



**MITR PHOL GROUP**  
**Task Force on Climate-related Financial**  
**Disclosures Report 2022**

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# Mitr Phol's Philosophy

Over half a century, Mitr Phol group has been conducting the cane and sugar business to be the world-class sugar and bio-based leader by integrated agribusiness model with innovative technology and management talent under the following working philosophy.



## **STRIVE FOR LEADERSHIP**

At Mitr Phol, we aim to produce and offer high quality products for our consumers with the best of our efforts in every process we do



## **BELIEVE IN THE VALUE OF HUMAN DIGNITY**

At Mitr Phol, we have a firm conviction that human resources are the most valuable assets of the organization. We take pride in encouraging every team member to gain knowledge and skills in what they do. It is our commitment to enhance the performance of Mitr Phol Group by combining the individual talents of our human resources



## **STAND TALL IN FAIRNESS**

At Mitr Phol, we conduct our business with utmost integrity and are fair in dealing with our stakeholders, especially our employees, farmers, buyers, suppliers and consumers



## **RESPONSIBLE FOR SOCIETY**

At Mitr Phol, we are committed to operate our business under the respected principle of “Grow Together” that emphasizes on social and environmental development no less

For more information: <https://www.mitrphol.com/about-us.php>

## Mitr Phol's Sustainability

Mitr Phol Group is a global sugar producer and the largest sugar producer in Asia. Our major businesses include sugar, renewable energy, wood substitute materials, fertilizer, logistics and warehouse, etc. such as bio-based products, plant-based food, and yeast extracted and specialty product. As a group of companies, we play an important part in the Thai economy, especially in the Thai agricultural sector, cane farmers' lives, and the lives of individual consumers.

We have committed to executing a business with social and environmental responsibilities in order to empower the economy and community. We realize the importance of the circular economy, which not only aims at effectively utilizing natural resources but also emphasizes upcycling through the use of innovation and technology in order to achieve the most efficient use of natural resources while balancing the environment.

These are linked to our ESG commitment to help stakeholders improve their economy and to provide transparency into our environmental sustainability practices.

For more information: <https://www.mitrphol.com/sustainability>

For more information: <https://www.mitrphol.com/sustainability/framework>

## Mitr Phol Group in action to respond to climate change



As agricultural-based businesses, we realized that climate change causes not only atypical weather but also creates an unavoidable impact on our value chains. Therefore, climate change has been embraced to play an important role in our maternity since 2016, which is part of the environmental pillar of the sustainable development goal.

Additional, In August 2022, we decided to declare our commitment by pursuing the two goals of "reduction of 50% of GHG emission in line with science base target and offset all of the residue emissions to achieve a carbon neutral organization by 2030" and achieving "net zero" by 2050. As an additional target for reducing CO<sub>2</sub> emissions, we acquired 1.5°C verification from the Science Based Targets initiative (SBTi).

For more information: <https://www.mitrphol.com/sustainability/net-zero>

## About TCFD Framework

The Task Force on Climate-related Financial Disclosures (TCFD) is an enterprise launched by the Financial Stability Board (FSB), an international body founded with support from G20 members, to promote international financial stability by encourage businesses disclosure the climate-related information with financial implication in annual reporting.

The TCFD recommendations is a framework for companies to provide quantitative and qualitative information which are grouped into 4 areas or core element of governance, strategy, risk management, and metrics and targets.



**Pic 1 :** The Core Element of Recommendation Climate-Related Disclosures

In 2022 is the first year of Mitr Phol Group initiative of TCFD Recommendation. It was introduced to all business unit by assessing the climate change related risks and opportunities through a conducting of climate change scenario analysis. Also, in August 2022, Mitr Phol Group announced its net zero ambition in 2050 and committed to pursuing an ambitious 1.5 °C aligned to science-based target in 2030. The GHG emission reduction will be driven by 5 core activities such as scaling up of using renewable energy, reshaped business model by increasing of bio circular green product or BCG business model applying a modern farm model, reforestation and applying of a state of art of an eco-friendly technology and investment in carbon capture utilization and storage (CCUS) technology. Aside from those ambitions, we aim to become a "carbon neutral organization" by 2030 by taking action to reduce

emissions from scope 1, scope 2, and scope 3 in accordance with the science base target and offsetting residue emissions to achieve carbon neutrality in 2030.

Even if we are in an early stage of our journey to a net-zero pathway and this is our first year of the TCFD report, it provides important disclosure information regarding climate-related financials to our investors, partners, and broader stakeholders.

