MITR PHOL GROUP

TCFD 2024

TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

TASK FORCE ON CLIMATE - RELATED FINANACIAL DISCLOSURES

Overview

Mitr Phol TCFD Report

OVERVIEW

TCFD 2024
Task Force on Climate-Related Financial Disclosures

Message from the Chairman of Mitr Phol Group

In 2023, the climate change crisis continued to impact our world, posing one of the geopolitical threats to the global community. It is thus crucial for the government, the private sector, and civil society to collaborate and timely adapt to these changes. At Mitr Phol Group, we recognize these challenges and are committed to conducting our business in line with the principles of the circular economy within the sustainable development framework. Our business practices are aligned with the United Nations Sustainable Development Goals (UN SDGs), aiming to balance economic growth with social and environmental sustainability.

Simultaneously, we remain committed to empowering farmers by enhancing their knowledge and skills, transforming them into modern farmers who harness technology to enhance efficiency. We disseminate modern farming techniques through the "Mitr Phol ModernFarm" approach and extend this knowledge to the educational sector to prepare future agricultural professionals in Thailand. In addition, Mitr Phol Group is dedicated to adding value to agricultural products by optimizing renewable resources under the "From Waste to Value Creation" concept. We have expanded sugar production and various forms of renewable energy into a bio-based business that transforms agricultural waste into environmentally friendly industries and products while adhering to principles of good corporate governance.

In our environmental efforts, Mitr Phol Group aims to achieve carbon neutrality by 2030 and reach net-zero greenhouse gas emissions by 2050 .We support efforts to combat climate change both in Thailand and globally and promote sustainable development initiatives among our customers and suppliers .A significant milestone in our journey is the Mitr Phol Dan Chang Complex in Suphan Buri Province, certified by the Thailand Greenhouse Gas Management Organization) Public Organization (as the country's first Carbon Neutrality Complex . Furthermore, we plan to expand our operations to create an ecosystem conducive to reducing greenhouse gas emissions, encompassing factory operations across the entire supply chain and investments in environmentally friendly businesses

On this occasion, I would like to express my gratitude to our employees, farmers, customers, suppliers, and business partners for their unwavering support of Mitr Phol Group's business operations in accordance with the sustainable development framework. We are committed to advancing Thailand's agricultural sector as a hub for food production, raw materials for bio-based industrial development, and a reliable source of renewable energy. Together, we will strive to thrive, prosper, and create value for a sustainable life.

Mr. Buntoeng Vongkusolkit
Chairman of Mitr Phol Group

Mitr Phol Decarbonization Strategy
Carbon Neutrality by 2030 and Net Zero by 2050

Neutralize Residue Emissions

- Reforestation
- Tech-based carbon removal
- Carbon offsetting

3

Decarbonization in Supply Chain

- Sustainable procurement
- Supplier collaboration

2

4

New Investment/ Business

- Sustainable energy
- Carbon credit and RECs

Decarbonization in Operation

- Energy efficiency
- Waste management

1

5

Economic Value

- Sustainability-linked finance
- Carbon Tax / Emission Trading Scheme (ETS)

Mitr Phol TCFD Report

About This Report

The 2024 TCFD report outlines the advancements in following the TCFD recommendations, divided into four key sections:

- Governance
- Strategy
- Risk Management
- Metrics and Targets

Since our initial adoption of TCFD in 2022, we have now integrated TCFD principles across all business units to evaluate climate change-related risks and opportunities using climate change scenarios

In the report, we describe the impact of climate change on business through risks and opportunities and update the change in risk management, such as the embedment of climate risk in business operations and the result of an annually revised risk assessment. In the metrics and targets sections, this year's emission data for scope 3 fully meets the GHG protocol and covers all categories

1. Governance

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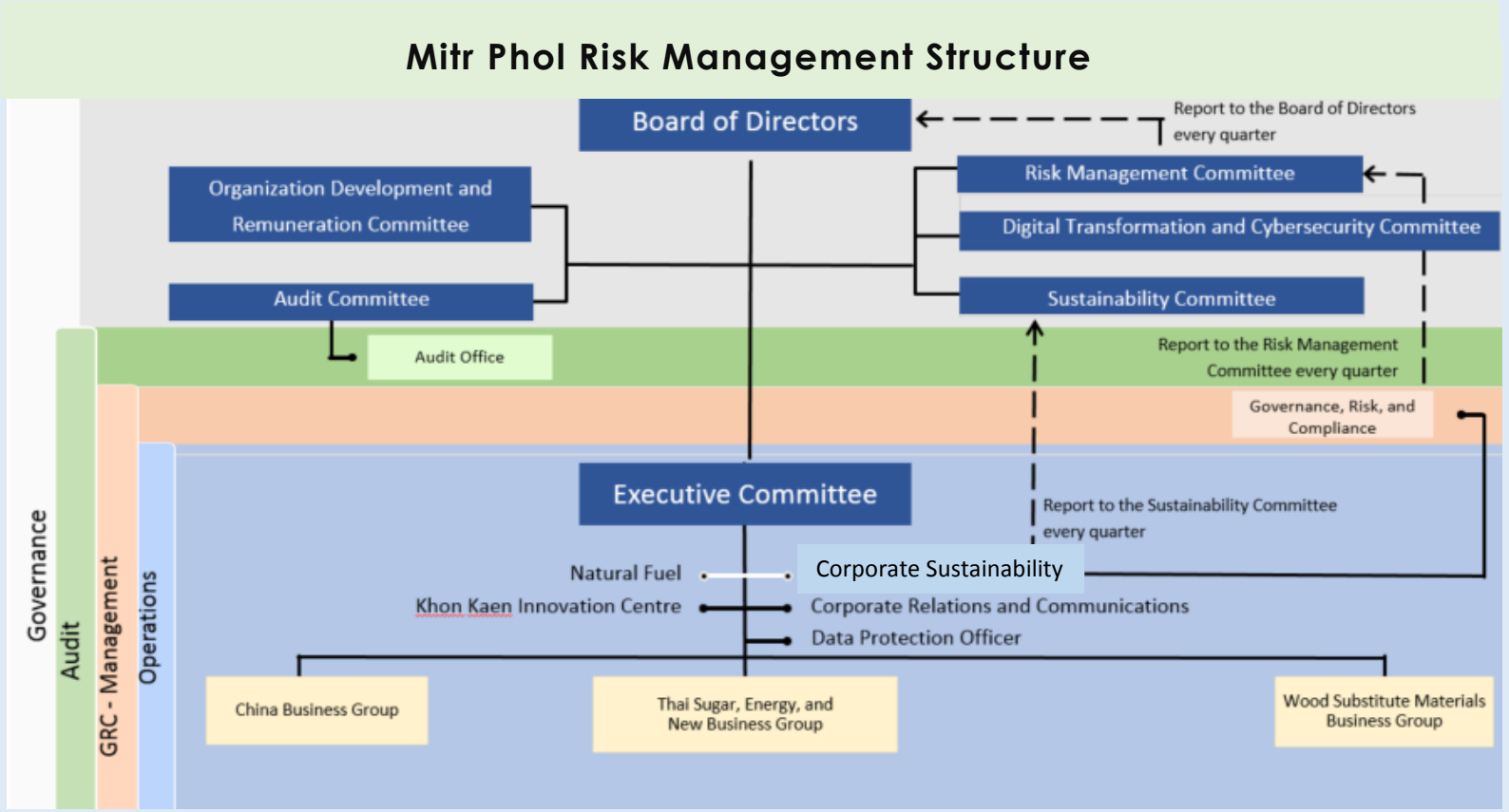
1. Governance

1.1 Climate Change and Risk Management Structure

Mitr Phol Group has established two committees—a sustainability committee and a risk management committee (RMC)—to oversee and monitor climate change and risks related to climate change. Even though both committees have roles and obligations in different areas, climate change risk is a co-responsibility task force. Focusing on risk management structure, RMC is an independent panel assisting the Board of Directors in overseeing issues related to risk management, such as governance, policies, strategy, and risk framework. At the operational level, those risks and opportunities are overseen and monitored by the executive committee.

