทต่อลิตร ทุกสาขาทั่วประเทศ เป็นเวลา 1 วัน

• กลิ่นตุ่งเงินนิ่ง •

สแกน QR Code เพื่อรับชม

วิถีบางจากตามปรัชญาของเศรษฐกิจพอเพียง

จากภารกิจในวันก่อตั้งองค์กรที่ใมมุ่งสร้างความมั่นคงด้านพลังงานและส่งเสริมความเป็นอยู่ที่ดีขึ้นของสังคมไทย บริษัทฯ ได้ดำเนินธุรกิจด้วยการน้อมนำ **ปรัชญาของเศรษฐกิจพอเพียง** ของพระบาทสมเด็จพระปรมินทรมหาภูมิพลอดุลยเดช บรมนาถบพิตรรัชกาลที่ 9 มาใช้ในการบริหารองค์กรและเผยแพร่ต่อผู้มีส่วนได้เสียอย่างเป็นรูปธรรมมากขึ้น การตั้งอยู่บนพื้นฐานของทางสายกลางและความไม่ประมาท โดยคำนึงถึง ความพอประมาณ ความมีเหตุผล และการสร้างภูมิคุ้มกันที่ดีในตัว โดยมีความรู้ และคุณธรรมเป็นเงื่อนไข เป็นการยอมรับกำไรในระดับพอประมาณ อย่างมีเหตุมีผล ความรับผิดชอบต่อผู้มีส่วนได้เสีย รักษาสมดุลในการดำเนินธุรกิจที่เคารพต่อสังคมและสิ่งแวดล้อม เพื่อเป็นองค์กรที่มีคุณค่าของประเทศไทย

โดยในปีที่ผ่านมา บริษัทฯ ได้ร่วมกับพันธมิตรในการน้อมนำ **ศาสตร์พระราชา ภายใต้ ปรัชญาของเศรษฐกิจพอเพียง** มาใช้เป็นแนวทางดำเนินงานกับผู้มีส่วนได้เสีย บริษัทฯ จึงริเริ่มจากกลุ่มผู้มีส่วนได้เสียที่ใกล้ชิดคุ้นเคยกับบริษัทฯ ก่อน โดยเฉพาะเครือข่ายเกษตรกรที่เป็นสมาชิกสหกรณ์ที่ดำเนินธุรกิจสถานีบริการน้ำมันชุมชนฯ นอกจากนี้ บริษัทฯ ก็ยังได้เริ่มต้นทำงานร่วม TEAM D กับเครือข่ายภาคประชาสังคม (มูลนิธิปิดทองหลังพระ) ภาครัฐ ภาคเอกชน 10 บริษัท และภาคประชาชน เพื่อแก้ไขปัญหาของประชาชนในระดับพื้นที่ที่ ต.แก่นมะกรูด อ.บ้านไร่ จ.อุทัยธานี โดยใช้ความรู้ และศักยภาพของแต่ละภาคส่วนในการทำงานสนับสนุนกัน เพื่อสร้างต้นแบบงานพัฒนาชุมชนที่ใช้องค์ความรู้เชิงบูรณาการในการพลิกฟื้นพื้นที่ สร้างความกินอยู่ที่ดีและพึ่งตนเองได้ให้กับประชาชน

สรุปผลการดำเนินงานสำคัญ ปี 2560

บริษัทย่อย/ Our Flagship Company

bcpg bbf bgn

บรรษัทภิบาล (Corporate Governance)

ปรับปรุงนโยบาย CG ครั้งที่ 14

Recertificate for membership of CAC (Thailand's Private Sector Collective Action Coalition against Corruption).

Suppliers declared their intention to join CAC 91 suppliers

NO Gift Policy ต่อเนื่องปีที่ 4

ผู้บริหารและพนักงานเข้าตอบรับนโยบายและทดสอบความรู้การต่อต้านทุจริต ร้อยละ 100

การแจ้งข้อมูลความขัดแย้งทางผลประโยชน์ออนไลน์ ร้อยละ 100

จำนวนเหตุการณ์ที่เกิดจากการทุจริต 0 กรณี

การเติบโตทางเศรษฐกิจ (Economic Growth)

รายได้รวม 173,378 ล้านบาท

กำไรสุทธิ 6,404 ล้านบาท

เงินปันผล 2.15 บาทต่อหุ้น

EBITDA 13,663 ล้านบาท

สัดส่วนรายได้จำแนกตามกลุ่มธุรกิจ (Accounting EBITDA)

- กลุ่มธุรกิจโรงกลั่น 55%
- ธุรกิจพลังงานไฟฟ้าสีเขียว 22%
- กลุ่มธุรกิจการตลาด 17%
- ธุรกิจผลิตภัณฑ์ชีวภาพ 4%
- ธุรกิจทรัพยากรธรรมชาติฯ 2%

จัดตั้ง สถาบันนวัตกรรมและบ่มเพาะธุรกิจ (Bangchak Initiative and Innovation Center : BiiC)

Bangchak Initiative and Innovation Center

มี EBITDA จากสินค้าและบริการด้านนวัตกรรม 36.7 ล้านบาท

การจัดซื้อจัดจ้างภายในท้องถิ่น (ประเทศไทย)*

5,749 THB Million

84% ร้อยละ Percentage

*Exclude Non Hydro Carbon Product

จรรยาบรรณคู่ค้าเพื่อการพัฒนาธุรกิจอย่างยั่งยืน (SCOC: Supplier Code of Conduct)

28 Suppliers agreed to conform SCOC

31 Suppliers self-assessed in SCOC

พัฒนาปรับปรุงกระบวนการทางธุรกิจให้มีประสิทธิภาพ สร้างมูลค่าเพิ่มได้ 260 ล้านบาท

ประโยชน์ที่ได้รับจากโครงการส่งเสริมนวัตกรรมภายในองค์กร 145 ล้าน

ควบคู่ไปกับสิ่งแวดล้อม (In harmony with Environment)

การปล่อยก๊าซเรือนกระจก
(GHG Emission: Equity Share)
1.02 ล้านตัน คาร์บอนไดออกไซด์เทียบเท่า

สัดส่วนการปล่อยก๊าซเรือนกระจก
(สัดส่วนการถือหุ้น) (GHG Emission: Equity Share)
- กลุ่มธุรกิจโรงกลั่น 96.8%
- ธุรกิจพลังงานไฟฟ้าสีเขียว 0.4%
- ธุรกิจผลิตภัณฑ์ชีวภาพ 2.7%
- กลุ่มธุรกิจการตลาด 0.1%

การใช้พลังงานรวม
15,612 เทราจูล

อัตราการใช้พลังงาน
(กลุ่มธุรกิจโรงกลั่น)
EII = 103

น้ำใหม่ (น้ำประปา)
(Tab Water Withdrawal)
2.54 ล้าน ลบ.ม.

ปริมาณน้ำใช้ซ้ำ/ น้ำรีไซเคิล (Water Reuse/ Recycle)
1.19 ล้าน ลบ.ม.
คิดเป็น 32.58% ของน้ำใช้ทั้งหมด

น้ำทิ้ง
(Water discharge)
0.9 ล้าน ลบ.ม.

จัดการของเสียด้วยหลัก 3 Rs (Water discharge)
98% ของปริมาณของเสียทั้งหมด

การรั่วไหลของน้ำมันและสารเคมี (กรณี)
(Number of significant oil and chemical spills (more than 100 Barrels)
0

ผลิตภัณฑ์ที่เป็นมิตรต่อสิ่งแวดล้อม
- Green Power Business (Avoid Carbon Product)
- Green Product (Low Carbon Product)

อุบัติเหตุจากการขนส่งผลิตภัณฑ์
(ความเสียหายต่อรถเกิน 1 ล้านบาท)
0

SPAR
ขยาย SPAR 27 แห่ง

กาแฟอินทนิลและอินทนิลการ์เด้น 77 แห่ง

บิ๊กซีมินิ 2 แห่ง

Greenovative Experience

สถานีบริการน้ำมันบางจาก
499 แห่ง
(เพิ่มขึ้น 53 แห่ง)

สถานีบริการน้ำมันชุมชน
615 แห่ง
(เพิ่มขึ้น 9 แห่ง)

สร้างคุณค่าสู่สังคม (and Creating Values for Society)

ความปลอดภัย

จำนวนอุบัติเหตุถึงขั้นหยุดงาน (LWC)

พนักงาน	0	ครั้ง
ผู้รับเหมา	0	ครั้ง

อัตราการบาดเจ็บรวม (TRIR)

	ชาย	หญิง
พนักงาน	0.74	0
ผู้รับเหมา	0	0

ลูกค้า

ความพึงพอใจของลูกค้า
ร้อยละ 80.5

NPS Score
TOP 2nd Ranking

พนักงาน

The Best Employer Score 61%

Employee Engagement Score 61%

ชั่วโมงฝึกอบรมเฉลี่ย (ชั่วโมง/คน/ปี) 45

การจ้างงานคนพิการ 6 คน

สังคม

ชั่วโมงทำงานอาสาของ พนักงาน
13,460 ชั่วโมง

ผลิตภัณฑ์เกษตรแปรรูปสู่สินค้าส่งเสริมการขายผ่านสถานีบริการ

ก่อตั้ง มูลนิธิใบไม้ปันสุข

รางวัลแห่งความภาคภูมิใจรายงานการพัฒนาความยั่งยืนประจำปี 2017
ชนะเลิศรางวัลสูงสุด Asia's Sustainability Reporting Award of the Year 2017
และได้รับรางวัลยอดเยี่ยมใน 3 หมวด ได้แก่
Asia's Best Materiality Reporting / Asia's Best Community Reporting / Asia's Best Stakeholder Reporting
จากงานประกวด Asia Sustainability Reporting Award (ASRA) 2017
จัดโดย CSR Work International Pte, Ltd ประเทศสิงคโปร์ โดยมี 69 บริษัท จาก 15 ประเทศที่เข้ารอบสุดท้าย.

Bangchak and Sustainability

Bangchak's corporate sustainability management includes economics, environmental, and social aspects. Building immunity at Bangchak means taking into considerations both external and internal factors such impacts and scale of climate change and human rights issues, which have been recognized by the Sustainability Management Committee.
There are three levels of sustainability management:

Policy level → Management level → Project level

Sustainability Policy Committee (SPC)

(Disclosure 102-26)

Set a policy and sustainability goals embracing balanced economy, environment, and society and quarterly review for stakeholders' needs and expectations

Sustainability Management Committee (SMC)

mplement the SPC-set policy and goals and monitor progress

Sub - Sustainability Management Committee (Sub-SMC)

Established in 2016 to show the intent to address SDGs introduces initiatives or builds on plans in response to the nine SDGs in the medium term (until 2020) and the long term (until 2030) throughout the business value chain, which includes the entire Bangchak Group.
Sub-SMC is comprised of 4 Sub-SMC as the followings;

1. Sub SMC - Climate Change
2. Sub SMC - Water Management
3. Sub SMC - Society and Inclusive Development
4. Sub-SMC-Education and Human Resource Development)

Sub - SMC : Climate Change

Sub - SMC : Water Management

Sub - SMC : Society and Inclusive Development

Sub - SMC : Education and Human Resource Development

*To respond to the UN SDGs targets selected by the Bangchak

In 2016, Bangchak selected 9 United Nations Sustainable Development Goals (SDGs) based on the company's capacity and business interests, Thai social context, and global trends. *(Please refer to 2016 Sustainability Report for more details)*

Principles and Framework for Sustainability Management (Disclosure 102-16)

"Corporate Sustainable Development Policy for Environmental and Social Development" Sub-policy and Guidelines cover eight sustainability topics which are corporate governance, fair business conduct, human rights and hiring to drive the economy towards sustainability, water and climate management, goods production and service with responsibility and promotion of sustainable society, investment in clean-energy business, engagement in development of educational quality, and engagement in community and social development and promotion of sustainable innovation. (For the details of the Corporate Sustainable Development Policy, sub policies, practical guidelines, relevant tools and standards, please see our Sustainability Report 2016) In 2017, the XXX and Guidelines were updated to include 2 new issues: Business and Human Rights Policy and Tax Transparency Policy. The new policies were added to monitor changes to reduce risks for the company as well as to serve as guidelines for business activities in the increasingly complex supply chain and to expand coverage to new stakeholder groups.

In addition to the above policies, the company employs external frameworks, guidelines, and standards such as the Dow Jones Sustainability Indices, Thailand Quality Award, United Nations Global Compact to help improve corporate sustainability management. The diverse set of criteria for these guidelines and standards have provided Bangchak with valuable feedback that the company has used to improve business outcomes, environmental performance, and social impacts. In 2017, the Sustainability Policy Committee defined 2 focus areas for improvement:

1) Process for sustainability management
2) Process for collecting and evaluating data and reporting outcomes

The company has achieved 91% process on 6 priority areas.

Implementation of Frameworks, Guidelines, and Standards

Assesement and Rating • DJSI • TQA	**Joint Partner** • SDGs • UNGC • CAC
Guidance and Standards • UNGP • ISO	**Reporting** • GRI Standards

ประเด็นการพัฒนาเพื่อปรับปรุงผลงานด้านความยั่งยืน*

1 (Leadership)
- Additional reporting on Board of Directors and Executives

2 (Strategic Planning)
- Integration of climate change and tax into business strategy development and risk management processes

3 (Customer Focus)
- Customer satisfaction improvement through better customer segmentation and increase collection of customer feedbacks and expectations

4 (Operation Improvement)
- Corporate wide work process improvement
- Raise environmental improvement targets and conduct audits on indicators that have not been audited

5 (KM and Innovation)
- Systematic development of learning organization and innovation culture

6 (Human Resource)
- Human capital return-on-investment metric development
- Implementation of more diverse employee assessment programs

* Please refer to the relevant chapter for more details on improvement of the 6 priority areas

In addition to the improvements in the 6 priority areas, Bangchak has assessed corporate actions against all 17 of the UN SDGs. Based on this SDG mapping, Bangchak is working toward all 17 Goals although in varying degrees. As a result, we have selected 9 SDGs that are in line with our sustainability development strategy and our stakeholders' expectations for further actions (for more information on the selection of 9 SDGs please refer to page 12 of 2016 Sustainability Report). Bangchak has established plans to achieve these goal by: 1) continuously improve on existing plans, 2) expand on existing plans/projects, 3) develop new action plans.

Action plans and targets to support Sustainable Development Goals

	SDGs/ Objectives	Plans (continuous improvement/ expansion/new initiative)	Bangchak's Benefits	Environmental and Social Benefits	2020 Targets
Core	7.2 / 7.3	• Increase energy efficiency • Increase installed capacity of renewable energy business	• Energy consumption reduction • Cost reduction • Revenue stability improvement Renewable energy expansion in line with government policy	• Pollution reduction • Renewable energy expansion • Climate change risk reduction	• Energy Intensity Index (EII) for refinery = 90 • 298 MW of solar installed capacity • 30 MW of wind installed capacity • 930 kg/day of biodiesel capacity • 600 kl/day of bio-ethanol capacity
Core	6.3/ 6.4/ 6.6	• Improve water efficiency and waste water quality • Manage water in Pa Sak river basin based on Sufficiency Economy Philosophy	• Water security for business operations • Cost reduction • Corporate image enhancement	• Elimination of negative water impacts to communities • Long term and sustainable flood and drought prevention for agricultural activities in Pa Sak River Basin • Reclamation of forest area in Pa Sak River Basin	• Reduce water consumption by 15% • Water management for agricultural purposes for at least 50 famers
Core	12.2/ 12.4/ 12.5	• Reduce water consumption • Reduce energy consumption • Use 3Rs in waste and industrial waste management processes • Develop green concept service stations • Use environmentally-friendly material and products	• Resource efficiency • GHG reduction • Reduction of costs for raw materials and waste management • Increased value added and corporate image in service stations	• Environmental sustainability	• Refer to target 6, 7, 13 • Zero Waste to Landfill for the entire Bangchak Group • 25 green concept service stations • XX% share of environmentally-friendly products
Core	13.1/ 13.3	• Reduce GHG emission through renewable energy business • Increase youth awareness related to climate change through Thailand Go Green Project	• Climate change impacts and risks reduction for business operations	• Environmental impact reduction to support 2 degrees Celsius limit • Youth participation in climate change efforts	• At least 60% reduction in GHG emission • 80,000 students participated in the project annually
Additional	16.5	• Provide knowledge and support for Bangchak Group subsidiaries and business partners to join Thailand's Private Sector Collective Action Coalition against Corruption (CAC)	• Business transparency and good relationships among companies within the CAC network • Corporate sustainability	• Corruption reduction in the society	• Achieved recognition as a top 3 companies in the CAC and receive invitation to share knowledge with outside organizations
Additional	8.5	• Employ disabled employees	• Support government policy on employment of disabled people	• More employment opportunities • Equal career opportunities in the society	• Employ at least 13 disabled employees
Supplementary	4.1/ 4.6/ 4.7	• Alleviate illiteracy problems in elementary school children • Improve vocational education for youth • Support and co-ordinate undergraduate program in energy, environment, and sustainability	• Social development according to the company's mission • Quality youth in the pipeline to support market needs • Informational exchange between educational institution and the company	• High quality personnel for the labor market • Youth employment opportunity improvement	• 800 elementary school students participated in Read and Write with Ease (Literacy) project each year • Jointly develop a vocational curriculum with 3 institutions • Jointly develop an undergraduate curriculum with 2 higher education institutions
Supplementary	9.5	• Establish Innovation Center to support research and development of new businesses • Collaborate with industry and universities on research and development • Encourage employees to propose new innovations	• Innovative corporate culture • New products and services to support businesses • Research networks	• Research and development in science and technology to develop the country	• 8 researchers • XXX innovations • XXX IP products
Supplementary	11.A	• Increase safety in the community through emergency drills • Establish community enterprises and improve career prospects	• Strengthen relationship with communities and increase trust in the company	• Community development in terms of career prospects, environment, and safety	• Create 11 safe communities and expand the concept to other communities • Establish 3 community enterprise and expand the network

Note: 1) The shade intensity of blue background indicates priority of each target for the company. Prioritization is based on Bangchak's capabilities, industry's interests, and Thailand's policies. (Core Level/ Supplementary Level/ Additional Level)

2) Text color indicates 3 types of action plans: 1) continuously improve on existing plans, 2) expand on existing plans/projects, 3) develop new action plans (more details on action plans and target can be found in Sustainability Strategy Chapter)

Bangchak and Stakeholders

Stakeholder Engagement

As part of Bangchak's corporate strategy setting we conducted Business Environment Scanning, big data management scenario planning, and intelligent risks to set roadmap and framework for our strategy formulation. In late 2017, we reviewed our stakeholder identification and prioritization process (Disclosure 102-42) to expand coverage to include stakeholders that come with our business expansions especially new customers and suppliers. This was done so that we can collect more complete information to better support our 2018-2019 strategic planning. Our stakeholder engagement process is shown below.

However, this report contains the results from our engagement with 9 stakeholder groups (Disclosure 102-40) in 2017. The 9 stakeholder groups include: employees, suppliers, customers, shareholders, communities and society, media, creditors, government agencies, and competitors. Responsible units have been established with manpower provided and duties assigned. Communication channels have also been established for both long term strategy and short term plan to ensure that Bangchak can meet stakeholders interests, concerns, and expectations. In 2017, our engagement with stakeholders included:

Media

1. Press Briefing/ Press Release
2. Quarterly visit to media outlets
3. Press Tour
4. Special interviews as requested by media outlets

Creditors

1. Analyst meetings
2. Consultation visits
3. Site visits

Competitors

1. Follow industry activities from the Department of Energy Business and provide reports to management
2. Conduct research on competitors based on financial data and report findings to management
3. Participate in working team that are relevant to competitors as requested by the government
4. Follow news and marketing activities

Government agencies

1. Face-to-face meetings
2. Participations in government activities
3. Site visits
4. Participations in government lead committee as requested

Stakeholder Engagement Process (Disclosure 102-43)

Employees
1. Engagement Ambassador project/team building activities
2. Quarterly CEO Townhall
3. CEO Feedback Box
4. Company's intranet and other IT system communications
5. Employee's Committee
6. Employee engagement survey (B-Voice) and New VMV (I am BCP) surveys

Communities and Society
1. Face-to-face meetings
2. Community activities
3. Community Committee seminars
4. Satisfaction surveys (activity/annual)
5. Other communication channel/ complaint channel/ direct phone line/community announcement board

Suppliers
1. Face-to-face meetings
2. Annual meeting/ BCP-SUP. Code of conduct seminars
3. Satisfaction survey
4. Site visits
5. Website

Shareholders
1. AGM/ Opportunity day
2. IR website/ news/marketing

ลูกค้าอุตสาหกรรม
1. ผู้แทนการตลาด/ ผู้จัดการ
2. พนักงานบริการลูกค้า
3. พนักงานบริการเทคนิค/ให้คำปรึกษาผลิตภัณฑ์
4. พนักงานซ่อมบำรุงอุปกรณ์
5. การจัดกิจกรรมส่งเสริมความผูกพันประจำปี
6. รายการส่งเสริมการตลาดต่างๆ

Customers
1. Customer satisfaction survey
2. Service station Net Promoter Score
3. Customer relation activities/marketing activities
4. Call Center
5. BCP's Line Official & Social Media/ BCP's Club Card BCP's Mobile Application
6. Service station staffs

สถานีบริการน้ำมัน (ผู้ประกอบการสถานีบริการ/ สหกรณ์การเกษตร/ บจ. บางจากกรีนเนท)
1. ผู้แทนการตลาด/ ผู้จัดการ
2. การประชุมกลุ่มย่อยรายเดือน/ไตรมาส
3. การสัมมนาลูกค้าประจำปี
4. การสำรวจความพึงพอใจผู้ประกอบการสถานีบริการ
5. Call Center/ Web Ordering/ Application BCP Link
7. การเข้าร่วมโครงการประกวดเพื่อส่งเสริมภาพลักษณ์/ งานบริการเหนือความคาดหวัง/ ส่งเสริมยอดขาย

The Color of text indicates the frequency of engagement method (Disclosure 102-43)

- Regularly / Monthly
- Quarterly
- Annually

Stakeholder Engagement Framework

การระบุผู้มีส่วนได้เสียและจัดลำดับความสำคัญ
(Disclosure 102-42)

Identify and priority stakeholders using 3 criteria:

- Stakeholder groups who can impact Bangchak
- Stakeholder groups impacted by Bangchak
- Stakeholder groups with influence to potentially

Stakeholder Engagement Process

- Assign responsible function
- Develop methods for stakeholder engagement, establish communication channel/protocol, and specify engagement frequency

Issues Selection

- Analyze stakeholders' demands and expectations to develop response strategy/masterplan/ implementation plan or immediate response for relevant functions

Implementation

- Report stakeholders demands and expectations to the Sustainability Policy Committee to set sustainability management direction and to be used as input for next year's

Needs/ Expectations (Disclosure 102-44)	2017 Responses (Disclosure 102-43)	2017 Results
 Employees* 1. Career development 2. Talent management 3. Leadership 4. Appraisals *All Bangchak employees are under full-time long term employment contracs We do not have short term hires, part-time, self-employed or seasonal workers.	1.1 Established Career Path and Competency Management to improve ปรับปรุงระบบ Job Family & Career Group, and design promotion tracks and career path for each group as well as identify Successor for director level and above for the entire company 2.1 Conducted 360-degree performance assessment method for director level and above as well as talent group 3.1 Developed Certificate of Top Management (CoT) to improve business skills and improve leadership skills of top management through collaboration with Duke CE 4.1 Modifyied employees' behavior assessment to be in line with the new valuel AM BCP	1. 4% turnover rate 2. Employee engagement score was 61% a significant drop from prior year due to transformation effort 3. 70% Progress in holistic improvement and development of human resource management system in 3 dimensions for pursuing a hign performence company. 4. 13.96% internal career promotion rate

Needs/ Expectations (Disclosure 102-44)	2017 Responses (Disclosure 102-43)	2017 Results
Community and Society **Local Communities** 1. Safe operations 2. Prompt communication during emergencies 3. Knowledge of emergency preparedness 4. Participation in communities' events	1.1 Improved Process Safety Management (PSM) 1.2 Conducted an emergency evacuation drill with the Phra Khanong District and the Phra Khanong Fire Station in Ban Suan Ruampatana community. This was the first emergency evacuation drill conducted in Bangkok. The results from the drill were used to improve emergency plans and to develop evacuation manual for other communities 1.3 Establish direct emergency line for environment and added environmental monitoring points 1.4 Educated local residents on refinery processes and open refinery for visits to all target groups around the refinery 2.1 Used LINE to communicate with local leaders for faster communication and provide information over radio and bulletin board 2.2 Improving and regularly maintaining the refinery-communities public broadcasting system 3.1 Conducted fire and evacuation drills with all target groups such as schools, communities, family groups, and condominiums 4.1 Provided for communities in 8 areas: education, environment, safety, quality of life, economic, sports, relationship, and infrastructure	1. Zero safety incidents for both employees and contractors (improvement over last year) 2. Zero complaints related to air pollution (Compared to 3 complaints in 2016) and no complaints from the wider communities 3. Number of activities 4. Survey results • Satisfaction 98.8% • Relationship 86% reflecting friendly relations and safe operation from the refinery

Needs/ Expectations (Disclosure 102-44)	2017 Responses (Disclosure 102-43)	2017 Results
Community and Society Thai Society (Youth) 1. On-going environmental activities/ projects aimed at youth 2. Study trips to support variety of education	1.1 Held the 10th Thailand Go Green project under the banner "Thailand without Trash: Working to Limit 2 Degrees Celsius"	1. Over 130,000 participants from 70 schools
Suppliers (Contractors / Logistics Providers) 1. Clear requirements for products and services 2. Effective, transparent, and auditable procurement process 3. Supplier development to support mutual and sustainable growth with Bangchak 4. Improve procurement system to support corporate goals 5. Timely payment	1.1 Met with relevant users to provide feedback on TOR improvement 1.2 Invited suppliers to hear products and services requirements for complex orders so that vendors have the opportunities to ask questions prior to submitting bids 2.1 Used electronics system for quotations so that it can be audited 2.2 Held seminars on Supplier Code of Conduct and Dynamic Procurement as well as company's policies. The seminars also offer suppliers opportunities to provide comments, voice complaints, and set expectations. 2.3 Provided channel to receive complaints on non-transparent or unfair procurement. Issued letters to all suppliers to inform them of Bangchak's policy on transparent and fair procurement. Any complaints will go directly to procurement director 3.1 Developed suppliers through Supplier Code of Conduct assessment and improvement monitoring as well as site visits 3.2 Reviewed Pre-Qualification requirement for suppliers on an annual basis to build Approved Vendor List 3.3 Conducted sustainability risk assessment for Tier 1 suppliers and non-tier 1 suppliers for some product groups	1. 86.31% of suppliers are satisfied with Bangchak (based on survey) 2. 409M baht cost reduction 3.63 suppliers with over 500,000 USD contract are in compliance with Supplier Code of Conduct 4. Reduced procurement time. Reduced procurement jobs that exceed schedule from 24% to 22% 5. Complaints related to non-transparency of procurement

Needs/ Expectations (Disclosure 102-44)	2017 Responses (Disclosure 102-43)	2017 Results
	4.1 Reorganized procurement function structure to reduce redundancy and work time 4.2 Improved proactive procurement process 5.1 Improved billing by enabling suppliers to submit invoice directly to the function to reduce payment time	
Fuel transportation partners 1. Consistent and stable income from transportation jobs 2. Co-development of business 3. Good working conditions	1.1 Developed program to ensure that suppliers for Bangkok Depot areas received equal work and to design routes so that suppliers had similar average travel distance as suppliers for Bang Pa In Depot 1.2 Improved plans to use large truck for transportation, 24 hours delivery, and backhaul 2.1 Developed online E-Complaint system and improve existing Transportation Management System (TMS) 2.2 Conducted satisfaction survey 2.1 Improved relationships by conducting activitied that let Bangchak, customers, suppliers, and consumers collaborate on improving service stations 3.1 Improved oil deport, office for transportation contractors, Bangkok depot, parking lots, and cafeteria 3.2 Followed safety measures and be in compliance with regulations	1. Used of large trucks for product transport increasing to 30% 2. A steady drop in the number of com plaints on product transport 3. No accident involving delivery trucks (with damage over THB 1 million) 4. Managing all contracts efficiently and fairly (80% achieved) 5. Reducing losses associated with ethanol transportation for over 450 trips resulting in cost reduction of 0.7M THB per year
Customers Service Stations • Dealer • Agricultural cooperative • Bangchak Green Net Company 1. Better sales and higher revenue 2. Support to maintain service station competitiveness 3. Effective operations 4. Effective marketing and advertising campaigns 5. On time delivery of fuel at the correct volume	1.1 Developed new service station models and expand non-oil businesses to increase revenue and marketing reach 2.1 Developed a Standard Operation Procedure (SOP) for service stations to improve service quality 2.2 Created Bangchak Sod Sai Project to encourage service station employees to improve service quality	1. Increased revenue per service station resulting in XX% increase in average sale per station 2. 2nd place in market share in 2017 increasing from 15% to 15.3% 3. Developed new diesel premium product to satisfy customers' demand resulting in higher sale and increase market share for premium diesel to X place

