



PTTGC Sustainable Finance Framework

October 2023

1. Introduction

1.1 Company Background

PTT Global Chemical Public Company Limited (“PTTGC” or “GC” or the “Company”) is a leader in integrated petrochemical and refining business with combined petrochemical and chemical production capacity of more than 14.23 million tons per year, plus a crude oil and condensate refining capacity of 280,000 barrels per day. PTTGC has 47 production facilities based in Thailand, which has enabled PTTGC to become the largest petrochemical and refining company in ASEAN.

Besides its production facilities in Thailand, PTTGC has stamped its global footprint with 43 global production facilities which mainly contributed from Allnex Holding GmbH, a wholly owned subsidiary and a world’s leading industrial coating producer, as our vehicle to grow in Performance Chemicals with ambitious target to have 30% EBITDA contribution from this business group. PTTGC’s products portfolio can be divided into five core Business groups including Upstream, Intermediates, Polymers & Chemicals, Bio & Circularity, and Performance Chemicals. This business structure supports PTTGC’s Long-term business direction and aspiration to deliver values to all stakeholders as well as to match with the future global megatrends in order to be a Leading Global Chemical Company for Better Living.



1.2 PTTGC’s Climate Ambitions

PTTGC’s vision is to become a leading global chemical company for better living that combines environmentally friendly innovations with advanced technologies to develop products which enable improvement of people’s lives. The company’s commitment to sustainability is evident as PTTGC has been rated #1 in the World for sustainability in DJSI Chemicals Sector for the past four years since 2019-2022. PTTGC has also earned the highest ranking in Thailand for Climate Change Management and scored an “A” (Leadership Level), which is the highest ranking based on the assessment framework of the Carbon Disclosure Project (CDP), a globally trusted assessment institute. Additionally, PTTGC has received recognition from leading Thai

institutes, the Stock Exchange of Thailand (SET) Sustainability Awards of Honor for the fifth consecutive year and the Thailand Sustainability Investment (THSI) Awards for the eighth consecutive year from SET. These rankings reflect PTTGC's standards for excellence in its operations as a multinational organization, and as a company that strongly supports the environment, society, and its respective stakeholders.

More recently, PTTGC has set itself a net-zero target for Scope 1 and 2 emissions to be reached by 2050 with 50% emissions reduction in Scope 3 emissions within the same timeline. PTTGC also has set up an interim target of Scope 1 and 2 emission reduction 20% by 2030 with 2021 based year. The company aims to be a net-zero company that maintains sustainable growth.

PTTGC has applied the principles of circular economy, combined with three different approaches, to offset carbon emissions and decarbonize. The three approaches are:

1. Efficiency-driven – to enhance process efficiency, switch to alternative energy, and develop and implement new low-carbon technology in the production process to reduce greenhouse gas emission with more efficiency
2. Portfolio-driven – to transform portfolio to low-carbon business in line with the demands of more environmentally conscious consumers through investments in the High Value Business (HVB) group which includes high-performance specialty chemicals, bioplastics and recycled plastics
3. Compensation-driven – to employ high-efficiency carbon capture, utilization and storage (CCUS) technology, nature-based solutions, such as reforestation, soil and ocean sequestration, etc., and carbon credit management to deal with excess carbon from production processes and business operations

Under the efficiency-driven pillar, PTTGC will look to maximize operational efficiency across all assets and implement new breakthrough technologies where possible. Some key levers include:

- Energy conservation and efficiency improvement initiatives
- Clean energy utilization in manufacturing processes (whether renewable energy, co-generation with Carbon Capture and Storage technology, or combination)
- Deployment of new low-carbon technology in the future to overcome existing limitations such as hydrogen fuel switching and electrification of operational processes.

The portfolio-driven pillar aims to adjust PTTGC's business portfolio in order to increase quality of earning, while adopting an integrated circular economy concept. In particular, PTTGC targets to adjust long-term business portfolio by transferring 40 percent of the long-term adjusted EBITDA into low-carbon businesses by 2030. In 2022, PTTGC's combined production capacity for bio-based products (chemical & polymers) and plastic recycling (mechanical & chemical recycling) totaled more than 1,500,000 tons. PTTGC further targets to expand investment to support a production capacity of 2,500,000 tons by 2027.

Levers within this pillar include

- Enhance quality of earning via investments in Performance Chemicals (e.g., High Value Business: HVB)
- Create circularity solution options for customers and value chain partners to reduce GHG and plastic waste (e.g., performance resins, bio-based products, recycled resins)

The pillar of compensation-driven focuses on utilizing high-efficiency carbon capture utilization and storage (CCUS) technology and nature-based solutions (NBS) to help reduce PTTGC's

emissions. For CCS, PTTGC will aim to scale up its capabilities through collaborations with strategic partners. Accordingly, PTTGC has signed a Memorandum of Understanding (MoU) to conduct a feasibility study on the application of Carbon Capture and Storage (CCS) technology, or CCS Hub Model, in collaboration with PTT Group. The project is expected to commence its operations in 2030, initially capturing and storing up to 1.3 million tons of carbon dioxide per year.