Mitr Phol Risk Management Structure



1.2 Role and Responsibility

Mitr Phol Group Board of Directors (BOD)	The BOD is ultimately collectively responsible for oversight of all strategic matters and supervision and control of all groups' business units. The BOD has six standing committees; each committee has its own responsibility: the organization development remuneration committee, the audit committee, the risk management committee, the digital transformation and cyber security committee , executive committee and the sustainability committee.	Every 2 months
Mitr Phol Group Sustainability Committee	The sustainability committee is responsible for oversight duties with respect to the group's sustainability strategy and development. The responsibilities included sustainability policy, performance relating to ESG, and the climate change issue associated with risk and opportunity, where climate change impact and organization greenhouse gas emissions are important parts of materiality.	Quarterly
Risk Management Committee (RMC)	The RMC was established to assist the BOD in overseeing the company's management of enterprise-wide risk management and practice and environmental-related issues, as well as the implementation of policies and standards for monitoring and mitigating such risks and climate change. The RMC holds an annual meeting to review business key risks, of which climate risk is included, and a quarterly meeting to consider and report on issues related to risk management.	Quarterly

1.3 Management's Role in Assessing and Managing Climate-Related Risks and Opportunities

To oversee enterprise risk and climate change, the BOD delegated decision-making on operational matters to executive committees in order to drive strategy, implementation, and execution at the operational level. At this level, sustainability management sub-business group was established two divisions to manage day-to-day work, such as corporate sustainable, governance, risk and compliance. Concerning climate-related risks and issues, two major departments, enterprise risk management and sustainable development, share responsibility. These departments work together to identify climate change-related risks and opportunities. Furthermore, the results of risk and opportunity assessments are collected in ESG and reported to the BOD on a quarterly basis, which will be material for RMC in risk strategy planning.

2. Strategy

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2.1 Climate Strategy Overview

Mitr Phol Group climate strategies, the GHG emission pathway, and achieving Net Zero 2050 are embedded in risk assessment and opportunities and also associated with TCFD recommendations. We conducted assessments to identify, analyze, and evaluate major climate-related risks and opportunities, covering all operations in Thailand and its value chain. To this end, risk has been categorized into physical risk, transitional risk, and opportunities. They were accounting for three different time horizons: short (annually), medium (2030), and long-term (2050), and through different climate scenarios.

Scope of Assessment	Risk and opportunity	Time Horizon	Impact Analysis
Own Operation in Thailand - Sugarcane farming - Sugar - Energy - Wood Substitute materials - Fertilizer - Warehouse and logistics - Other business as Folder yeast **Upstream and downstream** - Sugarcane Farmers - Customer	**Climate-Related Risks** ▪ Physical Risk ▪Transition Risk ▪ Opportunity	• Annually • 2030 – Medium Term • 2050 – Long Term	• Screening of the identified risks and opportunities • Collect Identification data of Climate-Related risks and opportunity in terms of qualitative as the level of likelihood and quantitative as financial impact

2.2 PHYSICAL RISK

All assets in Thailand and all business units were covered in these physical impacts of the climate change assessment. Physical risk (extreme heat, water stress, drought, and flooding) is evaluated using four physical indicators based on **qualitative and quantitative** analysis through three climate scenarios of **shared socio-economic pathways (SSPs):** SSP1-2.6: Taking the Green Road (1.2–1.8 °C), SSP2-4.5: Middle of the Road (2.7 °C), and SSP5-8.5: Fossil Fuel Development (4.4 °C) and was conducted based on **medium-term (2030) and long-term (2050).**

Scope of Assessment	Physical Risk	Scenario and Tool	Impact Analysis
Own Operation in Thailand - Sugarcane farming - Sugar - Energy - Wood Substitute materials - Fertilizer - Warehouse and logistics - Other business as Folder yeast **Upstream and downstream** - Sugarcane Farmers - Customers	• Extremely Heat • Drought • Water Stress • Flood	**Scenario *** : SSP1-2.6 – Taking the Green Road (1.2-1.8 °C) SSP2-4.5 – Middle of the Road (2.7 °C) SSP5-8.5 – Fossil Fuel Development (4.4 °C) **Tool :** World Bank Data Aqueduct	▪ Level of Impact Low –Medium-High ▪ Impact on Business ▪ Ratio of Damage ▪ Expect cost of damage ▪ Failure probability on operation ▪ Risk Condition ▪ Acute / Chronic

Remark* : SSPs is a set of Shared Socio-economic Pathways (SSPs) which is The latest iteration of scenarios, used for CMIP6 (2016-2021) and featured in the IPCC Sixth Assessment Report (AR6) (2021).

2.2.1 Extremely Heat

Low	Medium	HIGH

PHYSICAL RISK		2030	2050	Impact on Value Chain
Extremely Heat ☑ACUTE ☑CHRONIC	**SSP 1-2.6**			<u>Upstream</u> Longer periods of heat might harm sugar cane production due to the fact that the rate of evaporation in sugar cane plantations is higher than normal and may impact sugar cane production as sugar cane growth is related to temperature (27–33 °C). The sweetness of sugar cane is reduced by heat stress. A longer period of Heat Day affects farmer heat-related illnesses. <u>Own operation</u> Higher investment costs to protect and recover sugar cane plantations from heat stress Higher costs for the collection of raw materials Less production due to lower production of raw materials A longer period of Heat Day affects employee heat-related illness. <u>Downstream</u> Lack of raw materials due to a reduction in sugar production Increasing sugar prices create a higher cost of raw materials for products using sugar as an ingredient.
	SSP 2-4.5			
	SSP 5- 8.5			

Remark : Extremely Heat indicator is Number of Days with Heat Index > 35°C

2.2.2 Drought

		Low		Medium		HIGH

PHYSICAL RISK	Scenario	2030	2050	Impact on Value Chain
Drought ☑ACUTE ☑CHRONIC	**SSP 1-2.6**			Upstream Because sugar cane plantations face a long period of lack of water, yield is decreasing accordingly. Potential for infestation by pests such as the longhorn beetle due to the long period of dough Increasing costs for water management Low-quality sugar cane sweetness, caused by a long period of water shortage. Own operation product quality and quantity as sweetness and production are decreasing. Increase in operational costs for water Water shortage: in the production process of all business units Downstream: Low-level production may cause monetary damage.
	SSP 2-4.5			
	SSP 5- 8.5			