Needs/ Expectations (Disclosure 102-44)	2017 Responses (Disclosure 102-43)	2017 Results
6. Good reputation/ Create trust for cooperative and benefits to members	2.3 Provided training for service station employees through coaching and mystery shopper programs 2.3 Renovated service stations through Refresh Project 3.1 Added EDC machines at Coop Stations to accept fleet card 3.1 Implemented Automatic Order System (AOS) in sercie station procurement system 4.1 Created marketing campaigns for premium diesel, fuel treatment for motorcycles, gasohol E20 and E85 5.1 Implemented Automation Point Of Sale (POS) to improve management, inventory, and accounting 6.1 Created Green Partnership Award to encourage service station dealers to be socially and environmentally responsible 6.2 Understood and promoted the engagement with dealers and of the entrepreneurial group and maintained a cooperative member base.	4. XX% customer satisfaction score 5. Expanded POS to another 363 locations to a total of 641 locations 6. Opened 20 SPAR minimarts, 50 Inthanin Coffee Shops, and 2 Mini Big C in 9 month 7. Increased Mystery Shopper Score from XX to XX 8. Expanded 9 Coop Services Stations and X Dealer Stations
 Customers 1. Fast and quality service 2. Convenient locations 3. Restaurants, convenient stores and clean restrooms 4. Quality products that are good for the environment 5. Discounts for using services	1.1 Developed a Standard Operation Procedure (SOP) and quick service "Tun Jai in 3 Minutes" in locations with high traffic and sales 2.1 Expanded service stations into underserved areas 2.2 Developed 4 Flagship Service Station Standards 3.1 Expanded non-oil businesses with new partners 3.2 Developed SPAR minimart 4.1 Became more customer centric by developing green products and providing quality services to create Greenovative Experience 4.2 Developeded new products to satisfy consumers' demands (e.g. Premium diesel)	1. Bangchak ranked as No.2 in 2016 as a service station brand customers would recommend to others, reducing gap with the number 1 brand from XX to XX 2. XX% customer satisfaction score 3. XX% Brand Loyalty 4. Expanded 9 Coop Services Stations and X Dealer Stations 5. Renovated XX Service Stations, Opened 20 SPAR stores and XX Inthanin coffee shops

Needs/ Expectations (Disclosure 102-44)	2017 Responses (Disclosure 102-43)	2017 Results
	5. Increased BCP Club Card privileges such as point redemption, increase new partners, and develop LINE Business Connection เช่น การแลกแต้มสมาชิก/ เพิ่มพันธมิตรใหม่/ พัฒนาระบบ Line Business Connection	
 Industrial Customers 1. Product quality and value 2. Good logistics and product delivery 3. After sale service/advices on products and services including maintenance/ equipment leasing/emergency drills 4. การขอสนับสนุนของขวัญในเทศกาลต่างๆ Translator Note: Are you sure you want to put this in?	1.1 Delayed price increase when the excise tax for engine oil increased in the early 2017 1.2 Marketing activities 2.1 Set timely and accurate delivery of products as division KPI 3.1 Provided training on product knowledge / emergency response / after-sales service / equipment support / regular check-ups, which included arrangement of emergency drills and provision of machinery maintenance service 3.2 Added the numbers of technicians and specialists 4.1 Conducted additional relationship building activities such as games and annual trips	1. XX% of industrial customers who are satisfied with Bangchak 2. Industrial customers' satisfaction with after-sales service scoring XX%
 Government Agencies 1. Compliance with the laws or better 2. Corporate social responsibility and good relations with communities 3. Environmental protection and safety process 4. Provide information on a timely basis and support government projects	1.1 Complying with laws and regulations on business operations correctly and transparency 1.2. Kept superior control of environmental quality beyond legal requirements 2.1 Stakeholders were classified to find expectations and responses for each group. As well as to contribute to continuous community development. 3.1 Implementation of the PSM, Carbon Footprint, Water Footprint, 3Rs systems 4.1 Provided prompt, accurate information to regulators 4.2 Cooperatied with the public sector to promote green projects 4.3 Participated in a work group as requested by the government (e.g. National Reform Steering Assembly)	1. Renewal of permits on a continuous basis 2. Certified with Green Industry Level 5 – the highest level - from the Department of Industrial Works 3. Control air quality within the limits and no complaints from communities related to air pollution

Needs/ Expectations (Disclosure 102-44)	2017 Responses (Disclosure 102-43)	2017 Results
 Shareholders 1. Higher capital gain 2. Satisfactory dividend payments at regular interval 3. Steady and robust revenue growth 4. Excellence in petroleum business 5. Clear goals and direction in business expansion	1.1 Maintained high production yield at the refinery 2.1 Paid suitable dividends on a par with peers 3.1 Increased communication channel for shareholders to receive information on the company 3.3 Updated Investor Relations website to improve user experience 3.4 Developed an investment factsheet to introduce investors to the company and reported on quarterly earnings 4.1 Increased investment in service station business and non-oil businesses to better serve customers 5.1 Staging activities where executives can engage major shareholders (institutional investors) 5.2 Increased frequency of shareholder engagement including staging Roadshows both in Thailand and internationally, participating in conferences, and events such as analyst meeting every quarter 5.3 Held seminars to educate institutional investors on Bangchak's new businesses	• Received Asian Excellence Recognition Awards 2017 - Best Investor Relations Company, Best CEO • Received more invitations to conduct Roadshows both domestic and international due to higher interests from investors • Share price increased from 33.5 baht per share at the end of 2016 to XX baht per share at the end of 2017
 Media Include both traditional media and social media 1 Newspaper 2 Magazine 3 Television 4 Radio 5 Online 1. Demand for accurate, timely information on updates of existing businesses and new ones, as well as issues about the energy industry 2. Grant exclusive interview on specific issues 3. Demand for the President & CEO to be the spoke person in order to create trust and interests in the news.	1.1 Released news and holding press conferences regularly 1.2. Responded to demand from media that are beneficial to the society and the compancy 2.1 Supported activities organized by the media for the public as well as supporting founding anniversaries of the media to promote ties and mutual sincerity	1. Bangchak news regularly presented in the media, reflecting healthy relations

Needs/ Expectations (Disclosure 102-44)	2017 Responses (Disclosure 102-43)	2017 Results
 Creditors Financial Institutions/Bondholders 1. Honoring terms and agreements on loan and debenture contracts	1.1 Strictly meeting conditions of loan and debenture agreements 1.2 Strictly observing regulations of financial institutions issued by government agencies 1.3 Gave accurate, prompt answers to questions from loan officers 1.4 Arranging site visits to instill confidence in business performance and to enhance good relations with financial institutions and shareholders	1. Created confidence in the company's financial performance and maintain good relations
 Competitors Energy companies, Oil trader/retailers 1. Conducting businesses with transparency under fair competition	1.1 Free competition and fair marketing campaigns	1. No complaints or negative media related to competitions 2. No complaints from competitors about unfair practices

Key Sustainability Issues

Bangchak has identified key sustainability topics based on global trends and changes, the UN Sustainable Development Goals (SDGs), the Dow Jones Sustainability Indices (DJSI) evaluation criteria, Thailand's national economic and social development plan, needs and expectations of stakeholders, Corporate business plans, risk management, and opportunities for improvement from assessments following by key sustainability issues selection processes (Materiality) in accordance with the GRI Standards (Disclosure102-40)

Key sustainability issues selection criteria (Materiality)

1. Identification of key sustainability issues for Bangchak and stakeholders

Key sustainability issues which have potential impacts on sustainability are compiled and reconciled from both internal and external factors that may impact on the corporate sustainability in the areas of economy, environment and society.

- **Internal factors,** were derived from the executive brainstorming workshop in addition to business strategies, sustainability issues and enterprise risk with potential short-term and long-term impacts.
- **External data,** were future trends of sustainability and the expectations of the 9 stakeholders from structured or unstructured and formal or informal channel such as forums, focus groups, conferences, seminars, or interviews as well as the global direction on sustainability or SDGs, DJSI, United Nations Global Compact (UNGC), Thailand's national economic and social development plan, All these issues were then grouped and prioritized for further review.

Identification of key sustainability issues for Bangchak

2. Prioritization

The prioritization of key sustainability issues was done using correlation and conformance between the set of key sustainability issues significant to business and stakeholders and GRI indicators in accordance with the GRI Standards. A total of 52 issues were categorized into 32 topics and mapped in the Materiality Matrix with two distinctive considerations: .

- **Horizontal axis :** Key sustainability issues significant to BCP by considering short-term and long-term impacts.
- **Vertical axis :** Key sustainability issues significant to stakeholders by considering impact level may occur.

3. Validation

Results of materiality assessment have been endorsed by the Sustainability Policy Committee (Disclosure XXX-XX). This year the issue raised by customers with respect to expectations on products and services have been added. The materiality analysis Included global trends in sustainability in the energy industry and the issue has driven Bangchak to double our efforts to innovate and grow our green energy businesses. We have set a structure to respond to issues raised by stakeholders. The level of importance and appropriateness of the four levels are: Initiative Base, Strategic Focus, Mission Driven, and Leadership. In addition, indicators are developed to track progress at corporate, division, and initiative levels. Indicators have also been integrated into employees' and management's performance assessment in appropriate proportions to foster a culture of sustainability. In 2017, the materiality assessment results are as follows:

Materiality Matrix Analysis

ที่มา

Primary Source

- Employee engagement surveys (B-Voice)
- Business Group/ Line conferences and seminars
- Engagement Ambassador activities
- Strategic planning process
- Industry conferences
- Joint conferences/ seminars with business partners
- Customers' complaints
- Market research
- Regulatory controls
- Meetings with state agencies
- Various engagement activities
- Others

Secondary Source

- Reviews against various standards
- Reviews against sustainability directions
- Reviews against global and industrial economy and risks
- Others

ประเด็นสำคัญด้านความยั่งยืน 32 ประเด็น

(Disclosure 102-74)

พนักงาน

- โอกาสทางอาชีพ
- การจัดการคนเก่งและบุคลากร
- ภาวะผู้นำของผู้บริหาร (Leadership)
- ระบบการประเมินผลงานประจำปี

ชุมชนและสังคม

- การดำเนินธุรกิจด้วยความปลอดภัย
- การสื่อสารอย่างรวดเร็วในกรณีเหตุฉุกเฉิน
- การให้ความรู้ด้านการปฏิบัติตนในเหตุฉุกเฉิน
- การมีส่วนร่วมในกิจกรรมชุมชนสัมพันธ์

คู่ค้า

- ความชัดเจนของงาน-สินค้าและบริการที่ต้องการ
- ระบบการจัดซื้อจัดจ้างที่ดี โปร่งใส ตรวจสอบได้
- การพัฒนาคู่ค้าให้มีแนวปฏิบัติที่ดีและเติบโตไปพร้อมกับ บมจ. บางจากฯ ได้อย่างยั่งยืน
- มีรายได้จากปริมาณงานที่เหมาะสมสม่ำเสมอ เป็นธรรม เพื่อการพัฒนาธุรกิจร่วมกัน

ผู้ถือหุ้น

- ผลตอบแทนที่สูงขึ้น (Capital Gain)
- การจ่ายเงินปันผลของบริษัทฯ ที่น่าพอใจและสม่ำเสมอ
- เห็นผลประกอบการที่ดี และเติบโตอย่างต่อเนื่อง มั่นคง
- บริษัทฯ มีความเป็นเลิศในธุรกิจปิโตรเลียมซึ่งเป็นธุรกิจหลักก่อน
- ต้องมีเป้าหมายและทิศทางการขยายธุรกิจของบริษัทฯ ที่ชัดเจน

ลูกค้าอุตสาหกรรม

- ยอดขาย/ ผลประกอบการที่ดีขึ้น
- การสนับสนุนและดูแลมาตรฐานสถานีบริการให้มีความพร้อมในการแข่งขัน
- การดำเนินงานอย่างมีประสิทธิภาพ
- โปรแกรมส่งเสริมการขาย การโฆษณาที่มีประสิทธิภาพ
- การบริการจัดส่งน้ำมันตรงเวลา ครบถ้วน

ลูกค้า

- ราคาสินค้าและบริการ
- การบริการจัดส่งที่ตรงเวลาและครบถ้วน

สื่อมวลชน

- การสัมภาษณ์พิเศษเพื่อให้ได้ประเด็นเฉพาะที่สื่อนั้นๆ เพื่อให้มีข่าวเดี่ยวที่แตกต่าง เพื่อสร้างความโดดเด่น

คู่แข่งทางการค้า

- ดำเนินกิจการด้วยความโปร่งใสภายใต้การค้าและการแข่งขันที่เป็นธรรม

ลูกค้าทั่วไป

- งานบริการที่ดี รวดเร็ว
- ทำเลที่สะดวก
- มีร้านอาหาร มีร้านสะดวกซื้อและห้องน้ำสะอาด
- ผลิตภัณฑ์ที่มีคุณภาพดีต่อสิ่งแวดล้อม
- ส่วนลดต่างๆ เมื่อเข้าใช้บริการ

หน่วยงานราชการ

- การปฏิบัติตามหรือดีกว่ากฎหมาย
- ระบบความรับผิดชอบต่อสังคมและสิ่งแวดล้อม การอยู่ร่วมกับชุมชนอย่างยั่งยืน
- การจัดการความปลอดภัยและสิ่งแวดล้อมที่ดี (ตัวชี้วัดด้านสิ่งแวดล้อม : พลังงาน ก๊าซเรือนกระจก การใช้น้ำ การนำน้ำกลับมาใช้ใหม่ การปล่อยมลพิษ หอเผา การจัดการของเสีย)
- ให้ความร่วมมือในการให้ข้อมูลอย่างรวดเร็ว และสนับสนุนโครงการของหน่วยงานราชการ

Reviews: Management decision-making process

Internal Processes

- Sustainability Policy Committee (SPC)
- Strategic Planning Process / Enterprise-wide Risk Management
- Business Group / Line Planning Processes

External Processes

- Benchmarking with peers
- 3rd Party Process / KPI Assessment
- DJSI Assessment
- International Competition on Sustainability

Decisions

- Internationalize sustainability policy
- Continue / top up and Initiate existing and new projects
- Challenge higher targets, esp. environmental indicators
- Develop and extend reporting scope

Prioritization Key Criteria

Stakeholders

- Impact / Dependency
- Local influential power
- Impacted group diversity
- Expectancy

Organization

- Likelihood / Impact Severity
- Impact duration
- Risk / Business Opportunity

Materiality Matrix

Governance (4 issues)

1. Regulatory compliance
2. Corporate Governance: Excellence in Main Business
3. Corporate Governance: Clear directions and Target for business expansion
4. Transparent Business Operations

Economic (5 issues)

1. Business Growth and stability
2. Consistently improve Capital Gain
3. Supplier Sustainable Development
4. Procurement Excellence
5. Fair Procurement Process

Environment (9 issues)

1. Energy Consumption
2. GHG Emission
3. Premium Product Development
4. Water Consumption/ Product Transportatation
5. Water Reuse
6. Flaring
7. Air emission
8. Waste management and Spills

Social (14 issues)

1. Safe Operations/ Prompt Communication/ Leadership Development
2. Service Excellence/ Service Station Location/ Increasing Service Station Competitiveness / Diversified Businesses/ Marketing and Promotions
3. Talent Management
4. Emergency Training and Drills
5. Local Community Partnerships
6. Career Development
7. Employee Evaluation

ด้าน	Issues		Impacts Internal	Impacts External	Significance
บรรษัทภิบาล	Regulatory Compliance	Mission Driven	BCP	Community, Society, Government Entities	Be in full compliance with relevant laws and regulation to ensure that business operations are not impacted
	Corporate Governance: Excellence in Main Business	Mission Driven	BCP	Shareholders	Maintain revenue from petroleum businesses which are the company main revenue sources (share of EBITDA greater than XX%)
	Corporate Governance: Clear Directions and Target for Business Expansion	Mission Driven, sustainability Leader	BCP/ BCPG/ BBF/ UBE/ BGN	Shareholders	Clear goal and direction for business expansion. Invest inbusinesses that provide reasonable returns.
	Transparent Business Operations	Mission Driven	BCP	Shareholders, Competitors	Support strong institution (SDG 16) through open and transparent operation and reporting as well as be accountable to stakeholders.
เศรษฐกิจ	Continuous Business Growth	Mission Driven	BCP/ BCPG/ BBF/ UBE/ BGN	Shareholders, Service Station Operators	Maintain business growth and operational stability. Protect shareholder values.
	Consistently Improve Capital Gain	Mission Driven	BCP	Shareholders	Dividend payments are comparable to companies in the same industry.
	Supplier Sustainable Development	sustainability Leader	BCP	Suppliers	Capability building for major suppliers to improve safety and quality in line with Sustainability Policy and SDG 12
	Procurement Excellence	Strategic Focus	BCP	Suppliers	Increase efficiency of packaging procurement process to reduce errors, improve timeliness, and reduce costs.
	Fair Procurement Process	Strategic Focus	BCP	Suppliers	Fairly distribute product transport jobs to suppliers to build confidence and equitability
สิ่งแวดล้อม	Energy Consumption	Strategic Focus	BCP/ BCPG/ BBF/ UBE/ BGN	Government Entities	Corporate target on energy efficiency (SDG 7)
	GHG Emission	Strategic Focus	BCP/ BCPG/ BBF/ UBE/ BGN	Government Entities	Corporate target on GHG emissions and climate change (SDG 7 and 13)
	Premium Product Development	Strategic Focus	BCP	Customers, Service Station Customers	Development of quality environmentally-friendly products to increase share of revenue from service stations and meet customers demand for premium gasoline.
	Water Consumption	sustainability Leader	BCP	Government Entities, Communities, Society	Better management of water consumption by conducting Water Footprint assessment with external organization.
	Product Transportation	Strategic Focus	BCP/ BGN	Service Station Customers, Industrial Customers	Safe transportation to reduce customers' complaints and accidents.
	Water Reuse	Strategic Focus	BCP	Government Entities, Communities, Society	Better management of water consumption by conducting Water Footprint assessment with external organization.
	Flaring	Strategic Focus	BCP	Government Entities, Communities, Society	Mitigation measures to reduce impacts of flaring to local communities.
	Air Emission	Mission Driven	BCP	Government Entities, Communities, Society	Quality of air emission better than regulatory limits.
	Waste Management and Spills	Mission Driven	BCP	Government Entities, Communities, Society	Waste management using 3Rs to ensure better performance than regulations.

GRI Topic	Contents	Topic-Specific	Page
GRI 419 Socioeconomic Compliance	• Corporate Governance • Anti-Corruption • Bangchak and Sustainability • Air Emission	419-1 Non-compliance with laws and regulations in the social and economic area	44 45 16-18 75-76
GRI 201 Economic Performance	• Business Growth • Economic Performance	201-1 Direct economic value generated and distributed	54, 124
GRI 201 Economic Performance	• Sustainability Strategy Economic performance (Sustainability performance statistics)	201-1 Direct economic value generated and distributed	37-43 54, 124
GRI 205 Anti-Corruption	• Corporate Governance • Anti-Corruption	GRI 205-2 Communication and training about anti-corruption policies and procedures 205-3 Confirmed incidents of corruption and actions taken	44 45
GRI 201 Economic Performance Product and service development	• Business Growth • Economic Performance • Sustainable Products and Services Development	201-1 Direct economic value generated and distributed BCP Indicator: Revenue per Service Station	54, 124 78-87
GRI 201 Economic Performance	• Business Growth • Economic Performance	201-1 Direct economic value generated and distributed	54, 124
GRI 308: Supplier Environmental Assessment GRI 414: Supplier Social Assessment	• Supply Chain Management	308-2 Negative environmental impacts in the supply chain and actions taken 414-2 Negative social impacts in the supply chain and actions taken	57-59
Sustainable Supplier Development	• Supply Chain Management	BCP Indicator : Effective time and cost management of packaging procurement	57-59
Supplier Contract Management	• Product Transportation	BCP Indicator: Percentage of efficiency in supplier contract management	88-90
GRI 302: Energy	• Energy Consumption and GHG Emissions	302-1: Energy consumption within the organization	67-69
GRI 305: Emissions	• Energy Consumption and GHG Emissions • Community and Social Engagement	305-1 Direct (Scope1) GHG emissions 305-2 Energy indirect (Scope2) GHG emissions	67-69 119-120, 125
Product and Service Development	• Developing sustainable products and services	BCP Indicator: Launch Diesel HiDSL	78-87
GRI 303: Water	• Water Management	303-1 Water withdrawal by source	70-72
Transport	• Product Transportation	BCP Indicator: Share of products transported by larger vehicles Complaints of product transport service	88-90
GRI 303: Water	• Water Management	303-3 Water recycled and reused	70-72
GRI 305: Emissions	• Air Emissions	OGSS 6 - Flaring	75-76, 126
GRI 305: Emissions	• Air Emissions	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	75-76, 126
GRI 306: Effluents and Wasted	• Waste Management	306-2 Waste by type and disposal method 306-3 Signicant Spills	77 126-127

ด้าน	Issues		Impacts: Internal	Impacts: External	Significance
ด้านสังคม	Safe Operations	Strategic Focus	BCP	Suppliers, Government Entities, Communities, Society	Zero incidents that may impact the well-being and properties of employees, contractors, and local communities.
	Prompt Communication	Strategic Focus	BCP	Suppliers, Government Entities, Communities, Society, Media	Prompt communication with stakeholders, especially local communities to ensure effective emergency response.
	Leadership Development	Strategic Focus	BCP		Corporate transformation from old to new businesses.
	Service Excellence	Strategic Focus	BCP/ BGN	Customers, Service Station Customers, Industrial Customers	Improve customer satisfaction and brand loyalty through Greenovative Experience.
	Service Station Locations	Strategic Focus	BCP/ BGN	Customers	Improve customer satisfaction and brand loyalty through Greenovative Experience.
	Increasing Service Station Competitiveness	Strategic Focus	BCP/ BGN	Customers, Service Station Customers	Improve customer satisfaction and brand loyalty through Greenovative Experience.
	Diversified Businesses	Strategic Focus	BCP/ BGN	Customers, Service Station Customers	Improve customer satisfaction and brand loyalty through Greenovative Experience.
	Marketing and Promotions	Strategic Focus	BCP/ BGN	Customers, Service Station Customers	Improve customer satisfaction and brand loyalty through Greenovative Experience.
	Talent Management	Strategic Focus	BCP		Promote High Performance Culture and talent management.
	Emergency Training and Drills	Strategic Focus	BCP	Government Entities, Communities, Society	Readiness of emergency response.
	Local Community Partnerships	Strategic Focus	BCP	Government Entities, Communities, Society	Create value to local communities.
	Career Development	Strategic Focus	BCP		Employee career development and retention.
	Employee Evaluation	Strategic Focus	BCP		Improve 360 degree feedback process for management

In addition to the above-mentioned expectations, Bangchak uses the United Nations Development Goals (UN SDGs) and the Dow Jones Sustainability Index to help improve corporate sustainability performance. Our Evolving Greenovation vision and I AM BCP values were updated to adapted to the changing global situations. To that end, we have restructured the

*Four levels of stakeholder responsive work plan

Initiative Base

Project/event that are not operation oriented organized by specific Division to achieve short-term target. Results are measured once. The operation of the responsible section.

Strategic Focus

Operation or business process improvement efforts to **corporate vision/strategy** that require collaboration among multiple functions to achieve medium-term goal and impacts on the value chain.

GRI Topic	Contents	Topic-Specific	Page
GRI 403: Occupational Health and Safety	• Occupational Health and Safety	403-2 Types of injury and rates of injury, occupational diseases, lost days and absenteeism, and number of workrelated fatalities	96-98 130
Emergency Preparedness	• Corporate Risk Management • Occupational Health and Safety • Community and Social Engagement	OGSS : Emergency Preparedness	46-51 96-98 114-115
Labor and Management Relations	• Change Management • Employee stewardship	BCP Indicator: BEST EMPLOYER SCORE by AON Hewitt	55-56 101-112
Product and service Development	• Sustainable Products and Services Development • Customer Relationship and Responsibility	BCP Indicator: Net Promoter Score/ (NPS) Customer Satisfaction	78-87 99-100
Product and service Development	• Sustainable Products and Services Development	BCP Indicator: Number of new service station	83
Product and service Development	• Sustainable Products and Services Development	BCP Indicator: Number of renovated service station	80
Product and service Development	• Sustainable Products and Services Development	BCP Indicator: Expansion of convenient stores, coffee shops, and restaurants	80
GRI 417 Marketing and Labeling	• Sustainable Products and Services Development	417-3 Incidents of noncompliance concerning marketing communications	100
Employment	• Employee	BCP Indicator: BEST EMPLOYER SCORE by AON Hewitt	101-112
Emergency Preparedness	• Community and Social Engagement	Emergency Preparedness	96-115
GRI 413: Local Communities	• Community and Social Engagement	413-1 Operations with local community engagement, impact assessments, and development programs	114-119
GRI 401: Employment	• Employee	GRI 401-1 New employee hires and employee turnove	112, 128
GRI 404 Training	• Employee	404-3 Percentage of employees receiving regular performance and career development reviews	108

organization and recruited personnel with the right expertise our new business strategy. We also developed human rights and tax policies policies to be consistent with the growth of the business that will involve more diverse stakeholder groups. We are reporting our progress on Change Management, Innovation Management, and Human Rights efforts on pages 56, 61, 113 respectively.

Mission Driven

The same structure as the Executive Committee in line with **business direction and goals with aim to create a competitive advantage** in order to create value to the organization and stakeholders. Goals are integrated into the entire organization.

Sustainability Leader

Business processes that are self-sustain, well managed, and recognized as industry leader. Goals are set long-term and values are created for the organization, stakeholders as well as the wider environment and society.

สมเด็จพระอริยวงศาคตญาณ สมเด็จพระสังฆราช สกลมหาสังฆปริณายก ทรงพระกรุณาเสด็จมาเป็นประธานฝ่ายสงฆ์ ในพิธีทำบุญเนื่องในโอกาสเปลี่ยนชื่อบริษัทและเปิดสำนักงานใหญ่แห่งใหม่ของ บริษัท บางจาก คอร์ปอเรชั่น จำกัด (มหาชน)

อาคารสำนักงานใหญ่ ได้รับการรับรองจาก LEED (Leadership in Energy and Environment Design) ของสภาอาคารเขียวสหรัฐอเมริกา ในระดับสูงสุด (Platinum) โดยเป็นอันดับ 1 ในประเทศไทยที่ได้รับใบรับรองประเภทงานตกแต่งภายในเชิงพาณิชย์ (LEED for Commercial Interior : LEED CI) บนพื้นที่ที่ใหญ่ที่สุดในประเทศไทย ซึ่งมีการตกแต่งด้านสถาปัตยกรรมที่เกี่ยวกับสิ่งแวดล้อม โดยคำนึงถึงการประหยัดพลังงาน น้ำ คุณภาพอากาศและการลดการปล่อยก๊าซคาร์บอนไดออกไซด์และใช้ทรัพยากรอย่างมีประสิทธิภาพ ควบคู่ไปกับการดูแลคุณภาพชีวิต เป็นกำลังสำคัญเพื่อก้าวไปสู่การเป็นองค์กรแห่งความยั่งยืน

Sustainability Strategy

To grow its business sustainably and advance its operational excellence to the international level, and to humbly induce the philosophy of Sufficient Economy to integrate with its business for reasonable profit and avoid profiteering under full realization of the value of natural resources, Bangchak manages its businesses to strive for a vision to become a **"leader in green innovation in Asia with good governance, inclusive and sustainable business operations"**, known as **"Evolving Greenovation"**, towards its 2020 business goals and socio-environmental targets.

3S Strategy (Security, Stability, Sustainability) remains the key business strategy for Bangchak to advance its business growth and sustainability in line with global megatrends and clearly meet the demands and expectations of all

Security :

Enhance national energy security

Build competitiveness and create stable returns. Ensure energy security for businesses and consumers through an integrated strategy that see the refinery and marketing business work together to source, produce, and distribute fuel. We do this by sourcing crude oil from both domestic and international markets that yield high distillation. In addition, we expand our investment in alternative energy sources such as lithium mines, which is a key component in battery production, to ensure that we are ready for technology change.

Stability :

Grow with business development and diversify into businesses with more stable income.

Create long term value for the organization by increasing share of revenue from new businesses. Focus on clean energy business and product and services innovation to create high value products and stable source of revenue with low external risks such as renewable energy power plants and bio-based products.

Sustainability :

Develop businesses and activities beneficial to the environment and society

Balance business value with social and environmental values. Increase renewable energy, reduce energy and water consumption by setting targets for water consumption reduction, water reuse, and GHG reduction for the entire Bangchak Group.

To create sustainable operations and clear guidelines, Bangchak developed Sustainability Strategy in parallel with operational strategy resulting in the 4 GREEN strategy as describe below:

4 Green strategy

- Green Business
- Green Production
- Greenovative Experience
- Green Society

1. Green Business

Our Green Business strategy focuses on sustainable, responsible investments and value creation by diversifying the investment portfolio towards an increased share in clean-energy businesses and other businesses, leading Bangchak toward being a low-carbon company. Solar power plants (solar farms), geothermal, biomass, bioenergy, biodiesel and ethanol exemplify Bangchak's investment under the Green Business strategy, which also defines the types of investment with stable returns and low domestic and international risks.

"Energy crops are a source of green energy. They can play a part in lessening climate change. This is why BBGI was established as a new unit to focus to developing energy crops into alternative energy such as ethanol and biodiesel. In addition, BBGI has a mission to make the most use of agricultural waste by turning them into second generation biofuel, bioplastic, and other products that are good for the environment and good for the health of our customers. This mission is squarely in line with Bangchak's position on stakeholder engagement and sustainable development."

Pongchai Chaijirawiwat
Senior Executive Vice President,
BBGI Co. Ltd.

2. Green Production

Green Production controls our operations under the Process Safety Management (PSM) system, comprising OHSAS 18001 (occupational health and safety management system), ISO 14001 (environmental management system), waste treatment and management, stable, and efficient consumption of water and energy resources guided by the Roadmap of Carbon and Water Footprint - a strategic plan developed to align with the Paris Agreement following COP21 World Conference on Global Climate Change following the Paris Agreement to limit the global temperature rise to no more than 2 degree Celsius and to cope with regional drought and severe water deficiency.