In the case of compensating emissions, PTTGC's plans are to look into long-term solutions such as:

- Execution of forestation and reforestation projects
- Employ carbon credit management to explore carbon credit from global market based on competitive price
- Deploy breakthrough technologies (if economically feasible) on carbon sequestration (e.g., direct air capture technology)

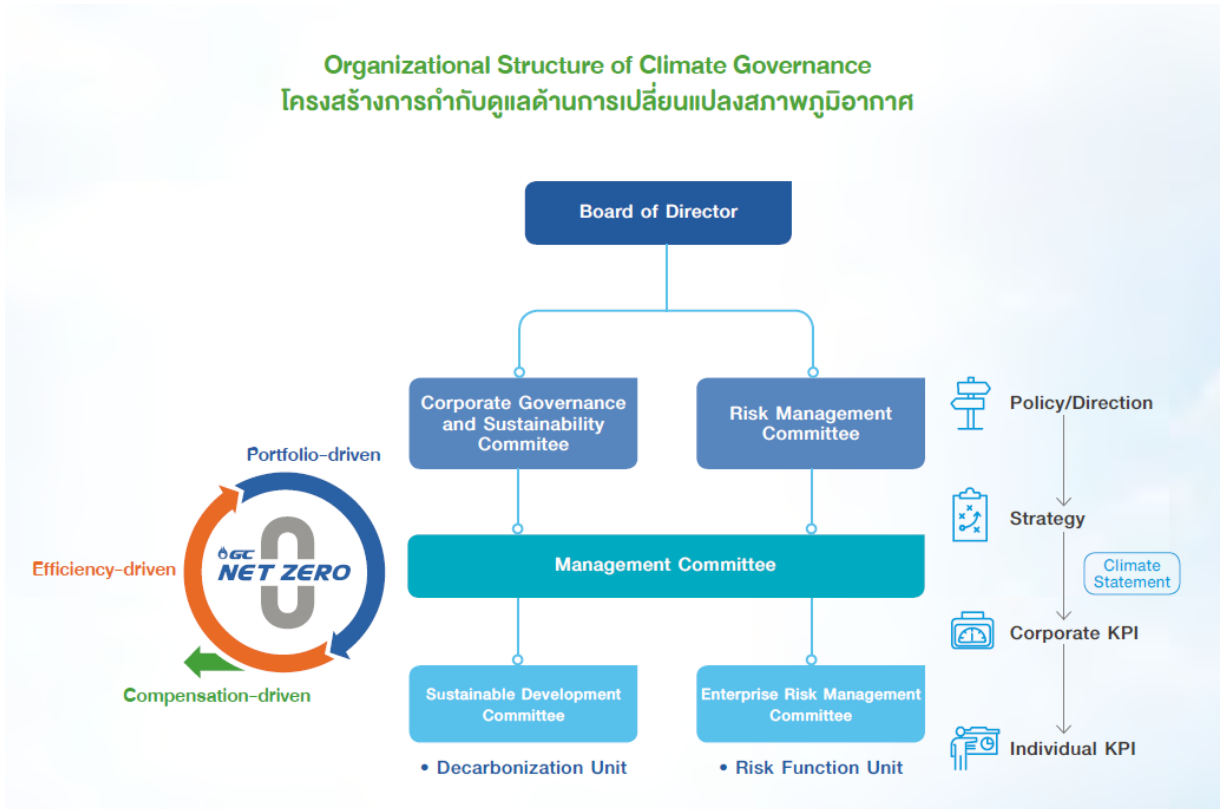
PTTGC's roadmap towards net-zero will require a significant investment until 2050 in order to achieve the target. Setting such goals is a challenging target for the business but PTTGC is committed in playing its part to reduce emissions for the benefit of wider society.

In addition, PTTGC has also formulated Scope 3 emission reduction framework to achieve 50% reduction in 2050 through three strategies.

1. Low carbon feedstock – to switch feedstocks from fossil-based to renewable, bio-based, and recycled for production, and apply sustainable procurement policy to enhance engagement of suppliers.
2. Fuel to chemical – to adjust product portfolio by reducing production of fuel and converting to produce more chemical products.
3. Low carbon and eco solutions – to develop products and solutions via collaborating with customers aimed to reduce Product Carbon Footprint and to reduce lifecycle GHG emission through circular economy model and end-to-end waste management.

1.3 PTTGC's Climate Governance

PTTGC has established a decarbonization governance and management structure, covering from the Board of Directors various Senior Management Committees through to operational level, to enable integration and efficiency in all processes. In this regard, PTTGC has appointed the Board Chair to define corporate vision, mission, direction, and strategies. The Corporate Governance and Sustainability Committee and the Risk Management Committee (RMC) are in charge of monitoring and evaluating the efficiency of climate risks and opportunities governance. Meanwhile, the Management Committee (MC) has been tasked with determining and reviewing sustainability policies, approaches and goals as well as consider implementing guidelines based on PTTGC's sustainability strategy framework which includes climate change management and circular economy management. The MC also supports the Sustainable Development Committee (SDC) in its duty to shape PTTGC's sustainability strategies and directions. Subsequently, the SDC summarizes and reports its performance to the Sustainability Policy Supervisory Board every three months.



Furthermore, PTTGC analyzes both physical and transition risks to identify significant climate-related risks on business operations using qualitative and quantitative climate-related scenario analysis in order to formulate a Climate Adaption Plan for potential risks and opportunities.

2. Sustainable Finance Framework

The purpose of this framework is to communicate PTTGC’s sustainable finance issuances in a clear, comprehensive, and transparent manner. Proceeds raised under framework will be utilized to support the company’s long-term target of reaching net-zero GHG emissions (Scope 1 and 2) by 2050 including specific activity defining in use of proceed of loan or bond. PTTGC’s Sustainable Finance Framework includes a Sustainability-Linked Finance Framework and a Green Finance Framework.

This framework has been established in accordance with the following principles and guidelines to align with global best practices:

2.1 Sustainability-Linked Finance Framework

PTTGC’s Sustainability-Linked Finance Framework is aligned with the following principles:

- Sustainability-Linked Bond Principles 2020 (“SLBP”)¹ as published by the International Capital Market Association (“ICMA”)
- Sustainability-Linked Loan Principles 2023 (“SLLP”)² as published by the Loan Market Association (“LMA”), Loan Syndications and Trading Association (“LSTA”) and the Asia-Pacific Loan Market Association (“APLMA”)
- ASEAN Sustainability-Linked Bond Standards 2023 (“ASEAN SLBS”)³ as published by the ASEAN Capital Markets Forum (“ACMF”)

There are five components that form the basis of PTTGC’s sustainable-linked finance framework (“SLFF”) in line with the SLBP, SLLP and ASEAN SLBS:

1. Selection of Key Performance Indicators (“KPI”)
2. Calibration of Sustainability Performance Targets (“SPT”)
3. Financing characteristics
4. Reporting
5. Verification

The following sustainability-linked financing instruments (“SLF Instruments”) may be raised by PTTGC pursuant to this framework:

- Sustainability-linked bonds
- Sustainability-linked loans

2.1.1 Selection of KPIs

PTTGC has selected two ambitious KPIs, which are core, relevant, and material to its business and measure the sustainability improvements of the Company:

- **KPI #1: Reduction of Absolute Scope 1 and 2 Greenhouse Gas emissions**

The above KPI is in line with PTTGC’s UN SDG priorities:



SDG 7: Affordable and clean energy

PTTGC has been striving to invest in renewable energy technology and integrate green initiatives into its business operations by aiming to reduce the consumption of fossil fuels.



