MITR PHOL GROUP

TCFD/IFRS S2 Report 2025

Aligned with Task Force on Climate-related Financial Disclosures (TCFD) and International Financial Reporting Standards (IFRS) S2 Climate-related Disclosures.

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IFRS S2 Climate-related Disclosures

Message from the Chairman of Mitr Phol Group

"Grow Together" has consistently guided Mitr Phol Group's approach to business operations. For over seven decades, we have remained committed to advancing Thailand's agricultural sector. This commitment is driven by the conviction that a sustainable future for both Thailand and the global community must be built upon collaboration across all sectors of the supply chain, including government, private enterprises, farmers, and civil society.

Mitr Phol Group recognizes its responsibility to all stakeholders in fostering inclusive and high-quality growth across economic, social, and environmental dimensions. This commitment is especially critical in today's rapidly evolving global landscape, shaped by the intensifying impacts of climate change, widening inequality, geopolitical tensions, and economic volatility.

We remain steadfast in our commitment to sustainable development, adopting a comprehensive approach aligned with the United Nations Sustainable Development Goals (SDGs). Our efforts focus on generating positive impact at both national and international levels. We continue to improve our operations in tangible and measurable ways by integrating sustainability principles across the organization.

This includes empowering farmers through modern farming practices that prioritize environmental stewardship, and promoting the efficient use of limited resources, especially water, which is a key resource for agro-industrial resilience.
We also leverage innovation to enhance performance across the supply chain while supporting communities and broader society.

Today, Mitr Phol Group is recognized not only as a leader in the sugarcane, sugar, renewable energy, and related industries in Thailand and abroad, but also as a global leader in sustainability. This recognition reflects our enduring commitment to purposeful growth and to delivering meaningful outcomes for both society and the environment.

On behalf of Mitr Phol Group, I would like to express our sincere appreciation to our business partners, suppliers, farmers, employees, and all valued stakeholders for their continued trust and confidence throughout our journey.

I reaffirm our unwavering commitment to conducting our business with responsibility, transparency, and integrity, creating long-term value for a sustainable future. We will continue to lead Thailand's sugarcane, sugar, and related industries, as well as the agricultural sector, toward a future that is resilient, secure, and truly sustainable.

Mr. Buntoeng Vongkusolkit
Chairman of Mitr Phol Group

About This Report

In 2024, we adopt the IFRS S2 Climate-related Disclosures standard, a framework designed to enhance our ability to provide comprehensive information on identifying, assessing, and managing climate-related risks. This standard integrates the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) while introducing additional requirements to improve transparency and support strategic decision-making.

This report outlines our progress in implementing TCFD ,now mapped to IFRS S2 Climate-related standard, across four key areas: Governance, Strategy, Risk Management, and Metrics & Targets. Since adopting IFRS S2 , we have embedded its principles across all business units in Thailand and utilizing climate scenarios to evaluate climate-related risks and opportunities. The report provides insights into the impacts of climate change on our business in Thailand, updates on risk management practices—including the integration of climate risks into operations and annual risk assessments—and presents scope 3 emissions data fully aligned with the GHG Protocol, covering all relevant categories.

IFRS2

Governance

•Disclose the organization's governance on climate-related risks opportunities, including detail on the board's oversight responsibilities and management's role in assessing and managing these risks and opportunities.

Strategy

•Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.
•Covers short, medium, and long-term impacts.

Risk Management

•Disclose how the organization identifies, assesses, and manages climate-related risks.
•Includes integration of these processes into the overall risk enterprise management framework.

Metric and Target

•Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities.
•Includes information on greenhouse gas emissions and performance against set targets

Mitr Phol's Decarbonization Strategy

Carbon Neutrality by 2030 and Net-Zero by 2050

Decarbonization Strategy

1 Decarbonization in Operation
- Energy efficiency
- Waste management

2 Decarbonization in Supply Chain
- Sustainable procurement
- Supplier collaboration

3 Neutralize Residue Emissions
- Reforestation
- Tech-based carbon removal
- Carbon offset

4 New Investment/ Business
- Sustainable energy
- Carbon credit and REC service

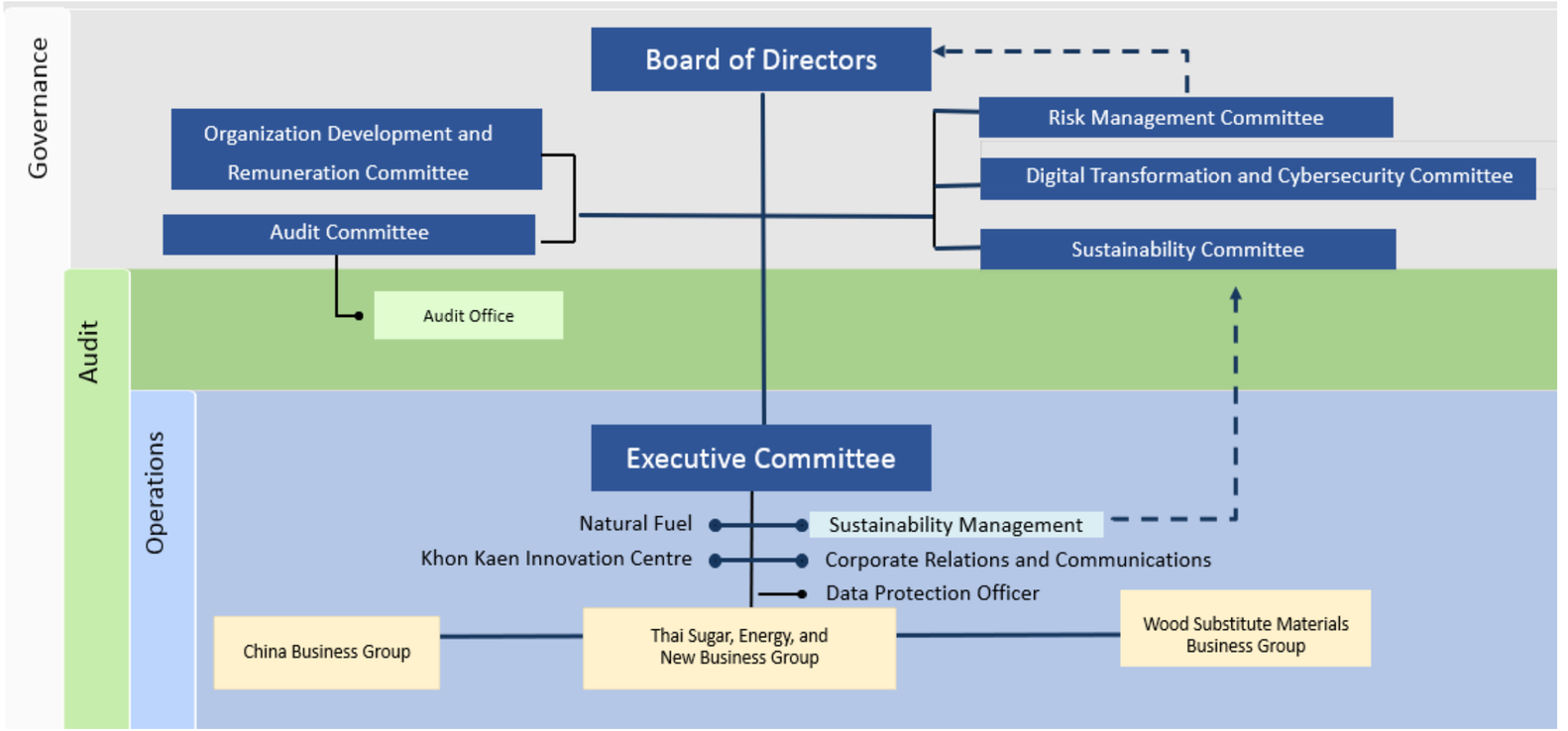
5 Economic Value
- Sustainability-linked finance
- Carbon Tax / ETS