3. Greenovative Experience

The strategy focuses on development of green experience and green innovation for customers of the modern generation. The concept is based on ideas and practices for customers to naturally participate in sustainable environmental conservation and environmental setting under the new economic development defined and driven by the national "Thailand 4.0" policy. Included in the strategy are:

- Greenovative Product - All products developed and produced to satisfy customers' needs must be green and derived from clean-energy development. Bangchak has developed a new product, "Hi Premium Diesel S" which is an innovative premium diesel fuel. The product aims to satisfy customers' demand for high quality diesel that is environmentally friendly. In addition, we reduce our chemical and raw material use as well as reduce waste. We support forest conservation by using organic coffee and bio-degradable coffee cups at our all Inthanin Garden coffee shops, and we offer discounts to customers who bring their own coffee cups.
- Greenovative Service Station - A newly modernized retail station providing services with four work processes including Renewable, Recycle, Reuse, and Reduce including installation of a solar rooftop to generate solar power for the station, installation of EV chargers for electric vehicles, dedicated automatic bins for plastic bottles for recycling plastic bottle to produce polyester fiber, a "recycle and reuse system" to use rainfall and sewage used water to water plants, usage of energy-saving materials, expansion of green and shaded areas, universal design of toilets for senior citizens and the handicapped, and the "Single One Roof" architectural design for shops and stores at service stations. Under this building concept, all services and complimentary services are housed under one roof, providing convenience for all customers to enjoy and service quality for Bangchak to become the Most Admired Brand. "All in One food station" is another food store concept providing high-quality food prepared with health consciousness and environmental protection. Under a joint venture with a supermarket chain from the Netherlands, Bangchak launched a newly designed mini-mart under the brand of "SPAR" 'FRESH & EASY FOOD MARKET', providing new, different shopping experience with fresh, high-quality goods and services. With these distribution channels, local communities can use space in SPAR to offer their products and farm produce to Bangchak customers. More and more local products are planned for branding as SPAR for export to international markets.
- Greenovative Service - The service is an integration of IT and high-quality service to maximize service efficiency and customer satisfaction. Starting with the installation of the Automation Point of Sale system, data on customers and services and system applications have been developed to offer convenience to various customers, such as the Professional Franchise Scheme Application system, BCP Link, AOS, or Auto Ordering System. The goal is to become "The Most Admired Brand".

4. Green Society

Green Society is another major strategy. Bangchak continuously deploys with society to preserve the environment and improve the quality of life for Thai society, particularly with SMEs (small and medium-sized enterprises) and local farmers to sustainably generate higher income and to promote the concept of community-responsible production and consumption in line with SDG (Sustainable Development Goals) 11 and 12 under various programs as follows:

- CSR in Process Joint ventures with local co-ops to operate retail service stations have been promoted for many years. Following the centennial of the Thai co-operatives, Bangchak launched several campaigns to commemorate the event, including a standard upgrade of local community sernce stations, a coaching program for co-op management staff to grow their knowledge and capability, a sales promotion of farm produce from local communities, leveraging Bangchak's service stations as distribution channels, particularly during price downturns for farm produce or oversupply.
- CSR after Process Bangchak continues to support society and local communities with a focus on education, safety, sports, quality of life, the environment, stakeholder relations, and economic development.
- CSR as Process Bangchak established Bai Mai Punsook Foundation with a mission to improve youth education, protect the environment, and raise living standards for Thais. The foundation establishment expands Bangchak's commitment to corporate social responsibility into areas that are not directly related to our core business capabilities.
- For sustainable success in the creation of green society, Bangchak sees a crucial need to engage suppliers to mutually drive for joint success. A Supplier Code of Conduct (SCOC) was developed to designate joint operating procedures to support mutual benefits and business growth in a sustainable way.
- Pursuing its business model toward Social Enterprise (SE) with an establishment of Oam Suk Social Enterprise Co., Ltd., jointly with the Buddhist Economic Foundation, by revered monk Phra Maha Vutthichai Vajiramedhi, SE operates agricultural businesses, including buying and selling agricultural proaeects rice and organic vegetables for value-added products, marketing and distribution, and R&D.

Progress on sustainable development and business operations

Strategy 1. Sustainable, responsible investments and value-creation (Green Business)

Plans	Results	2020 Targets
1.1 Develop power generation businesses from solar and wind energy and become an Asian player	• Able to generate and distribute 169 MWdc of solar power, 139 MWdc in Thailand and 30 MWdc in Japan • Expanded investment into wind energy in the Philippines with 20 MW based on equity holding (14 MW is already operating) and geothermal energy in Indonesia with 182 MW based on equity holding (158 MW is already operating).	• Increase capacity from solar power and renewable energy to 1,000 MWdc
1.2 Develop the bio-diesel business to 810,000-liter/day capacity.	• Operated total biodiesel production at 810,000 liters/day with a throughput of 83% (Bangchak Biofuel Co., Ltd.)	• Increase bio-diesel capacity to 935,000 liters/day.
1.3 Develop the ethanol business with the capacity of 900,000 liter/day	• Operated ethanol production capacity (Bangchak Bioethanol Co., Ltd) at 150,000 litre/day and at average production rate at 90% incorporated with Ubon Bio Ethanol Co., Ltd which has ethanol production capacity at 400,000 litre/day and has average production rate at 93% for total ethanol production capacity at 550,000 litre per day • Conglomerated BBP Holdings Ltd.(an affiliate of Bangchak) and KSL Green Innovation Ltd. (an affiliate of Khon Kaen Sugar Industry PCL.) to establish BBGI Company Ltd to expand bio-based raw materials to sugarcrane and molasses, and to increase business opportunities by increasing ethanol production capacity by 350,000 litre/day from the KSL Green Innovation Ltd.	• Develop bio-based business by establishing Bio-Complex to leverage our biofuel into high value bio product, expand business opportunities, and support research and development in energy crops such as sugar cane, tapioca, palm oil, and algae as well as to add value to agricultural products to support farmers. • Increase ethanol production to 1,200,000 liter/day
1.4 Develop innovative business to add value and expand business opportunities	• Expanded investment in lithium mine an additional 42.5M CAD or 1,099.2M THB. This investment increases Bangchak's share to 16.1% (later some investor exercise the rights to convert options into ordinary share which reduces BCPI's equity share to 15.86%) • Launched Bangchak Innovation and Initiative Center (BiiC) and signed a Memorandum of Understanding with Asian Institute of Technology to create environment that support startups. Invested 2.8M USD in innovation, incubators, and startups. Achieved 36.7M baht of EBITDA from innovative products and services • Three internal researchers	• Invest in incubator and startup businesses with focus on green energy such as energy storage and bio based business that are beneficial to the society and the environment • At least 1% of EBITDA from innovative products • At least 8 additional internal researchers

Strategy 2. Upgrading of environmental and safety management (Green Production)

6.3 6.4 6.6 7.3 13.1 13.3

Plans	Results	2020 Targets

2.1 Invest in renewable-energy businesses (same as 1.1-1.3)
2.2 Replace fuel oil with clean-burning natural gas.
2.3 Invest in projects to improve the stability and efficiency of energy consumption.
2.4 Generate electricity and steam from combined-cycle power plants.
2.5 Share knowledge and raise public awareness to support the effort to limit the global temperature rise to 2 degrees Celsius.
	• Same as 1.1 – 1.3
	★ Tie the achievement of GHG reduction target to the performance of top executives. In 2017, Bangchak Group was able to reduce 319,432 ton Co_2e which is roughly 30% of the target of 550,000 ton of CO2e.
	• Replaced 100% of fuel oil with natural gas (ahead of target) Recheck ทวนสอบพลังงานยังใช้อยู่
	• Implemented YES-R+ project to increase yield, energy efficiency, safety, and reliability
	• Implemented refinery energy improvement project (Refinery: Energy Intensity Index = 103.1)
	• Commenced operations for 12 MW cogeneration power plant unit 3 to increase production reliability
	  ◦ Continuous Catalyst Regeneration Unit (CCR)
	  ◦ Debottlenecking to improve distillation unit efficiency
	• Raised public awareness through projects such as Thailand Go Green and "Two Degree Crisis - Economic and Social" seminar. Over 130,000 youths participated in the projects.
		• Use carbon offset from renewable energy business to reduce GHG reduction by 60% by 2020 and to become carbon neutral by 2030
		• Complete YES-R+ project to increase yield, energy efficiency, safety, and reliability
		• Achieve 90 Refinery Energy Intensity Index EII by 2020 and EII 80 by 2022
		• Complete construction of 3E project on schedule
		• Continuous Catalyst Regeneration Unit (CCR) in 2020
		• Debottlenecking to improve distillation unit efficiency in 2020
		• Enroll more than 80,000 youths/year in the project

2.6 Improve the efficiency of water consumption for production processes by reducing consumption and reuse-recycle. 2.7 Develop a Water Footprint to manage water consumption throughout product life-cycles	• Reduced tap water consumption by 3.42 % (based year 2015) • Improved water consumption efficiency to 60.5 cu.m./1000 barrel of crude oil processed. • Continuously conducted the study of Water Footprint of products with King Mongkut University of Technology Thonburi for the most effective water management	• Reduced tab water consumption by 15% (compared to base year 2015) (2020 target) • Increase water efficiency per production output to 54 cubic meter/barrel of oil equivalent (2020 target)
2.8 Implement a Process Safety Management (PSM) system and enlarge surrounding community areas to promote awareness of safety, occupational health, and the environment.	• Appointed PSM Governance Committee (PSM GC) • Developed safety management systems in accordance with the Process Safety Management (PSM) covering 3 areas which are Management of Change Technology - Facilities (MOC-T, F), and Pre-Startup Safety Review: PSSR • Carried out safety activities and emergency drills with communities around the refinery. Conducted evacuation drill in Ban Suan Pattana community with the help of Phra Khanong Office and Prakanong Fire Station. This was the first community evacuation drill conducted in Bangkok. The results have been used to improve the plan and provide training guides for 8 other communities. ★ No incident that lead to complaints from the community • Online monitoring of air quality at stacks, work areas, and in the surrounding communities to ensure higher air quality than required by law and to ensure there are no complaint related to air quality • Implement 3Rs for waste management in the refinery for at least 98% of all waste	• Improve safety activities to build trust and engagement with the stakeholders • Develop safety systems in all 14 areas to create culture and develop software to help with management • 11 communities are safer through emergency and evacuation drills (2020 target) • No incidents that lead to community complaints (2020 target) • No complaints related to air emission (2020 target) • Implement 3Rs for waste management, recognized by the 3Rs Award and Zero Waste to Landfill

Strategy 3. Development of green and innovation experience (Greenovative Experience)

12.2 12.4 12.5

แผนงาน	ผลการดำเนินงาน	เป้าหมายปี 2565 (2022)
3.1 Develop customer-centric service stations, including the concept and image redesign, service upgrade, complimentary and value-added services to deliver novel service experience to customers.	• Greenovative Product: launch "Bangchak Hi Premium Diesel S" an environmentally-friendly diesel fuel ★ Improve service quality to significantly increase Net Promoter Score from the previous year • Greenovative Service: Modernized the format and image of service stations under the 4Rs concept (Renewable, Recycle, Reuse, and Reduce) under a Single Roof Top architectural design. In 2017, 97 service stations were renovated, and total renovated service station was 1,057 service stations • Greenovative Service: Revamped service standard and conducted trainings across the country. Expanded POS Automation system to XXX locations and develop IT system to management customer database in order to improve service quality and increase customer satisfaction • Bangchak is working with a respectable and expert institution to develop a new environmental standard for service stations.	• The Most Admired Brand recognition • Develop at least 25 service stations into environmentally-friendly pilot stations through energy, water, and waste management (2020 target)

Strategy 4. Develop businesses/activities that are beneficial to the society and the environment (Green Society)

4.4 4.6 4.7 6.6 11.a

แผนงาน	ผลการดำเนินงาน	เป้าหมายปี 2565 (2022)
4.1 Promote social activities and social enterprises that create value for the society and protect the environment (CSV)	• Added value to agricultural products and supported marketing activities for products such as "rice pop" from Aom Sook Social Enterprise which brought in over 5.7M THB in revenue • Co-developed additional 9 service stations with community agricultural cooperatives. • Upgraded high-potential community service stations with COOP Coaching and COOP Turn Pro programs for 14 community service stations and 15 community service station respectively • Broadened the sustainability network with 31 suppliers whose overall transactions exceed US$ 800,000 by sharing the business Code of Conduct and enforcing self-assessment.	• Support products from agricultural cooperative by providing shelf space in SPAR stores domestically and for exports as well as continue to use these products for promotional gifts at Bangchak service stations. • Continuously Develop service stations with agricultural cooperatives • Upgrade potential services for community service stations • All qualified suppliers participated the code of conduct programs and self-ethical assessment. • Develop projects in the Eastern Economic Corridor to support Thailand 4.0 and sustainable development. Support basic economic development in parallel with improving quality of life under self-sufficiency philosophy by focusing on innovation in bio-based products and green energy.

4.2 Develop activities for society to respond to social needs on tackling national social issues.	• Established Aom Sook Social Enterprise to expand business partnerships with farmers by leveraging business knowledge and marketing channel to increase value of agricultural products. The social enterprise also works with the Buddhist Economic Foundation Network in Chiang Rai.
	• Conducted 251 activities to improve economic, environment, and social conditions of communities around the refinery and continue to support community enterprise "Khun Jaew Cleaning Service."
	• Established Bai Mai Punsook Foundation with a mission to improve youth education, protect the environment, and raise living standards for Thai farmers. At our initial stage, we have helped:
	  ◦ 591 elementary schools children to improve literacy
	  ◦ 14 farmers in Pak Sak Basin which includes building their capacity on organic and natural methods and help them design and improve water management on their plots.
	  ◦ Vocational and undergraduate degree program are under development
		• Conduct community survey to assess the friendliness, benefits, safety, and overall engagement level which scored 85%. Support at least 3 community enterprises (2020 target)
		• Develop youths to achieve academic goals (2020 target)
		  ◦ develop at least 800 children to achieve literacy per year (2022 target)
		  ◦ develop one vocational curriculum to support the labor market and Thailand 4.0 (2020 target)
		  ◦ co-develop one undergraduate curriculum to support business, environment, and sustainable development - help at least 50 farmers to design and improve water management on the plots (2022 target)

Note: 1) Targets are set for 2020 and 2022 to be in line with 5 year corporate strategy and SDG
2) ★ Designates sustainability performance that ties to the President & CEO's performance assessment in 2017

Please refer to Corporate Governance and Anti-corruption chapters for our response to SDG 16 and Employees chapter for SDG 8.

Corporate Governance

"... His Majesty explained that "Tam" is goodness and correctness. Notice that these two must exists together as many people say "I am doing good" or "I am obeying the laws and regulations." That is not enough because sometimes what's correct according to the law is not good. Therefore, both good and correct must go hand in hand."

Dr. Sumet Tantivejkul,
Secretary-General,
The Chaipattana Foundation
CG Day 2017
December 1, 2017

Good governance is the cornerstone of business. Ever since its inception, Bangchak has therefore defined a **Corporate Governance Policy** to guide directors, executives, and employees in their business conduct with transparent and accountability. A Corporate Governance Committee, consisting of four directors, steers Bangchak's compliance with the policy and revises it to keep pace with international standards each year. This year, meetings were held to monitor outcomes of the corporate governance development plans as follows (Disclosure 102-17)

Policy revision	Determined commitment	Sharing of views
Undertook the 14 th revision of the policy, including • Adding to the roles and responsibilities of the Commmitee. Ie innovation and technology for resource allocation. • Adding a code of conduct for should or shouldn't act with management level • Adding a code of conduct for Committee Diversity	• Required all employees to acknowledge and complete the annual test on the policy • Required all employees to provide their information concerning conflicts of interest annually • Staged the CG Day 2017 (Year 13th) to roll out corporate governance among employees and campaign on ongoing anti-corruption in the corporation in the from the lecture "How to be good: the principles and practical guidance of His Majesty" Dr. Sumet Tantivejkul, Secretary-General, The Chaipattana Foundation • Issued an annual letter on the No-Gift Policy to repeat the message among employees and all involved in Bangchak Group	• Shared experiences on corporate governance and anti-corruption with others, Pruksa Real Estate Plc, King Prajadhipok's Institute. • Staged an annual business partner seminar to roll out the "Supplier Code of Conduct for Sustainable Business Development" and encourage business partners to become CAC allies, as detailed under Anti-corruption, page XX

To enable corporate governance practices to achieve full efficiency, the Board has required performance assessments in three formats, namely

95.36

1. Individual self-assessment
Average score: 95.36 %
Excellent

96.65

2. Individual cross-assessment
(by 3-4 anonymous directors on each director)
Average score: 96.65%
Excellent

96.67

3. Group assessment
Average score: 96.67%
Excellent

In addition, each subcommittee was assessed, as detailed in the 2017 annual report under Management Structure.

Anti-corruption

In 2016 Bangchak was certified (renewal) for membership of CAC (Thailand's Private Sector Collective Action Coalition against Corruption). It was among the first 22 companies to have received the certification in 2013.

Bangchak has illustrated its commitment to anti-corruption in the following ways.

Executive and employees who acknowledged the policy and peedthe test (Disclosuer 205-2)

adrowledged the policy
100%

Completed the test
100%

100%
Notification the online conflict of interest through e-HR

0 กรณี
จำนวนเหตุการณ์การที่เกิดจากการทุจริต (Disclosure 205-3)

- **Communication and education :** Bangchak relied on the "We Share" online learning channel to inform executives and employees to learn and take tests on the corporate governance policy, help them understand correctly the policy and learn efficiently
- **Anti-corruption measures :** For the third year in a row, informed employees and those parties relevant to Bangchak and subsidiaries about the No-Gift Policy for festive periods and other occasions to stress Bangchak's commitment to laying down a solid foundation for fair business with all
- **Sharing of views :** Staged the 2 annual business partner seminars to announce the Supplier Code of Conduct, which consisted of ESG (Environment, Social, and Governance) to promote their business dealings in line with Bangchak's code of conduct to foster growth and sustainability together. Also, Bangchak has encouraged 4 year consecutively business partners to join CAC This year, 91 business partners agreed to declare such intention and Bangchak also encouraged these subsidiaries to join CAC
- BCPG Public Company Limited on August 18, 2017

The number of business partners that declared their intention to join CAC this

2014	2015	2016	2017
44	22	58	91

"...when working with His Majesty, he emphasized "goodness" before other qualities. If someone is intelligent but is not a good person, that person can do more harm to the society than someone who may not be as intelligent because he or she will come up with an elaborate plan to get away with things." Excerpt from the lecture "How to be good: the principles and practical guidance of His Majesty"

Dr. Sumet Tantivejkul,
Secretary-General,
The Chaipattana Foundation
CG Day 2017 December 1, 2017

Corporate Risk Management

Due to the dynamic changes in business environment, corporate risk management is an important process to systematically plan for and mitigate risks. Bangchak has adopted an enterprise-wide COSO ERM and ISO 31000 as tools for its risk management system and applied them to all levels from business groups to divisions, sections, and all investment projects. Corporate risk management process has been standardized and deployed to all subsidiaries where risk management structure has been implemented to ensure full coverage of all business operations and successful achievement of short and long term targets in line with sustainable development strategy.

Corporate Risk Management Structures

Everyone at Bangchak is responsible of risk management. The Enterprise-wide Risk Management Committee (ERMC) has been established by the Board of Director to oversee corporate risk management. The Risk Management Sub-Committee (RMC), which makes up by top management from various businesses and divisions, has the responsibility to monitor and improve risk management efforts. The Price and Finance Risk Management Committee (PRMC) is responsible for manageing risk related to price and currency fluctuations.

In addition, every business, division, and function has two representatives, Risk Manager and Risk Coordinator, who are responsible for coordinating risk management efforts with strategy function and corporate risk management function as well as increase awareness of risk management amongst employees to ensure that risk management plan is executed properly.

หมายเหตุ

Risk Manager - ผู้อำนวยการตำแหน่งหรือผู้ได้รับมอบหมาย

Risk Coordinator - มอบหมายหน้าที่โดยรองกรรมการผู้จัดการใหญ่/ผู้ช่วยกรรมการผู้จัดการใหญ่

สายการรายงาน

——— Functional

- - - - - Risk Communication

Promoting Risk Culture Enterprise-wide Risk Management Policy states that:

"The Company encourages and drives risk management to be a part of our corporate culture and be valued by all employees" In addition to assessing short and long term business risk as well as systematize corporate risk management process, risk management is one of the performance indicators for Bangchak's management at every level. This ensures that every employee has a part in managing corporate risks to achieve company's targets. To further promote risk culture, Bangchak has organized forums to exchange knowledge relating to changes in business environment as well as provide analysis on threats and opportunities to the business to relevant management and employees. The knowledge dissimination events are conducted to ensure that every employee has the same understanding and standards (based on Bangchak's Risk Management Handbook) when it comes to corporate risk managment.

Risk Management Performance

Risk management at Bangchak covers strategic risks, operational risks, financial risks, and reputational risks that may arise from health and safety, environmental, social and community, and regulatory performance. In 2017, Banchak assessed internal and external factors that could impact business. These include oil price and exchange rate volatility, industry competitiveness, state of the economy, innovation and technological change (e.g. energy storage and electric vehicle), and government policies. We also take into account megatrends identified in the World Economic Forum's "The Global Risks Report 2017" and stakeholders inputs when conducting risk assessment to identify impacts and opportunities to the business.

We have divided risk management framework into 3 areas: 1) Corporate Risk Management 2) New Business Investment Risk Management 3) Business Continuity Management (BCM) in order to effectively assess and manage impacts according to the nature of risks.

1. Corporate Risk Managment

Risk assessment takes into consideration internal and external factors as well as future trends that may impact corporate target in both short term and long term.

Economic Risks

Risks	Mitigation Measures
1) Oil and raw material price volatility Impact : Revenue stream fluctuation in petroleum and other businesses 	Short-term and long-term mitigation measures includes: • Closely monitoring oil price and develop new tools and measures to manage the spread between crude and refined products. The Price Risk Managemnet Committee (PRMC) is responsible for selecting measures to mitigate price risks. • Secure raw meterials for biofuel production from reliable sources at a price that ensure profitability for Bangchak. Develop high value products to increase revenue. • Increase investment in new businesses, specifically green power generation both in Thailand and overseas through subsidiary, Bangchak Green Power • Establish a new subsidiary, BBGI, that focuses on biofuel production to increase competitiveness and diversify risk of raw materials price fluction from tapiocal, molasses, and crude palm oil prices. Currently BBGI has production capacity of over 1,710,000 liter/day (ethanol capacity of 900,000 liter/day and biodiesel capacity of 810,000 liter/day).
2) Supply chain and raw material management Impact : Business disruption/ production costs 	• Securing crude offtake agreements in a more long-term format from both domestic and overseas sources to consistently stabilize the level of crude supply. • Procuring crude oil quality more suitable to existing technologies to maximize yield and value to the company. • Categorizing suppliers with a focus on high-value raw materials and feedstock, goods, and services properly processed with appropriate sets of risk assessment, i.e. economic, environmental and social, to ensure business continuity.
3) Technological Change and Energy Innovations Impact : Decrease in revenue growth from petroleum businesses 	• Increase investment in lithium mining through 16.1% share purchase of Lithium Americas Corp. to support the growing trend in battery usage • Setup Bangchak Initiative and Innovation Center (BiiC) and collaborating with industry network to create Green Ecosystem that supports green innovation leading to business breakthrough and resource efficiency

Social Risks

Risks	Mitigation Measures
4) Operations could create impacts on communities and the public **Impact :** Public and community confidence in Bangchak's operations 	• Adding Safety Integrity Level (SIL), Reliability-Centered Maintenance (RCM), and Risk-Based Inspection (RBI) to the risk management system to expand risk assessment coverage all equipment and work processes and design the maintenance program in advance with high accuracy, leading to reduction of accidents. • Complying the Occupational Health and Safety Management System with TIS/OHSAS 18001 standard, identifying work hazard (HAZOP: Hazard and Operability Studies) and implementing the Process Safety Management System (PSM). • Installing online air emission monitoring stations at Sai Jai Thai Foundation (under the royal patronage) on Sanpawuth Road, and the entry gate No. 2 of Bangchak Refinery. The installation of these two new monitoring stations increased the coverage of air emission control and bolstered the confidence level among the surrounding communities and the public. There are now six online air emission monitoring stations. • Installing an enclosed ground flare to reduce emission impact on surrounding communities. The project is set for completion in 2018. • Promoting activities with surrounding communities for more knowledge and better understanding, as well as awareness of safety. People from schools, temples, and nearby condominiums attended these activities and participated in evacuation and firefighting drills. Installing fire alarm and communication systems to better communicate with the communities and having community representatives participate in and observe emergency drills.

Environmental Risks

Risks	Mitigation Measures
5) Climate Change **Impact :** Climate change impacts dirupting business operations 	Bangchak has implemented short-term and long-term measures to mitigate impacts from climate change that could disrupt business operations. In addition, Bangchak is actively reducing our GHG emissions. • Moniting potential risks that may arise from climate change (e.g. floods) and put in place plans (based on impact level) to ensure business continuity • Replacing fuel oil power plant with 12 MW Cogeneration Power Plant in 2017 resulting in increase in energy efficiency and decrease in GHG emission from the refinery • Promoting environmental stewardship culture in the company through energy and environmental conservation. Bangchak refinery has received Level 5 Award (Green Network) from from the Department of Industrial Works. The new Head Office building has also been LEED Platinum certified. • Developing green energy business by expanding renewable energy power generation through BCPG and biofuel production through BBGI. • Collaborate in research and development effort for "Environmental technology Development for Sustainable Refinery" to reduce GHG emission which includes Carbon Footprint assessment and ISO 14067 Standard.

Environmental Risks

Risk	Measures
6) Water Supply Shortage **Impact :** Insufficient water for production processes 	• Formulation of a Refinery Water Management Taskforce to explore optimal water management measures to stabilize the entire production processes, minimize water consumption, reuse, and recycle with reverse osmosis technology. This year Bangchak successfully reduced the volume of discharged effluent and consumption by 32.58 % of the total water consumption. • Developing a water footprint to enhance water management through the product life-cycles. • Promote water efficiency in subsidiaries's operations begining with water reuse and constructing new water reservoirs to increase water reserve
7) Ecosystem Collapse **Impact :** oil spill from marine transportation could cause severe impacts to the ecosystem 	• Deploying oil spill prevention measures by redefining the standards for crude and refined product vessels with double hulls. • Providing capability measures associated with emergency equipment and oil spill equipment to cope with oil spills and fires of vessels and floating storage unit) • Constantly developing and enhancing safety technologies for equipment, system, and instruments at ports under the standards defined by Oil Company International Marine Forum (OCIMF) such as the upgrade of the firefighting system and redesigning the wharf to become a Quick Release Hook, and installation of additional closed-circuit television (CCTV) system at the jetties.

2. New Business Investment Risk Management

n addition to consideration of strategic alignment and returns on investment of new businesses, project risk management is crucial to business success. A systematic project review must be conducted to identify:

1) Development Phase Risk;
2) Construction Phase Risk;
3) Operational Phase Risk (including financial, tax regulations in various countries, business risks, and reputational risks); and
4) Natural Disaster Risk in order to ensure that new investment will achieve business targets and objectives without negative impacts to the environment, society, and local communities. Each new business investment risk management plan must be approved by the Enterprise-wide Risk Management Committee prior to Board's approval.

3. Business Continuity Management (BCM)

Bangchak continues to be ISO 22301: 2012-certified for its BCM standard, for its Head Office, refinery, and Bangchak Oil Distribution Center, Central Region Business Office, and Bang Pa-in Oil Distribution Center, the same certification for five consecutive years for an international standard and efficiency on crisis management and an emergency response system. This recognition bolsters confidence among stakeholders in Bangchak's ability to properly respond to any potential emergencies and deliver products to customer without disruption.

In 2017, we updated out BCM plan to include our new Head Office and expand coverage to our subsidiaries. In addition, we conducted an emergency drill with Bongkot Ship of Bongkot Marine Service company to simulate an oil spill incident from a Floating Storage Unit. The drill scope covers communications among subsidiaries. Findings from the drill are used to improve emergency response process and allocate additional resources for all subsidiaries to ensure that business can continue to operate during emergencies.

Net profit

6,404

million THB

Total Revenue

173,373

million THB

Tax payment to government and local authorities

544 million THB

EBIDA

13,663

million THB

Economic Performanee

Revenue

In 2017, Bangchak and subsidiaries posted 172.138 billion THB in revenue from sales and services with net profit of 6,404 million THB. Revenue from sales of goods and services from multiples businesses lead to an increase of 18.96% including from refinery business, marketing business, power generation business, and bio-based business. Our refinery business contributed to the most increase due to rising crude oil prices which lead to stock profit of 834 million THB. In addition, we were able to achieve full capacity at 111,370 barrels per day.

Bangchak has announced its *tax policy* for Bangchak and its affiliates to possess and adhere to the legal tax management guideline and practices in accordance with the business operations based in Thailand and overseas to reflect transparency and fairness associated with tax operations. In addition, our tax policy aims to create and maximize values to all stakeholders together with considering direct and indirect risks related to taxes.

For more information about the tax policy, please visit our website : http://www.bangchak.co.th

For the marketing business, we continue to maintain our second position in market share. In 2017, we added 1,114 service stations. Volume of gasoline sales increased 4.5% in line with higher domestic fuel consumption.

We recognized revenue from our green energy business from our subsidiary, BCPG. In 2017, our portfolio of 160 MW solar farms generated 3,322 million THB in revenue, an increase of 238 million THB over last year. In addition, we received 341 million THB and 408 million THB in shared profits from our investments in wind power in the Philippines and geothermal in Indonesia, respectively. For our bio-based business, we combined BBP Holdings Company Limited (a subsidiary of Bangchak Corporation) and KLSGI Company Limited (a subsidiary of Khon Kaen Sugar), to established BBGI Company Limited. In 2017, BBGI generated 8,073 million THB in revenue, an increase of 980 million THB from the previous year. As for our natural resources business, Nido Petroleum Limited generated 1,510 million THB in revenue, an increase of 7 million THB over the previous year.