SDG 13: Climate action

PTTGC has strived to adopt adaptive measures in upstream production processes and downstream products to alleviate climate-related hazard, including setting internal carbon pricing, investing towards clean energy, and optimizing process efficiency along supply chain to reduce GHG emissions.

¹ <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/sustainability-linked-bond-principles-slbp/>

² <https://www.lsta.org/content/sustainability-linked-loan-principles-sllp/>

³ <https://www.theacmf.org/initiatives/sustainable-finance/asean-sustainability-linked-bond-standards>

This is aligned with PTTGC's long-term target to reach net-zero GHG emissions by 2050.

Definition

Greenhouse Gas ("GHG") emissions is expressed as Total GHG Emissions (Scope 1 and 2). GHG Emissions are calculated as per "GHG Protocol Corporate Accounting and Reporting Standard" by World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD).

Scope 1 emissions are direct GHG emissions that occur from sources that are owned or controlled by the Company, for example, emissions from combustion in owned or controlled boilers, furnaces, and vehicles.

Scope 2 accounts for GHG emissions from the generation of purchased electricity and steam consumed by the Company. Purchased electricity and steam are defined as electricity and steam that are purchased or otherwise brought into the organizational boundary of the Company.

Scope

The KPI above includes all of PTTGC's own operations including subsidiaries in Thailand. PTTGC utilizes the Operational Control approach for GHG accounting, which accounts for GHG emissions from operations where it has authority to introduce and implement relevance GHG policies⁴ as specified in Appendix 1. Acquisitions may be considered as of January 1st of reported year to the extent possible or as of the following year. GHG emissions for Scope 1 and 2 will be measured and reported on annual basis

Basis of Selection

The selected KPI is relevant, core and material to PTTGC's business, and is of high strategic significance to PTTGC's current and/or future operations. Scope 1 and 2 GHG emissions accounts for 19% of PTTGC's overall emissions across Scope 1, 2 and 3 (based on Y2022).

To play its part in addressing climate change in a significant manner, achieving net-zero emissions is extremely important for PTTGC. This KPI will be a key indicator to show PTTGC's decarbonization efforts across its operations.

⁴ Operational control is determined if 1) GC owns 100 % in equity share of the Company; or 2) GC has the full authority to introduce and implement its operating policies at the operational level to control GHG emission

This KPI is measurable, quantifiable on a consistent methodological basis, externally verifiable and able to be benchmark as it is a common disclosure within the industry.

- **KPI #2: Dow Jones Sustainability™ World Index (DJSI World) Ranking in the Chemicals Sector**

The Dow Jones Sustainability™ Indices (DJSI), created by S&P Global, are float-adjusted market capitalization weighted indices that measure the performance of companies selected with ESG (Environmental, Social, Governance) & Economic criteria using a best-in-class approach. The Indices are used to assess the effectiveness of business operations in accordance with the sustainability practices of leading global companies, to ensure that companies manage all business dimensions in accordance with ESG principles and can generate sustainable returns for investors as well as create long-term value for stakeholders. Furthermore, the DJSI questionnaire is continually updated to reflect the latest trends and best practices, it is continuously raising the bar and posing new challenges across a company.

Definition

The DJSI, including the Dow Jones Sustainability™ World Index (DJSI World), were launched in 1999 and the index family is comprised of global, regional and country benchmarks. For the purpose of the Sustainability-Linked KPI, PTTGC will be using its ranking in the Chemicals Sector within DJSI World.

- The DJSI World comprises global sustainability leaders as identified by S&P Global through the Corporate Sustainability Assessment (CSA). It represents the top 10% of the largest 2,500 companies in the S&P Global Broad Market Index (BMI)⁵ based on long-term economic, environmental and social criteria.
- The CSA is an annual evaluation of companies' sustainability practices covering over 10,000 companies globally. The CSA focuses on sustainability criteria that are both industry-specific and financially material. A consistent, rule-based methodology to convert an average of 1,000 data points per company into a S&P Global ESG Score.
- The DJSI are rebalanced annually with the results from the annual CSA assessment, and results are also published in the Sustainability Yearbook⁶.
- The methodology of DJSI (and DJSI World)⁷ and the information of CSA are available on S&P Global website⁸

Scope

The DJSI World Ranking in the Chemicals Sector covers PTTGC's ranking in the DJSI World as a result of its CSA, which is submitted on the Company level and covers the entire scope of its operations.

⁵ S&P Global BMI is based on an existing constituent threshold of above US\$500 million in market capitalization.

⁶ <https://www.spglobal.com/esg/csa/yearbook/2023/ranking/>

⁷ <https://www.spglobal.com/spdji/en/documents/methodologies/methodology-dj-sustainability-indices.pdf>

⁸ <https://www.spglobal.com/esg/csa>

Basis of Selection

PTTGC considers its ranking in the DJSI World as a means of benchmarking itself against the best practices of its peers in the chemicals sector globally across ESG Factors.

