

# Energy Consumption and Climate Change Management

## Energy Consumption

The refinery business is an energy-intensive industry that requires substantial amounts of heat, electricity, and steam. Recognizing the importance of energy efficiency and conservation, the Company has adopted the ISO 50001 standard for Energy Management Systems and has been implementing it consistently since 2014. The Company has short, medium, and long-term goals and development plans to improve the energy efficiency of the refinery. The short-term plans include setting energy consumption targets and optimizing existing systems. The medium-term plans aim to improve efficiency and effectiveness throughout the production process. Lastly, the long-term plans involve a project called the Energy Improvement Project, which seeks to achieve significant reductions in energy consumption.

## Energy Efficiency Target in 2023

The company set the energy consumption target for the refinery in 2023 at %FOEB 4.86, considering the energy consumption per unit of production equivalent to percent of Fuel of Oil Equivalent Barrel (%FOEB), which was developed from 2022 and is near the upcoming major maintenance period scheduled for 2024. The energy consumption within the production units in 2023 was 4.90%, which closely aligns with the target.

## Operating Results in 2023

The Company adopts the CCRU (Continuous Catalytic Regeneration Unit), which is a more energy-efficient unit compared to the previous one, resulting in an overall improvement in energy usage. Moreover, the Company has embraced the rapid development in technological innovations and has incorporated Artificial Intelligence (AI) systems along with workforce development to improve operational efficiency. This effort aims to advance the Company's refineries and enable them to be positioned as state-of-the-art facilities that comply with global standards.

The Company has been undertaking several refinery development projects and consistently monitoring them since 2019. These projects aim to enhance energy efficiency. Examples of projects carried out include:

- Installation project of heat-insulating surface coating materials on the furnace walls to reduce energy consumption in steam boiler unit 1
- Installation project of heat-insulating surface coating materials on the furnace walls to reduce energy consumption in steam boiler unit 2
- High-pressure steam usage reduction at CCRU (Continuous Catalytic Regeneration Unit) tower
- High-pressure steam usage reduction in the air compression unit at Light Naphtha Isomerization Unit 2
- High-pressure steam usage reduction at the Hydrodesulfurization Tower 4
- Heat exchange systems improvement to reuse residual heat at Crude Oil Distillation Unit 2
- Inlet temperature reduction at the reactor of the CCRU (Continuous Catalytic Regeneration Unit)

From the energy management initiatives and the efficiency improvement projects, the energy consumption in the production unit is equivalent to 4.90% FOEB which is closely aligned with the 4.86% target.

## Future Plan

For the energy usage reduction plan, the Company collaborated with international firms in the expert matters to exchange technology and experiences to be utilized in the future projects. These collaborations serve as an assurance that the energy consumption will be at an efficient level. Additionally, the Company has other energy usage reduction initiatives in the pipeline for the year 2024 including:

- Catalyst reforming unit shutdown at the Distillation Unit 2
- Gas engine generator installation to replace gas turbine generator

## Refinery Business Operating Results



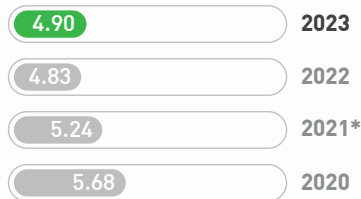
### Energy Consumption in Production Unit (% FOEB)



#### Target



#### Performance



\*Annual Turnaround

## Climate Change Management

Climate change from the greenhouse gas emission is a sustainability matter of all industries. The Company acknowledges the risks and physical impacts associated with climate change, as well as the regulatory changes related to climate transition impacting the Company and stakeholders. This commitment aligns with the Paris Agreement, which aims to limit global temperature rise to below 2 degrees Celsius, and the UN Sustainable Development Goal (SDG) 13. Bangchak group has declared a Carbon Neutrality target by the year 2030, and aims to reduce greenhouse gas emissions (Scopes 1 and 2) by 30% and ultimately achieve Net Zero GHG Emissions by 2050. The greenhouse gas emissions target is set as a corporate

key performance indicator (KPI), and as evaluation criteria for the Group's CEO, president, and the management's performance. Additionally, the Company has determined the strategies, assessed risks and opportunities related to climate change in both the short and long term, in line with the Task Force on Climate-Related Financial Disclosures (TCFD) guidelines. These assessments cover financial implications associated with physical risks and transition risks such as those risks associated with carbon pricing policy, crude oil market price, organizational reputation, and climate impact reporting requirements. Additionally, there are assessments of policies supporting the renewable energy technology and greenhouse gas reduction. Opportunities also exist in carbon capture, utilization, and storage (CCUS) technologies, as well as the market demand for renewable electricity. For more information, please see the 2024 Task Force on Climate-Related Financial Disclosures (TCFD) Report as per the QR Code.



More information available in

Task Force on  
Climate-Related Financial  
Disclosures (TCFD) 2024

The Company has a sustainability policy on the efficient management of resources and the environment, promoting awareness in the management and employee levels regarding environmental risks and impacts from business operations, covering climate change, by requiring regular audits, risk management and impact assessment that may affect the environment and climate, promoting the use of technology and innovation to develop environmental, energy, water, and waste management systems to be efficient throughout the business process and in new businesses, as well as developing cooperation with local and international organizations in the management of resources, environmental care, adaptation, and mitigation of climate change impacts to be effective and economically valuable.