1

Governance

1.1 Climate Change and Risk Management Structure

Mitr Phol Group's Board of Directors ultimately oversees all ESG-related matters, including climate change and nature-related governance structures. To ensure effective oversight of these critical issues, Mitr Phol Group has established two committees, a Sustainability Committee and a Risk Management Committee (RMC) to provide support to the board's policy. While their responsibilities differ; they share a common goal of managing climate and nature-related risks. The RMC acts as an independent advisory panel, supporting the Board in areas of governance, enterprise risk, policy development, and risk management frameworks. Meanwhile, the Sustainability Committee focuses on strategic planning, risk and opportunity assessment, and disclosure. At the management and operational level, the Executive Committee is responsible for monitoring and acting to risks and opportunities management , ensuring alignment with the Group's overall strategy.



1.1 The board's Oversight of Climate-Related Risks and Opportunities

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
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, ,climate change and nature related 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
Executive Committee	The Executive Committee is responsible for implementing risk management at the business unit level and ensuring continuous oversight, with strategic support from the governance body.	Monthly
Audit Committee	Audit committee have role on an independently reviews the Company's operations, ensuring that risk management and internal controls align with policies and comply with relevant laws, rules, and regulations.	Monthly

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

- In relation to climate-related risks and opportunities, two key departments—Enterprise Risk Management and Sustainable Development share responsibility. These departments work collaboratively with business units to identify and assess climate-related risks and opportunities. The results of ESG risk and opportunity assessments are consolidated and reported to the Board of Director on a quarterly basis, ensuring that strategic oversight is informed by operational insights.

- To oversee enterprise risk and climate change , the Board of Directors (BOD) has delegated decision-making authority on operational matters to the Executive Committee. This delegation enables the organization to drive strategy, implementation, and execution of climate-related initiatives at the operational level. The Executive Committee plays a role in translating strategic directives into practical execution. It is responsible for converting risk management policies into actionable plans that align with the organization's sustainability objectives. The committee ensures that risk management practices are embedded across all departments, fostering a culture of risk awareness. It also monitors the effectiveness of ESG and climate risk mitigation measures, facilitates cross-functional coordination, and ensures that all sustainability and risk-related initiatives are aligned with corporate strategy and regulatory requirements

1.3 Skill and Competencies

The Board of Directors has formed two committees, the Sustainability Committee and the Risk Management Committee. Each committee consists of directors with extensive knowledge and expertise in climate change, including power industry, innovation, and sustainability management. These committees have the skills necessary to effectively monitor and govern climate-related strategies, risks, and opportunities. By doing so, they aim to maximize the benefits of addressing climate-related issues.

Governing Body	Member	Relevant Skills
Mr. Buntoeng Vongkusokit	Chairman	• Agricultural and Food Industry • Energy and Utilities Industry • Sustainability
Sustainability Committee	Members	• Sustainability • Risk Management • Strategy and Innovation • Agricultural and Food Industry • Energy and Utilities Industrial
Risk Management Committee	Members	• Information Technology • Financials • Agricultural and Food Industry • Energy and Utilities Industrial • Risk Management

1.4 Climate-Related Public Policy Engagement (Mitr Phol Context)

Mitr Phol Group is committed to supporting global efforts to limit temperature rise to below 1.5 °C in alignment with the Paris Agreement and Thailand reaffirmed in COP28 as **Increase its greenhouse gas reduction target** from 30% to 40% under its updated Nationally Determined Contributions (NDC) and achieve **carbon neutrality by 2050** and **net-zero emissions by 2065**. Mitr Phol actively engages in climate-related public policy through collaboration with trade associations and multi-stakeholder platforms. The Group has joined the **UN Global Compact Network Thailand**, publicly declaring its intention to achieve **Net Zero emissions by 2050**, or no later than 2070. Mitr Phol is also a member of the **Thailand Carbon Neutral Network (TCNN) and The Federation of Thai Industries (FTI), Thai Sugar Miller Company Limited (TSMC) , Thai Sugar and Bio-Energy Producers Association (TSEA),** working alongside private sector peers, government agencies, and communities to promote industrial sustainability, foster innovation, and drive climate action. To ensure alignment with climate-related public policy, Mitr Phol has developed a comprehensive management system that spans all operational jurisdictions. This system supports proactive engagement and transparency through four key processes:

Review

Conduct comparative analysis of internal policies and public climate policies to assess alignment with the Paris Agreement, focusing on direct climate-related activities and trade association positions.

Monitoring

Track and communicate policy developments regularly to identify and address any misalignments with climate change positions held by those trade associations.

Engagement

Facilitate dialogue with internal and external stakeholders to build a shared understanding and alignment on climate public policy.

Disclosure

Report transparently on direct climate-related engagement activities and the positions and actions of trade associations regarding climate public policy.

2

Strategy

2.1 Climate Strategy Overview

2.1.1 Decarbonization Actions

We have implemented a decarbonization strategy with targets to allied to 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 Actions

1.Decarbonization in Operation	2.Decarbonization in Supply Chain	3.Neutralize Residue Emissions	4.New Investment/ Business	5.Economic Value
• Energy Efficiency • Renewable Energy • Waste Water & Waste Management	• Packaging • Low-carbon Products	• Reforestation	• BIO-JET • RECs and Carbon credit	• Green Loan

2.1 Climate Strategy Overview

2.1.2 Other Decarbonization Actions

2.1.2 Other Decarbonization Actions

(1) Internal Carbon Pricing : ICP

Mitr Phol Group has adopted a **mixed approach** of Internal Carbon Pricing (ICP) to support its decarbonization strategy. This includes two key mechanisms:

(1.1) Shadow Price

This mechanism is used to evaluate the financial risks and potential impacts of carbon emissions. It helps the organization prepare for future climate-related policies, regulations, and carbon pricing schemes.
Mitr Phol anticipates potential costs from future carbon tax regulations by applying a shadow price based on the current carbon tax on oil products—THB 200 per metric ton of CO_2 emissions—covering Scope 1 and Scope 2 greenhouse gas (GHG) emissions. Starting in 2025, this price will be used as a hypothetical cost in project evaluations to encourage investment in low-emission alternatives.