2.1.2 Calibration of SPTs

- **SPT #1:** Reduction of Scope 1 and 2 Greenhouse Gas emissions

The following SPT set is aligned with PTTGC's aim to reduce emissions within operations:

SPT	Category	Target	Target Observation Date
#1	Scope 1 and 2 GHG emissions reduction	20% of its Scope 1 and 2 GHG emissions (in absolute terms) by 2030 to be measured against 2021 GHG emissions levels	By 31 st December, 2030

Past 3 years historical data benchmarking

	2020	2021 (Baseline)	2022	2030 (Target)
Scope 1 and 2 GHG emissions (million tCO ₂ e)	7.77	8.78 ⁹	8.28	7.02 (20% decrease from 2021)

Remark: GC has chosen absolute GHG emissions (Scope 1 and 2) instead of an intensity metric given that GHG intensity varies along product lines

Rationale

Targets set out under SPT #1 are part of PTTGC's overall net-zero roadmap plans to 2050. The SPT clearly sets out the Company's commitments towards a lower carbon future. In order to achieve its SPT, this will require several decarbonization initiatives to be carried out by PTTGC.

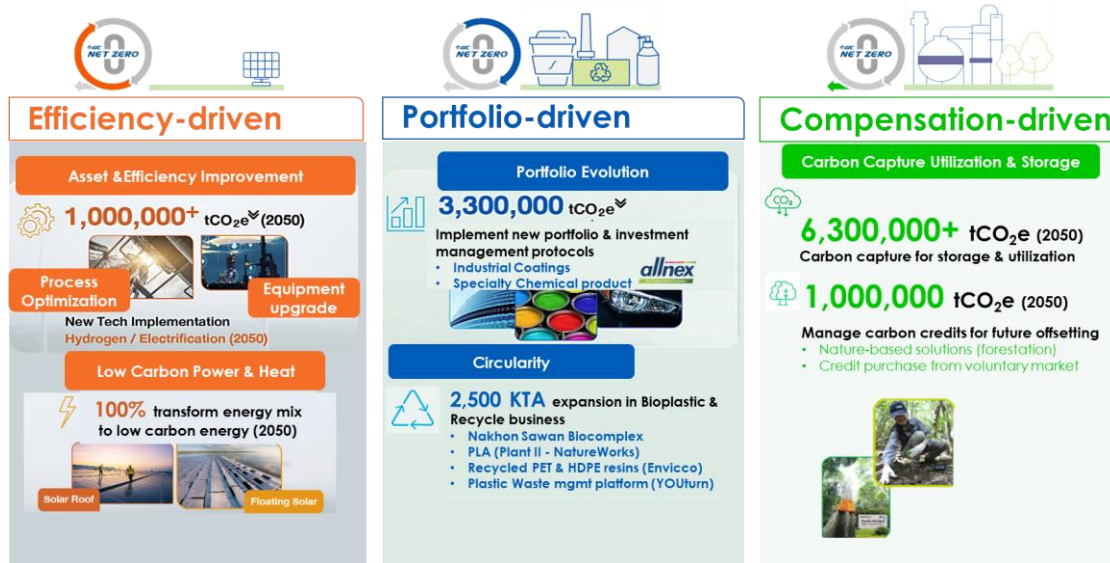
These projects require significant investments to be developed hence the need for PTTGC to access capital markets to finance these capital-intensive projects.

PTTGC group had major business structural change through the recent M&A in 2021. In addition, the recent asset performances, impacting by operating rates and targeted product portfolio revision in accordance to the market landscape changes from post COVID 19 / global recession events, were fully anticipated in 2021. Also, the recent Thailand's grid emission factor and Global Warming Potential (GWP) numbers (IPCC AR6) were updated into 2021 GHG data and the trajectory numbers in 2021-2030. The 2021 GHG emissions has been then selected to represent the realistic baseline / base year.

⁹ GC baseline is referred to verified GC GHG accounting report as of 2022.

PTTGC recognizes that its emissions are expected to increase in 2024 and peak before declining. This is primarily driven by ongoing growth projects that are still under completion; at the same time GC is continuously implementing ongoing studies on technologies with high GHG reduction impact that are expected to be implemented after 2025.

Strategy to Achieve Targets



- **Efficiency-driven:** Enhancing the efficiency of production processes with emphasis on integration in order to optimize resource efficiency, increase machinery efficiency, employ new technologies to reduce energy consumption, utilize clean energy, and raise the proportion of renewable energy, for instance, installing solar floating systems, replacing existing gas turbine generator with higher efficiency model, and applying advance pinch analysis for process heat integration improvement.
- **Portfolio-driven:** Transforming business portfolio over the long-term into a high value and low carbon business while still generating excellent returns for the company and integrating the principles of Circular Economy to provide options to customers with three main product groups, namely Bio-based products; Product designs that are sustainable and beneficial for the planet, including circularity & recycling system; and Specialty & performance chemicals. In addition, PTTGC has completed Life Cycle Assessment (LCA) and assessment of Carbon Footprint of Products (CFP) of 100% its assets under its operational control as of FY 2022.
 - 1) Bio-based products: As the world’s No. 1 manufacturer of bioplastics, PTTGC continues to grow by building a new polylactic acid (PLA) bioplastic plant in Thailand’s Nakhon Sawan province in response to the rapidly increasing demands of the market. The construction is expected to be completed in the second half of 2024.
 - 2) Circularity & Recycling: PTTGC has begun the implementation of end-to-end plastic management with the commercial operation of a high-quality food grade recycled plastic resin production plant under ENVICCO Limited, which is

a joint venture between PTTGC and ALPLA, a global leader in plastic and recycled plastic packaging, to optimize resource efficiency and create value for used plastic. ENVICCO is the largest recycling facility in Southeast Asia with the capacity to support up to 60,000 tons of domestically used plastic per year. The plant will contribute to the reduction of plastic waste for landfill disposal and greenhouse gas emissions by 140,000 tons CO2 equivalent. PTTGC aims to transform its product portfolio to include more recycled products.