Cost

In 2017, our operating cost increased 25,786 million THB. The major contribution to the increase was from our raw material costs as Dubai oil price increase by an average of 11.71 USD per barrel from low global supply tightening from OPEC and non-OPEC members.

Other expenditures include social, school, and community expenses, as well as donations in the form of items and approximately 106.59 million THB. This included construction of classroom building for Vidyasirimedhi Institute of Science and Technology, construction of the Thai Red Cross health center, support for the Thailand Swimming Association, support for Thailand Boxing Association, support for Chulalongkorn university 100 year activities, support for the government's public-private collaboration project, donations to victims of natural disasters, and various scholarships such as 2017 Bangchak's youth scholarship, AIT scholarships under BIIC project. Expenses related to wages and employees benefits increased 373 million THB over 2016. Tax payments decreased 278.16 million THB due to 897 million THB tax refund from 2007, 2009, and 2010. However, our tax payment increased by Baht 619 million, compared to the previous year. This year our dividend payment was 3,310 million bath which is an increase from 2016.

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Change Management

Due to the changes in Bangchak's businesses based on the Company's vision, a change management process has been implemented in 2016 and continued in 2017 to deal with potential impacts to operations and help the organization adjust to changes. Change Management Division was established with the responsibility to plan, coordinate, consult, monitor, and report progress directly to top executives. Two main areas of focus are:

Strategy

1. Business Process Redesign
2. Operation Process Redesign to become High Performance Organization

2022 Target*

- Add value and reduce cost from business process redesign (target 1,000M THB)

(Target year was extended to be in line with opration process redesign)

2017 Results

Business Process Redesign continues to focus on improvements that maximize performance, reduce costs, and better serve our customers. Resulting in over 260M THB in added value in 2017. 2017 Project Highlights include:

Improvement of crude oil depot management efficiency resulting in 35M THB cost saving.

35 M THB

Management of oil transportation costs, both by ship and by truck resulting in 28M THB cost saving.

28 M THB

Improving the quality of heavy naptha oil resulting in 22M of added value.

22 M THB

Improvement of procurement efficiency through strategic procurement resulting in 78M THB cost saving.

78 M THB

Improvement of raw material procurement planning process for ethanol and biodiesel production resulting in 27M THB cost saving from raw material.

27 M THB

Bangchak has extended its goal of value creation and cost reduction through Business Process Redesign by more than 1,000M THB Baht from 2020 to 2022 to align with Operation Process Improvement projects such as Tarnaround. Management Cycle Extension. The target extension also takes into consideration various experts advices in order to minimize impacts to business process and operational safety.

"Becoming a change agent to promote healthier lifestyle to Bangchak employees has definitely been a great challenge and opportunity for me. I got trained to become a better public speaker, to change my behaviors for the better and to share my experiences with colleagues. As a change agent, I am committed to inspiring colleagues to create change and innovations for the future. In addition, becoming healthier is an important of this so I aim to inspire Bangchak's employees to take better care of themselves because people are becoming more prone to sickness. I use myself as an example so that everyone can become healthier and be ready to create change in the organization."

Thanakorn Wongsoonthorn
Senior Team Lead - Refinery

"The Business Process Redesign (BPR) aims to find improvements in business processes. We used BPR in our ethanol business by comparing the cost effectiveness of using unprocessed tapioca or tapioca chips at different time. The analysis lead to over 13.8 million bath costs saving from procurement process in 2017. This directly impacted our bottom line and lead to better business performance."

Benjamaporn Oonkreng
Finance and Administration Manager
Bangchak Bioethanol
(Chachoengsao) Co., Ltd. (BBE)

The Evolving Greenovation mission is a new vision that aims to propel Bangchak to becoming a High Performance Organization that emphasizes and focuses on goal-oriented work for clearer outcomes. To that end, Bangchak has colloborated with Aon Hewitt (Thailand) Co., Ltd. to analyze corporate's agility to support and link work processes within the organization based on 9 dimensions:

Change Management Division and Human Resources Development Division have jointly initiated 3 areas for improvement: 1) Change Management, 2) Engagement and Culture, 3) People. The progress of the initiative is over 70%. (For more information please refer to Employee Chapter).

Supply Chain Management

Suppliers are an important stakeholder group. Therefore, good management of supplier relationship is integral to corporate sustainability.

Since 2016, Bangchak has organized seminars for our suppliers to disseminate knowledge about issues that affect the sustainability of the organization and encourages all partners to conform to **BCP-Suppliers Code of Conduct.** We strive to provide all our partners with corporate sustainability so that they can become long-term business partners to Bangchak. The SCOC consists of 5 aspects which are;

- Business ethics
- Labor practices and human rights
- Safety and occupational health
- Environment
- Community development engagement

In addition, we have analyzed our supply chain to assess the risk from suppliers including raw material suppliers, logistics suppliers, and products and services suppliers. The process starts by identifying major supplies. Then suppliers are evaluated to identify risks. Lastly, risk mitigation measures are put in place as shown in the Figure.

In 2017, the Company has analyzed 798 suppliers and found that there are 87 major suppliers. The risks associated with suppliers include: 1) economic (risk of late delivery / delivery of quality goods; 2) social (risk of being misled by the community due to improper operations); 3) environment (risk of chemical and oil spills). Whereby economic risks accounted for 12%, social risks 8%, and environmental risk 7%. The Company has put in place diversified risk mitigation measures to prevent and reduce any impacts that may occur from these risks. In addition, we are implementing the Supplier Code of Conduct compliance and assessment process as a screening tool for all suppliers by 2020. The assessment and evaluation process will help to mitigate the risks associated with suppliers' operations. We also aim to expand our network of sustainable suppliers to include all major suppliers by 2020.

Process for Supply Chain Risk Assessment

Strategy

1. Build supplier capacity through SCOC
2. Implement strategic sourcing to improve procurement process and increase channels for suppliers feedback
3. Establish Procurement COP to develop best practices which are shared among procurement officers and users for the entire Bangchak Group

2020 Targets

1. Develop all major suppliers to be in compliance with the SCOC
2. 5% annual reduction of procurement cost 5%
3. Support Green Procurement

2017 Performance

Reorganization and Process Improvement

Reorganization	Process Improvement
• Reorganize the procurement function based on type of products and services procured • Setup new procurement indicators to be more inline with corporate targets	• Implement strategic sourcing to improve procurement process • Provide training to procurement officers on Strategic Sourcing and IT procurement process • Conduct knowledge sharing session through the establishment of Procurement COP

Results - Reducd 22% excessive procurement time, better 22 than the target (Target : 40%)
- Reducd procurement cost by 7.6% or 406M THB in 2017 2560 (Target 5% reduction)

Supplier Sustainablility Development Program is now in its second year of implementation. The program was established because Bangchak recognizes the importance of supplier development toward sustainable business operations. Bangchak uses the Supplier Code of Conduct as a framework for supplier development. Suppliers are asked to sign and conduct self-assessment against the SCOC. The SCOC rollout begins with high contract value suppliers. In 2017, 94% (31 out of 33) of suppliers with contract value between 500,000 - 1M USD participated in the assessment program which was slightly below target. In 2018, we expect to engage with all major suppliers on SCOC assessment.

Result Suppliers recived training and agreed to conform to the Supplier Code of Conduct

suppliers
2015

suppliers
2016

Result Suppliers who received evaluation against the SCOC and have developed an improvement plan

ราย
2016

Suppliers with contract value over 1M USD (70 suppliers)

ราย
2016

Suppliers with contract value 500,000 - 1M USD (33 suppliers)

2017 Supplier Development Plans

- Rank suppliers with annual contract value between 500,000 - 1M USD (17 – 35M THB)
- Provide knowledge and feedback on the Supplier Code of Conduct for the 2nd consecutive year
- Implemente "Online Assessment of Supplier Code of Conduct" so that suppliers can conduct self-evaulation on 5 areas of the Code of Conduct
- Provide feedback and suggestion of improvement to suppliers self-assessment
- Conduct site visits to provide advice and feedback to suppliers as well as to forster greater understanding between Bangchak and its suppliers
- Help suppliers develop improvement plans against SCOC

Supplier Relationship Management

To build confidence in a transparent and fair procurement process Bangchak has organized seminars to educate suppliers on dynamic procurement and guideline on the package management process of the procurement office. The seminars also allow suppliers to exchange information and ask questions. In addition, job satisfaction survey for users and procurement officers on suppliers' performance were conducted. Channels to receive suppliers' complaints and feedback were open to ensure that feedbacks are incorporated to improve work process.

In addition, internal users, procurement officers, and suppliers are working together to improve work processes. Contract Management System was developed to facilitate the contract review and tracking (such as start date, end date, contract amount, and budget spent) by users and management to be used for their respective process improvement.

"Bangchak's Supplier Code of Conduct has helped us to have better environmental protection process as well as encouraged our employees to be more aware of their resource consumption and to reduce their environmental impacts."

Chairisi Chantasim
Assistance Manager Customer Relationship Management
Flowco Company

Result

92 — 92% of user indicate high satisfaction with procurement officers

85 — 85% of users indicate high satisfaction with contractor performace

Green Procurement

We have completed the development of manual and green product directory to support green product and services procurement effort.

21 green products and services procured

Bangchak has established a Procurement Community of Practice (COP) which include procurement officers and users from various functions. The objective of the COP is to ensure consistent understanding of procurement practices. To that end the COP has conducted:

- Capacity building seminars on negotiation, ethics, and governance
- Strategic sourcing workshop for employees to exchange ideas and information to improve collaborations among various functions

การทำงานร่วมกับบางจากฯ ทำให้เราพัฒนา Feature ของผลิตภัณฑ์ที่เกี่ยวข้องกับพลังงานเพิ่ม ส่งผลให้ผลิตภัณฑ์ Meeting in Touch ก้าวหน้ามากขึ้น เราได้ทำงานร่วมกันใกล้ชิดและได้รับข้อมูลที่เป็นประโยชน์ระหว่างกัน และการที่บางจากฯ มุ่งมั่นว่าจะต้องเข้ารับรองในมาตรฐาน LEED ระดับ Platinum ก็ยิ่งเป็นโจทย์ที่ท้าทายให้กับเรา เพราะไม่ใช่แค่ส่งเสริมตามมาตรฐานในอุตสาหกรรมเท่านั้น แต่ต้องมีนวัตกรรมเพื่อให้สอดคล้องกับวิสัยทัศน์ของบางจากฯ ด้วยอีกเรื่องหนึ่ง คือ ทีมงานของบางจากฯ ก็ทำงานกับทีมของเราเหมือนเป็นทีมเดียวกัน รู้สึกภาคภูมิใจที่ได้ร่วมงานกับทีมงานที่มีคุณภาพเช่นนี้ครับ

คุณจอมทรัพย์ สิทธิพิทยา
บริษัทเอ็กซ์ซี จำกัด

Innovation Management

It is commonly accepted that innovation is essential to business competitiveness and sustainability. Bangchak believes that a culture that fosters innovations in the organization is key to becoming a strong and sustainable business. In 2016, we set new Corporate Vision (Evolving Greenovation) and Corporate Value (*i AM* BCP) to emphasize our commitment to innovation. The " *i* " in I AM BCP stands for Innovation which means being innovative in our work. In addition, we developed policy to promote learning across the organization and to develop our human capital. WE also reorganized our management structure that will foster both process and product innovations as well as creating new businesses.

Organizational Structure to Promote Innovation

1. Each business unit that generates revenue has at least one business development department/division (as shown) that identify new opportunities and develop projects to add value to the business unit. The business development department/division is responsible for the planning and budgeting as part of the annual strategic plan.
2. Bangchak Initiative and Innovation Center (BIIC) is responsible for engaging and collaborating with external institutions. The BIIC is made up of 3 division:
   - 2.1 Research & Development - collaborate with external research institutions/labs on researches focusing on new energy technologies. Bangchak may provide funding to external institutions in exchange for future share of revenue and/or patents for product development.
   - 2.2 Technology Acquisition & Networking - collaborate with startups both domestic and international to develop new businesses within and outside of Bangchak's current industries.
   - 2.3 Incubation & Start up - select projects for commercialization stage. The selection is made by the Startup Committee made up of high level executives from business units that are related to that specific projects, information technology unit, and external experts. In order to be selected for commercialization project must have business merits and the committee will decide on funding level and potential profit sharing. Alternatively, some projects may be selected for implementation within existing business/operations.
3. Process Improvement and Innovation Division is responsible for designing processes and tools to support innovation at operations level.

Bangchak has also appointed for all business groups innovation facilitators, innovation managers, and innovation sponsors to promote understanding, to cultivate a learning culture, and to improve work done by respective business groups in line with the ultimate "Learning Organization" goal. We also designated a Change Agent for each Business Unit. The Change Agent is selected from employees who have the right behavior and mindset in line with corporate values. He/she is responsible for promoting I AM BCP value by:

BCP Corporate Innovation Structure

"Bangchak is a small organization but we are committed to running a green business to protect our planet."

From the "Two Degree Crisis: Economics and Social"
Chaiwat Kovavisarach
President & CEO

Roks and responsibilities of Change Agents:

- Developing a strong employee network to promote behavior change
- Communicating results, challenges, and opportunities for improvement to executives, working team, and employees across Bangchak.

Corporate Innovation Framework

Bangchak deploys various necessary tools and projects to come up with employee innovation in cross-functional teams as described below

Tool / project	Detail	Staff group
Kaizen	Improve business processes to cut cost, raise efficiency, and improve work environment	Companywide
QCC (Quality Control Circle)	To cut costs and raise efficiency, which are complicated and need multiple data analysis	RFBG
BCP The Entrepreneur	Format development of businesses, products, or services under each year's project theme, set in line with strategies	Companywide
Community of Practice (CoP)	Grouping by professional expertise to develop specialized knowledge CoP IT: Activities include IT Share, IT Talk, IT Clinic, IT Day CoP marketing representatives: Collective business process improvement for market representatives CoP TQA: Application of TQA criteria and management tools Groups of professional practitioners	Groups of professional practitioners
Internship Innovation	Grouping of student interns to devise new work improvement projects or new businesses	Student interns

Projects at different levels call for deliberation by their corresponding panels, including the Kaizen and the QCC panels. Corporate-level projects go to BIIC (Bangchak Initiative and Innovation Center), which consists of relevant executives, academic/business experts, are members, and the Corporate Innovation Committee, which consists of Bangchak's management team members, for commercialization.

To advocate the innovation culture, Bangchak has set innovation project participation as a KPI for each employee. The executives also join the activities in each step of project launch,, project-awarding, and commendation. That way, employees may recognize the value of innovation and modify their behavior for the desired culture under corporate VMV.

Knowledge derived from innovation projects is recorded, distributed, shared, and extended in the corporation through "WeShare" under the BCP Knowledge Management system. All employees have ready access (called Anywhere Anyplace Anytime) through computer devices and mobile phones. A "Gamification Function" attracts employees' participation round the clock. Bangchak has modified "We Share" to accommodate business units' essential knowledge and also the recording and approval systems of Kaizen projects to ensure modernity and efficiency of corporate innovation development since 2016.

2017 Performance

โครงการด้าน Business Model ที่ดำเนินการ	2	1	1	1	-
รางวัลด้านนวัตกรรม	2 - 2 รางวัล QCC ยอดเยี่ยม (ก.อุตสาหกรรม)	4 - 2 รางวัล QCC ยอดเยี่ยม (ก.อุตสาหกรรม) - 2 รางวัลจาก (Thailand Kaizen Award)	2 - 2 รางวัล QCC ยอดเยี่ยม (ก.อุตสาหกรรม)	3 - 2 รางวัล QCC ยอดเยี่ยม (ก.อุตสาหกรรม) - 1 Thailand ICT Excellence Award	4 - 2 รางวัล QCC ยอดเยี่ยม (ก.อุตสาหกรรม) - 2. Thailand ICT Excellence Award

In 2017, we launched "BCP The Entrepreneur" program to promote employee engagement in new business development. Participants in the program compete to win prize money as well as "Implementation Reward," a profit-sharing model based on 5%-10% EBITDA from projects that are implemented. In its first year, the program attracted 34 projects from 20 groups of employees. Selections were made in two rounds: 1) pitching and 2) business model. Judges are Bangchak Executives, business owners, and startup experts. The finalists will be selected and winner announced in February 2018.

In addition, we are promoting individual work process improvement throughout the organization via the "Corporate Kaizen Project" award. Employees are encouraged to submit their project on the e-Kaizen system, which is part of the Knowledge Management System. Direct supervisor can approve project submission directly in the system. Projects submitted can be shared and viewed by everyone in Bangchak via the Social Media function of the system which allows employees to like, comment, and share projects. The e-Kaizen system can be accessed on mobile devices such as phones and tablets. In addition, the e-Kaizen system has passed the first round of the Thailand ICT Excellence Award, an award for IT projects that support organizational learning and development.

3Rs

Waste Management

98 %

of total waste

Total Greenhouse Gas Emissicns

1.02

Million ton CO_2e

Total Energy Consumption

15,612

TJ

Total Reused & Recycled Water

32.58 %

(equal to 3.42 compared to desad year

Total Water consumption

2.54

Million CU.m.

Environment Performanee

Operational Eco Efficiency

In 2017, the refinery business maintained an average capacity of 111,400 barrels per day which was higher than 111,000 barrels per day target. Bangchak places great importance in making our processes as efficient and as clean as they can be due to climate change and resource scarcities. We conducted carbon footprint study to find areas where we can further improve our environmental performance. We also decommissioned low efficiency fuel oil boiler and power generator and switched to natural gas co-generation plant which not only reduces our GHG emission but also improve the stability of our production process.

In addition, we reduced our water consumption by installed water efficiency technologies and conducting water footprint study to create more opportunities for savings.

Our 3Rs waste management helps us to continue achieving zero waste to landfill target while further reducing resources consumption and waste generation from production process. Further, we are expanding our 3Rs management to our subsidiaries.

In addition to environmental and safety improvements to our production process, we are investing in digital technologies and IT systems to improve effectiveness and stability of our processes. We also use technologies to build our employees' capabilities such as the Operator Training Simulator. In 2017, we used information system and data linkages to increase our ability to analyze data from production planning and data to product delivery. We used the analysis to quickly identify opportunities to improve efficiency and reduce losses in production process. This lets us be agile in adjusting our processes to internal and external factors. The system is being continually implemented, the production data will be implemented in early 2018.

We are also improving the information system for data related to monitoring and maintenance to ensure that our operators can access reliable information quickly. This system will be launched in 2018 and will be linked to other reliability data system in the refinery.

Bangchak continues to receive Green Industry Level 5: Green Network certification, which is the highest recognition from the Department of Industrial Works given to companies that exemplify environmental management best practices including efforts to support environmental management throughout the value chain and creating a green network within the surrounding communities.

Energy Consumption and Climate Change

Energy is an important resource for production. However, it is a significant source of greenhouse gas emissions resulting in climate change impacts. Bangchak deeply recognizes the importance of energy and its impacts. As a result, Bangchak has conducted energy management system in accordance with ISO 5001 continuously since 2014 for controlling and reducing energy consumption which has annual short term goals and intermediate-term projects by the process improvement called Yield optimization, Energy efficiency, Safety excellence, and Reliability enhancement—more commonly referred to as YES-R for increasing energy efficiency and effective oil refinery. In addition, Bangchak has invested in in long-term projects to significantly reduce energy consumption, called the 3Es Project (Efficiency, Energy, and Environmental improvement).

2017 Energy Efficiency Targets

Bangchak set annual energy efficiency target, and monitored plans and energy efficiency. The energy efficiency targets of 2017 shows as the followings;

Energy Intensity Index (EII)

less than **101.5**

(Target less than 90 following Solomon Benchmarking by 2020)

Production process units' energy consumption of **5.84%** of FOEB (fuel oil equivalent barrel).

2017 Performance

In 2017, Bangchak commissioned the cogeneration power plant unit 3, a project in the 3Es program, to improve the reliability of electricity and stream used in production process. The cogeneration plant allowed Bangchak to decommission old inefficient boiler. In addition, we completed two energy efficiency projects:

Electricity Consumption Reduction Project

- Project to replace light bulbs to LEDs for production plant 2 and 3, tank farm, and control buildings.

Fuel Consumption Reduction Project

- Project to relocate napta intake to distillation unit 3 to reduce energy consumption of the furnace

Performance of Refinery Business

Energy Intensity Index; EII

	2014*	2015	2016*	2017
Targets	107	109	102.5	101.5
Results	114.4	105.8	103.1	103.1

Process unit energy consumption (% of FOEB)

	2014*	2015	2016*	2017
Targets	5.89	6.07	5.92	5.84
Results	5.96	5.70	5.69	5.43

*major turnaround year

In 2017, we achieved our energy consumption target of 5.43% FOEB; however, we our EII performance of 103.1 was slightly above our target due to the maintenance at our cogeneration plant unit 1 and 2 which required us to switch to less efficient boilers to generate electricity and steam.

Future Plans

Our plans to improve energy efficiency in 2018 are:

1. Resurfacing the internal lining of the cracker unit and hydrogen production unit
2. Quality improvement of low pressure steam from cogeneration unit for reuse
3. Replacement of high pressure steam in cogeneration power plant with low pressure steam from distillation unit 3
4. Installation of heat exchanger to exchange heat from desalter waste water in distillation unit 2.
5. Installation of temperature control system for the low-pressure steam piping intake at the anaerobic distillation unit

Climate Change

Recognizing the changes in our climate and its devastating impacts to property and lives, Bangchak has set a proactive operational response to reduce and avoid GHG emissions. We look to do this at every stage of our process from production, transportation, procurement, and support services as well as to expand into renewable energy business. Our efforts reflect our commitment to keep temperature rise to under 2 degrees Clesius and to support SDG 13. Bangchak has set GHG reduction target, though carbon offset within the Group, as a KPI for the performance assessment of the President & CEO.

Strategy

- Grow investment in clean-energy businesses in pursuit of a Low Carbon Company
- Use clean energy in processes
- Develop and conduct Carbon Footprints
- Increase energy efficiency

2020 Targets

- Cut 60% carbon dioxide emission with carbon offsetting of Bangchak's renewable-energy businesses of affiliates
- Replace the entire fuel oil volume with natural gas for production processes

In addition, we are working with the Thailand National Metal and Materials Technology Center and the National Science and Technology Development Agency to conduct a gate-to-gate carbon footprint assessment for our refinery business. The finding from the study will be used to further improve our energy efficiency and reduce GHG emissions.

"The Carbon Footprint project helped us to better understand the energy efficiency and carbon performance of our production process and throughout the entire life cycle of our products. This helps us to improve our processes which not only gives us payback through cost savings but also helps reduce environmental impacts for the community and the wider society, which is in line with our corporate culture."

Chalermchai Udomranu
Senior Executive Vice President
Refinery Business

2017 Performance

Bangchak has included internal carbon pricing as an investment criteria for new projects. The project's potential to reduce carbon emission is another tool in Bangchak's Environmental Management Accounting process.

In 2017 Bangchak set Inter Carbon Pricing at 112THB/ton CO2e. The internal carbon price is used in investment calculation through the e-Budgeting system prior to commencing corporate investment process.

In 2017, Bangchak was able to reduce 339,500 ton Coe from renewable energy investments of our subsidiary, BCPG; a project to reduce the use of reboiler to increase the production of unconverted oil; and from a project to use low pressure waste gas from cracker as input for hydrogen production in the refinery business.

In 2017, the commissioning of natural gas cogeneration plant unit 3 to replace fuel oil boiler lead to a 10% reduction of GHG emission from 2015 baseline.

In addition, Bangchak has developed new products and services to help reduce GHG emission. For example, our gasohol products and new premium grade diesel were developed to help reduce emission from the tailpipes. In addition, our service stations are designed to be energy efficient, have green space for the customers, as well as have EV charging stations in some of our pilot sites.

Water Consumption

Water scacity is a global issue. In Thailand, impacts from drought and flooding have increased in severity. Climate change and poor water managment have caused negative impacts to everyone in the society from industrial users to farmers to consumers. As a result, all segtors within the society recognize the gravity of the problem and are beoming active in water conservation and water management to reduce impacts to society.

At Bangchak, we are aware that our operations are located in an important economic zone with high water consumption. We established the Refinery Water Management Taskforce in 2015 to drive water consumption improvement while maintaining operational stability. We have begun product water footprint study to further identify opportunities for improving our water performance.

Strategy

- Apply 3Rs to improve water consumption efficiency
- Manage water consumption with state-of-the-art technologies

2020 targets

- Use water efficiently.
  Control new water intake
  to no more than 54 cubic meters / KB
- Reduce by 15% of tap-water use
  (2015 is the base year)

2017 Performance

Bangchak used 2,433,646 cubic meters of water produced by the Metropolitan Waterworks Authority. Additional 108,689 cubic meters was drawn from the Chaophraya River and stored for tank cleaning. This resulted in 2,542,335 cubic meters of water use. The ratio of water used per barrel of oil produced is 0.061 cubic meter/barrel equal to oil production last year.

In 2017, Bangchak maintained our effort to reduce water consumption and water dischange. We expect that by 20XX when the product water footprint study is complete, we will have more options to further reduce our water consumption. In 2017, we were able to reduce water consumption by 1,195,506 cubic meters or 32.58% of total water consumption (around 36% compare to 2015 baseline). The reduction was achieve through the following:

Item	2017 plan	Achievement
Water Reduction		
1	Applied the micro-filtration and Reverse Osmosis (RO) systems in water treatment in conjunction with the RO system for tap water and the electro de-ionization to pre-treat raw water prior to entering it into the demineralization system at the Power Plant.	**42,719 cu.m./year** reduction (1.16% of total water consumption or 1,018 cu.m./million barrels equivalent of oil output)

Item	2017 plan	Achievement
Water Reuse		
2	Used high quality condensate water for boilers operations.	**587,938 cu.m./year** reduction (16.02 % of total water consumption or 14,023 cu.m./million barrels equivalent of oil output)
3	Used water from the Sour Water Stripping Unit and water dischargedfrom the stripping stream of Plant 3 instead of tap water in the Desalter Unit.	**50,496 cu.m./year** reduction (1.38% of total water consumption or 1,204 cu.m./million barrels equivalent of oil output)
Water Recycle		
4	Treated slightly contaminated condensate water from Plant 4 for reuse in the boiler feed water system	**Reduction of 438,444 cu.m./year** (11.95 % of total water consumption or 10,457 cu.m./million barrels equivalent of oil output)
5	Improve quality of treated water from wastewater treatment processes by using micro-filtration system and Reverse Osmosis System in order to use as water for the cooling system	**Reduction of 75,907 cu.m./year** (2.07 % of total water consumption or 1,801 cu.m./million barrels equivalent of oil output)

*เทียบข้อมูลจากปีฐาน 2558 จากผลรวมของน้ำที่นำกลับมาใช้ใหม่จากการนำน้ำควบแน่น (Condensate Water) คุณภาพดีมาใช้ซ้ำที่หม้อต้มไอน้ำและภายในหน่วยกลั่นที่ 4 รวมกับการนำน้ำจากหน่วยบำบัดน้ำมันทิ้งมาปรับปรุงคุณภาพเพิ่มเติมด้วยระบบรีเวอร์สออสโมซิส และการนำน้ำที่ผ่านการบำบัดจากหน่วยบำบัดน้ำทิ้งมาปรับปรุงคุณภาพเพิ่มเติมด้วยระบบรีเวอร์สออสโมซิสไปใช้ที่หอหล่อเย็น

Performance Indicator

Control water consumption per equivalent of oil output
(Target less than 61.2 cu.m. / 1000 barrels equivalent of oil output)

60.52
cu.m. / 1000 barrels

Percentage of Water saved compared with Annual Water Demand (Percent and Water Saved)

28.60 %	32.97 %	32.58 %
Water saved	Water saved	Water saved
1.12 Million cu,m.	1.15 Million cu,m.	1.19 Million cu,m.

Total water demand

3.92	3.51	3.66
Million cu.m.	Million cu.m.	Million cu.m.
2015	2016	2017

Water saving (household equivalent)
3,150 household equivalent *

3,150
Households

* Based on water consumption data in Phra Khanong District, where the refinery is located and with 1.85 persons/household. Average consumption here is 0.56 cubic meter/person/day or 1.04 cubic meters/ household/day.

Future Plans

- Increase capacity of the reverse osmosis system for waste water treatment plant. Improve raw water treatment system with reserse osmosis system and Electro De-Ionization System to improve water quality prior to entering the de-mineralization System at the power plant
- Collaborate with specialist from King Monkut's University of Technology Thonburi to conduct study of Water Footprint of Product to better manage water consumption.

Water is an extremely important resource for all human activities; this has also been underlined by the SDGs 2, 6 and 14. Though Thailand is a tropicalcountry, the distribution of water across the country varies spatially and seasonally; these variations will only be exacerbated due to climate change. Thus, it is imperative that the private sector in Thailand turns proactive on water footprint projects. One of the frontrunners on this has been the Bangchak Corporation Public Company Limited.Having a long-term vision on sustainability, Bangchak has already startedto look at the water use of their operations which will help prepare for physical, regulatory as well as reputation risks vis-a-vis water

Prof. Shabbir H. Gheewala (Ph.D)
The Joint Graduate School
of Energy and Environment King Mongkut's
University of Technology Thonburi (KMUTT)

"Water crisis is a global megatrend and is a major risk to Bangchak's operation. We have put in place water management practices in our production process by conducting water footprint assessment to make sure that we manage water effectively in accordance with international standard, specifically ISO 14046. We aim to be the leader in water management and to share our knowledge to other entities."