(1.2) Internal Carbon Fee

Mitr Phol has piloted an internal carbon fee in the Suphanburi Carbon Neutral and Logistics Business Unit. This fee is based on the Thai carbon market price, currently set at THB 35 per metric ton of CO_2.
The fee is applied to carbon offsetting and is reinvested into internal sustainability projects, reinforcing the company's commitment to climate action.

(2) Development water management for sugarcane farm and Solar power for agricultural

Both water development for sugarcane farm and solar power pumps are the Mitrphol's sustainable agriculture which support farmer to increase crop yield and resilience to climate variability.

2.2 Climate change related risk and opportunity assessment

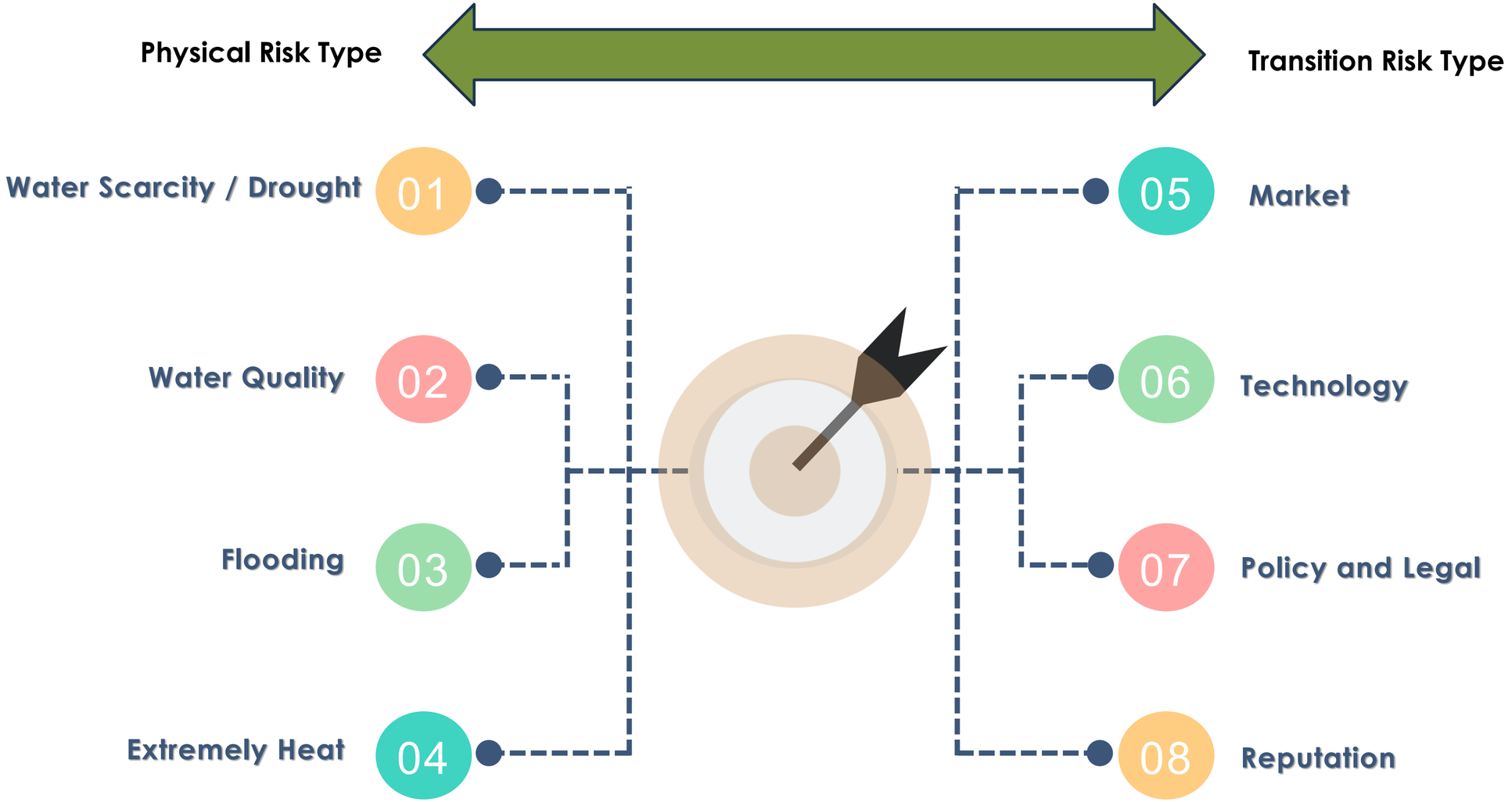
Mitr Phol Group's climate strategies, GHG emission pathway, and Net Zero 2050 targets are integrated into our risk assessments and opportunity evaluations, in alignment with the TCFD recommendations. We have conducted comprehensive assessments to identify, analyze, and evaluate key climate-related risks and opportunities across all operations in Thailand and throughout our value chain. These risks and opportunities are categorized into physical risks and transition risks, and climate-related opportunities. Each category is assessed across three-time horizons medium by 2030, and long-term by 2050—and under difference climate scenarios.

Scope of Assessment	Risk and opportunity	Time Horizon	Impact Analysis
Own Operation in Thailand - Sugarcane farming - Sugar - Energy - Wood substitute materials - Fertilizer - logistics - New business **Upstream and downstream** - Sugarcane Farmers - Customer - Tier 1 suppliers	**Climate-Related Risks** • Physical Risk • Transition Risk and Opportunity	• Short term / 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

* Short term is implied to risk management which is review annually, detail in Chapter 3 : Risk Management

2. Strategy

Physical Risk and Transition Risk Overview



2.2.1 Physical Risk

All assets and business units in Thailand were included in the physical climate change impact assessment. Physical risks—such as extreme heat, water scarcity, water quality, flooding, but water related to regulatory change is assessed in own operation only—were evaluated through both qualitative and quantitative analyses. These assessments were conducted under three climate scenarios based on Shared Socioeconomic 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 **SSP 3-7.0: Rational Rivalry** (3.5 °C),with projections for the medium term (2030) and long term (2050). In addition, water risk assessment was a key focus area, encompassing water stress, water quality, and flooding. These risks were evaluated using the WWF Water Risk Filter across both operations and supply chains. The outcomes related to supply chain water risk and mitigation are presented in the **Supply Chain Water Risk** section. For water risk assessment —including scarcity, quality, and flood—was assessed using the WWF Water Risk Filter and reported in TNFD and TCFD. Of 73 operational sites assessed, 11 shared coordinates, resulting in 62 locations..

Physical Risk Type

	Water Scarcity
	Water Quality
	Flood
	Water Related to Regulatory Change
	Extremely Heat

Scenario and Tool

Strategy	
SSP1-2.6	Taking the Green Road
SSP2-4.5	Middle of the Road
SSP3-7.0	Rational Rivalry

Tool	
1	World Bank Data
2	Aqueduct
3	WWF Water Risk Filter

Impact Analysis

Level of Impact	Low / Medium / High
Impact on Business	• Ratio on 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).