Remark : Drought mean Change in SPEI Drought Index

2.2.3 Water Stress

Low | Medium | HIGH

PHYSICAL RISK	Scenario	2030	2050	Impact on Value Chain
Water Stress ☑ACUTE ☑CHRONIC 	**SSP 1-2.6**			Upstream • Longer periods of water stress harm Sugar cane yield and production • Framer faces financial problems due to production losses and instability in yield. • Loss of soil moisture content affects the poor growth of sugar cane and requires more financial input to recover the soil condition. Own operation • Higher investment costs to protect and recover sugar cane plantations from heat stress and a lack of water • Lack of raw materials for producing sugar • Less production due to lower production of raw materials • More investment cost in the water system Downstream • Lack of raw materials due to a reduction in sugar production • Increasing sugar prices affect in more expenditure for business which use as ingredient
	SSP 2-4.5			
	SSP 5- 8.5			

Remark : Water Stress mean the ratio of total water demand to available renewable surface and groundwater supplies
Source : Aqueduct

2.2.4 Flood

Low | Medium | HIGH

PHYSICAL RISK		2030	2050	Impact on Value Chain
Flood  ☑ACUTE	SSP 1-2.6			Upstream • a decrease in the quantity of raw materials in the wood substitute material business unit because the southern part of Thailand is an area affected by heavy rain and storms. Therefore, roads are blocked, and it is difficult to cut off wood from rubber plantations. • There has been an increase in sugarcane borer due to high humidity. • The transport of raw materials was interrupted because roads were blocked by flash floods and landslides. Own Operation • Damaged buildings • Employees are unable to travel to work due to the flood. • The product was damaged during transportation. • Damage to raw materials that are stored in an outdoor area that is flood-affected Downstream • Late delivery of product to customer, that might impact their production process.
	SSP 2-4.5			
	SSP 5- 8.5			

2.3 Transition Risk

Transition risks are risks that occur related to a low-carbon transition organization. These risks are classified into legislation and policy, technology, market, and reputation. Each risk is analyzed over both time horizons: 2030, or medium, and 2050, or long. Both direct and indirect effects are measured in terms of impact. Additionally, the evaluation of transition risk is analyzed using the World Energy Outlook (WEO) scenarios, which are recommended by the IEA (International Energy Agency). These scenarios included State Policy (STEP) and Announced Policies Scenario (AP).

Scope of Assessment	Risk	Scenario and Tool	Impact Analysis
Own Operation in Thailand - Sugarcane farming - Sugar - Energy - Wood Substitute materials - Fertilizer - Warehouse and logistics - Other business as Folder yeast **Upstream and downstream** - Sugarcane Farmers - Customer	**Risk Type** • Market • Technology • Policy and Legal • Reputation	**Scenario** : **STEPS**: *State Policy is mean Current* and previously policies announced by Thai governments (Implemented in 2015 after COP21) **AP:** *Announced Policies Scenario is* all climate commitments of Thai governments, (Nationally Determined Contributions (NDCs) and longer-term net zero targets.	**Impact** ▪ Level of Impact Low –Medium-High ▪ Impact on Business ▪ Ratio of Damage ▪ Expect cost of damage ▪ Failure probability on operation ▪ Risk Condition Direct / Indirect

2.3.1 Market

Marketing risk is a potential impact on the loss of revenue due to changing customer behavior cause by climate change or stakeholder expectations on sustainability standards and ESG practices, such as the requirement for low-GHG products or other environments, biodiversity, human right, and other social standards.

Low | Medium | HIGH

Transition Risk	Scenario	2030	2050	Impact on Value Chain
Market ☑Direct	**STEPs**			Upstream • Farmers receive more pressure from other stakeholders to change farm management to be in line with Bonsucro and other regenerative farm standards, or either SBTi GHG-FLAG. • More investment is needed for new farm practices, such as the installation of solar panels and land preparation equipment or harvest equipment to prevent of soil's carbon stock change and reduce burnt farms. • A possible loss of income is an effect of less fertilizer application. Own operation • More investment costs for production and research on low-carbon products • Higher costs of quality control and raw materials • Reduce ethanol sales due to the changing behavior of customers toward fossil fuels. • higher cost on bio-jet fuel technology and no market feasible till 2030 afterward, there are uncertain factors affecting investment, such as type of technology, feedstock, and domestic policy and regulation support. Downstream • Customer-changing behavior from fossil cars to EVs will affect demand for ethanol. • An increase in customer requests for carbon labels and Bonsucro certificate.
	AP			

2.3.2 Technology

Technology is a potential risk that occurs related to a transition to a low-carbon economy. This risk is evaluated based on whether the company's ability to adapt to these changes or may find itself at a disadvantage or an opportunity. Technology risk is measured by the capacity to switch to existing products and services with lower GHG emissions and the cost of investment in new technology, either a new low-GHG product or GHG capture technology.

Low	Medium	HIGH

Transition Risk	Scenario	2030	2050	Impact on Value Chain
Technology ☑Direct	**STEPs**			Upstream An increase in new technologies or the use of low-GHG raw materials has an impact on costs, such as clean biomass fuel, due to the increased demand for clean energy. Own operation • Technologies that rely on unclean energy may not be able to operate due to obsolescence or a lack of fuel. • Higher cost of developing technology due to the investment in new low-emission technologies • Higher costs are due to the fuel shift from high-emission fossil fuels to clean energy. • Long-term, we require CCS or CCUS technology to capture GHG from biogenic Downstream There is an increase in customer and business partner expectations for the adaptation of clean technology, which may result in higher prices for the product.
	AP			

2.3.3 Policy & Legal

There are two policies and regulations that contribute to GHG reduction: (1) the National Power Development Plan 2024 (PDP 2024) and (2) the draft climate change law. The PDP 2024 is intended for use from 2024 to 2037 as the national energy plan for the alternative energy development plan, the energy efficiency plan, the oil plan, and the gas plan. Under the new PDP, the proportion of renewable energy is set to increase to 51% of the total by 2037, up from 20% last year, while gas will make up 41%, a decline from 57% in 2023. This plan is set to achieve carbon neutrality by 2050. For the draft of climate change, the carbon tax is considered to be a mechanism to reduce GHG from using fossil fuels.

	Low		Medium		HIGH

Policy	Scenario	2030	2050	Impact
PDP 2024 ☑Direct ☑Indirect	STEP			<u>All Value Chain</u> • Impact on electricity expenditure due to the increasing cost of renewable energy in the national grid, which price is higher than electricity from fossil fuels and natural gas. This impact on revenue and cost of raw material and transportation • The raw material price will be higher than usual because electricity costs will be increasing due to renewable energy price • Cost of changing from fossil used car to be EV car or truck
	AP			
Carbon Tax ☑Indirect	STEP			<u>Upstream</u> An increasing price for raw material costs is due to the carbon tax. <u>Own operation</u> • Higher cost of transportation and fossil fuels • Investment costs for switching vehicles from fossil fuels to EVs <u>Downstream</u> • Obstacle to expanding the business due to a violation of the law • Higher cost of transforming product to be the lower GHG emission product
	AP			

(Remark: Policy & legal include current regulations, emerging regulations and legal risks)

2.3.4 Reputation

Reputation risk mean changing customer or community perceptions of an organization's contribution to or detraction from the transition to a lower-carbon economy. This might cause company -facing reputational damage if they are perceived as not taking sufficient action to address climate change.