Prapasri Phantujariya
Environmental Engineering Manager
Safety, Occupational Health, and Environmental Division

Waste Water

Oil residue in waste water from refinery is seperate using both physical and chemical processes. Then the water is further treated using biological process. Water to be reuse is filtered through sand, activated carbon, and zeolite prior to being treated using reserve osmosis. The remaining waste water is sent to retention pond. The water is then tested by our testing laboratory that has been certified by the Departmet of Industrial Works and ISO/IEC 17025 in addition to monitoring COD online prior to discharge to ensure that water quality is within the regulatory limits. In 2107, 903,980 cubic meter of water was discharged to the environment. As our refinery discharges water into the Chao Praya river, we are ensuring effective communication with government entities and local communities. In addition, we conduct a test of water quality in the Chao Praya river three times a year. We also have conducted training on Physico-chemical treatment for waste water treatment system operators to improve their understanding of treatment techniques.

In 2017, we added a color test of the discharge water in accordance with the Ministry of Natural Resources and Environment's new regulation on water discharge quality from factories and industrial estate. Test results showed quality of discharge water to be better than standard.

Strategy

Knowledge building :
Share knowledge of water treatment and technologies with related units.

Method building :
Enable wastewater treatment operators to self-develop work instruction under the supervision of engineers.

Equipment building :
Automate equipment by fabricating or improving it

2021 Targets

- Wastewater treatment operators know, understand, and can operate the system.
- Develop and improve the system to become more automatic. In 2017, we upgraded our dewatering process from Sand Drying bed (Manual) to Decanter (Automation) process. The upgrade is expected to be completed by October 2018.

Oil and Chemical Spills

Bangchak recognizes the importance of safety in every work process and strive to ensure that company's activities do not impact communities and the environment. This includes all our operations from crude oil transportation by large vessels to the small transport vessels from large ship to the refinery to refining process all the way to transportation to oil depots in Samut Sakhon and Surat Thani and customers. We aim to prevent any accidents; therefore, we place high importance on reducing environmental and safety risks and continually improve our response process by:

- Selecting oil tankers that meet industry standards and have been inspected and assessed
- Putting in place plans to prevent and stop spills, including conducting emergency drill on an annual basis
- Ensuring that emergency equipment and cleanup supplies are available and inviting local communities to observe drills to build confident
- Building capacity of personnel to respond to events by continuously participating in training and practice with stakeholders in government and oil industry
- Developing and improving safety technologies, equipment, systems and tools in compliance with the Oil Company International Marine Forum (OCIMF), such as the modernization of fire system at jetty and the installation of additional CCTV.
- Ensuring that oil tank, piping system, and equipment are designed and installed based on compliance with international standards.
- Develop procedures and provide training to employees.
- Develop a system for planning and monitoring equipment (preventative maintenance) at the appropriate time.

In addition to reporting to the Process Safety Management Governance Committee, results are reported to Risk Management Sub-committee and Enterprise-wise Risk Management Committee on a monthly basis. This is to ensure that we are managing risks and operations related to oil and chemical spills effectively. As a result, there were no significant leakage of oil and chemicals for the 3rd consecutive year. The result has assured our stakeholders of Bangchak's ability to manage safety and environmental risks.

Oil and Chemical Spills (case)

Number of significant oil and chemical spills (more than 100 Barrels)

Air Emissions

Keenly aware that its emissions may be a concern to communities, Bangchak uses fuel gas and natural gas, considered the cleanest energy sources in its production processes. As a result, emission to air is far better than governing emission standards. Bangchak continues monitoring the quality of air emission by using on-line measuring devices and periodically measures by, third-party to ensure that the quality of ambient air around the refinery always meets or superior to the emission standards. Any abnormal will be investigated, and measures will be determined to prevent recurrence. These will be reviewed and continually improved by the management team of the refinery in accordance with the ISO 14001 Environmental Management System Standard in a proactive approach.

Strategy

- Monitor the quality of stack emissions, workplaces, and ambient air around the refinery to ensure it meets the emission standard
- Reduce impacts on communities from flared gas during shutdowns and emergencies
- Transparently communicate environmental quality to the

2020 targets

- Zero complaint about air emission
- Install to completion an enclosed ground flare

There were no complaints from the local communities in 2017.

Although Bangchak achieved our zero-complaint target, we continue to improve the effectiveness of our air monitoring system. We are implementing proactive environmental protection policy as follows:

1. **Monitor air quality from stack, operations, and surrounding areas.**

1.1 Install Air Quality Monitoring System (AQMs) at Sai Jai Thai Foundation ofce on Sanpawuth Road, Bang Na district which is on the south of the renery. It is also the third AQMs in addition to the North and the East. Bangchak has plans for addition AQMs installation on the West of the renery at Bang Kachao Sub-district, Phra Pradaeng district, Samut Prakan province which will be the forth AQMs in 2018-2019

1.2 Hire specialists to inspect every stack in the renery, advise the location to install air monitoring equipment, and select best method to analyze air pollution level. We are using results from the inspection and analysis to further improve our performance by:

1.2.1 Increasing the accuracy of CEMs used to monitor air pollution from HRSG1 and HRSG2 stacks by switching to a new monitoring technique and installing a dedicated monitoring equipment by 2018

1.2.2 Drilling stacks during 2018 turnaround maintenance

1.2.3 Installing additional monitoring equipment and bring them online for remote control and monitoring of air pollution management by 2019.

1.3 Conduct training workshop on Volatile Organic Compounds (VOCs) for engineers and operators in 2018.

1.4 Upgrade oil sampling equipment to a closed system to minimize the release of VOCs

1.5 Set environmental inspection teams to perform local area inspection every Monday, Wednesday and Saturday in order to build confidence for local communities due to refinery operations, environmental protection, and cooperation with environmental inspection teams of the refinery for verifying abnormality. In addition, Bangchak specifies that all contractors must have an environmental officer to cooperate with Bangchak's environmental officers for controlling operations and effects on local communities during TAM

2. Minimize impacts from air pollution to local communities

2.1 Retire old inefficient boiler once natural gas cogeneration project came online in late 2017 resulting in lower release of sulfur dioxide and dust particulate.

2.2 Set more stringent emission target to 80% of standard to improve environmental performance of production process.

2.3 Improve online stack air quality monitoring system from to have two alert levels: 1) before reaching internal control limit 2) before reaching regulatory limit.

2.4 Set 2018 budget to replace burner for the Auxiliary Boiler1 to improve combustion performance and reduce particulate matter.

3. Transparent communication of environmental quality to the public

3.1 Install two additional public environmental monitoring billboards at Sai Jai Thai Foundation office on Sanpawuth Road and at the west gate next to the old railway road, Bang Na, for a total of six public environmental billboards.

3.2 Install one additional public environmental billboard at Bang Kachao Sub-district, Phra Pradaeng district, Samut Prakan province for total 7 public environmental billboards in 2018-2019

The above activities are part of Bangchak's proactive environmental management system, which has been ISO 14001:2015-certified for 20 consecutive years. In addition, it has earned Green Industry Level 5 (Green network) certification, the highest green certification from the Department of Industrial Works.

Results

Waste Management

Bangchak ensures that our operations are always in compliance with relevant laws and regulations. We continually improve our 3Rs implementation including reducing material usage, reusing water, and recycling to reduce waste and impacts on the environment. In addition, we have set targets and received certification in our achievement of zero waste to landfill target (except for insulation material which currently does not have technological solutions to manage this waste).

In 2017, due to effective management of 3Rs and lack of major turnaround we were able to use 3Rs for 98% of our waste. In addition, we continue to achieve our zero waste to landfill target.

Strategy

- 3Rs waste management
- Compliance with laws and regulations

2017 Performance

Non-hazardous waste

17%

Non-hazardous waste

83%

3Rs Waste Management

% Total Waste

2022 Targets

- Reduce volume of waste generated
- Zero waste to landfill

Developing Sustainable Products and Services

With a Vision to become **"The Most Admired Brand"** for service stations for Thai citizens, Bangchak has adopted a **"customer centric"** business strategy to respond to the needs of customers ranging from end user groups, dealers and co-ops, to industrial groups. Under the **"Bangchak Greenovative Experience"** conceptual framework, developing products and services with innovative technologies that are environmentally friendly (green) and socially friendly has always been its main focus. To ensure that all products and services are up to this standard, it enforces a program to track all goods with marketing tools including Net Promoter Score (NPS), Brand Loyalty, and Customer Satisfaction. For service quality, it enforces the uses of the Mystery Shopper program (service station facility audit by unclassified and undisclosed company representatives), mobile lab (product quality inspection by company's mobile lab facility), and service audits.

Bangchak's analytical research on customers' needs and expectations strongly suggests that customers demand good quality and speedy service, convenient locations, adequate supplies, a variety of supplementary services such as food stores and restaurants, convenient stores, and a sufficient number of clean toilets. Good quality, green products are high on customers' list. It has therefore deployed a business strategy with clear goals toward the findings and, as a result, driven itself to success and achieved outstanding performance.

2020 Targets

To become customers' "The Most Admired Brand" for service stations, evaluated with Net Promoter Score as the indicator

To push the sales volume up from to 500 million liters/month (from 315 million liters/month currently)

To develop services of service station and non-oil businesses with the concept of Bangchak Greenovative Experience to support new life style of Thai people together with sustainable environmental protection

To develop non-oil businesses and supplementary services at service stations in response to customers' needs

700

To expand the number of service stations more than 700 nationwide

To upgrade the community retail service stations to the to the standard service stations

2017 Performance

Green and socially friendly products

- Developed Bangchak Hi-Premium Diesel S with up to 70 Centane number and up to 4.3% fuel saving. Bangchak Hi-Premium Diesel S also helps to protect engine life while achieving Euro 5 standard for emitting 5 times less sulfur than Euro 4.

- Developed new lubricant products. In 2017, Bangchak and Manor, a racing team, co-developed a new lubricant to be marketed under FURiO brand. The lubricant helps protect engine and prolong engine life even under racing conditions where engine runs constantly for 24 hours.
- Developed S-ULTRA – a fuel oil product for motorcycles, from studying motorcyclists' behaviors. We found that customers desired product which helped prevent and clean their engines. As a result, the S-ULTRA was developed to enhance the performance of engines as well as to respond to customers' needs.

" Now consumers want convenience. Our job is to respond to that demand to ensure the greatest satisfaction. Our service station design doesn't only concern about appearance but functions as well, the stores should be designed to be inviting and customer-friendly. We try to make our service station unique. Each area is connected to facilitate good flow of traffic and we incorporate natures into the space to create Greenovation experience for our customers."

Suphisra Kingphikun
Bangchak Service Station
Manager, Wittanasap Co. Saraburi

Expanding business lines to increase sales volumes, products, and

- Expanding retail service stations with the new standard by 53 stations in 2017
- Modernizing the image of 311 service stations along main roads to reflect Bangchak's highly competitive capability in supportive management structure and service under the concept of "Renovate, Bright & Clean, Refresh"
- Developing a new service station prototype with innovative technology that can generate a different experience for consumers and focus on environmental preservation and reducing greenhouse gas emissions
- Upgrading high-potential community retail stations that are ready to expand their businesses with a more complete set of supplementary services to better respond to customers' needs by increasing their competitiveness with the "Co-Op Turn Pro"program and CO-OP Coaching
- Growing the number of fleet card users for growing sale volumes through service stations
- Developing business from voices of customers in small business groups which desire to control and verify oil use, but inconvenient to ask for credits with financial institutes for opening Fleet Card customer accounts. Due to this, Bangchak has developed Prepaid Fleet Card named Prepaid Plus
- Expanding non-oil business in service stations for convenience of customers
  - 77 Inthanin Coffee shops and Inthanin Garden
  - 27 SPAR branches

- Developing potential cooperation with other businesses for providing services for customers in service station such as restaurants, A&W, Burger King, and McDonalds
- Develop Smart Payments system using QR Code in SPAR and Inthanin shops
- Improve management of service station to increase revenue by adding new businesses such as: food kiosk, food truck, and automatic drop boxes to support e-commerce growth.
- Develop BCP Mobile Application and Bangchak Marketplace website to improve information access for our customers
- Partner with Line to develop "BCP Line Business Connect" to promote Bangchak products, services, and promotion to customers via Bangchak's official Line account.

Bangchak Greenovative Experience

Bangchak Greenovative Experience is developed for customers to get Greenovative experience together with special value-added care suitable for all ages in modern society, combined with social participation to sustainably conserve the environment in parallel with business and economic growth as well as social and market consumption in support of Thailand 4.0.

Developing Non-Oil Business to respond to different needs of customers

- Developing retail businesses under Bangchak Retail Co., Ltd., to operate Non-oil businesses including SPAR convenience stores, Inthanin Coffee Shops. And other related businesses to facilitate Non-oil businesses.
- Developing a new convenience store business with a joint venture from the Netherlands under the "SPAR" brand under the "Fresh & Easy Food Market" concept. Six retail stores have been in operation in Bangkok and its vicinity. In addition to products manufactured by Bangchak, local produce and OTOP (One Tambon One Product) products from farmers and communities, as well as products under the SPAR brand, are available. Sale of SPAR brand products is believed to exceed 50% of the overall sale. The store houses two main areas, a 300-sq.m. neighborhood store and a >500-sq.m. supermarket. Part of these areas is allocated to be a 'Co-Working' space with free-WiFi to serve customers. The plan calls for 400 stores within 2020.
- Continually develop SPAR layout and product offering to match demand of customers at each location. Currently, SPAR have three models: express store, neighborhood store, and supermarket.
- Designated Products Champion to develop new products to attract customers into SPAR. For example, in 2017, we added sugar cane and lime juice to our product offerings.

Development of services and management system toward excellence

- Develop "Tun Jai in 3 Minutes" standard to reduce our service time to response to customers' demands for quick services.
- Develop a standard for services at our Flagship Station that further improves customers' service experience such as "Tun Jai in 3 Minutes" and higher standards for restrooms.
- Expanding Automation Point-of-Sale (POS) system for all service stations to increase potential and work efficiency for all station owners and dealers, accelerate work at the forecourt, quicken financial transactions, and prevent losses and fraud. Moreover, POS data can significantly enhance analyses to identify ways to continuously improve services to maximize customers' satisfaction in the future.

- Developing a Standard Operating Procedure (SOP) to help define standards of existing and new services to fit the behavior of customers. Organizing related training for more than 4,000 service personnel from over 700 service stations to fully understand modern servicing standards and adapt their service attitude toward service excellence.
- Service Monitoring and Auditing by Mystery Shopper Project and Mobile Training & Lab (Mobile Training and Product quality check at the service station)
- Implementing a Co-Op Coaching program to upgrade management and service levels for international standards.
- Developing programs to enhance the income of station owners and dealers:
  - Continuous sales promotion for each customer group, such as projects under the Royal Project jointly organized by co-ops and BAAC (Bank for Agriculture and Agricultural Cooperatives).
  - Organizing special sales promotions of local produce and products from co-op members during price downturns.
  - Setting up a new food and drink business development group to increase choices of income for owners

Results

Retail market share (Target 15.3%)

Bangchak Net Promoter Score (NPS Score)
(Target: reduce gap From The Market leader)

Average sales per station
(Target 489 kiloliter/month/station)

Average sales per station

Standard Service Station

+53 Service Station (Total 499 Service Stations)

Community Service Station

+9 Service Station (Total 615 Service Stations)

บริษัทฯ ร่วมถวายความไว้อาลัยกับประชาชนไทย ด้วยการลดราคาน้ำมันใส ทุกผลิตภัณฑ์ 1.50 บาท ในวันที่ 26 ตุลาคม เพื่อลดค่าใช้จ่ายให้กับประชาชน ในการเดินทางไปร่วมในวันพระราชพิธีถวายพระเพลิงพระบรมศพ พระบาทสมเด็จพระปรมินทรมหาภูมิพลอดุลยเดช บรมนาถบพิตร

CO2 Reduction

Every fuel brought using Bangchak Gasohol and Diesel Club cards at Bangchak service stations can help reduce CO2 emission. In 2017, these cards contributed to 186,240 tCO2e reduction.

CO2 reduction (gCO2e/ liter of fuels) หน่วย : กรัมคาร์บอนไดออกไซด์เทียบเท่า	91s 95s	E20s	E85s	ไฮดีเซลs
	100	200	850	50
Total 2017 CO2 reduction from customers' contribution (tCO2e) หน่วย : ตันคาร์บอนไดออกไซด์เทียบเท่า	25,042.6	39,8756	94,853.7	24,468.3

Accumulated CO2 emission from using Bangchak Gasohol and Diesel Club cards (tCO2e (หน่วย : ตันคาร์บอนไดออกไซด์เทียบเท่า)	139,000	162,000	186,240
	2015	2016	2017

2017 Products and Services Innovations

New diesel fuel - Hi-Premium Diesel S

Bangchak Hi-Premium Diesel S with up to 70 Centane number and up to 4.3% fuel saving. Bangchak Hi-Premium Diesel S also helps to protect engine life while achieving Euro 5 standard for emitting 5 times less sulfur than Euro 4.

Lubricant under new brand "FURiO"

In November 2017, Bangchak unveiled a new lubricant product under FURiO brand. FURiO lubricant is a premium product designed to reduce engine wear and tear even under extreme conditions. The lubricant was used in racing cars from CEFC MANOR TRS RACING for 5,000 kilometers twenty-four consecutive hours racing at the FIA Word Endurance Championship 2017 in France.

Professional Franchise Development:

A scheme to study and develop pragmatic management control for service station owners and dealers to manage their stations efficiently.

BCP Link Application development:

This computer and mobile-phone application provides links and communication channels between Bangchak and service station owners and dealers, other Bangchak businesses, and relevant people in other functions on the sharing of information, news, activities, and other programs, to optimize the business.

Line Business Connect

Line is one of the most popular social media application in Thailand. It offers a direct channel for Bangchak to connect with our customers. To capture the customers in Line ecosystem, Bangchak developed Line Business Connect function within the application that let customers "check in" to our service station to receive reward points to increase traffic and incentivize customers to the station. In addition, users can sign up for membership and search for nearest service station directly from their Line application. Currently, Bangchak has 21 millions members in our LINE Office account.

What is a pre-paid Fleet Card

Bangchak offers Bangchak Prepaid Card and Bangchak Prepaid Card Plus to small and medium size businesses (SME) who want to control their fuel cost without needing to get credit approval from banks.

Bangchak Mobile Application

We developed an application for smart phone and tablet that has search function for our service stations and shops, shows new promotions, helps plan route, check Bangchak reward points, check fuel prices as well as provide notifications when price changes.

Developed "Tunjai in 3 minutes" Standard

The quality of service is crucial for our business. We aim to provide quick and effective services to our customers. To that end, we have developed "Tunjai in 3 minutes" standard to ensure that our customers receive services in a timely and efficient manner. In 2017, 182 of our service stations adopted the standard of which 77 service stations are operated by our partners.

Flagship Service Station

In 2017, Bangchak desired to upgrade services of service station staff to be the premium level to emphasize our unique service standards which are different from others. Also, we intended to create exceptional perceptions to impress customers with the premium service standards to attach more customers to our service stations and to become the number 1 service station for customers. Currently, there are 4 flagship service stations which are at Ratchaphruek 2, Vibhavadi Rangsit, Kanchanaphisek road, and Ekkamai.

Organic Vegetable Garden Project

We encourage employees at our service stations to grow organic fruits and vegetables in empty plots in our service stations. The produce from the plots are given out to employees as well as customers so that they can enjoy safe and local products that are healthy and free.

COOP Turn Pro

We improved potential community service stations to compete with other brand service stations by improving features of community service stations to be more attractive, as well as providing suitable Non-Oil businesses for those service stations. In 2017, there were 17 community service station joining the COOP Turn Pro.

Triple M Dealer Training Project

We provided the Triple M Dealer Traing Project (a new training course for community service station dealers) to develop potentials of community service station networks with service station management strategies to be ready for the present and future market competitions, as well as for becoming the number 1 service stations for customers. In 2017, there were 43 community service stations participated in this project.

"Wheelie by Inthanin" a new coffee shop model for our COOP service stations

In 2017, we worked with our COOP service stations to develop a new coffee shop model that would better serve customers who frequent these service stations. The result is "Wheelie by Inthanin" where we adjust our beverages to the taste of our customers who prefer stronger flavors at an affordable price. Translator note: I used "Wheelie" which means ยกล้อ. If you prefer to ทับศัพท์ then YokLor may be used. Also it would be great to be able to show increase revenue/traffic from these locations once the new model is implemented

Bangchak Sharing for Thai Rice Farmers

One of Bangchak's long term project. In 2017, Bangchak promoted organic brown rice product from Aomsook Co,Ltd (supported by Bangchak's corporate social responsibility). Organic brown rice crackers, "Rice Pop", developed by farmers are given out as gifts to our customers who visited our service stations between December 1-25. The products will be available for sale at our SPAR convenient stores and Intanin shops to promote products from the communities.

CO-OP Coaching Program

One of Bangchak's long term project. In 2017, Bangchak promoted organic brown rice product from Aomsook Co,Ltd (supported by Bangchak's corporate social responsibility). Organic brown rice crackers, "Rice Pop", developed by farmers are given out as gifts to our customers who visited our service stations between December 1-25. The products will be available for sale at our SPAR convenient stores and Intanin shops to promote products from the communities.

CO-OP Coaching Program

Co-operative (COOP) service stations have grown and become stronger, leading to more business expansion among the group. However, not all co-op stations are equally successful because of a lack of confidence and skills in business, as well as management expertise. Recognizing the need to develop and equip these dealers with management knowledge and skills, Bangchak Green Net Co., Ltd. experiencing in the operation of 190 service stations, has been assigned to set up a dedicated team to provide training and development to co-op service stations. During 2016, the program was joined by 60 co-op stations

Product Transport

To ensure that deliveries of products through various distribution channels, namely pipelines, trucks, and ships, at customers' service stations, and at industrial sites are made with the correct types and volumes of products and with punctuality and safety, Bangchak raises the efficiency of business partners (transport operators) to the same standard as that of the company which in turn enhances its overall efficiency in product transport. It is a joint effort for making partners' business strong and sustainable. Bangchak therefore drew up its "Supplier Code of Conduct" for partners to observe for business sustainability. To this end, training and seminars were provided to improve the work environment, while various activities fostered relationships between business partners and Bangchak. This develops business partners to their maximum potential.

2020 Targets

Product transport by large trucks (semi-trailer trucks) to increase by

2% per year

Product delivery to meet future distribution plans (based on expansion of the retail network by

350 stations

in 2020

(Zero Accident)

Complaints about product transport to be under

3.5 cases

per 1,000 delivery trips

Strategy Devising an efficient product transport plan with cost, environment impact reduction, time, and highest safety taken into account

Project to increase product transport by large trucks (semi-trailer trucks)

The change from using oil tanker to semi-trailer (40,000-liter capacity) reduces not only transport costs but also greenhouse gas (GHG) emissions per oil unit and reduces risk for accidents. Bangchak has seriously driven the change by giving discounts to station operators who opt for semi-trailer trucks. The attempt has resulted in an increased use of semi-trailer trucks by up to 5% from the previous year, reflecting cost savings of over 36 million THB. This also lessens the chance for accidents and reduces fuel consumption, thus, carbon dioxide emission reduction more than 3,945 tCO_2e.

Plan for 24-hour oil delivery

Bangchak has developed a transport plan to enable 24-hour oil delivery which involves having two drivers per truck instead of one without increasing the number of trucks. This has provided advantages for our partners in terms of continuous oil sells, increasing opportunities in attaching new customers. Business partners can also make more money from more on time-delivery trips with their fleets.

Strategy 2 Developing a technology for modern and efficient product transport

Smart Transportation

This project further improves the Transportation Management System (TMS). Currently, all oil trucks are equipped with CCTVs and GPS to facilitate the monitoring of delivery schedules, delivery routes, delivery time as well as driver behavior, and driving speeds. All information is sent to the control room, where operators work around the clock to keep track of oil trucks with the assistance of the notification system to prevent accidents and fraud along delivery routes. This year Bangchak has made another development in this area. With a mobile application, information from CCTVs installed on oil trucks can be traced on smart phones. Station operators can view real-time movements of delivery trucks and track their locations throughout the routes, starting from oil depots. All parties involved can check the delivery status at the same time. The new system has enhanced transparency and satisfaction, while reducing complaints about product transport.

Auto Ordering System (AOS) : To efficiently manage product orders from retail stations and efficiently plan punctual delivery, Bangchak has developed AOS to help station operators calculate their daily sales volumes and stock balances. They can then regularly place an automatic order with Bangchak using AOS. Retail stations can thus manage their stocks to ensure availability of products for sale. Essentially, transport plans and the number of trucks to be used can be better managed. Starting this year, AOS has been implemented at over 200 retail stations operated by Bangchak Green Net Co., Ltd.

E-Complaint : Bangchak has developed an E-Complaint System to ensure that complaints about product transport are systematically managed. Each step in dealing with problems can be followed up, and the cases can be closed efficiently. Moreover, in 2017 the online complaint-receiving system will be linked to the payment system, in which fines can be automatically calculated and added to transport service charges, particularly where complaints made on transport operators are so serious that Bangchak's corporate image may be tarnished. This is another way to maintain the standard of transport service since penalty is evident.

Backhaul

n general, unloaded trucks on their return trips to oil depots after delivery of products at retail stations or industrial sites are considered as loss of business opportunity. Bangchak has devised a plan for making use of backhaul. Empty trucks are used for receiving ethanol from ethanol plants located on return routes to feed the refinery's oil production processes. This year Bangchak made use of over 489 trips of backhaul, resulting in cost reduction for feedstock transport by over 0.85 million THB.

Developing professional truck drivers

Bangchak provided training on professional driving for truck drivers to equip them with knowledge of safe driving and firefighting, as well as depot operations. Learning about TMS and information management on the SAP system helps enhance drivers' confidence and professionalism. The attempt has resulted in a better quality control for delivering good and efficient transport to station operators.

The strategy has brought about an outstanding transport performance, that is, Bangchak can manage transport contract more efficiently (76%).

Results

Ratio of clear-fuel transport by semi-trailer
(Target: increase by 2% per year to reduce CO2 emission)

tCO2e)

No. of transport complaints
(Target: ≤3.5 complaints per 1,000 delivery trips)

No. of Accidents**
(Target: Zero accident)

(*cases of over 1 million THB)

Future Plans

- Improve Transportation Management System (TMS) so that all transport operators can join the 24-hour monitoring of product transport via CCTVs

Eco-efficiency

The balance between economic growth and environmental protection is important to Bangchak in order to pursue sustainable development. Because of this, eco-efciency has been applied as an indicator to demonstrate the comparison between economic growth and environmental impacts. For economic growth, Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) is used to reect economic growth. On the other hand, carbon dioxide (CO2) emission which is a signicant environmental material of oil and gas industry is used for representing environmental impacts. The high eco-efciency indicates high production efciency with low level of environmental impacts.

The 2017 eco-efciency was higher than the 2016 eco-efciency because of the increasing revenue generated by higher oil production, and higher CO2 equivalent reduction compared to year 2016. This demonstrated the continuous sustainable growth with less environmental impacts of the business.

Eco-Efficiency (THB thousand/tCO_2e)

Note: EBITDA and CO2e (scope 1 and 2) for the Refinery Business

Environmental Cost Accounting

Bangchak has prepared and developed environmental cost accounting, embracing oil rening processes, Bangchak Oil Depot, and Bang Pa-In Oil Depot. Such accounting has been publicized to external agencies and investors through its quarterly MD&A articles and IR Newsletters. In addition, knowledge has been constantly transferred to students and other interested agencies.

The total environmental expenses of 2017 raised by 21,595 million THB (29%) compared with year 2016 because material costs of product outputs grew by 21,622 million THB. In addition to the increase in crude oil price by 21% compared with year 2016, the average production capacity increased from 101.4 kB per day in 2016 to 111.4 kB per day in 2017. On the other hand, material costs of non-product outputs rose by 15.92 million THB due to the increase in slop oil from several planned and unplanned shutdowns in 2017. The costs of environmental control equipment decreased by 35.37 million THB (11%), which were maintenance costs of environmental equipment, pollution control equipment depreciation, because there was a turnaround maintenance leading to long life of equipment, and resulting in the decrease in costs of maintenance and depreciation of equipment. In addition, this was a result form the decline in waste disposal costs by 11 million THB because of wastewater pond cleaning in 2016 which resulted in an increase in waste disposal costs. The environmental prevention cost reduced by 7.87 million THB (31%) as a result of the decrease in environmental monitoring and measure costs by 10 million THB because there was no maintenance while the expenses for operating environmental management system increased as a result of the extension of the system certication.

For the nancial benets of by-products and reuse of scrap in 2017, the nancial benets fell by 3.35 million THB (21%) because iron scrap and surplus aluminum sold was lower than year 2016 by 3.64 million THB due to no turnaround maintenance in 2017. On the contrary, the sale of liquid sulfur increased by 0.46 million THB.

In 2017, Environmental Management Accounting (EMA) training course was organized and provided for employees whose work was related to investment in project development. This was because the advantages and necessity of the EMA in integrating environmental matters with costs and project assessments for prudent investment in accordance with the global investment trends and the DJSI for sustainable project development. In addition, the internal carbon pricing was adopted and applied for the project assessment.