2.2.1.1 Water Risk Assessment : Own Operation

Low | Medium | High

Water Risk	2030			2050			Acute-Chronic	
	SSP 1-2.6	SSP 2-4.5	SSP 3- 7.0	SSP 1-2.6	SSP 2-4.5	SSP 3- 7.0	Acute	Chronic
Water Scarcity							☑	
Water Quality							☑	
Flooding							☑	
Water risk in related to regulatory change								

Impact

Water Scarcity	•Decrease of sugarcane Production and sugarcane sweetness •Lack of raw material for sugar mill and biomass fuel for biomass power plant due to reduce of sugarcane and biomass •Increasing of investment cost for water reservoir of water pump system •Acute water shortage may lead to restriction on use in water stress area
Water Quality	•Rising costs for water treatment are necessary to prevent equipment damage, particularly in systems like boilers and cooling towers. •Operational expenses are increasing due to the need for water purification or treatment before use or disposal. •Poor water quality can disrupt processes, leading to delays or interruptions in production. •Water quality is critical in the food and beverage industry—any contamination can result in product recalls and severely damage brand reputation.
Flooding	•Damage cost for building, equipment of the low land area •Increasing cost of insurance •It difficult for employee to reach to business working place , then it impact on operation •Logistic of raw material and product may difficulty due to road closures and limited assess
Water risk in related to regulatory change	•In most scenarios, the water-related to regulatory change risk is assessed as low. However, under the SSP3 scenario in the year 2050, the risk level increases to medium. Overall, based on the water risk assessment, the most likely risk level remains low. •May increase operation cost due in the future due to potential fees for water withdraw from basin. •Regularly monitor and getting update for local's regulation change.

2.2.1.1 Water Risk Assessment : Value Chain

Low | Medium | High

Upstream and Downstream Value Chain

Water Risk	2030			2050		
	SSP 1-2.6	SSP 2-4.5	SSP 3- 7.0	SSP 1-2.6	SSP 2-4.5	SSP 3- 7.0
Water Scarcity						
Water Quality						
Flooding						

Impact

Water Scarcity	• Upstream sugarcane producer may affect on reduce yield • Upstream framer may Increased productions cost such as to invest in alternative water source or installation of solar pump for ground water • Governments in water-stressed regions may impose restrictions on water usage, limiting production capacity and affecting supply chain • Upstream farmer may loss of avenue due to lower production
Water Quality	• Unproper water quality can reduce crop yield • Contamination of food and beverage from unclean water may damage brand reputation and customer trust on brand.
Flooding	• Damage cost for building, equipment of supply chain or damage the lowland crop area if flood duration more than 2 weeks (100-150 CM) • Reducing yield in lowland area led to loss of revenue • It difficult for employee customer and suppliers to reach to business , then it impact on operation • Logistic of raw material and product may difficulty due to road closures and limited assess

2. Strategy

Mitigation

Risk	Mitigation	Financial Impact	Cost of Action
Water Scarcity	• Drought monitoring • Restoring water into underground water source • Building reservoirs for store water for dry period • Using water-efficient appliances such as water dipping system for sugar cane farm • Public awareness campaign to downstream supply chain • Recycling water within industrial process • Improving production process consuming less water	**Assumption** : • Water Scarcity implications to availability water and cost of water • The typical operation crunching season = 120 Days • Total amount of water withdrawal per year = 33,419 million liter and 91.56 million liter / day • Cost of water per liter = 3.5 baht • Total cost of water = 70 million baht	350 Million Baht Cover benefit area = 22,000 Rai
Water Quality	• Apply water quality standard and regulation • Monitoring for water quality • Water quality testing before using in production process	**Assumption** : Apply of wastewater Treatment cost x 45 days x 1 complex Treatment cost = 2,000,000 baht/day Financial Impact = 90,000,000 baht	Equal to financial impact as budget need to buy purify water = 90,000,000 baht
Flooding	• Build infrastructure in higher level compared to historical flood level • Prepare flood barriers to protect infrastructure. Flood barriers to protect critical infrastructure • Plant more tree to reduce runoff and stormwater flow • Monitor flood event and drivers • Adequate insurance can insulate utilities from financial losses due to extreme weather events, helping to maintain financial sustainability of utility operations • Emergency response plans for key critical area • Sandbag and mobile pumps	**Assumption** : Water depth 1.5 M – for 1 Day - No operation of flooded site for 1 day - Estimated of revenue loss for 1 day calculated base of average revenue of flooded site for 1 days - The duration of flooding 7 days Impact on EBT= 0.005%	Insurance Cost (Baht) =21,000,000 Asset Damage = 46,000,000 Total 67,000,000
Water risk in related to regulatory change	• Water withdrawal monitoring • Water management in 4R, reduce reuse recycle and resource • Regularly monitor and getting update for local's regulation change.	• Embed in operation cost	-

2.2.2 Extremely Heat

☑ CHRONIC ☑ ACUTE

Low | Medium | High

Extremely Heat	2030			2050		
	SSP 1-2.6	SSP 2-4.5	SSP 3-7.0	SSP 1-2.6	SSP 2-4.5	SSP 3-7.0
Own Operation						
Upstream						
Downstream						

Impact	Financial Impact	Mitigation
Own operation • Hot temperature can lead to shorter plant, high fiber and lower sucrose • Higher investment costs to protect and recover sugar cane plantations from heat stress • A longer period of heat day affects employee heat-related illness. • Consume more energy to cool down machines	• Embed in operation cost of energy cost and employee health care budget and safety	• Expand Green area: Increasing of planting trees and shaded areas within operational sites to help reduce ambient temperatures and improve overall environmental quality. • Implement Workplace Heat Stress Standards: Establish guidelines that ensure outdoor workers receive adequate rest, hydration, and protection from heat exposure to prevent heat-related illnesses. • Early Warning Systems for Extreme Heat: Collaborate with outdoor employees and upstream farmers and Provide guidance and resources to support proactive mitigation. • Long-Term Agricultural Adaptation: Promote crop diversification and rotation practices to reduce vulnerability to extreme heat, enhance soil health, and improve overall farm resilience
Upstream Longer periods of heat might harm sugar cane production because 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. **Downstream** 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.		