Low	Medium	HIGH

Transition Risk		2030	2050	Impact on Value Chain
Reputation ☑Direct	**STEPs**			Upstream Farmers shift cultivation from sugar cane to other agricultural products that are more profitable due to the impact of climate change. Own operation Reputation and recognition from the customer's consciousness of the product, organization, or other low-GHG agricultural practices Reputation and brand value may affect a decrease in revenue. Downstream Higher complexity in trading with partners, such as the GHG reduction assessment in purchase conditions.
	AP			

2.4 Opportunities

Low | Medium | HIGH

Opportunities	2030	2050	Impact on Value Chain
Renewable Energy			Upstream: Increase in saving costs for farmers due to renewable energy such as solar power Own operation Increased revenue from selling renewable power due to the increasing demand for clean energy, such as solar. Downstream: Increasing the capability of customers to achieve the GHG reduction target in scope 2.
Low Carbon Product			Upstream: increase in quantity and quality of low-carbon raw materials Own operation: Increases in income from environmentally friendly products have an upward trend. Downstream: increasing the capability of customers to achieve carbon targets in 2050 by reducing GHG emission scope 3.
Bio jet and Bio Plastic			Upstream: New income from selling raw materials Own operation Generate profit from selling bio-jet fuel. Create a new market for trading. Long term might face with other low emission fuel as hydrogen technology Downstream: increase in customer capability in aviation to reduce GHG
Carbon Credit Market			Upstream: New income from the carbon removal for the farmer and sustainable supplier from selling carbon credit Own operation Generate profit from selling RECs and carbon credits. Create a new market for trading. Create a brand image and an opportunity to compete in the market with low-carbon products. Downstream: Increase in capability to encourage customers to achieve carbon

2.5 Financial Impact of Physical Risks, Transition Risks and Opportunities

To measure climate risk, the financial impact of climate-related risks was analyzed through each of the three risk issues identified: physical risk, transition risk, and opportunity. However, some risks cannot translate into financial figures because of the difficulty of getting data and information from some stakeholders or the inability to estimate an investment in such a technology as CCS or CCUS and the reputation. So, these risks were identified in terms of their magnitude of financial impact instead. For the physical risk, financial impact of extremely heat, drought and water stress were group together as the mitigation and impact are in the same line.

Physical Risk	Time Frame		Impact		Transition Risk	Time Frame		Impact		Opportunity	Time Frame		Impact
	2030	2050	Own	VC		2030	2050	Own	VC		2030	2050	Own
Extremely Heat			✔	✔	Market			✔	✔	Renewable Energy			✔
Drought			✔	✔	Technology			✔	✔	Low carbon product			✔
Water stress			✔	✔	Carbon Tax			✔	✔	Bio jet and BIO-Plastic			✔
Flood			✔	✔	Reputation			✔	✔	Carbon Credit and RECs			✔

Remark : Financial Criteria of the opportunities

High Financial Impact ≥ 12% of EBT	**Medium Financial Impact 4 - <12% of EBT**	**Low Financial Impact < 4% of EBT**	**ST: Short term MT: Medium Term LT: Long Term**	**Own Operation: Own Value Chain : VC**

2.5.1 Financial Impact of Physical Risk

The physical risks, such as drought, water stress, and extreme heat, are grouped and prioritized as they create the highest impact on revenue. Based on the Mitr Phol Group financial impact criteria, the impact is defined as a slight risk if it creates a financial impact less than 4% of EBT, a medium impact of 4– <12% of EBT, and a high impact of equal or more than 12%.

Drought-Water Stress and Extremely Heat Impact	2030 (% of EBT)	2050 (% of EBT)	Cost of Action (million baht)
SSP1-2.6	18.75	14.06	180
SSP 2-4.5	16.02	13.59	
SSP 5-8.5	14	12	

High Financial Impact ≥ 12% of EBT	Medium Financial Impact 4 - <12% of EBT	Low Financial Impact < 4% of EBT	ST: Short term MT: Medium Term LT: Long Term	Own Operation: Own Value Chain : VC

2.5.2 Financial Impact of Transition Risk

Though the analysis of Transition risk, all risk create slightly impact on financial. However among them, carbon tax created the highest impact. The impact cause by implementation of the climate change law and Singapore carbon tax structure will be applied to calculate for financial impact. As Mitr Phol do not have product that related to fossil fuel use, so the impact was evaluated as indirect result.

Percentage of total financial impact when compare with EBT (%)	Year –Indirect Impact		Cost of Action (million baht)
	2030 (Medium)	2050 (Long Term)	
Stated Policies Scenario [STEP]	0.15	0.27	**170**
Announced Policies Scenario [AP]	0.15	0.78	

High Financial Impact ≥ 12% of EBT	**Medium Financial Impact 4 - <12% of EBT**	**Low Financial Impact < 4% of EBT**	**ST: Short term MT: Medium Term LT: Long Term**	**Own Operation: Own Value Chain : VC**

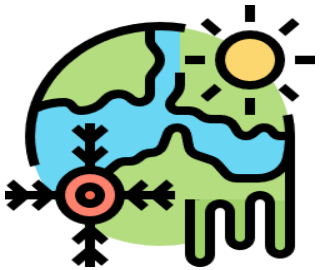
2.5.3 Financial Impact of Opportunity

Renewable energy is considered the highest prospect compared to other low-carbon products because we have raw materials collected from our own sugar mills. Furthermore, most climate ambitions target renewable energy, so the increased demand for renewable energy will have a direct impact on the price of renewable electricity. The higher ambition will have an impact on both demand and the price of renewable electricity. In the STEP scenario, the increase in the price of renewable electricity will be 0.54 % (2030) and 0.99% (2050) compared with AP scenario 0.54% (2030) and 2.88% in 2050, while the impact in the STEP scenario will be lower than AP.