(Unit: Million THB)

Environmental Cost Accounting	2015	2016	2017
Material costs of product outputs			
Crude oil	79,314.43	60,029.81	80,433.78
Ethanol	6,872.01	6,668.93	7,648.60
B100 biodiesel	4,407.44	4,966.32	4,607.19
B100 biodiesel -Premium	-	-	28.37
Wasted cooking oil	19.92	12.93	6.37
Chemicals	106.08	145.04	162.45
Process water	33.02	25.45	26.52
Process energy	2,278.92	1,511.03	2,068.72
Material costs of non-product outputs			
Slop oil	32.49	65.50	81.68
Oil sludge from crude/fuel oil tanks	-	-	-
Effluent	9.64	10.97	11.20
Excess chemicals from neutralizing pond	0.26	0.21	0.31
Low-quality sulfur	0.05	0.59	-
Waste and emission control costs			
Environmental equipment maintenance	30.34	38.82	26.65
Pollution control equipment depreciation	354.00	245.44	233.90
Effluent treatment	7.38	8.81	8.15
Waste disposal	6.11	21.48	10.48
Environmental fees and taxes	N.A.	N.A.	N.A.
Fines	-	-	-
Prevention and other environmental management costs			
Monitoring and measurement	11.10	24.58	14.58
Waste storage area depreciation	0.13	0.13	0.13
Management system operation	0.30	0.23	2.57
Environmental equipment maintenance	0.30	0.26	0.04
Benefits of by-products and recycling			
Liquid sulfur	(13.30)	(10.18)	(10.63)
Glycerine	(0.52)	(0.33)	(0.16)
Iron and aluminum scrap	(3.42)	(5.11)	(1.47)
Paper	-	-	-

ความปลอดภัย

จำนวนผู้บาดเจ็บจากการทำงาน (TRIC)

พนักงาน	1 ชาย	0 หญิง
ผู้รับเหมา	0 ชาย	0 หญิง

อัตราการบาดเจ็บรวม(TRIR)

พนักงาน	0.74 ชาย	0 หญิง
ผู้รับเหมา	0 ชาย	0 หญิง

พนักงาน

Best Employer Score

ร้อยละ **61**

ชั่วโมงฝึกอบรมเฉลี่ย

45 ชั่วโมง/คน/ต่อปี

อัตราการเลื่อนตำแหน่งภายใน

ร้อยละ **13.96**

สังคม

ชั่วโมงทำงานอาสาของพนักงาน

13,460 ชั่วโมง

คิดเป็นเงิน **4.20** ล้านบาท

ไม่มีข้อร้องเรียนจากชุมชนในวงกว้าง

โครงการ Green Partnership Award **47** โครงการ

การจัดตั้งมูลนิธิใบไม้ปันสุข

มูลนิธิใบไม้ปันสุข

สร้างคุณค่าสู่สังคม

Occupational Health & Safety

Safety is vital to the petroleum business, not only for the organization, but also for employees, contractors, and communities. Bangchak's implemented Security, Safety, Occupational Health, Environment and Energy (SHEE) policy requires employee and contractors to perform their tasks safely for themselves and co-workers in accordance with applicable laws and Bangchak's own safety standards. The policy required a functional SHEE organization and an OHSAS 18001 Safety and Occupational Health Management System. In addition, Bangchak established a Process Safety Management Governance Committee (PSMGC) and continues implementing Process Safety Management (PSM), designed by Du Pont since 2013. As a result of these efforts, its safety performance is significantly improved. In 2017, Bangchak organized events both inside and outside of the refinery to promote safety practices. The event, called "Safety 24 Hours", promoted safety culture and safe practices to employees and contractors at every level.

Activities to promote safety at the "Safety 24 Hours' event included:

- Safety Culture Transformation through an activity called "Line Walk" conducted by management from each operation to promote the importance of safety and through Field Risk Assessment (FRA) conducted by employees to spot safety risks in order to prevent near misses and incidents.
- Campaign to promote correct use of safety helmet by fastening chin strap at all time.
- Awareness raising through multiple communication channels such as email, posters, Safety Radio Channel in several formats such as news, informational, warning message, and games.
- Monthly area safety meetings and walkthrough conducted by safety officers and contractors.

In addition, Bangchak conducted campaigns to promote safety practices outside work such as defensive driving and wearing motorcycle helmets and seatbelts.

Safety values: The 3Es

Everyone goes home safely every day:

Efficient and Reliable Operation

Environment and Asset are protected:

Safety Performance

Continuing Programs	New Initiatives
• Developed Process Safety Information (PSI) and database to compile basic information on production processes and their potential hazards. • Implemented Process Hazard Analysis (PHA) to identify potential hazards in the production processes and determine proper safety measures. • Implemented Incident Investigation (II) to identify root causes of incidents to systematically and determine precautionary measures to prevent recurrence	• Implementation of Management of Change Technology-Facilities (MOC-T,F), a process to improve process safety through management, to ensure that experts and specialists analyze and assess any operational changes for potential impact to safety and communicate the changes to ensure understanding of all relevant personnel in order to reduce safety risks. • Implementation of Pre-Startup Safety Review (PSSR) to inspect equipment and review work process for any safety risks prior to resuming operation after a shutdown or turnaround

2016 Occupational health performance

Bangchak continues using a proactive approach. Health Risks Assessment is, hazard control at point sources, and the workplace monitor are introduced so that appropriate preventive measures to risks can be be provided as well as the improvement for safe workplace.

Continuing Programs	New Initiatives

• Implemented employee medical examination for pre-employment, employment, and post-employment
• Implemented annual employee medical examination. Such examination included both basic and occupational health risk-specific examination by Bangchak's occupational doctors and industrial hygienists. In the event of unlikely health risks, medical follow-up is provided.
• Implemented international medical and health surveillance program standards. Determined proactive requirements and guidelines for high-risk, medium-risk, and low-risk workforce
• Implemented an occupational health program for contractors, including workplace preparation, procedures, protective equipment, and education
• Executed medical emergency drills so that Bangchak's emergency rescue team and contracted hospitals understand their roles and responsibilities, consequently enhance coordination and efficiency between both parties
	• Employ occupational health specialists on an on-going basis to conduct:
	  ◦ Medical Examination and Surveillance Program
	  ◦ Medical and Health Related Incident Reporting, Investigating and Recording Program
	  ◦ Industrial Hygiene Program
	• Employ medical personnel and occupational health specialist to evaluate and improve routine health checkup program and risk-based checkup.

Future plans

Safety Continued implementing three PSM elements as the followings;

- Management of Change Personnel
- Contractor Safety Management

As a result of its commitment and efforts for safety management, Bangchak's safety performance in 2016 improved significantly

Safety statistics	2015	2016		2017	
		Male	Female	Male	Female
Total recordable injury rate (TRIR)					
• Employees	5.38	1.8	0	0	0
• Contractors	6.18	0.67	2.96	0	0
Injury frequency rate (IFR)					
• Employees	0.54	0	0	0	0
• Contractors	3.09	0.22			
อัตราความรุนแรงของการบาดเจ็บ (ISR)					
• Employees	2.69	0	0	0.74	0
• Contractors	21.65	10.24	0	0	0

Customer Relationship and Responsibility

End Users

Dealers

(COOP Service Stations)

Industries

Bangchak focuses on managing Customer relationship and responsibility in accordance with the strategy developing marketing businesses and aim to respond to customers' needs as "Customer Centric" which includes end user customers, dealers, CO-OP and community service stations, and industrial customers in order to develop customers' relationship to achieve loyalty level between customers and Bangchak for The Most Admired Brand target.

The Most Admired Brand

Development of two-way communication tools between customers and Bangchak	Development of systems and technology to support relationship	Relationship management to maintain current customers and obtain new ones

1. Seeking Information
• Constant development of offline and online social media
  ◦ Market representatives
  ◦ Call center 1651
  ◦ Facebook
  ◦ Website
  ◦ Email
  ◦ Line
  ◦ Mobile Application
• Add new channels to engage with customers: Line Official and Live Chat
• Use Net Listening Software to search for customers' information from social media
2. Obtaining Services
• Have evolved channels for fuel purchase orders through the call center since 2007 to ease dealers' and CO-OPs' purchase orders around the clock and through Web ordering and mobile application
3. Feedback
• Assess customers' satisfaction and develop report documenting the results which include complaints, inquiries, compliments, promotional and advertising information, and suggestions. The report is distributed to all the relevant functions to improve service quality.
• Annual market research
• Focus group preparation in search of customers' needs and satisfaction
• Document cases where customers provide positive feedbacks to award employees who provided good services.
	• CRM (Customer Relationship Management) developed to accommodate emerging features through the introduction of new marketing programs to enable customers to redeem membership points for items or discounts at major outlets as well as sales promotions
	• Installation of automation points of sale at service stations Improve compliant management system
	• Record the numbers to day required to close a complaint case. Set KPI to ensure that all complaints are addressed within 2 days.
	• Add new channels to engage with card members via Line Group and Live Chat
		Consumer
		• Bangchak card members will receive privileges for registering their membership card. Accrued points can be used for discounts or exchanged for products.
		• Promotional product such as drinking water, gooseberry juice, tomato juice, dried longan, jasmine rice, and "rice pop."
		• Public relations events with Bangchak card members who go on trips that promote local culture.
		• Customer engagement activities such as planting mangrove forest, visiting traditional rice farming learning center.
		• Promotional games through Facebook and Line Official
		• Compensate customers for damages caused by the use of service by adding points to their membership accounts.
		CO-OP operators of service stations/ community service stations
		• Increased business management capability through the Triple M course
		• Developed Professional Franchise Scheme for higher efficient management of service stations
		• Education to develop service station personnel, including education on products and service tasks
		• Developed CO-OP Turn Pro Program for community service stations with potential and readiness for operating complete business and supplementary services
		• Developed CO-OP Coaching Program and taught service station management by service station supervision experience staff from Bangchak Green Net Co., Ltd.,
		Industrial customers
		• training on products / emergency planning / after-sales service / equipment support / equipment check / machinery care

Bangchak recognizes the importance of quick and effective response to our customers. This year, we added two new channels, Line Official and Live Chat, for customers to get in contact with us. In addition, we improved our complaint management system to increase the effectiveness of response. We set target to respond each customers' complaint with in two days. In case of any damages caused by use of Bangchak's services, we set compensation guidelines based on severity and can compensate customers by giving more points to their membership account, for example.

On the other hand, Bangchak records compliments and positive feedback received in order to provide reward and recognition to the employees who perform the services.

To continually improve our service quality, we develop a monthly report documenting customers' complaints, inquiries, compliments, and suggestions. The report is distributed to all the relevant functions for feedback and use to improve service quality through the Voice of Customer Committee (VOCC) to be developed into an effective KPI.

Complaints and recommendation

Outcomes

Customers' return to Bangchak (Target: 95%)

2015	2016	2017
93%	94%	96%

No significant case of non-compliance with regulations concerning marketing communications (Disclosure 417-3)

Employee Stewardship

Employees are valuable resource for the company. Human resources management is a challenge for the organization as each employee has different expectations, especially during times of change. In late 2016, we changed our vision to "Evolving Greenovation", and added Innovation, Agility and Mobility to our vision "I AM BCP". We also set target to be "the Best Employer". Therefore, we must develop our human resources to response to the changes. Additionally, we are making improvement to our human resources management process to better meet employees' expectations, especially with regards to career's opportunity, talent management, leadership development, and performance appraisal. We have to manage these expectations carefully as implementation process involve multiple functions and take time to rollout to the entire organization.

The Evolving Greenovation mission is a new vision that aims to propel Bangchak to becoming a High Performance Organization that emphasizes and focuses on goal-oriented work for clearer outcomes. To that end, Bangchak has colloborated with Aon Hewitt (Thailand) Co., Ltd. to analyze corporate's agility to support and link work processes within the organization based on 9 dimensions:

In 2017, we selected three dimensions to develop a 3-years ★ improvement plan and initiatives. We have made 70% progress toward the plan.

★ Change Management Dimension

- Ensuring that IT implementations are most effectively integrated into the organization by educating management and planners who oversee IT projects.

★ Engagement and Culture Dimension

Providing personnel in human resources management function with training on corporate direction and integrating I AM BCP values into all work processes

- Recruiting the right talents according to business needs
- Developing training courses to support business plans and corporate direction
- Creating career development plan for future businesses
- Assessing employee' performance and compensation in line with employees' performance and behavior
- Increasing employee engagement to create good work culture

★ People Development Dimension

- Embedding I AM BCP value into employees to support corporate target and vision and to foster collaborative culture.
- Conducting a survey on the understanding of I AM BCP values, where survey results are used to create improvement plan for the next year.

In 2017, we use a framework, focusing on four main issues in order to be the Best Employer as follows:

The Best Employer

- Employee engagement

- Compensation management and employee retention
- Employee development

- Manpower planning
- Forging corporate reputation

- Leadership development

Highly Employee Engagement to our organization

Employee Engagement

Bangchak conducts employee engagement survey on an annual basis. The survey results are used to develop and improve employee engagement. In 2017, 99.75% of employees are engaged with the process to improve the organization. Eventhough the score was slightly below the prior year, overall result is still comparable with our peers in the industry. Our 2017 Overall Engagement Score was 61% slightly below Thailand Oil Gas & Consumable Fuel group and APAC Oil Gas & Consumable Fuel group by 2% and 3%, respectively. We believe that the reason for the score drop is party due to the on-going organizational change and rotation of executives and employees to support business flexibility and expansion. Furthermore, responding to employees' expectations take time to achieve desirable results. Therefore, it is expected that the engagement score may drop in the short tem.

However, Bangchak continues to communicate business direction, internal organization movement, and news throughout the organization using various channels. This includes direct communication from the Chairman and CEO via CEO Town Hall, which aims to create understanding of business direction, inevitable changes, and increasing employees morale.

We also continue our Engagement Ambassador Program based on last year's success. We select representatives from each business unit to develop employee engagement activities for each business unit and to become liaisons between management and employees by communicating policy changes to employees and informing management of any complaints or feedbacks from employees. The representatives also provide inputs to develop employee engagement activity plan and improvement plans, based on employees' expectations for approval by Management Development Sub Committee (Sub MDC) from each business unit.

Results

The Best Employer Score
(target year in 2017 : 68.5%)

Employee Engagement Score

High-Performance Culture

Compensation Management and Employee Retention

To become the Best Employer and have high-performance culture, Bangchak is focusing on telent attraction and retention, compensation scheme, and training and career development for our employees.

Each year we compare our compensation level agianst petroluem industry benchmark to make sure that we remain competitive. In addition, we implemented a new compensation scheme to fit with our younger workforce, including compensation based on long-term incentive. The result was a restructuring of pay-band and more flexible payment scheme. Most important, we ensure that our appraisal and compensation is fair and equal for both our male and femal employees.

For internal promotion, we consider previous performance, competency, strategic planning ability, leadership and completion of mandatory training and program. This ensures that we provide the appropriate career path for our talents.

In 2017, the company conducts 360-degree performance appraisal for executives (vice president and higher) who make up around 3.4% of all employees. This assessment was conducted in parallel with traditional assessment. The 360-degree feedbacks help employees to understand perspectives from colleagues, subordinate and management of other functions. These feedbacks are used to increase effectiveness in management development. Performance of employees in other levels were assessed on 2 dimension: achievement of personal KPI (50%) and behavior (50%). The behavior aspect is assessed by direct supervisor who has first hand knowledge of employee's performance.

Results

Performance appraisal Percentage of employee

Turnover Rate (target in 2017: <3%)

Internal Promotion Rate (percentage)

Compensation per employee (female to male)

1 : 1
Manager

0.93 : 1
Executive

1 : 0.77
Operation

Negotiation:

Twenty percent of our workforce belong in the union. There are 13 representatives in the Employee Committee, who were elected from employees. The committee is engaged with executives on employees' welfare and benefits. This year, Bangchak increased age range of employees' child health coverage for OPD payment, dental benefits, and risk premium in 3 southern provinces and risky areas in Songkhla province.

Employee Development

Each year Bangchak plans and develops employees at each level to ensure that they enjoy career advancement and see progress in their line of work. This is aligned with the the employee engagement survey 2015. The survey revealed the top three factors to be improved, including career path, talent and personnel management, and leadership. This led to the development of HR management in different dimensions of The Best Employer and strategies to gear toward a high-performance culture.

Career Development

- The company places an emphasis on creating opportunities and supporting career advancement of our employees. Therefore, we have analyzed and reviewed policies to dene career path for our employees in order to have enough knowledgeable and experience personnel for succession planning and to attract new generations to join the company.
- In 2017, we dened two tracks for career development: management track and specialist track. Since the company is going through restructuring, there are new job requirements and changing job descriptions. Therefore, we are taking a careful review of our career development effort and our appraisal criteria (including promotions), and other relevant practices prior to communicating to employees and commencing implementation.
- In 2018, we are planning on upgrading our e-HR system with new software. This upgrade is part of our larger program to integrate IT into career management.
- To be prepared for business expansion and retirement of key executives (Vice President and higher), the company came up with a Successor Program were executives are evaluated using 90-Degree Assessment (Self & Boss) and personality test assessment (ADEPT). In 2017, we added general knowledge and EQ aspects to the test. The EQ portion was added to ensure that personnel selected to be included in the Potential Successor group meet the Bangchak's Leadership DNA expectations.
- Specialist & Successor Development For specialist successors, such as those in the renery. Bangchak established a "Capacity Building Division for Renery Employees" to systematically prepare specialists and successors in each major eld by using technical career ladder development following the international standards of oil companies. Engineering Career Ladder (ECL) Program Development comprehensively analyzes and displays an overview of staff prociency levels by category and ve levels as expected by the organization: 1) Awareness, 2) Can do Functional, 3) Competent, 4) Advanced, and 5) Expert. It is used as a guidebook to improve employees' targeted capacity so that the management may obviously notice the change. This also increased the efciency of technical career ladder development and succession planning of employees in the renery. In addition, management can have an overall understanding of where skills gap exist in the organization to better manage resources and successors.

Curriculum Development/ Curriculum Development Program

The company creates BCP Development Guideline and defines Training Roadmap for all group of employees to improve employees' skills and ability to become professionals. The roadmap covers essential knowledge and skills for new business as well as management skills.

Executive Development Plan	Mandatory Courses	Core Competency Courses	Management Courses	Optimization Courses)
This course is aligned with Leadership DNA, which required the management to train at local and international institutions. Executives who participate in this program will gain essential knowledge that support the corporation as well as build industry network.	These courses focus on business knowledge and leadership development and are divided into five sub-courses by employee level.	These courses are designed to develop core competencies. The competency-based development include management and entrepreneurship.	These courses focus on building managerial skills and improving employees' understanding of the dynamic nature of business.	These courses aim to build company standard to support overseas business expansion. Curriculum include English and Chinese language development program, and Smart Technology programs for supporting Thailand 4.0.

Library and Electronic library (E-library)

According to 70: 20: 10 (action: observing: classroom learning) knowledge approach, the company supports self-learning thru various channels. One of the example are creating activities and library management at new head-office center to increase awareness employee involvement with electronic namely E-Library, E-Book and E-Magazine.

Key Performance in 2017

- **Bi-ChEPs Program:** A program designed to increase chemical engineering knowledge of shift superintendents, unit superintendent, and unit supervisors. The learning is given in case study format so that employees can combine new knowledge with their respective experiences to improve and solve problem. In 2017, there were six cases that could be implemented to create over XX to the company.
- Knowledge sharing with experts from Cosmo Oil Co., Ltd., Japan Cooperation Center Petroleum (JCCP) Co., Ltd., for HPU Improvement and Oil Movement and Blending System. The company exchange knowledge with experts from SK Group from Korea on enhancing the effectiveness of production control, leading to safer and more stable processes.

Key Performance Indicators

Percentage of employee received performance assessment (Target 100%) (Cisclosure 404-3)			Percentage of position with successor (Successor) (target : 2.27%)	Average training hours per employee (hours)			Return on Training Investment (capacity development only for employees from Refinery Business Unit) *
100%	100%	100%	2.27%	38%	44%	45%	52%
2015	2016	2017	2017	2015	2016	2017	2017

*2017 was the first year Bangchak piloted human capital development ROI in Refinery Business Unit. We calculate the ROI from employee development budget and business outcome such as Refinery Business Unit revenue, cost saving from unplanned shutdown and safety performance improvement. We defined proxy and assumptions based on the proportion of employee development program, which is 0.XX%. In 2018, we are planning to expand and refine the ROI calculate to be more complete.

Future Plans

- To corporate with professional associations/expert communities to learn and accumulate experiences at the international level. This will encourage employees in an expert level to play the roles of instructors who can transfer their experience and knowledge under their areas of expertise to others, especially employees in Refinery Business Unit. They needs specific technical practices.
- To develop user-friendly HR management applications (Digital HR) to manage employees' profiles, to serve business growth as part of the Big D Project 0 ("BCP is in Digital"), and to respond to national growth (Thailand 4.0). The application vendor is being sourced and selected. Application develop is expected to complete by 2018.

"The knowledge I got from Bi-Chepsprojectwas a kind of knowledge that one do notusually get from learning on the job. Eventhoughit was a very intensive course, I learned more knowledge that is directly applicable to my work which helps me understand and detect problems at a deeper level and find more effective solutions to the problems. The project is a good opportunity for employees to improve themselves; for example, by implementing a project to reduce hydrogen loss in production unit 2, 3, and 4."

Chakaphan Wongdaeng
Employee who participated in Bi-Cheps project
Refinery Unit 4, Area 2

"Hydrogen Loss Reduction Project – Refinery Units 2, 3, and 4"

Project Background

Hydrogen rich gas from units 2, 3, and 4 are sent to distillation units that needed hydrogen. The excess hydrogen will be send to fuel gas system as fuel for the furnace. Therefore, reduction of hydrogen rich gas to limit losses must be done through management of production system and by controlling hydrogen usage of each distillation unit. In the past management of this was done at individual unit level, but an integrated whole system approach to managing hydrogen rich gases from all 3 units will enable us to reduce 135M THB per year.

Knowledge Management

The company encourages individual learning by including knowledge transfer and sharing as part of the annual employee performance appraisal. The company also established an Organization Development Committee to set a direction for knowledge management implementation, encourage employees to participate in the learning process, evaluate performances, and continuously improve corporate knowledge management process.

Strategy

Promote learning as the corporate culture

Develop information management model/ tools for knowledge management

Build institutional knowledge and capability to support business development

Expand knowledge management throughout Bangchack Group

2020 Target

- To become a learning organization, focusing on knowledge management within Bangchak and susidiaries
- To enhance value and mitigate risk, leading to sustainable business competitive

The company uses knowledge management system called WE Share to serve as a platform for employees to share their experience, lessons learned, and working tips and tricks. The platform is divided into nine categories and has received 1,656 sharing since 2016.

Type	Refinery	Marketing	New Business	Human Resource	IT	Accounting and Finance	Procurement	Management Tools	Corporate Support
knowledge	287	562	66	40	175	190	53	52	181
Lesson Learned	29	12	0	0	0	0			
Total(issue)	**316**	**574**	**66**	**40**	**175**	**190**	**54**	**60**	**181**

"I had the opportunity to learn about "Bangchak, Sustainability, and UN the Sustainable Development Goals" via KM-Weshare platform. I gained a lot of knowledge and saw the company's effort and commitment in becoming more sustainable. The company used top-down approach, from policy to implementation, to drive sustainability throughout the organization. Employees are also involved in sustainability by participating in a survey and showing commitment to support SDGs target that they can contribute. All of these are the commitment from us to protect our planet."

Paweena Phuengpang
Senior Analyst
Process Improvement and Innovation

In addition, the company supported Community of Practice (CoP), which is an assembly of knowledgeable people with the same interests come and share their knowledge among members in order to gain more knowledge. In 2017, three new CoPs were established (from 18 to 21 groups) as seen below:

CoP Bangchak Channel Radio

Develop professional communications skills and improve communication processes such as Safety Radio Channel and employee communication.

CoP Inspection

Shared knowledge of inspection for machinery in refinery. One knowledge that was implemented this year was using demineralized water to clean stainless pipe to reduce chloride build-up from insulation material. This has enable our technician to save time during inspection.

CoP Secretary

Share administrative knowledge, including English language, professional skills development and process improvement.

Furthermore, three retired executives shared lesson learned, including tacit and explicit knowledge, to employees to retain institutional knowledge.

Results

Employee participation in "We Share" (Target: 80%)

Satisfaction with "We share" (Target: 60%)

No. of COPs (groups) (Target increase 3 groups/ yr.)

Compelling Employer Brand

Manpower Planning and Recruitment

Bangchak formulates manpower plan to support business strategy by both developing internal talents and recruiting externally. Our strategy and key performace in 2017 are shown below.

Strategy

- Formulating manpower planning to support three-year business strategy
- Providing opportunities for disable personnel through fair and value-based recruitment
- Fostering a positive corporate image via various media to attract the new generation to work for the company
- Applying new technology to improve the recruitment and selection process to enhance the effectiveness.

2020 Targets

- Having sufficient potential manpower for business operations
- Employing disable employees by 1% of all employees
- Being ranked in the Top 10 organizations that the, new generations want to work with
- ลดระยะเวลาสรรหาลงเหลือ 30 วัน

Key Performance in 2017

- Employ 6 disable employees. Bangchak practices equal opportunities in all our hiring. We also support disable employment in accrodance to Thai law and SDG Goal 8.

"Bangchak create opportunities for people with disability through the 'Employment to Create Endless Opportunities' project with the end goal to create opportunities and provide fair treatment. We hired people with disability instead of paying into the government fund. In our view, employment with Bangchak represents a key stepping stone to help people with disability to improve their quality of life and build pride and confidence. I personally believe that these are worthwhile hire for the company and is an important step toward sustainable and inclusive economic growth."

Nopphachai Nutsathi
Director
Human Resources Management

"I am happy to be a part of Bangchak. Everyone has been very welcoming and taking great care of me since the day I came to interview. I get to work in design, which I love. What's more I get to learn different designs, work with wonderful colleagues and get guidance and advices from management who recognize my potential and talents. I am very to be working here."

Saravut Phomsak
Designer
Advertising and Marketing Function

- Employ 6 disable employees. Bangchak practices equal opportunities in all our hiring. We also support disable employment in accrodance to Thai law and SDG Goal 8.
- Open internship positions to Thai and non-Thai student. The intership program helps to build good corporate image and attract young talents to the company. In 2017, there were 72 interns.
- Provide scholarship for High Vocational Certificate which covers tuition, room and board, and stipend during their internship with the company.

"I am very impressed with how Bangchak has provided opportunities for university students to get real work experience from very knowledgeable and high caliber personnel. Students get to learn through multiple activities such as field trips and summer internship. Bangchak also provides scholarships to students which really shows the company's commitment in supporting youth education and providing a path to career in the industry."

Prasert Sangpong
Career Counselor
Ayutthaya Technical College

- Establish a recruitment center to build a good impression of the company for potential employees. The center also serve as venue to conduct testing for prospective employees.
- Develop career page to facilitate applicants to apply online as well as to communicate with target groups to support corporate reputation.
- Develop online placement tests to increase the effectiveness of recruitment by reducing time to grade tests.

Results

Effective Leadership

Bangchak promotes and develops management capacity at all levels under "The Best Employer" approach, which requires the management to focus on Future Vision, Valuing People, and Business Excellence. As a result, Bangchak formulated an "Executive Development Program" to enhance the management's knowledge and capacity to be aligned with the direction, including developing networks with external organizations.

Human Rights

In 2017, we develop Human Rights Policy in accordance with the UN Global Compact, ISO 26000, the Universal Declaration of Human Rights, and the UN Guiding Principles on Business and Human Rights (UNGP) to ensure that our business operaitons will not violate human rights and to show our commitment on this issue. The policy provides expectations to our Board of Directors, executives, and employees on human rights issues.

Bangchak will conduct a through human rights risk assessment for refinery, oil trading, Head Office the assessment is expected to be completed within the first quarter of 2018.

Human rights risks assessment for our suppliers will be build upon requirements in the Supplier Code of Conduct which covers labors and human right, occupational health and safety, and the environment.

Once the assessments are complete. The results will be presented to the Sustainability Management Committee for approval. Final results will be made available to the public on our website.

Human Rights Risk Managment

Step 1

Declare
Policy Commitment

Step 2

Condut Human
Rights Due Diligence

Step 3

Conduct Human Rights Impact Assessment. The scope covers both internal and external stakeholder groups. The assessment should define vulnerable groups, human rights issues, and complaints. In addition, mitigation measures must be develop to reduce potential impacts from business operations.

Step 4

Engage impacted groups in the development of remedies in an event that a human rights violation is found. This include assessment of risks and indicators selection.

Step 5

Monitor Progress
Report results to management and public.

Community and Social Engagement

Bangchak conducts business operations with corporate social responsibility as part of the company's mission. Over the years we continue to take part in social development both near our operations (local area) as well as at the national level. In 2017, our community and social engagement activities were implemented on two levels:

1. Local community development
2. National development

Local Community Development

Bangchak categorizes communities around our refinery into 4 groups to properly respond to each group's needs and expectations. The most common concerns are: safe operations, prompt communication in case during emergencies and emergency preparedness, and engaging the communities in social and community development activities. Bangchak has set community relations strategy and conduct social and community development activities covering eight areas which are education, safety, sports, quality of life, environment, relationship promotion, cultural conservation, economy, and public benefits. During 2017, over 251 activities were held, providing benefits to over 24,774 people.

	Communities	Households	Schools	Condominiums
Approximated population	10 communities in Bang Na / Phra Khanong 1 military flat 1 Bang Nam-phueng subdistrict in Phra Pradaeng district	5,342 households who are subscribers of Khrob Khrua Bai Mai bulletin 5,342 people	14 schools in Bang Na, Phra Khanong districts, and Bang Nam-phueng subdistrict 10,610 people	14 projects around the refinery 9,023 people
Participants in activities THB-18-million social	15,196 people 7,731 people 50.88 %	5,793 people 100 % Development budget	10,610 people 100 %	640 people 7.09 %
investment (development budget / donation)	Development budget 52.86 % Donation 9.22 %	9.91 %	Development budget 16.68 % Donation 5%	Development budget 1.78 %

2017 Key Performance

- **Safety: public evacuation drill** to response to communities' demand and expectations and UN SDG 11 to make cities communities inclusive, safe, resilient, and sustainable. Bangchak conducted an emergency evacuation drill with the Phra Khanong District and the Phra Khanong Fire Station in Ban Suan Ruampatana community. This was the first emergency evacuation drill conducted in Bangkok. The results from the drill were used to improve emergency plans and to develop evacuation manual for other communities. Afterward, residents in the communities implemented lessons learned from the drill to improve their readiness such as ensuring that the emergency equipment are ready for use through regular inspection, procuring more emergency equipment for households, and installing equipment in locations that have been identified during the drill.