2.3 Transition Risk

Overview

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 term, and 2050, or long term. 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 The Net Zero Emissions by 2050 Scenario (NZE)

Scope of Assessment	Risk and Opportunity	Scenario and Tool	Impact Analysis
Own Operation in Thailand - Sugarcane farming - Sugar - Energy - Wood Substitute materials - Fertilizer - Warehouse and logistics - New business **Upstream and downstream** - Sugarcane Farmers - Customer	**Risk/Opportunity Type** • Market • Technology • Policy and Legal • Reputation	**Scenario** : **STEPS**: *State Policy is mean Current* and previously policies announced by Thai governments . Estimated temperature increase about 2.4-2.8 °C by 2100. **NZE :** This scenario sets out a pathway to the stabilization of global average temperatures at 1.5°C by 1.5 C. The NZE Scenario achieves net zero emissions by 2050 without relying on emissions reductions from outside the energy sector	**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

Transition Risk Analysis

TCFD Category	Driver	Driver Description
• **Market (Transition Risk and Opportunity)**	Risk Transition of Combustion Engine Vehicle to EV Car	• A significant shift in **consumer behavior** driven by the growing demand for **low-carbon emission vehicles**, particularly the transition from **ethanol-fueled cars** to **electric vehicles (EVs)**. This change poses a **market risk** for ethanol producers due to declining demand and production volumes.
	Opportunity • Sustainable Aviation Fuel (SAF) • Renewable Energy	• **SAF** refers to renewable, low-carbon jet fuel. It is produced from sustainable feedstocks such as agricultural residues, forestry byproducts. SAF is chemically like fossil-based jet fuel and can be used in existing aircraft engines. • Renewable Energy
• **Policy and Legal (Transition Risk)**	Carbon Pricing	• **Direct impact - Internal Carbon ricing (ICP)** is applied as shadow price a strategic tool used by organizations to assign a monetary value to their greenhouse gas emissions. This helps integrate climate-related costs into financial and operational decision-making—even in regions without formal carbon taxes on GHG emission this is applied
• **Technology (Transition Risk)**	new climate technologies.	• 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.
• **Reputation (Transition Risk)**	Changing stakeholder preferences	• This transition risk refers to the potential backlash a that company may receive for their efforts to reduce societal or environmental impact.
• **Financial Impact and Timeframe**		

High Financial Impact
≥ 12% of EBT

Medium Financial Impact
4 - <12% of EBT

Low Financial Impact
< 4% of EBT

2.3.1 Market Risk

Low | Medium | High

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, and social standards such as biodiversity and human rights.

Risk		Assumption and Impact	Time Horizon
Market Risk ☑ Direct	**Upstream** -Farmers and suppliers face increased pressure to adopt sustainable or regenerative practices, requiring investments in solar panels and land preparation. -Reduced fertilizer use may lower income. **Own Operations** -Higher costs for low-carbon product development. -Ethanol sales decline due to shifting consumer preferences. -Bio-jet fuel investment is costly and uncertain until at least 2030 due to technology, feedstock, and policy factors. **Downstream** EV adoption reduces ethanol demand. Customers increasingly request carbon labels and Bonsucro certification.	**Assumptions Based on Operational Risk: Decline in Ethanol Demand as Vehicle Fuel** • **Government Policy Direction: Thailand's Zero Emission Vehicle (ZEV) Promotion Strategy** - **Phase 1 (2025):** Target to increase electric vehicle (EV) production by **10%** - **Phase 2 (2030):** Target to increase EV production by **30%** - **Phase 3 (2035):** Target to increase EV production by **50%** • **Revenue Impact Assumptions for STEP and NZE** Revenue impact is projected to align with Thailand's ZEV adoption targets. By 2035, a **50% reduction in revenue** is anticipated due to declining demand for ethanol as a transportation fuel. • The **baseline year for revenue** is set as **2022**, marking the launch of Thailand's EV 3.0 incentive package. • **Estimated Revenue Loss (2025–2035)** Projected cumulative revenue loss: **฿1,000 – ฿6,000 million** Based on 2022 revenue figures as the reference point.	Short term Financial Impact STEP NZE

2.3.2 Market Opportunity

Low | Medium | High

Marketing is a potential impact on the opportunity to gain 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.

<table>
<tr><th>Opportunity</th><th></th><th colspan="3">Assumption and Impact on financial</th><th>Time Horizon</th></tr>
<tr><td rowspan="7">Renewable Energy
☑ Direct</td><td rowspan="7">Own Operation
• Increasing of revenue due to increasing of renewable energy demand

Upstream Supply Chain
• Increasing of revenue due to selling biomass or solar panel

Downstream Customer
• Reduce scope 2 emission by using renewable energy</td><td colspan="3">Assumption :
• The increase in electricity cost due to the higher ambition can raise the prices of renewable electricity product of the Mitr Phol
• Percentage increase in electricity cost = % increase in price of renewable energy product of Mitr Phol</td><td rowspan="7">2030
STEP
NZE

2050
STEP
NZE</td></tr>
<tr><td>Year</td><td>STEP</td><td>NZE</td></tr>
<tr><td>2030 (Million baht : MB)</td><td>297</td><td>543</td></tr>
<tr><td>% EBT</td><td>0.88</td><td>1.61</td></tr>
<tr><td>2050 (MB)</td><td>890</td><td>1978</td></tr>
<tr><td>% EBT</td><td>2.64</td><td>5.68</td></tr>
<tr><td></td></tr>
<tr><td>SAF
☑ Direct</td><td>Own Operation</td><td colspan="3">Assumption :
• Increasing demand of bio-jet according to CORSIA regulation
• As per Bio-jet driven by regulatory mandate for airline to reduce GHG emission, based on IEA data expected growth in SAF sector is 4% in lined with the aviation industry has pledged to reduce GHG by 50% from 2005 level by 2050, therefore only NZE the scenario will be applied, and 2% growth will be applied in revenue.</td><td>2030 , 2050
NZE</td></tr>
<tr><td></td><td>Year</td><td>NZE</td><td>% EBT</td><td></td></tr>
<tr><td></td><td>2030 (Million liter)</td><td>6,000</td><td>17.76</td><td></td></tr>
<tr><td></td><td>2050 (Million liter)</td><td>8,400</td><td>24.87</td><td></td></tr>
</table>

2.3.3 Technology Risk

Low | Medium | High

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.

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.
	NZE			

2.3.4 Policy and Legal Risk

Low | Medium | High

Policies and regulations that contribute to GHG reduction such as carbon tax or the draft of climate change act which will be enforced during 2028-2030.

Transition Risk	Risk	Assumption and Impact on financial	Time Horizon
Carbon Tax ☑ Direct	**Own Operation** • Loss of revenue due to carbon tax • Increasing operation cost due to carbon tax policy • Increasing of investment cost for new kind of low emission technology **Upstream and Down Stream Supply Chain** • Increasing Price of Transportation • Increasing of operation cost	**Assumption :** - Using Internal carbon pricing (Shadow Price) at 200 baht per metric ton of CO2e that Thai government taxed on petroleum product as a carbon tax (200 baht or 6.15 USD (1 USD= 32.5 baht) - Tax structure will be revised based on inflation rate of Thailand at +2% 1) 2028-2030 = 200 baht 2) 2031-2040 = 220 baht 3) 2041-2050 = 240 baht - Carbon Tax will be taxed on scope 1 and 2 emission	2030 STEP NZE 2050 STEP NZE

Year	STEP (MB)	NZE
2030 MB	120	87
% EBT	0.21%	0.15
2050 MB	121	17.53
% EBT	0.20%	0.03%

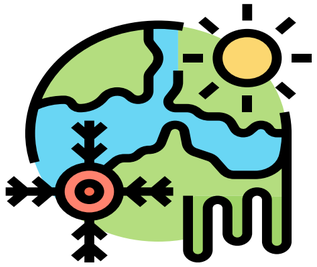
2.3.4 Reputation

Low | Medium | High

Reputation risk mean changing customer or community or other stakeholder 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.