Percentage of total financial impact when compare with EBT (%)	Year		Cost of Action (million baht)
	2030 (Medium term)	2050 (Long Term)	
Stated Policies Scenario [STEP]	0.54	0.99	**1300**
Announced Policies Scenario [AP]	0.54	2.88	

High Financial Impact ≥ 12% of EBT	**Medium Financial Impact 4 - <12% of EBT**	**Low Financial Impact < 4% of EBT**	**ST: Short term MT: Medium Term LT: Long Term**	**Own Operation: Own Value Chain : VC**

Climate Risk Mitigation & Adaptation



Physical Risk : Drought-Water Stress and Extremely Heat

1. Own Operation – Water reduction in sugar cane plantation
2. Upstream Value Chain the Oasis project, collaboration with government authorities for water reservoirs, and installation of solar pumps in agricultural areas
3. promoting the 4 R's project to reduce intake water and upgrading wastewater treatment, reuse, and recycling together with other water efficiency
4. Annual water risk measurement using AQUEDUCT

Transition Risk : Carbon Tax

1. Reduce the use of non-reusable packaging and support using bio-base raw material instead.
2. Setting an ambition target to reduce CO2 and achieve net zero
3. Reduce using of Fossil Fuel
4. Switching the use fossil fuel to clean energy in production process
5. EV to replace fossil fuel Vehicle

Opportunity : Renewable

1. The increase in demand of renewable energy can provide Mitr Phol with growth of revenue from renewable energy (biomass and Solar)
2. Potential for product diversification by developing several low carbon product such as bio-fuel jet.
3. Increase customers demand on carbon offset to achieve the climate target can provide Mitr Phol with chance to adapt business model by presenting new solutions to help customers to achieve their climate target. This includes selling Renewable Energy Certificates (RECs) and carbon credit

3. RISK MANAGEMENT

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Task Force on Climate-Related Financial Disclosures

3. Risk Management

3.1 Risk Management Overview

The Mitr Phol Group's risk management system and policy have been approved by the risk management committee (RMC). Since 2012, the enterprise risk management department has been established to function on a risk management basis in all business units.

This department conducted risk assessments, managed risk, and promoted risk awareness. The risk management policy and assessment are reviewed by the risk management department and RMC once a year. Generally, enterprise risk has been classified into the areas of strategic, operational, financial, compliance and digital risk. In addition, climate change is classified as part of strategic risk. Risks description are clearly stated and embedded in all business units. The risk system and management are carried out by the COSO Enterprise Risk Management framework, which is integrated into ESG-related risk management.

The process of risk identification is done on an ongoing basis, such as for workshops and engineering requirements. The measurement of each risk is subject to each business unit, which depends on both the perspective of likelihood and potential impact in line with the COSO framework

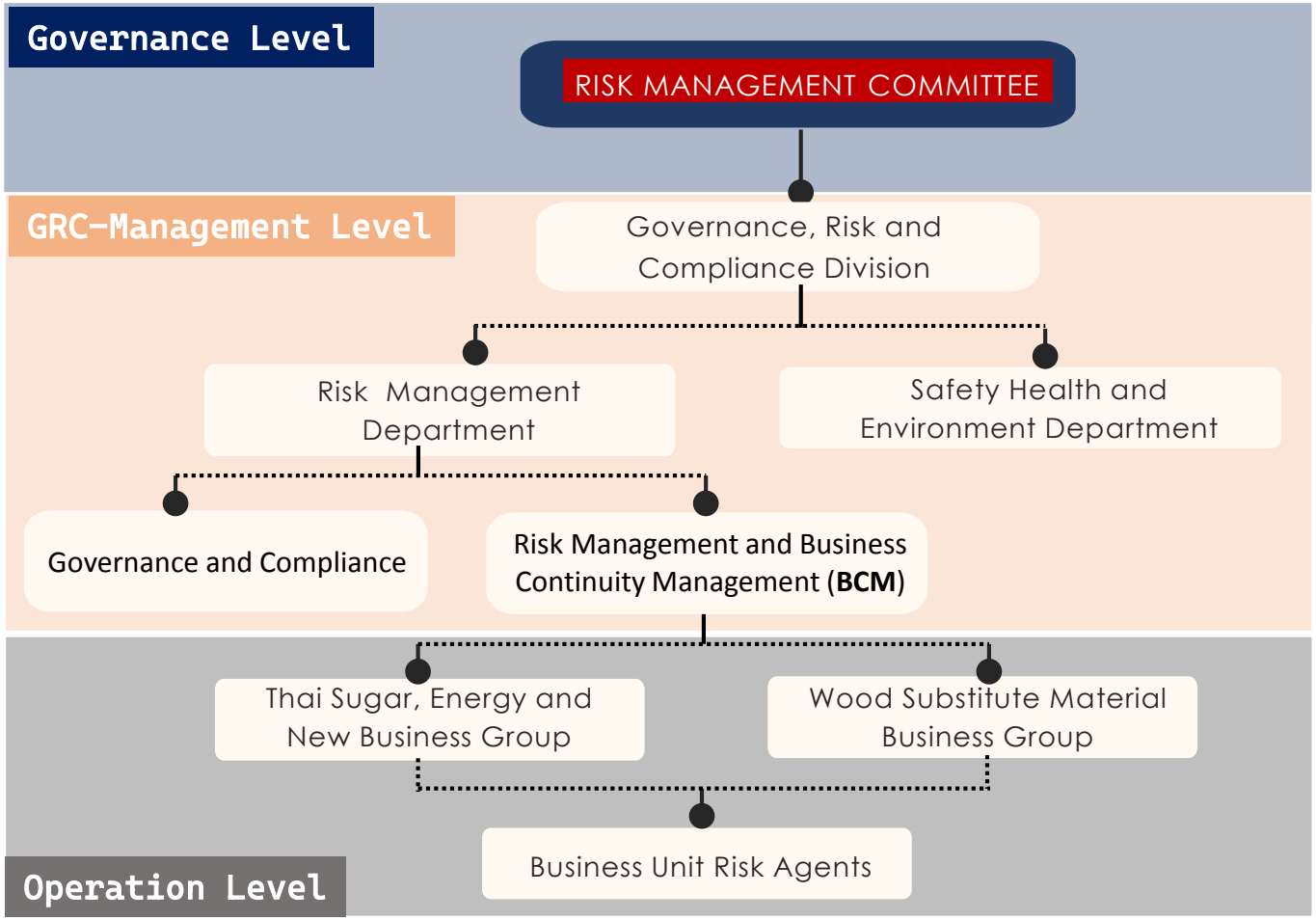
Risk Management Framework

3. Risk Management

3.2 Risk Management Structure

Mitr Phol Group has a clear structure of risk management structure. They are divided into three levels: governance, management, and operation.

- At the governance level, risk management is overseen by RMC, which is responsible for overseeing policy, evaluation, and annual risk reviews to identify potential risks and provide recommendations to minimize impact.
- At the management level, the tier above has cascaded the goals and targets on risk issues down to the Governance, Risk, and Compliance Division (GRC). The goals are determined and put into action in the organization's strategy and likelihood as part of risk management.
- Operation Level creates impact through the entire organization, from management to operation level. At this level, organization strategy has been cascaded from the above level to a business group composed of each business in the Thai Sugar, Energy, and New Business Group and the Wood Substitute Material Business Group. In this level, business unit risk agents have been put into action to respond, monitor, control, and report to the above tier.



3. Risk Management

3.3 Risk Identify, Assessing, and managing climate-related risks are integrated into the organization's overall risk management.

Objectives cascaded from the Corporate Level :

2030
Low Carbon organization
For near-term target

2050
NET ZERO For
Long-Term Target

Risk Identifying

Thai Sugar, Energy and New Business Group

Risk Universe

- Operation
- Climate
- Finance
- Compliance
- Strategy
- Digital and IT

Wood Substitute Material Business Group

Risk Assessment

1 → 2 → 3 → 4 → 5

Physical Risk (P) :
Extremely Heat
Drought & water stress
Flood

Transition Risk : (T)
Market
Technology
Legal
Reputation

Risk Analysis and Evaluation

Impact

likelihood

Each climate risk matrix

Prioritize

High Impact level risk are prioritized and implemented as part of the risk management process

P	Drought
T	Regulation

Risk Response

Mitigation Plan for Short term and Medium term are initiated to reduce impact and support organization goal

Risk Control and Monitoring

Risk Owner set KRI
For monitoring the likelihood and Impact

Review

Every 6 month by risk owner to track for performance
Annually to revise of risk management and plan.