3) Specialty & performance chemicals: PTTGC has acquired Allnex Holding GmbH (“allnex”), a global leader in coating resins, to solidify its position as a leading global chemicals company by combining eco-friendly innovations with modern technology.

- **Compensation-Driven**: Offsetting excess carbon using high-efficiency carbon capture technology and nature-based solutions. Accordingly, PTTGC has signed a Memorandum of Understanding to conduct a feasibility study on the application of Carbon Capture and Storage (CCS) technology, or CCS Hub Model, in collaboration with PTT Group. The project is expected to commence its operations in 2030, initially capturing and storing up to 1.3 million tons of carbon dioxide per year. Based on PTTGC's projections, CCS projects are expected to contribute to the emissions reduction from 2029 onwards. Before 2029, there is already investments into the technology in the leadup to operations in 2029. As such, there is the potential for CCS to contribute to the emissions reduction within the financing instrument term, particularly between 2029-2030

• **SPT #2: To obtain a Top 5 Ranking within the Chemicals Sector in DJSI World**

To ensure that PTTGC’s ESG Practices remain in line with the best-in-class practices for its sector, PTTGC has set an SPT of retaining a Top 5 Ranking within the Chemicals Sector in DJSI World.

SPT	Category	Target	Target Observation Date
#2	DJSI	To retain a Top 5 Ranking within the Chemicals Sector in DJSI World	Annual Basis, or as defined in the transaction documentation / To be provided based on intended tenor of the instruments

Past 4 years historical data benchmarking

	2019	2020	2021	2022
DJSI World Ranking in the Chemicals Sector	1 st	1 st	1 st	1 st
Score (out of 100)	89	89	92	89

Annual Targets

	2023	2024	2025	2026	2027	2028	2029	2030
DJSI World Ranking in the	Top 5	Top 5	Top 5	Top 5	Top 5	Top 5	Top 5	Top 5

Chemicals Sector								
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Rationale

In line with PTTGC's vision to be a leading global chemical company for better living, PTTGC aims to integrate social and environmental responsibility into its business to achieve sustainable development.

In 2022, PTTGC was ranked 1st in the 2022 DJSI in the Chemicals Sector for the fourth consecutive year, with a score of 89/100. In particular, PTTGC was amongst the companies with the Top 1% S&P Global ESG Score, and notably positioned among the Top 10 companies in the DJSI World and Emerging Markets Index for the tenth consecutive year as DJSI member.

In order to achieve a Top 5 Ranking within the Chemicals Sector in DJSI World, PTTGC would be required to meet certain criteria, such as having a score among the highest scoring companies in the Eligible Universe and being ranked within the top 10% for ESG score within its industry. In particular, PTTGC would have to ensure it obtains a leading S&P Global ESG Score within its industry.

Strategy to Achieve Targets

- Maintaining 11 criteria are reached score of 100.
- Focus on several key criteria such as tax reporting, VOC trend, biodiversity assessment, trends of HCROI etc.,
- Continuous Improvement by identifying areas for enhancement and implement appropriate measures to address any gaps. Also involve engaging in stakeholder consultations and adopting industry best practices.
- Proactive strategic responses to corporate sustainability pressure.

The methodology of the CSA is also reviewed and updated on an annual basis to ensure that it addresses emerging, forward looking sustainability issues. As such, PTTGC would have to address periodically such changes in the methodology as they are updated to ensure that it remains ahead of the curve and retains its positioning. At the same time, PTTGC’s peers are also constantly improving their sustainability practices and reporting, and have the potential to improve their ranking within the DJSI World.

2.1.3 Financial Characteristics

PTTGC will set out the relevant KPI, SPT, as well as financial implications in the event of its failure to achieve or achieve the SPT in the documentation of the financial instrument. The implications may include, but are not limited to:

- Coupon/margin rate variation via step-ups and step-downs
- Specific performance obligations which may include committing funding towards pre-defined projects with specific ESG objectives, purchase (and forthwith cancellation) of carbon credits etc.

The exact financial mechanism and subsequent impacts of the achievement/ failure to reach pre-defined SPTs will be detailed fully in the documentation of each specific financial transaction. PTTGC will notify the holders of the instrument or the lenders whether the SPT is

met or not, as soon as possible after the calculation date (as defined in the instrument's terms and conditions). If for any reason the KPI cannot be calculated, observed, or reported in a timely and satisfactory manner (as defined in the instrument's documentation), the defined bond or loan characteristic change will be triggered as if the SPT was not met.

If the specified SPT(s) have been met, and the specified reporting is available publicly, the financial characteristics of the sustainability-linked instrument either remains unchanged, or changes (in the case that a margin benefit is applicable as defined in the instrument's terms and conditions).

Fallback mechanisms / Amendments to the Framework and Recalculation

The relevant documentation of any SLF Instrument may stipulate that the SPTs and/or the historic values of KPIs may be subject to recalculation based on specific circumstances, such as changes in the calculation methodology or significant changes in PTTGC's corporate structure (e.g., acquisition, divestiture, mergers, insourcing or outsourcing).

In event of changes to the calculation methodology of the KPI, in data due to data accessibility; or change in the corporate structure (i.e. in the event of any acquisition or disposal of assets or any other relevant re-organizations), which, individually or in aggregate, has a significant impact on the level(s) of the historic value(s) of the KPI and/or the level of the SPT(s), PTTGC may review the Framework and the SPT(s) may be recalculated, without the prior consultation of the holders of PTTGC's SLBs and the lenders of SLLs, in good faith to reflect such change, provided that:

- the rationale for such change will be disclosed in the annual reporting on the KPIs; and
- an external verifier confirms that the proposed revision is in line with or more ambitious than the initial level of ambition of the SPT(s).

Any such change will be communicated as soon as reasonably practicable by PTTGC in accordance with the terms and conditions of the SLF Instruments.

2.1.4 Reporting

On an annual basis, PTTGC will disclose the performance of the KPI within its annual report and/or sustainability report and/or standalone report to be published and made available to investors/lenders on PTTGC's website or deliver to lenders (subject to agreed terms and conditions) each year until the maturity of the sustainability-linked instrument.