Transition Risk	Scenario	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 and stakeholders 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.
	NZE			

Climate Risk and Opportunity : Adaptation and Mitigation



Physical Risk : Water scarcity, Water Quality, Flood, and Extremely Heat

1. Upstream Value Chain the Oasis project, collaboration with government authorities for water reservoirs, and installation of solar pumps in agricultural areas
2. promoting the 4 R's project to reduce intake water and upgrading wastewater treatment, reuse, and recycling together with other water efficiency
3. Water - related monitoring
4. Annual water risk measurement using WWF water risk filer

Transition Risk : Carbon Tax, Market risk and Technology

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
6. CCS and CCUS technologies may involve significant capital investment and operational cost

Opportunity : BIO-Jet and Renewable Energy

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 and bio-plastic.
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 solar energy project (PPA), and Renewable Energy Certificates (RECs) and carbon credit

3

Risk Management

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 as the second line of defense to functions of oversee and monitor risk management and ensure compliance with policies and regulations and promoted risk awareness. The risk management reviews by The RMC once a year.

Generally, enterprise risk has been classified into the areas of strategic, operational, financial, compliance and digital IT 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 "Integrated into multi-disciplinary company-wide risk management processes.
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 risk management framework and review annually

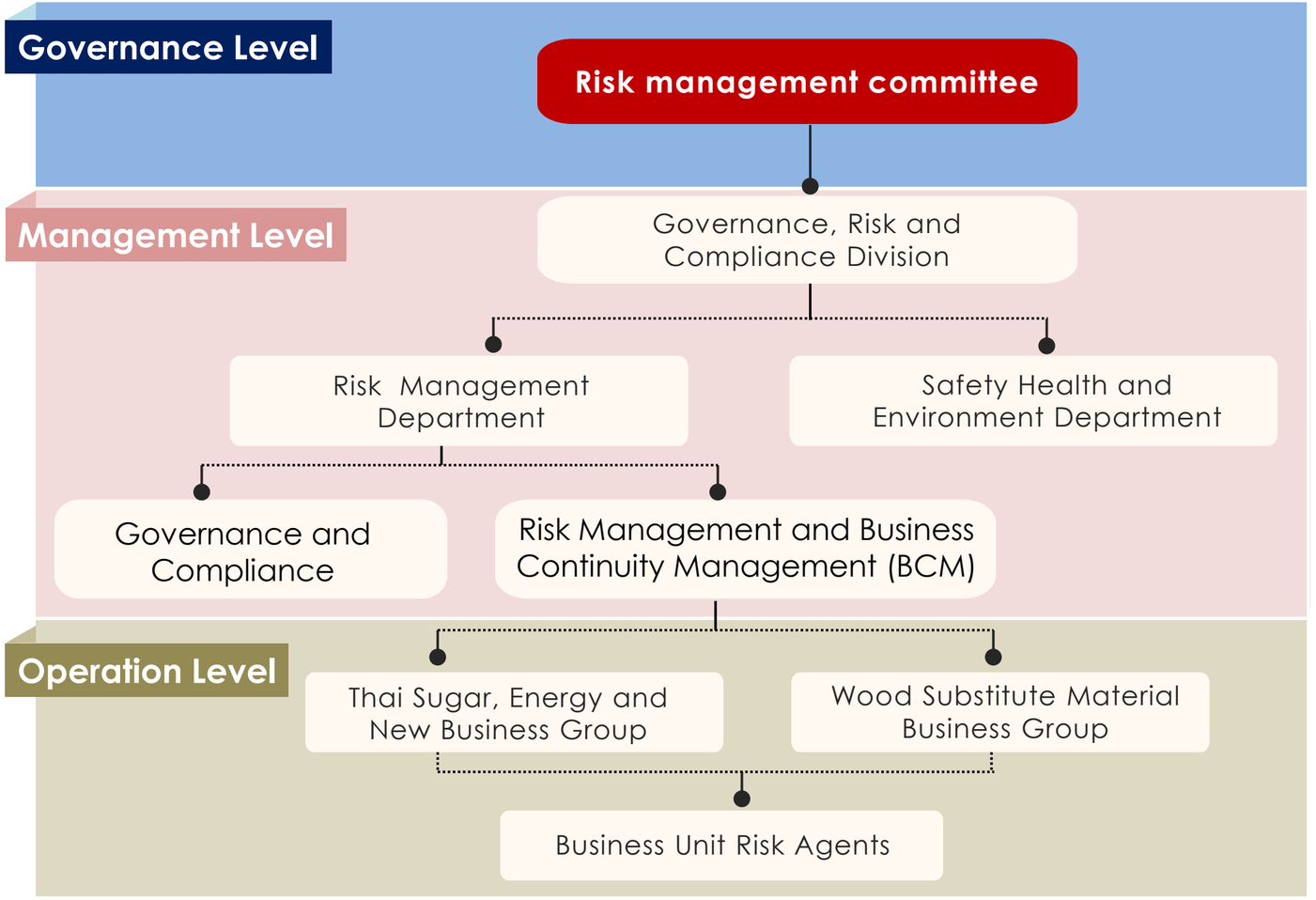
Risk Management Framework

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: government, management, and operation.

- At the governance level, enterprise 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 and likelihood.
- 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 operation as part of risk management.
- Operation Level, as a risk, creates impact through the entire organization. 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. 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

- Strategy
- Operation
- Finance
- Compliance
- ESG (Climate)
- Digital and IT

Wood Substitute Material Business Group

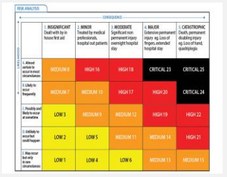
Risk Assessment

Physical Risk (P) :
Extremely Heat
Water scarcity
water quality
Flood

Transition Risk : (T)
Market
Technology
Policy and Legal
Reputation

1 → 2 → 3 → 4 → 5

1 Risk Analysis and Evaluation



Each climate risk matrix

2 Prioritize

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

P	Water Scarcity
T	Regulation

3 Risk Response

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

4 Risk Control and Monitoring

Risk Owner set KRI
For monitoring the likelihood and Impact

5 Review

Every 6 month by risk owner to track for performance Annually to revise of risk assessment and plans.

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

Strategy

- Climate change
- Raw material Security

Operation

- Waste and Pollution Management

Finance

- Commodity Price
- Currency Exchange

Compliance

- Law and Regulation

Digital and IT

- Cyber Insecurity from Generated AI *

* Emerging Risk

4

Metric &Target

4.1 Mitr Phol Group's 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 business, and other businesses. The GHG 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.