3. Risk Management

3.4 Embedding Climate Change in Risk Management

Since TCFD was initiated in 2022, climate risk is a crucial part of ESG risk and is carried out by the GRC (Government, Risk, and Compliance Division) to support the addressing of climate risk as an enterprise risk, which was classified as part of strategic risk. In 2023, climate change is embedded in all business units. Because our value chain is agricultural-based, when considering both physical and transitional risks, the physical risk from extreme weather is prioritized rather than the transitional risk for a short time frame. For the upstream value chain, such as the sugar business and sugar cane framer, the operation control, we used an aqueduct water risk to determine the risk of each site. If the site is located in a water-stress area or facing impacts from unusual El Nino and La Nina, mitigation for both floods and droughts shall be in action to reduce the impact of those risks.

RISK LIST					
1	2	3	4	5	6
Strategy	**Operation**	**Finance**	**Compliance**	**ESG**	**Digital and IT**
• Raw Material Security	• Waste and Pollution Management	• Commodity Price Fluctuations • Currency Exchange	• Law and Regulation	• Climate Change • Law and regulation * Change related to climate change	• Cyber Insecurity from Generated AI *

Remark * Emerging Risk

4. Metrics and Targets

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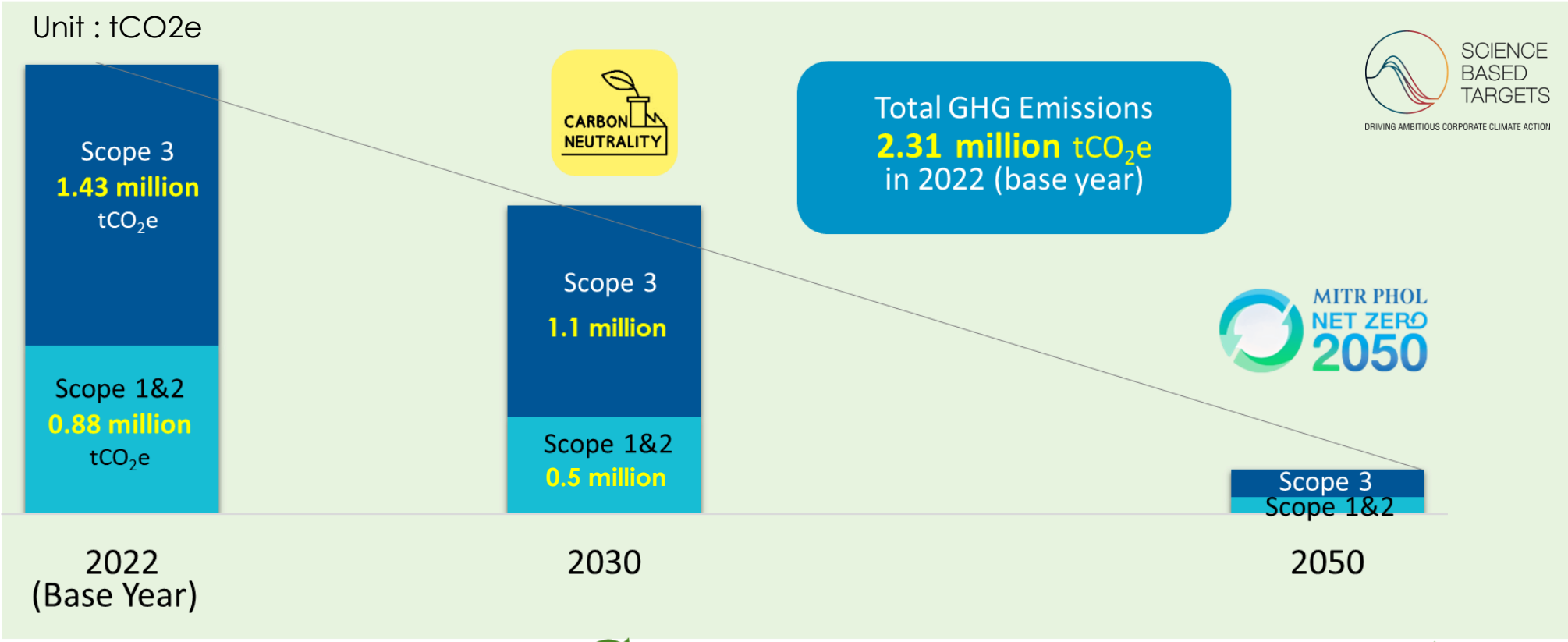
Task Force on Climate-Related Financial Disclosures

4. METRICS & TARGETS

To align with the Paris Agreement on climate commitment and mitigate the risks, we have set targets to reduce GHG emissions in line with the SBTi near-term targets by 2030, achieve carbon neutrality (Scope 1&2) by 2030, and reach Net Zero emissions by 2050.



GHG emissions Baseline

- Scope 1&2 reduction by 42%
- Scope 3 reduction by 25%

- Scope 1, 2 & 3 reduction by 90%
- Remaining 10% allowed to use nature-base capture / CCS

4.1 Mitr Phol Group GHG Emissions

The scope of GHG emissions data for Mitr Phol Group is based on the operational control approach and covers the data of Mitr Phol's operation in Thailand, including farming business, sugar business, energy business, wood substitute materials business, fertilizer business, logistics and warehouse business, and other businesses. The emissions are calculated based on the guidance from the GHG Protocol. The emission factors refer to data from the Thailand Greenhouse Gas Management Organization (Public Organization), IPCC 2006, and Thai National LCI database. The GWP data refer to IPCC, AR5. To evaluate the accuracy and reliability of the data and methodology, we conducted the limited assurance for the GHG emissions scope 1, scope 2 and scope 3 by the third party.