The reporting may include:

- Annual information concerning the performance of PTTGC against the selected KPI(s) and SPT(s)
- Details of any material change, or updates related to the KPIs set out in this framework
- Other information that will enable investors/lenders to monitor the progress of the SPT
- Verification assurance report related to the SPT as set out in section 2.1.5.

2.1.5 Verification

KPI 1: Annually, and in any case for any date/ period relevant for assessing the KPI performance against the SPT leading to a potential financial adjustment until the KPI trigger

event of the relevant SLF Instrument has been reached, PTTGC will appoint reputable and independent reviewers to obtain independent and external verification of the annual performance on KPI 1 by an Assurance Provider.

“Assurance Provider” means any qualified provider of third-party assurance or attestation services appointed by PTTGC, who will provide a verification assurance report in the form of a “Limited Assurance”.

The verification of the performance of the KPI, along with the Assurance Provider’s verification report, shall be made publicly available on PTTGC’s website as well as the company’s integrated annual report.

KPI 2: The results of KPI 2 will be announced on fourth quarter every year and publicly released by S&P/DJSI.¹⁰

2.2 Green Finance Framework

PTTGC’s Green Finance Framework is aligned with the following principles:

- Green Bond Principles 2021 (“GBP”)¹¹, published by ICMA
- Green Loan Principles 2023 (“GLP”)¹² as published by the LMA, LSTA and APLMA
- ASEAN Green Bond Standards 2018 (“ASEAN GBS”)¹³ as published by ACMF

The framework is intended to cover all future Green financial instruments issued by PTTGC subject to final approval by management team and in accordance with any current and future strategy. Financial instruments that may be issued by PTTGC under this framework include, but are not limited to the following:

- Green bonds
- Green loans

PTTGC’s Green Finance Framework is structured along four key pillars, aligned with the GBP, GLP and ASEAN GBS:

1. Use of proceeds
2. Process for evaluation and selection of projects
3. Management of proceeds
4. Reporting

¹⁰ <https://www.spglobal.com/esg/csa/yearbook/ranking/>

¹¹ <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/green-bond-principles-gbp/>

¹² <https://www.lsta.org/content/green-loan-principles/>

¹³ <https://www.theacmf.org/initiatives/sustainable-finance/asean-green-bond-standards>

2.2.1 Use of proceeds

The net proceeds from the issuance of the Green instruments will go towards:

- Repayment of intercompany loan within PTT group and/or any other loans received from any external party used to fund the development of the eligible projects
- Investments in fixed assets, other capital expenditures and/or equity injection required for new eligible projects
- Working capital funding related to the eligible projects
- Financing costs and related expenses including operating expenditure

The allocations of proceeds may be adjusted over the life of the financial instrument as determined by the Investment Committee and will be communicated clearly to investors/lenders.

The lookback period for projects to be eligible for any disbursement of proceeds shall be, where relevant:



- Capital expenditures within a 36-month period prior to the date of issuance
- Operating expenditures within a 36-month period prior to the date of issuance





PTTGC will communicate to investors/lenders an indicative amount to be allocated to any look-back projects before the financing is issued.

Additionally, for any further financing issuances, PTTGC will ensure that the estimated proportion of financing proceeds used for refinancing/financing will be explicitly documented in relevant publicly available company reports such as the annual report, sustainability report and annual impact report, whichever is relevant.



The net proceeds will finance or refinance Green Projects in the following categories:



Green Project Eligibility Criteria

Eligible Green Projects	Eligibility Criteria	Related UN SDG
Energy Efficiency	<p>Investments and expenditure to improve energy efficiency of production processes including revamps, modifications or installation of equipment (boilers, furnaces, reactors, heat exchanger, distillation columns and other separation units, etc.)</p> <p><i>Example projects include:</i></p> <ul style="list-style-type: none"> • Apply digital technology and install new equipment to optimize the heat management and operating condition (Aromatics business) • Utilize excess steam to produce electricity for existing production line (Polymers business) 	<p>Affordable and Clean Energy (SDG-7) </p> <p>Climate Action (SDG-13) </p>

	<ul style="list-style-type: none"> • <i>Install new equipment and optimize ethylene yield with lower fuel usage (Olefins business)</i> 	
Pollution Prevention and Control (Sustainable Aviation Fuel)	Expenditures and investments related to the development, construction, and installation of sustainable aviation fuels manufacturing facilities that utilize renewable and non-fossil fuel based inputs.	Responsible Consumption and Production (SDG-12) 
Pollution Prevention and Control (Carbon Capture and Storage)	<p>Expenditures and investments in Carbon capture technologies, utilization and/or storage projects whereby carbon emissions are captured for further use or sequestered (such as permanent underground storage). Captured CO2 will not be utilized for enhanced oil recovery (EOR).</p> <p><i>Example projects:</i></p> <ul style="list-style-type: none"> • <i>Capture CO2 from operating assets for storage in Nearshore which is new permanent storage; and</i> • <i>Capture CO2 emission from a production plant in US and transport to storage at new permanent underground storage</i> 	Responsible Consumption and Production (SDG-12) 
Renewable Energy	<p>Expenditures and investments related to the development, acquisition, construction, installation and maintenance of renewable power plants, generating energy using:</p> <ul style="list-style-type: none"> • <i>Solar Power (photovoltaic)</i> <p>This includes sourcing of renewable energy through long-term power purchase agreements (PPAs) or virtual power purchase agreements (vPPAs)¹⁴</p> <ul style="list-style-type: none"> • <i>Source of renewable energy is solar rooftop and floating solar PV.</i> 	<p>Affordable and Clean Energy (SDG-7) </p> <p>Climate Action (SDG-13) </p>

¹⁴ For avoidance of double counting, any PPA that is associated with a pre-existing green bond will be excluded from the Framework.