4. METRICS & TARGETS

2024 GHG Emissions

Scope 1

Direct GHG Emissions

0.4 M

Scope 2

Indirect GHG Emissions

0.08 M

Scope 3

Unit : tCO_2e

Other Indirect GHG Emissions Total : 1.62 M

Upstream

Category 1
Purchased goods and services
1.05 M

Category 2
Capital goods
4.19

Category 3
Fuel and energy related activities
0.06 M

Category 4
Upstream transportation and distribution
0.2 M

Category 5
Waste generated In operation
3,224.51

Category 6
Business travel
604.12

Category 7
Employee commuting
4,782.95

Category 8
Upstream Leased assets
973.99

Downstream

Category 9
Downstream transportation and distribution
0.11 M

Category 10
Downstream transportation and distribution
NR*

Category 11
Use of sold products
0.19 M

Category 12
End-of-life treatment
2,442.64

Category 13
Downstream leased assets
704.76

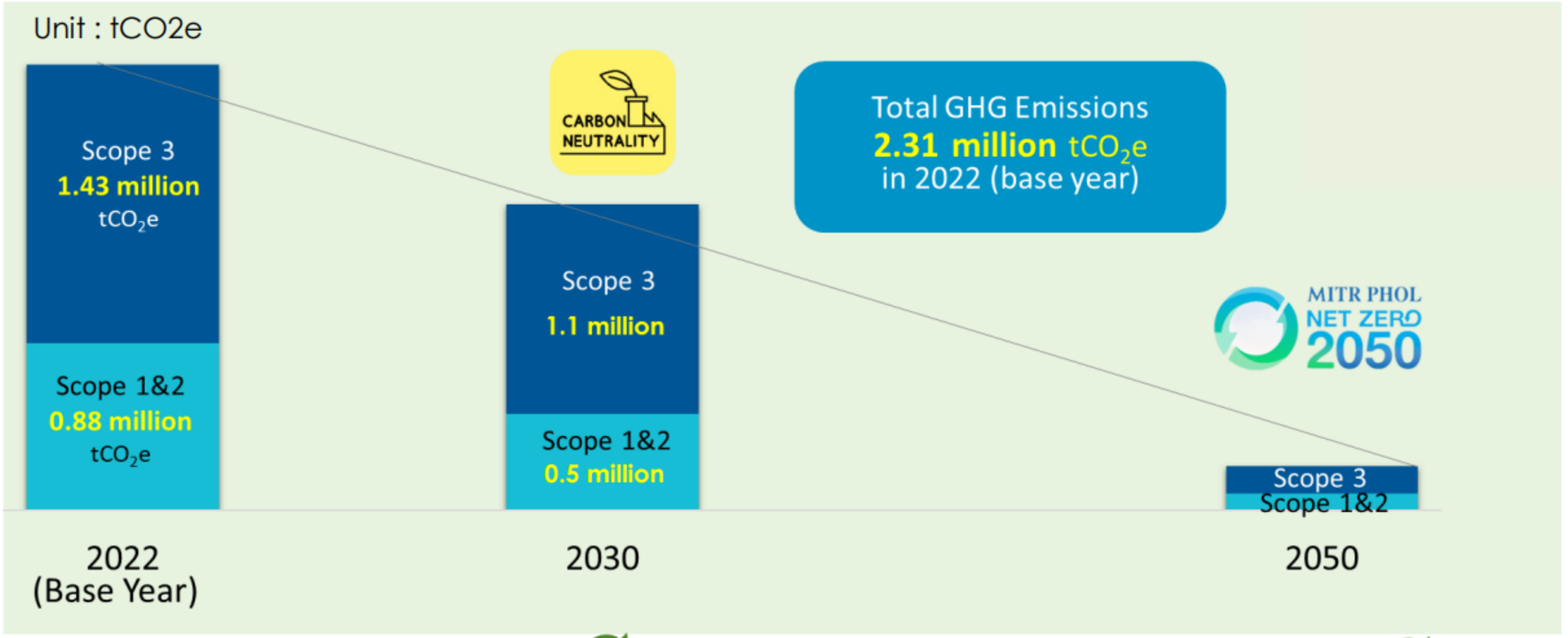
Category 14
Franchises
NR*

Category 15
Investments
-*

* NR means there are no other indirect greenhouse gas emission activities for Scope 3 categories 10 and 14.
- means category 15 cannot be calculated due to insufficient data.

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.



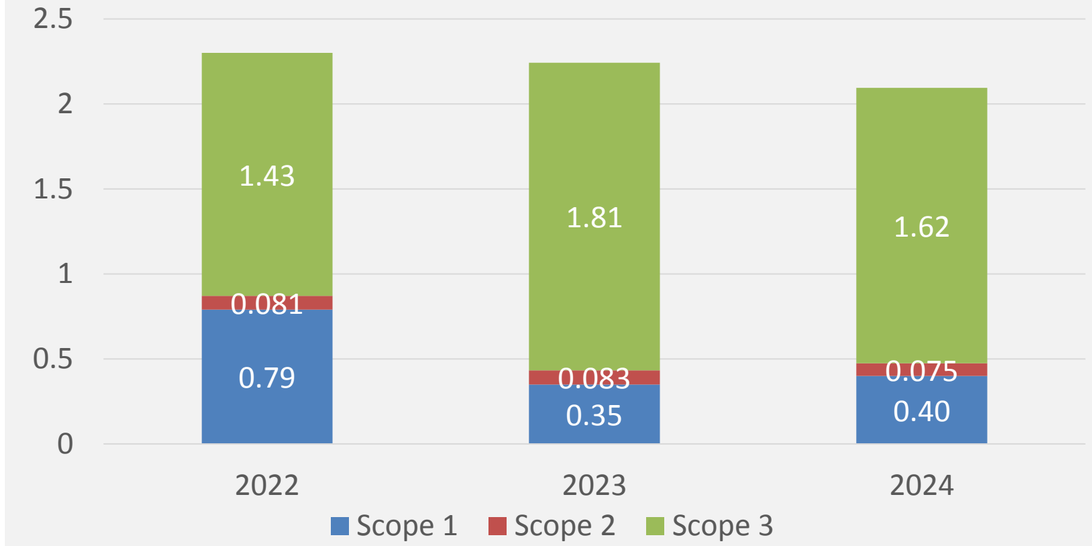
GHG emissions Baseline

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

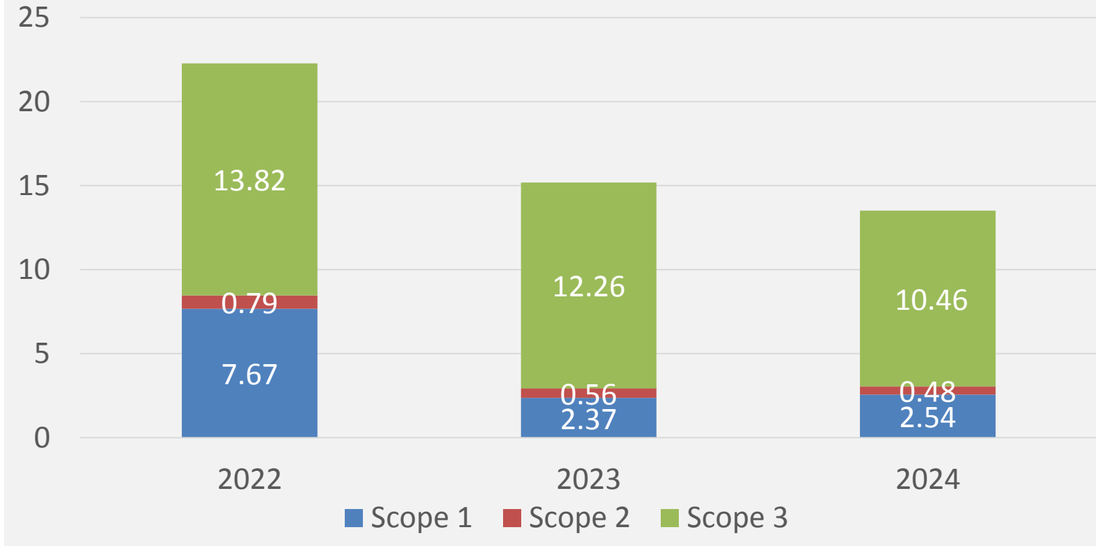
- Scope 1, 2 & 3 reduction by 90%
- Remaining 10% allowed to use nature-base capture / CCS