2023 GHG Emissions

Unit : tCO_2e

Scope 1

Direct GHG Emissions

0.35M

Scope 2

Indirect GHG Emissions

0.08M

Scope 3

Other Indirect GHG Emissions Total : 1.81M

Upstream

Category 1
Purchased goods and services
1.34M

Category 2
Capital goods
-*

Category 3
Fuel and energy related activities
0.02M

Category 4
Upstream transportation and distribution
0.15M

Category 5
Waste generated In operation
1,141

Category 6
Business travel
503

Category 7
Employee commuting
6,714

Category 8
Upstream Leased assets
NR

Downstream

Category 9
Downstream transportation and distribution
0.12M

Category 10
Downstream transportation and distribution
NR

Category 11
Use of sold products
0.16M

Category 12
End-of-life treatment
1,233

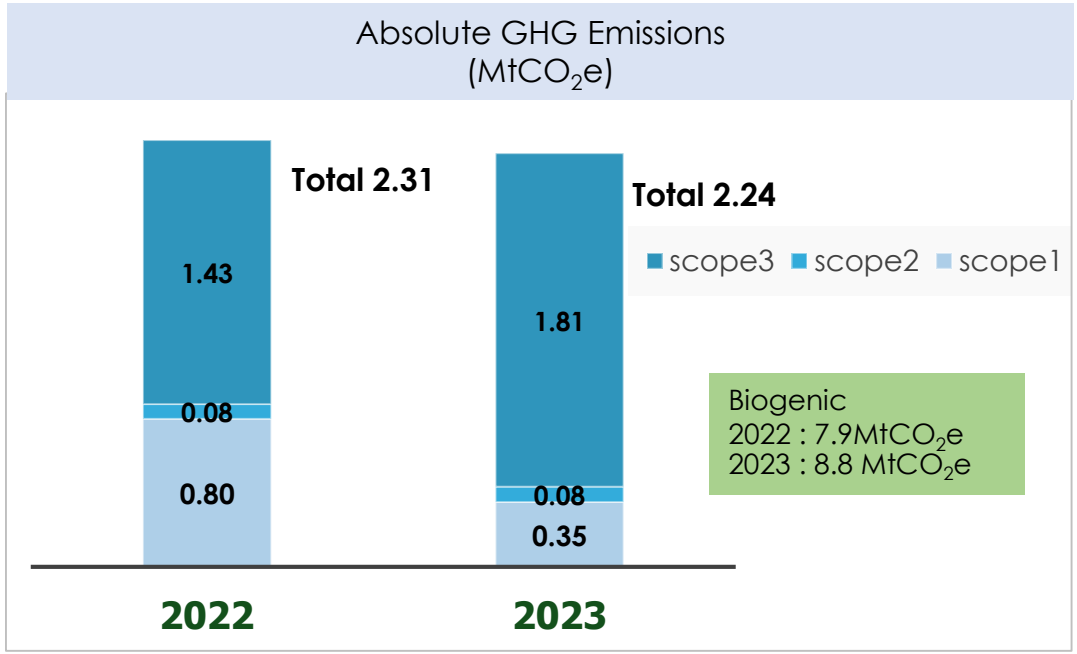
Category 13
Downstream leased assets
NR

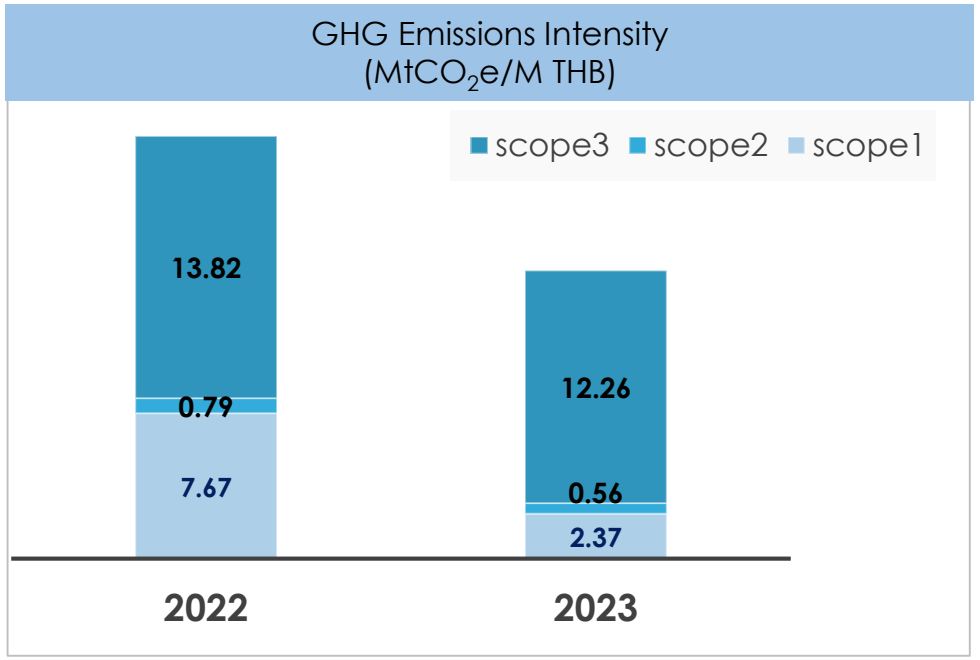
Category 14
Franchises
NR

Category 15
Investments
NR

Remark: * GHG emissions scope3, category 2 capital goods cannot be calculated since our suppliers are unable to provide the information of emission factor.