"Experience we gained from participating in the drill helps us to learn and understand how to evacuate in an orderly manner, designate persons to lead the evacuation in different areas, direct traffic to help first responder access the community faster. All of this has helped us to become more confidence in our ability to provide safety in the community than in the past. The process that Bangchak has put in place to ensure our safety such as emergency area radio, siren and flare warning system to make sure that the community is informed about what happened and the response Bangchak is doing. In addition, the production process that meet international safety standards gives use more confidence that Bangchak can operate safely. We as a community are willing to participate in Bangchak's safety activities because if we are confidence in our safety, our quality of life will also improve."

Saneh Nuchpoom
President – Baan Suan Pattana Community

- **Economic: Khun Jaew Clean Service Community Enterprise** an on-going project since 2015 that grew from Self-Sufficient Community Project. The Self-Sufficiency Community Project aimed to educate residents on family budgeting, life planning, creating opportunities and earn more income, and retirement planning. The Project grew into a Community Enterprise called "Khun Jaew Cleaning Service" that became a platform for house-keepers to create additional income by providing cleaning services to condominiums around the refinery. The project helps to build capabilities of housekeepers by encouraging members participations in designing and operating the business so that they learn management and financial skills to be able to effectively manage the enterprise. The community enterprise generate over 20,000 bath of additional income monthly.

- **Education: Youth Development in the 21st Century and Thailand 4.0** Bangchak collaborated with Prakanongpittayalai School to develop STEM (Science Technology Engineering and Mathematics) curriculum for junior high school students and teachers. We also piloted 7 Habits for Highly Effective People and The Leader in Me courses at Prapariyattitham Wat Dhammamongkol School. In addition, we are working to build teachers capability through a new medium, Google for Education, that is up-to-date with the 21st century.

"Bangchak's STEM project helps us to understand the teaching process for STEM curriculum. We can use it to help students to understand and think in terms of science, mathematics, engineering, and technology so that they can leverage that knowledge to create new projects. The knowledge and understanding also help them to achieve their academic goals and continually improve their analytical thinking to become better at life, economic, and social skills which lead to a life long learning process."

Aorathai Pornkosonsirilerd
Deputy Director – Academic Administration and Budget
Prakanongpittayalai School

- **Environment: Used Vegetable Oil to Bio-diesel** Bangchak has been buying used vegetable oil from the community and our partners, including universities, hotels, convention centers, to convert it to biodiesel for 12 years. The program helps to add value to used vegetable oil while protecting the environment by reducing crude oil consumption and preventing used oil being dumped into the environment. In addition, the program discourages people from reusing vegetable oil which can be harmful to your health. Every month employees volunteers open a drop off point for used vegetable oil in the communities. In 2017, Bangchak bought 94,600 kilogram of used oil which was converted to 80,450 liter of biodiesel equivalent to GHG reduction of 63 ton Co_2e.

Performance

Bangchak staff's man-hours on volunteer projects (hours/THB)

Satisfaction score for community relations projects around the refinery

On-going Projects

Areas	Objectives	On-going Projects
Education	• Youths' learning and development that suit their ages, and awareness of being both ethical and capable	• Citizen Awareness, Year 8 • Bangchak Youth Scholarships, Year13 • Read and Write with Ease (Literacy), Year4 • Fill up knowledge with Bangchak, Year 12
Safety	• Confidence in the refinery's safety • Swift and effective safety response in an emergency	• Arrangement of emergency exercises and fire drills for schools, communities, and neighboring condominiums • Donation of fire extinguishers and other apparatus (For more information on the refinery's safety development to address all stakeholder groups' expectations, please refer to "Safety" and "Air Emission" chapters.)
Sports	• Strong and healthy youths • Drug-free community with Income generation opportunities • Increased educational opportunities through sports	• Bangchak Youth Futsal, Year 14 • Bangchak Youth Soccer Club, Year 11
Quality of Life	• Better quality of life	• One Family, Year 24 • Healthy Community, Year 7 • Elderly and Healthy, Year 1 • Bangchak Good Youth, Year 2
Environment	• Environmental problems recognized and efficient use of resources	• Thot Pha Pa, Raksa Ton Nam, Chaiyaphum province, Year 13 • Purchase of used vegetable oil from communities around the refinery, Year 6 • Firefly Routes, Conservation Way, Year 4 • Youth Love Earth, Year 3 • Bai Mai Family, Year 13 • Roving Communities, Year 9
Relationship and Culture	• Cordial relations between the refinery and neighboring communities	• Roving Communities, Year 9 • Khrob Khrua Bai Mai bulletin (Year 13) and Rop Rua newsletter (Year 12) • Bangchak Children's Day, Year 33 Paying respects to senior citizens in communities on Songkran Day, Year 15 • Community visit during special holidays such as Mother's day, Father's day, and New Year day, Year 15 • Movie Night, Year 10 • Condo neighbors, Year 7
Economic	• Income generation and more opportunities for local residents to leverage their knowledge and skills to work	• Sufficiency Community, Year 3 teach family budgeting and was able to reduce expenses for 70% of the participants. • " Khun Jaew Clean Service Community Enterprise - supports local businesses by using community products and services in company's activities resulting in over 500,00 baht of wealth distribution • Provide free space for local food suppliers to sell products in the Head Office's cafeteria creating income of over 1,000 baht/shop/day

Future Plans

Results from our community survey shows that residents still expect us to improve quality of life and environment with in the communities. Therefore, Bangchak will continue to implement improvement plans under the King's Philosophy framework. In addition to raising awareness on environmental protection and climate change to improve livelihood, the environment, and society as a whole

National Development

Bangchak expanded our efforts at national level in the form of social enterprise to better address needs of farmers both as Bangchak's customers as well as citizens. Bangchak continues to use its activities to support the well-being and environmental consciousness of the Thai society through education and economic development through our business and operational channels. On issues that are not in our domain of expertise, we are still committed to meeting the country's sustainability and being part of an effort to limit global temperature rise to no more than 2 degrees by contributing our efforts in a network and working closely with our stakeholders. Bangchak believes that Climate Change is one of the most pressing issue that need to be addressed; therefore, we are working with capable partners in our network and our stakeholders to drive progress. We work under the guidance of the King's Philosophy to realize outcomes that are beneficial for the greater good and improve quality of life for the majority of Thai citizens. To that end, we are contributing our efforts toward SDG goals: 13 Climate Change, 12 Sustainable Consumption and Production, SDG 6 Clean Water & Sanitation, SDG 8 Decent Work and Economic Growth, and SDG 9 by developing capabilities and innovations for SMEs.

In the past year, we expand our efforts to support UN SDGs and to cover youth and farmers groups. Our activities are focused on raising awareness on environmental, social, and economic development issues. Our strategies and targets are:

Strategy	2021 Targets
1. Give support to agricultural groups and make a better society by increasing the number of community service stations and social support projects	• Expand community service stations by 20 sites per year • Promote activities that demonstrate Bangchak's social responsibility in community service stations, targeting ≥ 30 sites per year • Established a social enterprise to be a model for sustainable organic farming business • Increase farm land that are managed sustainably through our work with at least 50 members of the agricultural cooperative.
2. ncorporate activities concerning the environment into the policy that aims to decrease classroom time and increase learning time	• Children ≥ 80,000 children per year to be equipped with knowledge about the environment and global warming

2017 Key Performance

Public: "Two Degrees Crisis: Economic and Social Impacts" Talk To demonstrate our commitment to environmental awareness and climate change that could severely impact the ecosystem and to link those impacts to everyday life such as food security, crop cultivation, consumption behavior, and epidemic. These are drivers for the company to create a sustainable business and create awareness for Thais to take part in the solutions.

กลุ่มเยาวชน : Thailand Go Green ปีที่ 10 ในหัวข้อ "เมืองไทยไร้ขยะ ร่วมใจสู่เป้าหมายอุณหภูมิโลกเพิ่มไม่เกิน 2 องศาเซลเซียส" Bangchak collaborated with the Office of Basic Education Commmission, Ministry of Education and the Pollution Control Department to drive toward SDG 12 to promote responsible consumption through waste reduction. The project encourages youth to submit ideas to reduce household, school, and community waste. Over 130,000 students from 70 schools submitted their ideas. The outstanding award were from Bunyawat Witthayalai School and Prince Royal's College who submitted a project to use worms to destroy styrofoam used to contain food and a "Separate and Trade" project that was held at Muang Mai Market in Nakhon Pink, Chiang Mai to encourage sellers to separate trash and posting results on social media, respectively.

Over the past 8 years that we participated in "Thailand Go Green" project with Bangchak, our students have gain tremendous knowledge and confidence in proposing innovative ideas to help our world become greener. Most importantly, the project has helped students to change their daily habits especially their energy consumption. They become more energy conscious, turning off the lights and shutting off water when not being used. Even taking less food to make sure they finish everything on their plate as well as selecting healthier options. On the environmental side, everyone pitches in to help separate the trash using separate trash bins that are provided by the school. They all recognize the importance of sustainable consumption and share the mindset that we all must do our part to the environment in our school and communities.

Noppadol Teetrakul
Director
Dekdee Pittayakom School, Chaingrai Province

Agricultural Group

- **Increasing the number of community service stations** Cooperation between Bangchak and agricultural cooperatives in opening community service stations since 1992 not only saves energy expenses, but also generates income for farmers. Members benefit from the cooperative in the form of dividends, average returns from the business, and welfare. Bangchak aims to increase the number of community stations every year (by 5-12 stations per year) as another means to help raise the standard of living for over 1 million agricultural households. It is expected that the figure will climb to 1.12 million by 2021.

- **Green Partnership Award** In addition to expanding community service stations, which is part of the business value chain, Bangchak held the Green Partnership Award project as a way to support agricultural cooperatives to improve their business administration and promote activities that benefit society. The project aims to create shared value for society by making use of the potential and capability of cooperatives in response to the needs of cooperative members, customers, society and communities in the form of CSR-in-Process that is run in parallel with the business. The project was participated by 39 agricultural cooperatives and service station operators across the country.

projects on Staff care

projects on Customer / business partner care

projects on environmental care

projects on social care

projects on Promotion of Organic Farming

projects on Innovative CSR

projects on Sustainable Agriculture to Combat Climate Change

The impact of climate change is felt directly in the agricultural sector with the loss and decline of their crop production. Not only does this impact the livelihood of farmers, it also impacts the food security of the nation. Recognizing this risks, Bangchak is actively encouraging agricultural cooperatives that are in our network of service stations to switch to organic farming in order to fight climate change as well as improve agricultural system. Projects that were promoted this year were:

Examples of agricultural cooperatives and projects submitted for award

Agricultural Cooperative	Project
Agricultural Cooperative Don Toom, Nakorn Phathom	Promote organic rice farming and marketing to network members in Ratchaburi and Kamphaengphet
Agricultural Cooperative Toong Wat Sing, Chai Nat	Support members to grow jek white rice that meet GAP standard
Agricultural Cooperative Lam Phra Phloeng, Nakhon Ratchasima	Encourage members to use the system of rice intensification (SRI) which requires planting rice separately (not in bunches) and using azolla and organic material to condition the soil rather than chemical fertilizer
Agricultural Cooperative Khu Mueang, Buriram and Ban Chiewlarn, Surat Thani	Produce and distribute organic fertilizer to members to reduce the cost of cultivation and restore soil quality.
Agricultural Cooperative Nong Pai, Phetchabun	Promote low water consumption crops such as green beans

- **Establishment of Aom Sook Social Enterprise** We partnered with the Buddhist Economics Foundation to establish Aom Sook Social Enterprise in late 2016. Aom Sook Social Enterprise plays a role in helping farmers process, market, and sell their organic produce. In addition, it will help with the research and development stage of product development. In 2017, the social enterprise developed a new snack "rice pop" from brown rice. The product was given out to Bangchak service stations customers and was distributed to our SPAR Supermarket and Inthanin coffee shops for sale. The product adds value to organic brown rice which experienced oversupply in the market.

- **Establishment of Baimai Punsook Foundation** The foundation's mission is to conserve natural resources and the environment, improve quality of life for Thais, and support youth education. In 2017, the foundation worked with Agri - Nature Foundation and agricultural cooperative in Pa Sak basin on the "Water Management under Self-Sufficient Philosophies" Project to improve the livelihoods of residents and to increase forest area to alleviate drought and flood. The Project helps local farmers to redesign their land plots to ensure enough water for farming and increase yield using organic farming methods so that they don't need to encroach into the forest. The Foundation is committed to working in the area to create benefits to the local communities, environment, and wider society.

"... Water is an essential element for the agricultural sector. If farmers can store water in their own land they are much more secured. In the past, droughts and floods have greatly impacted their livelihood. When the government asks them to conserve water by planting rice only one season or to switch to growing less water intensive crops that directly impact their incomes. As a result, they become poorer, many moves to the cities in search of jobs. Therefore, we think the implementation of the King's philosophy on water management can be a long-term solution for farmers. The communities can come together to help each other dig retention ponds to be provide water during droughts and to serve as sink during rainy season so their farm lands and lower lying areas do not get flooded. These ponds will act as distributed reservoirs for the basin preventing the need for large scale reservoirs or dams. By working with Bangchak we get direct access to the farmers and work closely with them to drive changes and achieve our common goal.

Boomlorm Taokaew
SpeakerAgri-nature Foundation,
Institute of Sufficiency Economy

"...the cooperative was already working on projects to develop organic farming knowledge for our members. But when we started working with Bai Mai Punsook Foundation, Agri-Nature Foundation, and Bangchak Corporation in the "Water Management under Self-Sufficient Philosophies" project we were able to take our work to the next level. The project provides both theories and practical trainings such as house visits, designing water retention system, switching from single crops to rotational crops, and composting; all under the guidance of the King's Philosophies to balance soil, water, forest, and humans. This project requires a lot of physical efforts and dedication to see it through to completion. We were lucky that the farmers in Koak Toom community worked together to achieve the desired change and see tangible results in the area. Our hope is that the farmers will become self-sufficient and the cooperative, as a community organization, is ready to support them on this journey so that together we can achieve sustainable growth."

Areewan Aiamchan
President of the Koak Toom Self-Sufficient Cooperative, Muang district, Lopburi Province

"One project to help develop the education of the youth is the "Read and Write with Ease" project. Six schools in Phanom Sarakham district, Sanamchai Khet district, in Chachoengsao Province and Kabin Buri district in Prachin Buri province worked together since May 23, 2017 to test students capacity. We found that many students could not read or write so we continued to move ahead with the "Read and Write with Ease" project. We had three additional partners which are: Bai Mai Pansook Foundation, Tung Sak Arsom, and Bangchak Bioethanol (Chachoengsao) Co., Ltd. During 8 months duration of the project, we devoted ourselves to helping kids improve. We revamped learning schedule and cut out some activities to open up time for kids in elementary school and first grade to improve their reading and writing skills. We did it without hoping for recognition but for the good of the children. Because we fail as teachers if our students cannot read or write. This project has shown the strength of our teamwork. We all put efforts into improving our teaching techniques which help to improve results. We gained more confidence when we saw that students were improving and both students and teachers were committed to this process. Teachers follow the guidelines learned and practiced along with the children, which should be a suitable way to learn today. Thanks to all three partners who give gifts to the children at Wat Don Thana School."

Thawee Chaicharoen
Director Wat Don Thana School (Thanomkanjaraj)
Sanamchai Khet district, Chachoengsao
Province Teachers who participated in the project

Future Plans

Bangchak approved **"**Keeping the 2 Degrees Limit - Thailand Sustainability under the King's Philosophy**"** plan. The plan will be implemented through 4 mechanisms that focuses on social improvement toward key target groups: youth, farmers, and the general public. The objectives are to build society awareness on the environment by protecting natural resources, expand farmlands that are managed sustainably, promote social innovation to support social enterprise.

Sustainability Performance Statistics

Economic Performance

Revenue (Million THB) (Disclosure 201-1)	2014	2015	2016	2017
Sales and services	178,300.35	151,140.36	144,705.29	172,138.24
Total Revenue	181,876.03	151,683.24	145,232.40	173,378.94
Net profit	296.10	4,097.38	4,729.41	6.404.94
EBITDA	5,162.00	11,081.00	11,363.00	13,663.00

Expenditure for income sidtribution to stakeholders (Million THB) (Disclosure 201-1)	2014	2015	2016	2017
Operating expenses	176,384.23	139,686.22	132,809.35	158,595.55
Interest expenses paid to financial institution creditors	1,293.81	1,614.56	1,483.80	1,452.28
Tax payment to government and local authorities	51.50	647.32	822.32	544.16
Financial supports for encouraging public policies	-	-	-	-
Community and social development	25.52	37.45	38.88	32.98
Donation to society and schools	22.73	57.62	37.82	73.61
Dividend payment to shareholders	1,858.80	2,039.44	2,753.52	3,310.75
Dividend payment to shareholders (Baht/Share)	1.35	1.40	1.80	2.15
Wages and employee benefits	1,341.58	2,419.60	2,903.82	3,277.33

Supply chain management (Disclosure 204-1)	2014	2015	2016	2017
Local purchases of goods and services*	4,707	5,407	4,351	5,749
Percentage of Local purchases of goods and services*	91	93	98	84

Local purchasing in Thailand, exclude raw materials and crude oil

Corporate Income Tax (BCP) (Million THB)

Year	Tax Jurisdiction	Revenue			Profit / (Loss) before Income Tax	Income Tax Paid (on a Cash Basis)	Income Tax Accrued-Current Year
		Related Party	Unrelated Party	Total			
2017	Thailand	42,901	167,622	210,523	7,508	264	680
	Singapore	7,465	5,262	12,727	470	6	4
	Philippines	17	1,515	1,532	-1995	28	-
	Japan	18	533	571	-347		6

Sustainability Performance Statistics

Details	Refinery Business				Bio-based Product Business				Green Power Business			
	2014	2015	2016	2017	2014	2015	2016	2017	2014	2015	2016	2017
Material (Ton)												
- Renewable Material	334,348	360,650	305,374	395,578	162,967	490,584	434,836	524,967	0	0	0	0
- Non- Renewable Material	5,492,211	6,109,564	5,358,267	6,731,065	2,065	6,098	5,681	27,029	3	4	3	4
Product (kL)	9,324	10,329	8,618	11,070	N.A.	N.A.	268,751	393,249				

* There was no classification of raw material consumption in 2013, main raw materials such as crude oil, additive, chemicals, and packages were reported in 2014

Details	Refinery Business				Marketing Business				Bio-based Product Business				Green Power Business			
	2014	2015	2016	2017	2014	2015	2016	2017	2014	2015	2016	2017	2014	2015	2016	2017
Energy[1] (Terajoule: TJ) (Disclosure 302-1)	11,786.5	14,501.5	13,561.3	13,903.0	59.7	72.4	63.8	60.6	199.8	1,149.1	1,686.6	1,683.7	4.2	4.5	8.9	10.4
Non- Renewable Energy Consumption	11,786.5	14,501.4	13,561.3	13,903.0	59.7	72.4	63.8	60.6	199.8	323.5	386.1	613.0	4.2	4.5	8.9	10.4
- Energy used in process :																
• Fuel gas and LPG	6,163.2	6,924.4	6,589.8	6,776.3	-	-	-	-	-	-	-	-	-	-	-	-
• NG	2,612.8	3,937.4	3,227.1	3,457.0	-	-	-	-	173.8	179.8	208.5	386.2	-	-	-	-
• Natural gas for cogeneration	-	1,620.3	2,719.6	2,814.5	-	-	-	-	-	-	-	-	-	-	-	-
• Fuel oil	1,075.0	1,040.0	913.4	744.0	-	-	-	-	9.7	-	-	-	-	-	-	-
- Electricity and steam used in process:																
• Electricity	505.7	327.8	102.8	103.1	59.7	72.4	63.8	60.6	16.3	143.7	162.7	195.3	3.2	3.6	8.0	9.5
• Steam	1,424.0	646.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Other :																
• Fuel oil 5.8	4.6	8.4	8.0	-	-	-	-	-	-	14.9	31.6	1.0	0.9	0.9	0.9	
Renewable Energy	-	0.1	0.1	0.0	-	-	-	-	-	825.6	1,300.5	1,070.7	-	-	-	-
• Wind and Solar	-	0.1	0.1	0.0		-	-	-			-	-	-	-	-	-
• Biomass[2] and Biogas	-	-	-	-	-	-	-	-	-	825.6	1,300.5	1,070.7				
Energy	252.4	251.0		-	-	-	-	-	-	-	-	-	580.2	699.1	914.4	949.0
- Non- Renewable Energy Sale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
- Renewable Energy :	252.4	251.0	-	-	-	-	-	-	-	-	-	-	580.2	699.1	914.4	949.0
• Electricity generated by PV cells																
Energy Intensity Index (EII) (Disclosure 302-3)	**N.A.**	**105.8**	**103.1**	**103.1**												

[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.

Details	Refinery Business				Marketing Business				Bio-based Product Business				Green Power Business			
	2014	2015	2016	2017	2014	2015	2016	2017	2014	2015	2016	2017	2014	2015	2016	2017
Greenhouse gas (GHG) emissions (tCO_2e) (Disclosure 305-1), (Disclosure 305-2)	(Operational Control Approach)															
- Direct GHG emission from production processes (SCOPE 1)	753,078	999,297	989,258	972,926					9,757	84,393	101,943	121,638	68	63	66	61
• CO_2	751,876	997,689	987,722	972,012					9,748	84,368	101,913	121,579	66	62	65	60
• Biogenic CO_2			25	40						90,667	94,623	77,181			2	2
• CH_4	738	1,044	990	385					2	6	7	13	1		0	0
• N_2O	464	564	546	530					7	19	23	47	1	1	1	1
- Indirect GHG emission from power and biogas purchased (SCOPE 2)	157,173	84,793	15,540	23,554	8,591	10,424	9,649	8,716	2,479	20,663	24,589	28,099	2,572	2,585	1,219	1,370
• CO_2	157,173	84,793	15,540	23,554	8,591	10,424	9,649	8,716	2,479	20,663	24,589	28,099	2,572	2,585	1,219	1,370
• Biogenic CO_2											10,933	8,135				
• CH_4																
• N_2O																
Total	**910,251**	**1,084,090**	**1,004,798**	**996,480**	**8,591**	**10,424**	**9,649**	**8,716**	**12,236**	**105,056**	**126,532**	**149,737**	**2,640**	**2,648**	**1,285**	**1,431**
	(Equity Share Approach)															
- Direct GHG emission from production processes (SCOPE 1)	753,078	999,297	989,258	972,926					6,832	22,876	27,421	21,927	68	63	1	43
• CO_2	751,876	997,689	987,722	972,012					6,824	22,866	27,409	21,912	66	62		42
• Biogenic CO_2			25	40						19,294	20,137	9,856				2
• CH_4	738	1,044	990	385					3	3	4	5	1			0
• N_2O	464	564	546	530					5	7	8	10	1	1	1	1
- Indirect GHG emission from power and biogas purchased (SCOPE 2)	157,173	84,793	15,540	23,554	4,210	5,108	4,728	4,271	1,735	5,624	7,676	6,082	2,572	2,585	853	964
• CO_2	157,173	84,793	15,540	23,554	4,210	5,108	4,728	4,271	1,735	5,624	7,676	6,082	2,572	2,585	853	964
• Biogenic CO_2																
• CH_4										2,327						
• N_2O																
Total	**910,251**	**1,084,090**	**1,004,798**	**996,480**	**4,210**	**5,108**	**4,728**	**4,271**	**8,567**	**28,500**	**35,097**	**28,008**	**2,640**	**2,648**	**854**	**1,007**
GHGs Intensity (tCO_2e per raw material)		0.15	0.17	0.21	0.14											

*The report of 2017 direct and indirect GHG emissions data was calculated by using the new BCP calculation tool in accordance with IPCC 2006

*The reports of 2014 - 2016 direct and indirect GHG emissions data have been re-calculated by using the new BCP calculation tool in accordance with IPCC 2006

Air emissions (Disclosure 305-7), (OG 6)	Units	2014	2015	2016	2017	Targets
NO_x (Combustion)/3[3]	Ton	451	399	349	426	1,657
Intensity NO_x	ton per thousand tons crude	0.11	0.07	0.07	0.08	
SO_2 (Combustion & SRU/TGTU Stack)[3]	Ton	25	51[1]	35	75	2,899
Intensity SO_2	ton per thousand tons crude	0.04	0.01	0.01	0	
TSP PM10 (Combustion)[3]	Ton	8	8	17	48	450
Intensity TSP	ton per thousand tons crude	0.00	0.00	0.00	0	
H2S (SRU/TGTU Stack)[3]	Ton	7.08	0.47	0.36	0.5	N.A.
Intensity H_2S	ton per thousand tons crude	0.00	0.00	0.00		
Fugitive VOCs[4]	Ton	2.53[2]	4.91[2]	2.99	2.6	133
Intensity VOCs	Ton/ Barrel	N.A	0	0	0	
Flared hydrocarbon[5]	KL	4,548.05	1,934.87	1,892.1	2,809.1	N.A.
Flared hydrocarbon[5]	Ton CU.M. (Gas)	1.2505	0.6686	0.2047	0.4349	
Flared hydrocarbon per total product produced	Ton CU.M. (Gas) / million barrel oil equivalent	0.0378	0.0157	0.0053	0.0104	
Vented hydrocarbon	Ton CU.M. (Gas)	N.A	N.A	N.A	N.A	
Vented hydrocarbon per total product produced	million barrel oil equivalent	N.A	N.A	N.A	N.A	

[1] Excluding SO2 from Acid Flare, [2] Including additional cogeneration plant acquires from PTT Plc. but exclude Inventory VOCs [3] Calculated from production capacity using a thrid-party entity [4] Calibrated measurement tools and report only fugitive VOCs and excluding fugitive VOCs from Cogenerations and boilers which were operated in the last quarter of 2017 and were excluded for VOCs monitoring by regulation [5] Including Flared hydrocarbon from Plant 2, 3, 4

Water (Million M^3)	Refinery Business			
	2014	2015	2016	2017
Tap Water used in production[1] (Disclosure 303-1)	2.38	2.81	2.36	2.54
Reused water[2] [5] (Disclosure 303-3)	N.A.	1.06	1.1	1.19
Water discharged in Bang Ao Canel (Disclosure 306-1)	0.97	0.87	0.84	0.90
Ratio of water used perbarrel of oil produced (cu.m/BOE)[3]	0.072	0.066	0.061	0.06
COD (Ton)[4]	66.33	48.28	42.00	39.23
BOD (Ton)[4]	10.73	7.40	5.96	4.43
Oil and Grease (Ton)/4	2.26	3.08	1.68	1.36
TSS (Ton)[4]	14.31	10.53	10.92	9.04
TDS (Ton)[4]	1,465.15	1,121.80	1,321.23	1,105.00
Sulfude (Ton)[4]	0.32	0.47	0.29	0.18
Mercury (Ton)[4]	0.00	0.00	0.00	0.00

[1]Volume from water usage invoices [2]Volume from water meters [3] Volume from water balance and mesuring values by laboratory that is licensed by department of Industy work [4] Calibrated measurement tools [5] 2016 Total volume of recycled water combines condensate water, which is of high quality collected from the boiler and plant 4, and water from wastewater treating unit which is further treated with reverse osmosis.