4. METRICS & TARGETS

Absolute GHG Emissions (Million tCO_2e)



Intensity GHG Emissions (tCO_2e/Million THB)



GHG Emissions	Unit	2022 (base year)	2023	2024	2024 Target	Status
Scope 1&2	$MtCO_2e$	0.87	0.43	0.47	0.79	Achieved
Scope 1&2 Intensity	$MtCO_2e$/M THB	8.46	2.93	3.03	7.61	Achieved
Scope 3	$MtCO_2e$	1.43	1.81	1.62	1.34	Not Achieved
Scope 3 Intensity	$MtCO_2e$/M THB	13.82	12.26	10.46	12.99	Achieved

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 (3) reduce using electricity from grid

Year	Solar Energy Consumption (MWh)	GHG Reduction (tco_2e)
2022	8,244	4,121
2023	23,956	11,976
2024	24,561	12,278

4. METRICS & TARGETS

Decarbonization in Operation

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

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.

Decarbonization in Supply Chain

Mitr Phol Modern Farm and Packaging

- Modern Farm

To reduce GHG emissions at farm upstream supply chain, Mitr Phol encourages farmers to grow sugarcanes according to "Mitr Phol Modern Farm" 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 e.g. Carbon Footprint Reduction (CFR) certified by TGO	51,379*	12.94
Avoided emissions for third-parties e.g. Biomass electricity, Carbon credit, Solar power, Ethanol, Syrup that allows customers to reduce energy for melting sugar	14,032,062	14.29

*Avoided emissions are calculated from the difference between the product emissions using Thailand's emission factor and the company's own emission factor

"One Million Trees Planting Project"

Mitr Phol has initiated a tree planting project with the objective of conserving and restoring nature, as well as increasing green spaces to serve as carbon dioxide sinks for communities. The goal is to plant **1 million trees over a 10-year period**, from **2022 to 2032**, with a **total budget of 50 million baht**.

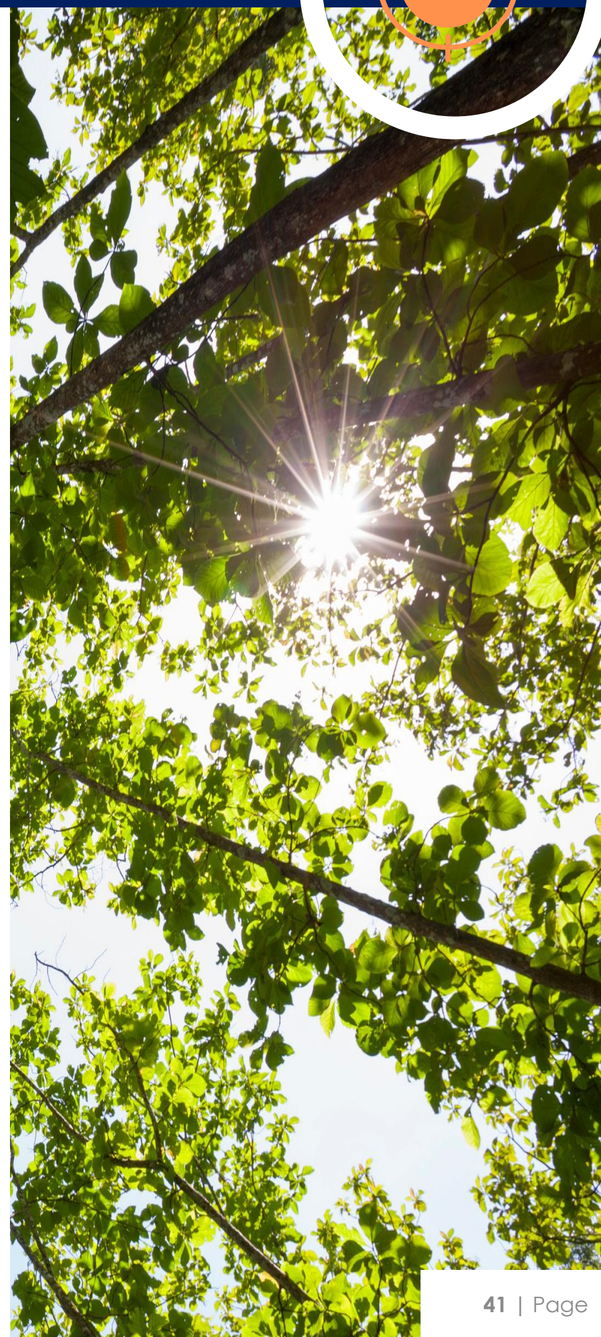
The project includes activities such as planting trees within the company's premises and promoting tree planting in community areas in collaboration with farmers and local residents through various initiatives.

As of 2024, the cumulative results of the tree planting project are as follows:

- **Total trees planted: 666,516**
(Trees planted by the company: 163,351; Trees planted in collaboration with external stakeholders: 503,165)

- **Total planting area: 1,970 rai**

- **Number of participating farmers and communities: 7,207**



New Investment Business

Bio-Jet (SAF)

- 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.
- The need for biofuel, which is expected to increase by more than 30% over the next five years to 38 billion liters between 2023 and 2028, would create an opportunity for SAF, turning the company from a sunset business to one.

However, in order for the ethanol producer to switch from conventional ethanol to a more sustainable fuel for aviation, the technology for 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 sugarcane farm
- In 2024 : Volume of carbon credit sell volume is 215,700 tCO_2e and REC is 715,700 kWh

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.

Development of Water Management for Sugarcane Farm 2024

■ Collaboration with Government Agencies

Royal Irrigation Department

Projects: 3 Area Covered: 19,000 rai
Sugarcane Support Area: 8,700 rai

Land Development Department

Ponds Constructed: 210
Covered: 1,050 rai Direct
Sugarcane Support: 1,050 rai

Department of Groundwater Resources Projects

Executed: 75 groundwater project
Area Covered: 2,250 rai
Sugarcane Support Area: 750 rai

■ Solar Panel Systems for Water Pumping

Installation of 2,000 sets of solar panel systems for water pumping , this initiative uses renewable energy to reduce dependency on traditional water distribution systems, enhancing energy efficiency and water availability.

MITR PHOL GROUP

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