GHG Emissions



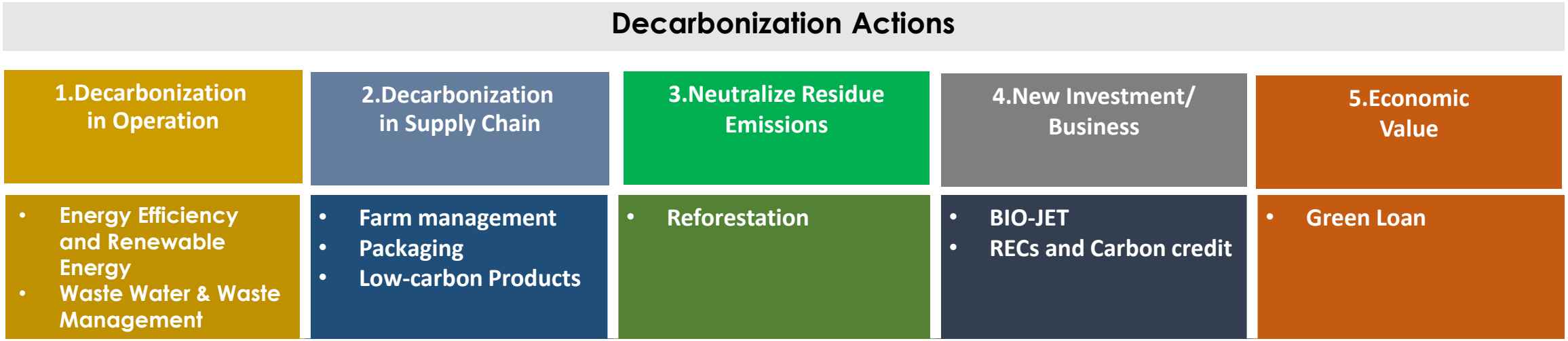


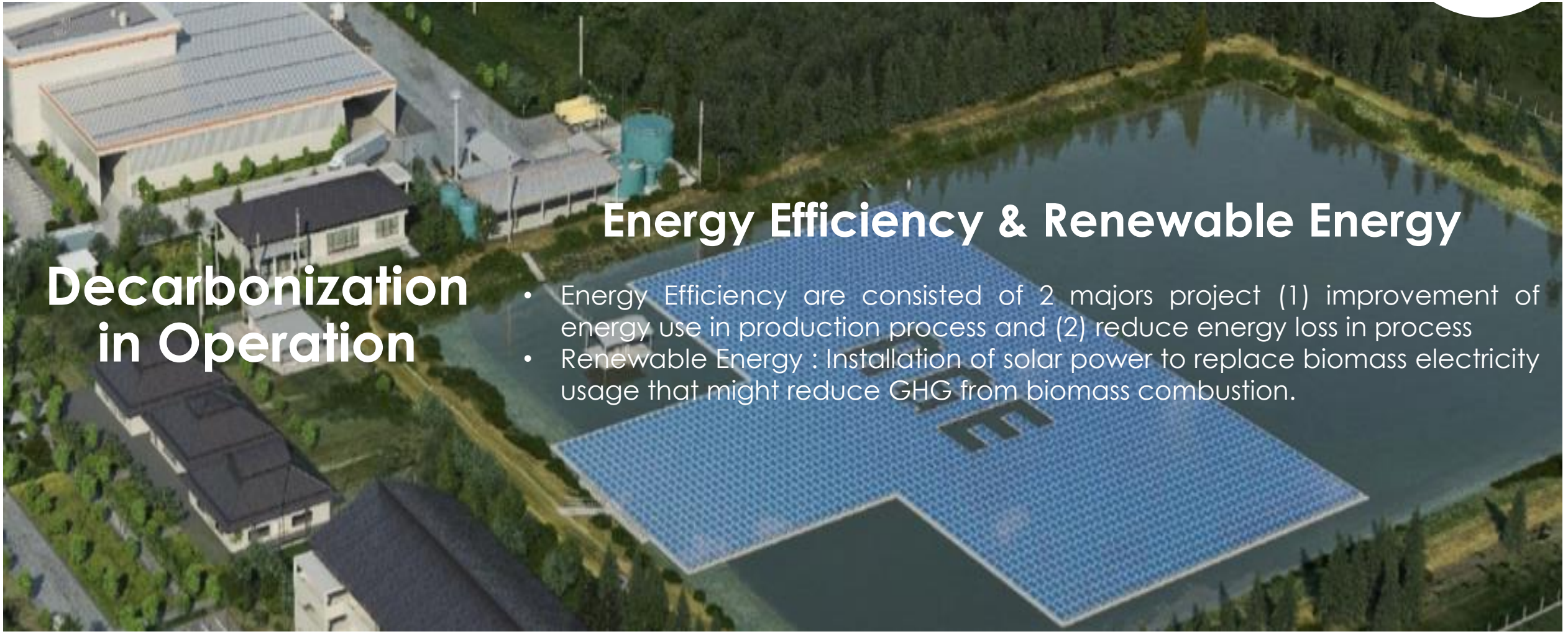
GHG Emissions	Unit	2022 * (base year)	2023	2023 Target	Status
Scope 1&2	$MtCO_2e$	0.88	0.43	0.84	Achieved
Scope 1&2 Intensity	$MtCO_2e$/M THB	8.46	2.93	8.12	Achieved
Scope 3	$MtCO_2e$	1.43	1.81	1.34	Not achieved
Scope 3 Intensity	$MtCO_2e$/M THB	13.82	12.26	13.54	Achieved

* Remark : Emission data in 2022 covered 100% of total emission of base year (Scope 1,Scope 2 and Scope3)

4.2 Decarbonization Actions

We have implemented a decarbonization actions with targets to achieve the SBTi near-term target, carbon neutrality by 2030 and net zero by 2050, and continuously implemented key mitigation and adaptation actions to reduce GHG emissions as follows.



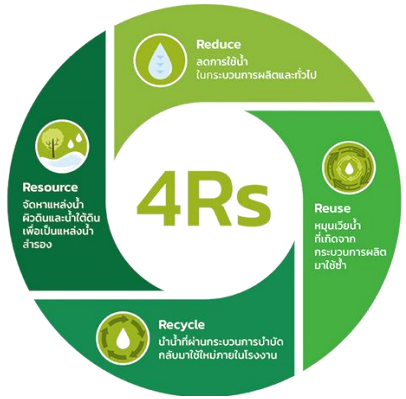


Decarbonization in Operation

Energy Efficiency & Renewable Energy

- Energy Efficiency are consisted of 2 majors project (1) improvement of energy use in production process and (2) reduce energy loss in process
- Renewable Energy : Installation of solar power to replace biomass electricity usage that might reduce GHG from biomass combustion.

Decarbonization in Operation



4Rs principle: Resource, Reduce, Reuse, and Recycle

Decarbonization in Supply Chain

Wastewater & Waste Management

- Reduce the volume of wastewater entering the wastewater treatment system to reduce GHG emission.
- Upgrade the aerated section of the oxidation pond at Dan Chang Mitr Phol Park to an activated sludge to improve efficiency of wastewater treatment system.
- Reduce volume of waste to landfill & incineration to reduce GHG emissions while maximizing its value through the “From Waste to Value” initiatives.

Farm Management and Packaging

- Farm Management

To reduce GHG emissions at farm upstream supply chain, Mitr Phol encourages farmers to grow sugarcanes according to “Mitr Phol Farming Practices” which have 4 major principles (legume rotation, trash blanket, controlled traffic and minimum tillage) integrated with irrigation system. These agricultural practice help to reduce sugarcane burning, increase soil health, reduce fuel consumption, efficiently use fertilizers, and manage water resources efficiently .

- Packaging

Key interventions to reduce GHG emissions related packaging are (1) environmentally friendly (2) reduce thickness of packaging materials and Collaborate with suppliers to produce low GHG packaging.

Decarbonization in Supply Chain

Low-carbon Products

We focus on development of low-carbon products to serve customers trends on green products and contribute to reduce GHG emissions.

Carbon Footprint Products:
38 Products

Carbon Footprint Reduction:
8 Products

Life Cycle Assessment:
5 Ethanol Plants
EU Red (Bonsucro):
3 Ethanol Plants

Products	Estimated total avoided emissions (ton CO_2e)	% of total revenue from product
Low-carbon products, which meet the criteria for reducing GHG emissions. e.g., 8 Sugar products certified Carbon Footprint Reduction (CFR) by TGO.	38,658	10
Avoided emissions for third-parties, which allow the clients or third parties to reduce GHG emissions, e.g., Biomass electricity sold to EGAT/ PEA, Carbon credits, Solar water pumps for farmers, Ethanol products sold to gasohol produces, Syrup that allows customers to reduce energy for melting sugar.	12,562,717	13.47

Neutralized Residue Emissions : Reforestations Project

- Number of Planted Trees : 657,768 Trees
- Reforestations : 2,116 Rais
- Number of Farmer join the reforestations project : 6,055 farmers

New Investment Business

Bio-Jet

- Global oil consumption suggests that oil demand is starting to level off as EV usage increases. As ethanol producer company, Mitr Phol is prepared to switch from making conventional ethanol to more advance and sustainable ethanol for airplanes, which need to comply aviation sustainable fuel standard.

However, in order for the ethanol producer to switch from conventional ethanol to a more sustainable fuel for aviation, the technology for Sustainable Aviation Fuel (SAF) requires a significant financial investment, legislative changes, and cooperation from the government.

Carbon Credit & RECs

- To promote carbon neutral and use of renewable energy
- To support low carbon emission project such as the biomass power plant and sugar cane farm

Economic Value

Green Loan

Mitr Phol Group has obtained a sustainability-linked loan to further its commitment to creating shared value with society and environmental development. This loan accommodation is instrumental in driving us to become a Carbon Neutral organization by 2030 and achieving the goal of net zero greenhouse gas emissions by 2050.

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