Waste (Disclosure 306-2)	2014	2015	2016	2017
Routine wastes (ton : percentage)				
Hazardous waste[1]	3,261 (83)	1,268 (88.5)	1,573 (20.2)	1,571 (80.69)
Non-hazardous waste[1]	644 (16.5)	62 (4.3)	179 (2.3)	332 (17.07)
Non-routine wastes (ton : percentage)				
Hazardous waste from oil and chemical spill clean-up[2] (Disclosure 306-2)	1.1	3 (0.2)	0	1.1 (0.05)
Construction waste [2]	N.A.	99 (6.9)	1,204 (15.5)	42.6 (2.19)
Hazardous waste for Turnaround Maintenance			4,745 (61)	
Non-Hazardous waste for Turnaround Maintenance[2]			84 (1)	
Total	**3,905 (100)**	**1,432 (100)**	**7,785 (100)**	**1,947 (100)**

[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 Method (Ton) (Disclosure 306-2)	2015		2016		2017	
	Hazardous Waste	Non-Hazardous Waste	Hazardous Waste	Non-Hazardous Waste	Hazardous Waste	Non-Hazardous Waste
- Reuse	-	-	-	-	-	-
- Recycle	396		1,137	16	564	28
- Recovery, including consumption as fuel	581	21	4,281	235	1,006	233
- Incineration	109	-	901	-	-	28
- Sent to secure landfill	-	41	-	11	-	-
- On site storage	1,185	161	318	-	-	-
- Other (Land Reclamation)	-	99	-	1,204	-	43
Total	1,271	322	6,637	1,466	1,571	332

Oil and chemical spills (Case) (Disclosure 306-3)	2014	2015	2016	2017
- Number of significant oil and chemical spills (more than 100 Barrels each)	0	0	0	0

Supply Chain Management (Percentage)	2014	2015	2016	2017
New Supplier/ Key Supplier were self assess on SCOC criteria	2	N.A.[/1]	62.[/2]	31

[/1] 2015 Preparation for screening process of potential Suppliers in accordance with sustainable business practices in three dimension : ESG

[/2] 2016 Number of Key suppliers were self assessed on Bangchak's Supplier Code of Conduct

Environment Compliance (Disclosure 307-1)	2017
Number/Monetary Value of significant fines	0
จำนวน/มูลค่าการถูกปรับอย่างมีนัยสำคัญ กรณีละเมิดกฎหมายด้านเศรษฐกิจและสังคม (Disclosure 419-1)	0

Sustainability Performance Statistics Social Performance

1. Employment

Employee* (Person)

* The Company has an exclusive fulltime employment policy. There are no temporary, part-time, or selfemployment and no seasonal

Employee (Disclosure 102-8), (Disclosure 401-1)	2014		2015		2016		2017	
	Persons	%	Persons	%	Persons	%	Persons	%
By gender								
• Male	762	72.43	822	72.81	847	70.82	866	69.84
• Female	290	27.57	307	27.19	349	29.18	374	30.16
Total	1,052	100	1,129	100	1,196	100	1,240	100
By Level								
- Level 10-14: Executive up	101	9.60	116	10.27	135	11.29	134	11.20
• Male					91	67.41	89	66.42
• Female					44	32.59	45	33.58
- Level 5-9: Manager up	494	46.96	557	49.34	616	51.51	669	55.94
• Male					373	60.55	401	59.94
• Female					243	39.45	268	40.06
- Level 1-4 : Practitioner	457	43.44	456	40.39	445	37.21	437	36.54
• Male					382	85.84	376	86.04
• Female					63	14.16	61	13.96
By Age								
• Less than 30	287	27.28	305	27.02	303	25.33	308	25.75
• Between 30-50	699	66.44	739	65.46	791	66.14	811	67.81
• More than 50	66	6.27	85	7.53	102	8.53	121	10.12
By Area								
• Head office	112	10.65	131	11.60	159	13.29	530	44.31
• Refinery	855	81.27	934	82.73	972	81.27	642	53.68
• North District	10	0.95	8	0.71	39	3.26	10	0.84
• Central District	57	5.42	37	3.28	9	0.75	41	3.43
• North-East District	10	0.95	11	0.97	10	0.84	10	0.84
• South District	8	0.76	8	0.71	7	0.59	7	0.59
Ratio of Salary by gender (Female : Male)					Female	Male	Female	Male
- By Level								
• Level 10-14: Executive up					0.88	1.00	1.00	1.00
• Level 5-9: Manager up					0.92	1.00	0.93	1.00
• Level 1-4 : Practitioner					1.00	0.78	1.00	0.77

Employees Turnover (Disclosure 401-1)	2014		2015		2016		2017	
	Persons	%	Persons	%	Persons	%	Persons	%
Turnover rate	3.46		2.67		3.20		4.00	
By Gender								
• Male	32	86.49	13	59.09	35	67.31	31	63.27
• Female	5	13.51	9	40.91	17	32.69	18	36.73
By Age								
• Less than 30	25	67.57	7	31.82	32	61.54	28	57.14
• Between 30-50	8	21.62	13	59.09	18	34.62	21	42.86
• More than 50	4	10.81	2	9.09	2	3.85	0	0.00

New Employee (Disclosure 401-1)	2014		2015		2016		2017	
	Persons	%	Persons	%	Persons	%	Persons	%
By Gender								
• Male	44	67.69	84	74.34	64	52.89	61	59.80
• Female	21	32.31	29	25.66	57	47.11	43	42.16
By Age								
• Less than 30	61	93.85	88	77.88	99	81.82	86	84.31
• Between 30-50	4	6.15	23	20.35	21	17.36	18	17.65
• More than 50	0	0.00	2	1.77	1	0.83	0	0.00

Parental leave	2014		2015		2016		2017	
	Persons	%	Persons	%	Persons	%	Persons	%
Parental leave	8	N.A.	6	0.53	5	0.42	4	0.32
Employee back to work after parental leave	8	N.A.	6	0.53	5	0.42	4	0.32

Average Training hours (Disclosure 404-1)	2014	2015	2016	2017
Total training hour		43,304	53,741	55,926
Total average training hour	44.86	44.86	44.92	45.10
By gender				
• Male	42.62	36.42	41.10	42.66
• Female	50.87	43.53	53.90	50.76
By Level				
• Level 10-14: Executive up	60.20	58.07	62.00	63.91
• Level 5-9: Manager up	54.30	47.44	59.20	56.31
• Level 1-4 : Practitioner29.44	22.23	20.10	22.39	
By Business Category				
• President	63.18	53.34	52.90	56.00
• Corporate Management and Sustainability Development	50.06	44.58	58.20	53.45
• Accounting and Finance	43.25	37.25	53.90	64.28
• Marketing Business Group	24.82	20.21	43.67	43.53
• Refinery Business Group	52.55	44.98	39.80	39.23
• Natural Resource and Business Development	58.87	51.56	62.20	63.00
• Bio Based Product Business Unit	54.00	52.18		
Best Employer (Percentage)	66.00	70.00	68.00	61.00
Employee Engagement (Percentage)	66.00	69.00	69.00	61.00
Labour and Human rights Complaint (Case)	0	0	0	0

Safety and Occupational Health

Safety* (Disclosure 403-2)	2014	2015	2016		2017	
			ชาย	หญิง	ชาย	หญิง
Total work hour (hr)						
• Employees	N.A.	N.A.	1,630,207.80	443,448.30	1,352,215.40	210,360.90
• Contractors	N.A.	N.A.	4,490,917.00	1,012,761.50	4,253,591.00	1,255,606.90
Near miss report (case)						
• Employees	N.A.	N.A.	6		25	
• Contractors	N.A.	N.A.	7		3	
TRIC						
• Employees	N.A.	N.A.	3	2	1	0
• Contractors	N.A.	N.A.	3	1	0	0
LWC						
• Employees	N.A.	N.A.	0	0	0	0
• Contractors	N.A.	N.A.	1	0	0	0
Fatalities						
• Employees	0	0	0	0	0	0
• Contractors	0	0	0	0	0	0
TRIR (Person per 1 million working hours)						
• Employees	2.77	5.38	1.8	0	0.74	0
• Contractors	5.38	6.18	0.67	2.96	0	0
IFR (Person per 1 million working hours)						
• Employees	1.11	0.54	0	0	0	0
• Contractors	2.09	3.09	0.22	0	0	0
ISR (Day per 1 million working hours)						
• Employees	43.16	2.69	0	0	0	0
• Contractors	6.13	21.65	10.24	0	0.00	0
Rate of work-related illness						
• Employees	0	0	N/A	N/A	N/A	N/A
• Contractors	0	0	N/A	N/A	N/A	N/A
Absentee rate (Percentage)						
• Contractors	0.90	0.90	0.83		1.05	
Tier 1 Process Safety Event	0	0	0		0	
Tier 2 Process Safety Event			0		0	

* 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	2014	2015	2016	2017
Customer Satisfaction survey : Customer (Disclosure 102-43), (Disclosure 102-44)	Percentage	N.A.	81.2	79.4	80.5
Customer Satisfaction survey : Industrial customer	Percentage	95	N.A.	90.3	88.9
Net Promoter Score (NPS)	Ranking	N.A.	3rd ranking	2rd ranking	2rd ranking
Total number of substantiated complaints regarding breaches of customer privacy	Case	0	0	0	0
Significant Case of Non compliance in marketing communication laws (Disclosure 417-3)	Case	N.A.	N.A.	0	0

GRI Content Index

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Sustainable Supplier Development	BCP Indicator	Effective time and cost management of packaging procurement Percentage of efficiency in supplier contract management	58, 90					
	ANTI-CORRUPTION							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	45					
GRI 205: Anti-Corruption 2016	205-2	Communication and training about anti-corruption policies and procedures	45				SDG 16 - Anti-corruption	
	205-3	Confirmed incidents of corruption and actions taken	45				SDG 16 - Anti-corruption	
Material Topics								
GRI 300 Environmental Standard Series								
	ENERGY							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	67-68					
GRI 302: Energy 2016	302-1	Energy consumption within the organization	125	Fuel Combustion from mobile source of BGN	Information unavailable	The data will be available in 2018	SDG 7 - Energy efficiency, Renewable energy SDG 8 - Energy efficiency SDG 12 - Energy efficiency, Transport SDG 13 - Energy efficiency	Yes
	302-3	Energy intensity	67, 125				SDG 7 / SDG 8 / SDG 12 SDG 13 - Energy efficiency	
	WATER							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	70-71					
GRI 303: Water 2016	303-1	Water withdrawal by source	70, 126	Water withdrawal from rivre in case of	Information unavailable	The data will be available in 2018 fire drills	SDG 6 - Sustainable water withdrawals	Yes
	303-3	Water recycled and reused	71, 126				SDG 6 - Water efficiency, Water recycling & reuse SDG 8 / SDG 12 - Water efficiency	Yes
	EMISSIONS							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	68-69, 75-76					
GRI 305: Emissions 2016	305-1	Direct (Scope 1) GHG emissions	125				SDG 12 - Transport SDG 13 - GHG emissions SDG 14 - Ocean acidification SDG 15 - Forest degradation	Yes

GRI Standard		Disclosure	Page number (s) and/or URL (s)	Omission			SDGs	External Assurance
				Part Omitted	Reason	Explanation		
Material Topics **GRI 300 Environmental Standard Series**								
	EMISSIONS							
GRI 305: Emissions 2016	305-2	Energy indirect (Scope 2) GHG emissions	125	Marketing Base Scope 2 GHG Emission	Not applicable	BCP account and report energy indirect (Scope 2) GHG Emission based on the location based method (Electricity grid) only	SDG 3 / SDG 12 Air quality SDG 13 - GHG emissions SDG 14 - Ocean acidification SDG 15 - Forest degradation	Yes
	305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	126	Does not include other VOCs emission except Fugitive VOCs emission. In additional, the reported fugitive VOCs emission of new facilities i.e. HRSG3 and Auxiliary Boiler2 which just have been started operation on last quarter of year 2017 and some unreachable equipment which allow to exclude by law	Information unavailable	The data will be available in 2020	SDG 3 / SDG 12 Air quality SDG 14 - Ocean acidification SDG 15 - Forest degradation	Yes
	OG6	Volume of flared and vented hydrocarbon	126	Volume of vented hydrocarbon and vented for oil andgas production in relation to volume produced	Not applicable	BCP is planning to install instrument for capture gas flared at plant 4, 2 and 3 in 2018 and 2020 respectively	SDG 3/SDG 12 - Air quality SDG 7/SDG 8 / SGD 12 - Energy efficiency SDG 12 Waste SDG 14 - Ocean acidification	
	EFFLUENTS AND WASTE							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	73, 74, 77					
GRI 306: Effluents and Waste 2016	306-1	Water discharge by quality and destination	126				SDG 3/ SDG 6/ SDG 12 - Water quality SDG 6 - Water-related ecosystem and biodiversity SDG 14 - Water discharge to oceans	
	306-2	Waste by type and disposal method	126-127				SDG 3 - Spills SDG 6 /SDG12 - Waste, SDG 6 - Water-related ecosystems and biodiversity	Yes
	306-3	Significant spills	127				SDG 3/ SDG 6/ SDG 12 SDG 14/ SDG 15/ - Spills	Yes
	ENVIRONMENTAL COMPLIANCE							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	75-76					
GRI 307: Environmental Compliance 2016	307-1	Non-compliance with environmental laws and regulations	127				SDG 16 - Compliance with law and regulations	
	SUPPLIER ENVIRONMENTAL ASSESSMENT							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	57					
GRI 308: Supplier Environmental Assessment 2016	308-2	Negative environmental impacts in the supply chain and actions taken	57					

GRI Standard		Disclosure	Page number (s) and/or URL (s)	Omission			SDGs	External Assurance
				Part Omitted	Reason	Explanation		
Material Topics GRI 300 Environmental Standard Series								
	ENVIRONMENTAL PROTECTION EXPENDITURES AND INVESTMENT							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	92					
Environmental protection expenditures and investment type	BCP Indicator	Total environmental protection expenditures and investment type	93					
	PRODUCTS TRANSPORTATION							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	88-90					
Transportation	BCP Indicator	Significant environmental impacts of transporting products	90					
Material Topics GRI 400 Social Standard Series								
	EMPLOYMENT							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	101-112					
GRI 401: Employment 2016	401-1	New employee hires and employee turnover	112, 128				SDG 5 - Gender equity SDG 8 - Employment, Youth employment	
	LABOR/MANAGEMENT RELATION							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	101-103					
Labor/ Management Relation	BCP Indicator	Best Employer Score by AON Hewitt	103, 129					
	OCCUPATIONAL HEALTH AND SAFETY							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	96-98					
GRI 403: Occupational Health and Safety 2016	403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	130	Occupational diseases and absentee rate by gender	Information unavailable	The data will be available in 2018	SDG 3/ SDG 8 - Occupational health and safety	Yes
	OGSS	Emergency Preparedness	96, 115					
	TRAINING AND EDUCATION							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	105-111					
GRI 404: Training and Education 2016	404-1	Average hours of training per year per employee	129				SDG 4/ SDG 8 - Employee training & education SDG 5 - Gender equity	
	404-3	Percentage of employees receiving regular performance and career	108				SDG 4/ SDG 8 - Employee training & education SDG 5 - Gender equity	
	LOCAL COMMUNITIES							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	114-119					
GRI 413: Local Communities 2016	413-1	Operations with local community engagement, impact assessments, and development programs	114					

GRI Standard	Disclosure		Page number (s) and/or URL (s)	Omission			SDGs	External Assurance
				Part Omitted	Reason	Explanation		
Material Topics **GRI 400 Social Standard Series**								
	SUPPLIER SOCIAL ASSESSMENT							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	57					
GRI 414: Supplier Social Assessment 2016	414-2	Negative social impacts in the supply chain and actions taken	57				SDG 5 - Workplace violence and harassment SDG 8 - Labor practices in the supply chain SDG 16 - Workplace violence and harassment	
Sustainable Supplier Development	BCP Indicator	Number of suppliers that were self-assessed using SCOC criteria	58					
	MARKETING AND LABELING							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	78-87, 99-100					
GRI 417: Marketing and Labeling 2016	417-3	Incidents of non-compliance concerning marketing communications	100					
Product and Service Development	BCP Indicator	Net Promoter Score (NPS) / Customer satisfaction	83					
	BCP Indicator	Number of new service stations	83					
	BCP Indicator	Number of renovated service stations	27, 80					
	BCP Indicator	Expansion of convenient stores, coffee shops, and restaurants	80					
	BCP Indicator	Launch Diesel HiDSL	79					
	BCP Indicator	Share of products transported by larger vehicles	90					
	BCP Indicator	Number of transportation service complaint	90					
	BCP Indicator	Average sales per service station	83					
	SOCIOECONOMIC COMPLIANCE							
GRI 103 Management Approach 2016	103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	44-45					
GRI 419: Socioeconomic Compliance 2016	419-1	Non-compliance with laws and regulations in the social and economic area	127				SDG 16 - Compliance with law and regulations	

Bangchak GC Advanced COP - Self Assessment

GC Scope or Principle	หลักเกณฑ์ขั้นสูงสุด	Criteria of GC Advanced Level	Disclose
Scope : Implementing the Ten Principles into Strategies & Operations	**Strategy, Governance and Engagement** 1. The COP describes mainstreaming into corporate functions and business units	• Bangchak and Sustainability • Sustainability Strategy	16-18 37-43
	2. The COP describes value chain implementation	• About Bangchak • Supply Chain Management	8-9 11
Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights **Principle 2 :** Businesses should make sure that they are not complicit inhuman rights abuses	**Human rights** 3. The COP describes robust commitments, strategies or policies in the area of human rights	• Human Rights	113
	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 **Principle 4:** The elimination of all forms of forced and compulsory labour. **Principle 5:** The effective abolition of child labour **Principle 6:** The elimination of discrimination in respect of employment and occupation	**Labour** 6. The COP describes robust commitments, strategies or policies in the area of labour	• Bangchak and Sustainability / Sustainability Policy • Stakeholder Engagement (Employee)	16-18 20-22
	7. The COP describes effective management systems to integrate the labour principle	• Safety & Occupational Health • Employee Stewardship	96-98 101-112
	8. The COP describes effective monitoring and evaluation mechanisms of labour principles integration		
Principle 7: Businesses should support a precautionary approach to environmental challenges **Principle 8:** Businesses should undertake initiatives to promote greater environmental responsibility **Principle 9:** Businesses should encourage the development and diffusion of environmentally friendly technologies	**Environment** 9. The COP describes robust commitments, strategies or policies in the area of environmental stewardship	• Bangchak and Sustainability / Sustainability Policy • Environment Performance	16-18 66-77
	10. The COP describes effective management systems to integrate the environmental principles	• Sustainable Product and Service • Eco Efficiency • Environmental Cost Accounting	78-87 91 92-93
	11. The COP describes effective monitoring and evaluation mechanisms for environmental stewardship		

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	• Bangchak and Sustainability / Sustainability Policy • Corporate Governance	16-18 44
	13. The COP describes effective management systems to integrate the anti-corruption principle	• Anti-Corruption • Supply Chain Management	45 57-59
	14. The COP describes effective monitoring and evaluation mechanisms for the integration of anti-corruption		
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	• Bangchak and Sustainability / Principle and conceptual framework of sustainability	16-18
	16. The COP describes strategic social investments and philanthropy	• Community & Social Engagement	114-123
	17. The COP describes advocacy and public policy engagement	• Bangchak and Sustainability / Sustainability Policy	16-18 114-123
	18. The COP describes partnerships and collective action	• Principle and conceptual framework of sustainability	13 16-18
Scope: Corporate Sustainability Governance and Leadership	**Governance** 19. The COP describes CEO commitment and leadership)	• Letter from President and CEO • Principle and conceptual framework of sustainability • Sustainability Strategy	4-6 16-18 37-43
	20. The COP describes Board adoption and oversight	• Bangchak and Sustainability / Sustainability Corporate Structure • Corporate Governance	16 44
	21. The COP describes stakeholder engagement	• Bangchak and its stakeholders	20-29

Thailand GO GREEN

พิธีมอบทุนการศึกษาเยาวชนบางจาก ปีที่ 13
บริษัท บางจาก คอร์ปอเรชั่น จำกัด (มหาชน)

การวิจัย สังเคราะห์

ทอดผ้าป่า รักษาต้นน้ำ ปีที่ 13
ณ วัดป่าสุคะโต อ.แก้งคร้อ จ.ชัยภูมิ
วันที่ 21-23 กรกฎาคม 2560

About this Report

Background

In 2017, we change our name from Bangchak Petroluem to Bangchak Corporation. The name change signifies our direction to develop new businesses outside of the petroleum industry. This is our 13th Sustainability Report which discloses our economic, environmental, and social performance (Disclosure 102-52) between January 1st 2017 to December 31st 2017 (Disclosure 102-50). The report is developed under the Global Reporting Initiatives Guideline Version Standards (GRI Standards) Oil & Gas Sector Supplement (OGSS) Core Option and United Nations Global Compact (Advance Level). In addition, we report our performances under our Sustainability Strategy in support of the United Nations Sustainable Development Goals (SDGs) to show our commitment in supporting sustainable development to our stakeholders. We have also included stakeholders' interviews in this report.

Reporting Boundary (Disclosure 102-45, Disclosure 103-1)

This report presents 2017 operating data of all Business Units under Bangchak Corporations Company Ltd. that operates in Thailand. The report does not cover the performances of Bangchak's subsidiaries and related companies, except for energy consumption and greenhouse gas emissions, which include subsidiaries where Bangchak holds more than 20%* equity, namely

- Bangchak Green Net Co., Ltd. (BGN)
- Bangchak Biofuel Co., Ltd. (BBF)
- BCPG Pcl (BCPG) and Bangchak Solar Energy Co.,Ltd. (BSE)
- Ubon Bio Ethanol Co., Ltd. (UBE).

As for data on injury rates, the numbers presented include only the offices and the refinery on Sukhumvit Soi 64, Bangchak's key operating sites. However, in March 2017 we relocated some of our employees from the refinery into our new Head Office which resulted in minor changes in the number of employees at both locations. In addition, we have re-categorized our employee and contractors grouping based on GRI Standards which resulted in a change in the safety performance data for both groups.

In addition, Bangchak has developed new methodology* for collecting and calculating GHG emissions for Bangchak and its subsidiaries (Disclosure 102-49). The results of the new methodology was found not to be significantly different than the previous methodology. We also adjusted our reporting of oil and chemical spills to be in line with GRI Standards and conducted verification for these indicators for the first time.

Assurance of this report

The key contents of the report were reviewed by high-level executives of each business group / department (Disclosure 102-32) to ensure complete and accurate responses to stakeholders. In addition, for credible and transparent reports in accordance with the GRI Standards, Bangchak organized report certification and that of KPIs by a third party well-versed in certification and independent assurance in the field of oil and gas business as detailed in the certification of assurance on page xx.

For further information, please direct your queries or recommendations to (Disclosure 102-53)

Sustainability Development Department Bangchak Corporation Public Company Limited E-mail: chongprode@bangchak.co.th
Tel: 0(+66) 2335 4608-4609

* In accordance with the Intergovernmental Panel on Climate Change's (IPCC) 2006 IPCC Guidelines for National Greenhouse Gas Inventories and American Petroleum Institute's (API) Compendium of Greenhouse Gas Emission Methodologies for the Oil and Natural Gas Industry. In addition, Bangchak uses Net Calorific Value (NCV) of various fuels in accordance with the Ministry of Energy's conversion factors to report energy and GHG emission for this report.

*ตามแนวทางการคำนวณก๊าซเรือนกระจก เวอร์ชั่น 2006 (2006 IPCC Guidelines for National Greenhouse Gas Inventories) ของคณะกรรมการระหว่างรัฐบาลว่าด้วยการเปลี่ยนแปลงสภาพภูมิอากาศ (Intergovernmental Panel on Climate Change: IPCC) และการรวบรวมวิธีการคำนวณก๊าซเรือนกระจกสำหรับอุตสาหกรรมปิโตรเลียมและก๊าซธรรมชาติ (Compendium of Greenhouse Gas Emission Methodologies for the Oil and Natural Gas Industry) ของสถาบันปิโตรเลียมแห่งสหรัฐอเมริกา (American Petroleum Institute: API) นอกจากนี้ บริษัทฯ ยังได้ใช้ค่าความร้อนสุทธิ (Net Caloric Value: NCV) ของเชื้อเพลิงต่างๆ ตามค่าการแปลงหน่วย (Conversion Factors) ของกระทรวงพลังงานมาใช้รายงานข้อมูลพลังงานและก๊าซเรือนกระจกสำหรับรายงานการพัฒนาความยั่งยืน ปี 2560

Companies under the scope of this report (Disclosure 102-45/ 103-1)

No.	Company	% equity	Production	Energy	GHG	Water use	Waste water	Air	Waste	Safety
1	Bangchak Petroleum Plc	/	/	/	/	/	/	/	/	R
Refining Business										
1	BCP Trading Pte. Ltd.	100								
2	Bongkot Marine Service Co., Ltd.	30	NR	NR	NR	NR	NR	NR	NR	NR
3	Fuel Pipeline Transportation Co., Ltd.	4.95	NR	NR		NR	NR	NR	NR	NR
Marketing Business										
1	Bangchak Retail Co., Ltd.	100								
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	70.35								
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 (Nakhonratchasima) Co., Ltd.	100	/	/	/	×	×	NR	NR	NR
9	Bangchak Solar Energy (Prachinburi) Co., Ltd.	100	/	/	/	×	×	NR	NR	NR
10	• BSE Energy Holdings Pte Ltd.	100								
11	• BCPG Japan Corporation Ltd.	100								
12	• BCPG Engineering Co., Ltd.	100								
13	BCPG Investment Holding Pte Ltd.	100								
14	• Greenergy Holdings Pte Ltd.	100								
15	• Greenergy Power Pte Ltd.	100								
16	BCPG Biopower 1 Co., Ltd.	100								
17	BCPG Biopower 2 Co., Ltd.	100								
Bio-Based Product Business										
1	BBGI Co.,Ltd	60								
2	KSL Green Innovation Plc.	100								
3	Bangchak Bioethanol (Chachoengsao) Co., Ltd.	85								
4	Bangchak Biofuel Co., Ltd.	70	/	/	/	×	×	×	×	×
5	Ubon Bio Ethanol Co., Ltd.	21.28	/	/	/	×	×	×	×	×
6	• Ubon Agricultural Energy Co., Ltd.	100	NR	NR	NR	NR	NR	NR	NR	NR
7	• Ubon Biogas Co., Ltd.	100	NR	NR	NR	NR	NR	NR	NR	NR
8	• NP Bio Energy Co., Ltd.	100	NR	NR	NR	NR	NR	NR	NR	NR
Natural Resource Business and Business Development										
	Exploration & Product Business									
1	BCP Energy International Pte Ltd.	100	NR	NR	NR	NR	NR	NR	NR	NR
2	Nido Petroleum Pty Ltd.	100								
3	Nido Management Pty Ltd.	100								
4	Nido Petroleum Philippines Pty Ltd.	100								
5	Nido Petroleum Indonesia (Holding) Pty Ltd.	100								
Innovation Business										
1	BCP Innovation Pte. Ltd.	100	NR	NR	NR	NR	NR	NR	NR	NR
2	Lithium Americas Corp.	16.1	NR	NR	NR	NR	NR	NR	NR	NR
3	• Minera Exar S.A	50	NR	NR	NR	NR	NR	NR	NR	NR
4	• Lithium Nevada Corp.	100	NR	NR	NR	NR	NR	NR	NR	NR
5	• Hectatone Inc.100	NR	NR	NR	NR	NR	NR	NR	NR	

Newly formed company / M&As that have operated domestically for under two years or newly formed company / M&As that have operated abroad for under three years (Disclosure 103-1)
Office buildings with no need for environmental and safety data collection

Non-relevant (NR) means data with no business significance or overall impact on Bangchak / Data displayed in the report X Data not collected

สีอักษรแสดงสถานะของบริษัท

Subsidiary" means over 50% equity held by Bangchak

Associate" means 20-50% equity held by Bangchak

Other businesses

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LRQA

LRQA Assurance Statement

Relating to the Bangchak Corporation Public Company Limited's Sustainability Report for the calendar year 2017

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

Lloyd's Register Quality Assurance Ltd. (LRQA) was commissioned by the Bangchak Corporation Public Company Limited (BCP) to provide independent assurance on its Sustainability Report 2017 ("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 approach. LRQA's verification approach is based on current best practise and uses the principles of AA1000AS (2008) - inclusivity, materiality, responsiveness and reliability of performance data and processes defined in ISAE3000.

Our assurance engagement covered BCP and the operations and activities of its business groups in Thailand under its operational control[1] and specifically the following requirements:

- Confirming that the Report is in accordance with:
  - GRI Sustainability Reporting Standards and core option
  - GRI Oil & Gas Sector Disclosure
- Evaluating the reliability of data and information for the following topic specific standards below:
  - Environmental:
    GRI 302-1 Energy consumption within the organization[2]
    GRI 303-1 Water withdrawal by source[3]
    GRI 303-3 Water recycled and reused [3]
    GRI 305-1 Direct (Scope 1) GHG emissions[2]
    GRI 305-2 Energy indirect (Scope 2) GHG emissions[2]
    GRI 305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions (VOC and H_2S)[4]
    GRI 306-2 Waste by type and disposal method[4]
    GRI 306-3 Significant spills[4]
  - Social:
    GRI 403-2 Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities[4].

Notes:
(1) Excludes subsidiaries and related companies in Thailand and overseas unless stated otherwise.
(2) Additionally includes BCP subsidiaries and related companies in Thailand, where BCP holds over 20% in equity, except mergers and acquisitions (M&As) that have been in operation for less than two years.
(3) Limited to BCP refinery and BCP Head office only.
(4) Limited to 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 nothing has come to our attention that would cause us to believe that BCP has not:

- Met the requirements above
- Disclosed reliable performance data and information as no errors or omissions were detected within the selected topic specific standards
- 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.

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 by interviewing BCP employees who engage directly with stakeholder groups as well as 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.

Lloyd's Register
LRQA

- 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 procedures, and systems. We also spoke with those key people responsible for compiling the data and drafting the Report.
- Sampling of evidences presented at BCP's refinery and office located at Sukhumvit 64 to confirm the reliability of the selected topic specific standards.

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. BCP has maintained open dialogue with its key stakeholders. The Report content, as well as BCP's visions for addressing sustainable development, has then been informed by the views and expectations of their key stakeholders.
- Materiality:
  We are not aware of any material issues concerning BCP's sustainability performance that have been excluded from the Report. It should be noted that BCP has established extensive criteria for determining which issue/aspect is material and that these criteria are not biased to the BCP's management.
- Responsiveness:
  BCP has 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 future reports should expand the reporting scope of other topic specific standards apart from energy consumption and GHG emission to its subsidiaries in Thailand and overseas to further demonstrate its responsiveness to and perception of stakeholder at a broader level. In addition, the reporting scope of VOC emission should cover all VOC inventory rather than being limited to fugitive VOC emission only.
- Reliability:
  Data management systems are considered to be properly defined for the data and information collection and calculation associated with the selected topic specific standards. However, BCP should further assess the methodology used to report for its renewable energy consumption from biomass fuel, particularly the use of dry-weight and net calorific values. We also believe that by implementing periodic internal verification covering all subsidiaries and including the material topic relevant to oil and gas sector such as OG6, into the scope of future external assurance, BCP can further demonstrate the reliability of its data and information.

LRQA's 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.

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

Signed

Dated: 26 February 2018

Paveena Hengsritawat
LRQA Lead Verifier

On behalf of Lloyd's Register Quality Assurance Ltd.
Lloyd's Register International (Thailand) Limited
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LRQA reference: BGK1299418

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