	<p>Investment and expenditures related to the procurement of biogas from industry by-products, waste or sustainable feedstocks that do not compete with food production</p> <p>Investment and expenditures related to R&D activities and the procurement of green hydrogen or ammonia (meeting the below criteria) and revamps or modifications to equipment (boilers, furnaces, burners, etc.) to employ switching of fuel source to hydrogen and ammonia or repair and maintenance of such assets and projects.</p> <ul style="list-style-type: none"> Green Hydrogen (and ammonia) projects are limited to production of hydrogen using electrolysis that meet either of the following criteria: <ol style="list-style-type: none"> Lifecycle GHG emissions threshold of under 3tCO₂e/tH₂; or Powered using 100% renewable energy (as defined in the Renewable Energy category) 	
<p>Eco-efficient and/or circular economy adapted products, production technologies and processes</p>	<p>Investments and expenditures related to the R&D, manufacturing and distribution of products that enable a circular economy, resulting in net reductions in product lifecycle GHG emissions. These include mechanical and chemical recycling of plastic waste as well as products made with:</p> <ul style="list-style-type: none"> Mechanically recycled feedstocks; Advanced (molecular) recycled feedstocks; and/or Renewable-based feedstocks derived from bio-based wastes, residual oils and other sustainable sources (e.g., sources should not include any inputs what divert arable land away from food). <p><i>These include projects that</i></p> <ul style="list-style-type: none"> <i>Convert the PET & HDPE waste or PE, PP to (food grade) rPET & (high-quality) rHDPE recycled resins</i> <i>Investment in PLA bioplastics plant. Bioplastic produced would have OK biobased and USDA BioPreferred certifications (biobased content of</i> 	<p>Responsible Consumption and Production (SDG-12)</p>  <p>Climate Action (SDG-13)</p> 

	<p><i>Ingeo biopolymer which can be determined through radiocarbon dating according to ASTM D6866).</i></p> <ul style="list-style-type: none"> • <i>Coprocess with existing refinery plant for biomass to bio-naphtha for further produce biopolymers in downstreams</i> 	
Terrestrial and Aquatic Biodiversity	Projects related to terrestrial and aquatic biodiversity conservation and protection of coastal, marine and watershed environments which are limited to planting of mangroves	<p>Climate Action (SDG-13)</p>  <p>Life on Land (SDG-15)</p> 

2.2.2 Process for evaluation and selection of projects

Any potentially eligible Green Projects to be financed with these proceeds will be evaluated and selected by the Investment Committee who will decide based on the eligibility criteria as well as any financial considerations. The Investment Committee will be comprised of top management and supporting function from Sustainability, Legal, Commercial and Finance team etc.

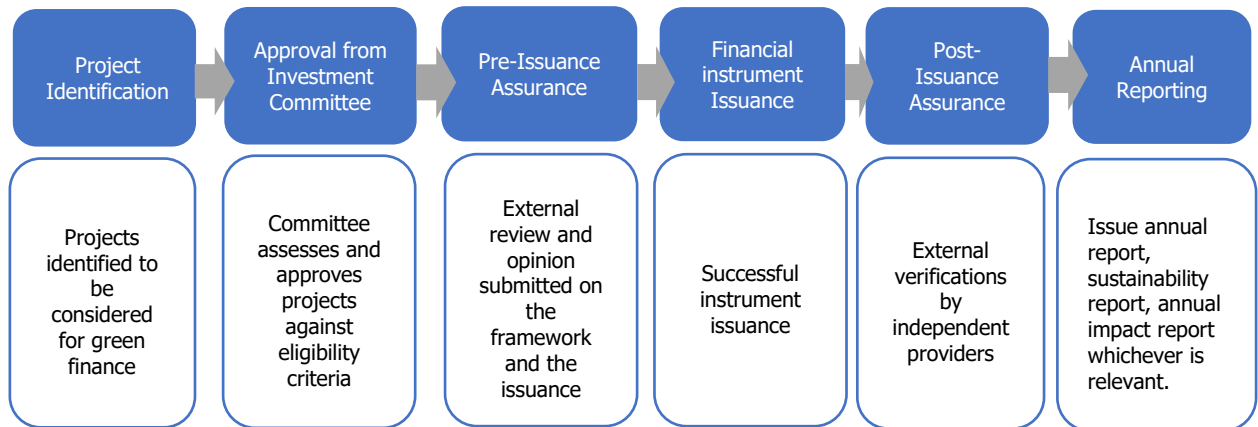
The Investment Committee may reference the company’s Net-zero roadmap in its decision-making process of selecting Green projects for financing. Only projects that meet all of PTTGC’s Green Project Criteria will be eligible for Green financing.

The Investment Committee will have the following key responsibilities:

- Ascertainment of eligibility and decide on projects to be included
- Adjustment to the project eligibility criteria if/when necessary
- Enforcement of requirements and restrictions on use of proceeds or introduce any relevant new restrictions if/when necessary
- Approval of proceeds allocation across approved Green Projects or adjust allocation as deems appropriate
- Documentation of project evaluation and selection process to be able to demonstrate eligibility of proposed projects
- Monitoring the compliance or achievement of the targets by the Green Projects that received proceeds
- Preparation of the annual reports on use of proceeds and achievements of ESG impacts
- Monitoring of external consultant’s annual independent assurance review
- Review framework whenever necessary to ensure alignment with PTTGC’s climate and sustainability strategy

The Investment Committee will convene meeting once a year to discuss matters related to the green financing issued and its use of proceeds.

Project evaluation and selection process



2.2.3 Management of proceeds

The net proceeds will be allocated according to the purposes set out under Section 2.2.1 with the proceeds to be managed by PTTGC’s Finance department.

PTTGC will maintain a Green register and earmark the respective Green projects, which allows investors/lenders to have full transparency and traceability of the use of proceeds.

The net proceeds shall be deposited either into PTTGC’s general funding account or into separate and specifically assigned 'green' bank account to be set up to receive, hold, disburse, and manage the proceeds. All corresponding amounts are adjusted on the respective accounts on a timely basis and tracked on the register.

PTTGC will aim to ensure that proceeds will be fully disbursed according to the Use of Proceeds set out under Section 2.2 and/or to future eligible Green Projects within 36 months of receipt (“Disbursement Period”).

Any unallocated proceeds will be placed temporarily into dedicated sub-portfolio for any eligible investments/assets as determined by the Investment Committee.

If PTTGC requires additional time beyond the Disbursement Period to fully disburse the proceeds for acceptable reasons, PTTGC will communicate explicitly and transparently to investors on a contingency plan within 3 months from the expiry.

Pending full allocation of such amounts to the portfolio of Eligible Projects, PTTGC may hold and/or invest the balance of net proceeds not yet allocated, at our discretion, in our Treasury liquidity portfolio (in cash or cash equivalents, government bond, fixed income, etc.) by considering liquidity and security.

2.2.4 Reporting

PTTGC will issue a dedicated impact report on an annual basis disclosing information on (“Annual Green Impact Report”) until full allocation or in case of any material change:

- Fund allocation - allocation of net proceeds to the eligible Green Projects
- Environmental impacts - quantitative and/or qualitative impacts of its eligible Green Projects financed/ refinanced

This report will be published and shared with investors/lenders and shall be made publicly available on the Company’s website.

On the allocation of proceeds, PTTGC will report on:

- List of eligible projects that have been financed/ refinanced, including the share of refinancing to new financing
- Detail of projects
- Total amount of assets and capital expenditures required or estimated for each of the eligible Green Projects, specified on category and activity level
- Allocation of the proceeds to the respective eligible Green Projects
- Breakdown of the eligible Green Projects according to what is being financed (e.g., assets, capital expenditures); and
- Balance of unallocated proceeds (if any)

On the environmental impact indicators, PTTGC will report on:

Eligible Green Projects	Eligibility Criteria
Energy Efficiency	<ul style="list-style-type: none"> • GHG emissions avoided/reduced (tons of CO2e) • Energy savings of electricity (MWh)
Pollution Prevention and Control	<ul style="list-style-type: none"> • GHG emissions avoided/reduced (tons of CO2e)
Renewable Energy	<ul style="list-style-type: none"> • GHG emissions avoided/reduced (tons of CO2e) • Renewable electricity consumed/generated (MWh)
Eco-efficient and/or circular economy adapted products, production technologies and processes	<ul style="list-style-type: none"> • Metric tons of plastic waste mechanically recycled (both wholly owned entities and % share of Joint Ventures) • Metric tons of recycled, bio-based, and/or renewable-based feedstocks • GHG emissions avoided/reduced (tons of CO2e)
Terrestrial and Aquatic Biodiversity	<ul style="list-style-type: none"> • Number of Mangroves Planted (Rai or Hectares)

Other environmental indicators (where relevant) may also be reported to supplement reporting by PTTGC.

Where relevant and possible, PTTGC will aim to provide information on its data reporting and impact assessment methodologies in order to be fully transparent on use of proceeds. PTTGC may consider engaging an external auditor to verify its internal tracking method and the allocation of funds from proceeds.

3. External Review

PTTGC's Sustainable Finance Framework has been reviewed by DNV (Thailand) Co., Ltd. ("DNV") in the form of a Second Party Opinion. The objective of the Second Party Opinion is to provide an independent assessment of the Framework's transparency and governance as well as its alignment with the SLBP, SLLP and ASEAN SLBS, as well as GBP, GLP and ASEAN GBS. The Second Party Opinion is published on the PTTGC's website at <https://www.pttgcgroup.com/en/home> subject to Company Decision.

PTTGC will review this Framework on a regular basis, including its alignment to updated versions of the relevant Principles as and when they are released, with the aim of adhering to best practices in the market. Such review may result in this Framework being updated and amended. The updates, if not minor in nature, will be subject to the prior approval of PTTGC and SPO Provider. Any future updated version of this Framework that may exist will either keep or improve the current levels of transparency and reporting disclosures, including the corresponding review by an external reviewer. The updated Framework, if any, will be published on our website and will replace this Framework.

Disclaimer

This document is only intended to provide non-exhaustive, general information. Information and opinions provided in this Framework are subject to change without notice. PTTGC that does not assume any responsibility or obligation to update or revise any such statements, regardless of whether these statements are affected by the results of new information, future events or otherwise.

No future projections, expectations, estimates or prospects in this document should be taken as forecasts nor should they be taken as implying any indication, assurance or guarantee that the assumptions on which such future projections have been prepared are correct or exhaustive or, in the case of the assumptions, fully stated in the document.

This document is not intended to be and should not be construed as providing legal or financial advice. It does not constitute an offer or an invitation to sell or any solicitation of any offer to subscribe for or purchase or a recommendation regarding any securities of PTTGC and its parent company, PTT Group.

Prospective investors are required to make its own independent investigations and appraisals of the business and financial condition of PTTGC and nature of the securities before taking any investment decision with respect to securities of the company.

Appendix 1: Operational Control Approach

- PTTGC – PTT Global Chemical Public Company Limited
- GGC - Global Green Chemicals Public Company Limited
- GCME - GC Maintenance and Engineering Company Limited
- NPC S&E - NPC S&E Security Guard Company Limited
- GCL - GC Logistics Solutions Company Limited
- GCM-PTA - GC-M PTA Company Limited
- TPRC - Thai PET Resin Company Limited
- GCP - GC Polyols Company Limited
- GCEC - GC Estate Company Limited
- Envicco - ENVICCO Limited
- GCM - GC Marketing Solutions Company Limited
- SUN - Solution Creation Company Limited
- GCTC - GC Treasury Center Company Limited
- TTT - Thai Tank Terminal Limited (not included in 2023 onward)

Note. As of September 2023, however the Operational Control Approach will be updated/change from time to time.