# 1. Governance

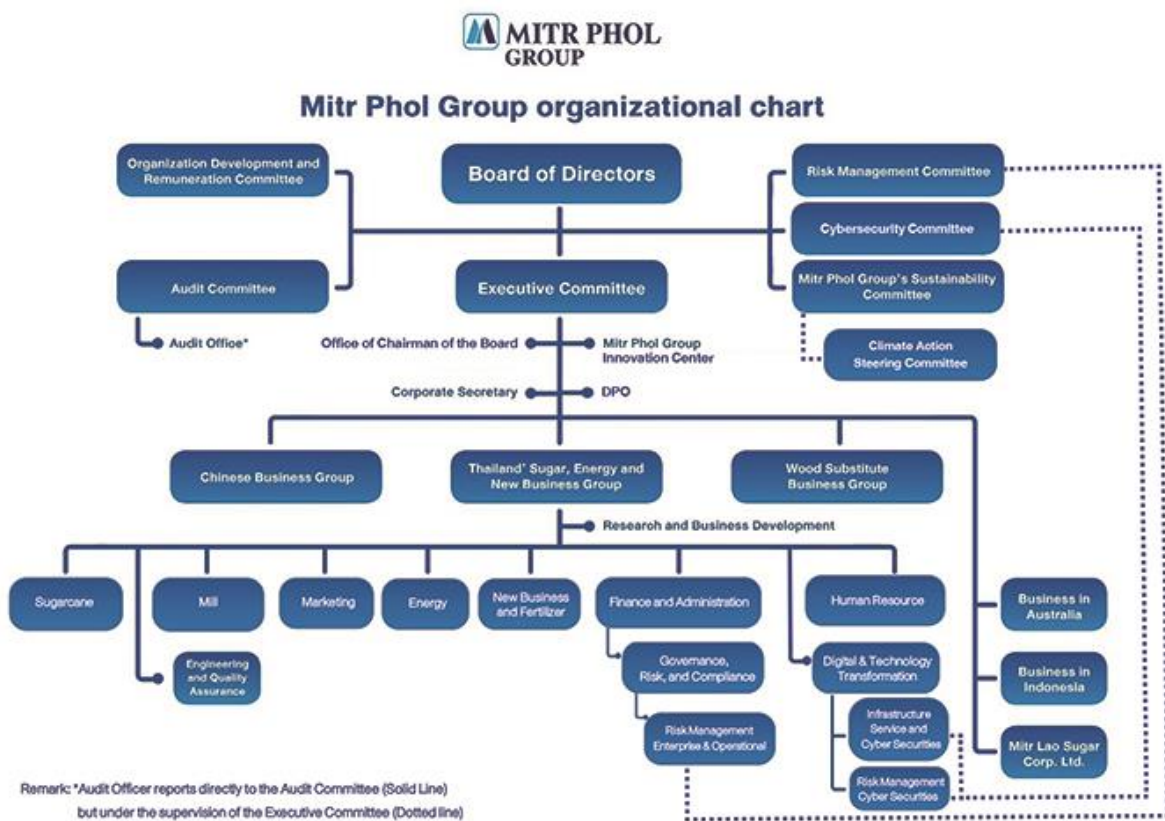
## 1.1 The Organization's governance around climate-related risks and opportunities

Mitr Phol has established Group's sustainability committee, Risk management committee (RMC) and climate action steering committee to monitor and manage climate-related strategies by oversight of Mitr Phol Group's Board of Directors (BOD).

Governing Body	Role and Responsibility	Meeting Frequency
<b>Mitr Phol Group's Board of Directors (BOD)</b>	BOD is ultimately collectively responsible for oversight of all strategic matters and supervision and control of all group's business unit. The BOD has four standing committees, each committee has its own responsibility; the organization development remuneration committee, the audit committee, the risk management committee and The sustainability committee.	At least once a year
<b>Mitr Phol Group's sustainability committee</b>	The sustainability committee is responsible for oversight duties in respect of the group's sustainability strategy and development. The responsibilities included sustainability policy, performance relating to ESG and the climate change issue, where the climate change impact and organization greenhouse gas emissions are important parts of materiality.	Quarterly
<b>Risk management committee (RMC)</b>	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



Governing Body	Role and Responsibility	Meeting Frequency
<b>The climate action steering committee</b>	This steering committee was established in 2022. The responsibility is to provide consultation, guidance, and overarching on the climate change strategy and risk issues related to climate change to Mitr Phol Group's sustainability committee, including the climate change strategy and climate change related risk.	Quarterly



**Pic2**: Mitr Phol Group organization chart

## 1.2 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 the operational level, sustainability management was established into 3 divisions to manage day-to-day work such as sustainable development, governance risk and compliance, and sustainable community development. Concerning climate-related risks and issues, two major departments, enterprise and



operational risk management and sustainable development, share responsibility. These departments work together to identify business and climate change-related risks and opportunities. Furthermore, the results of risk and opportunity assessments are collected in ESG and reported to the executive committee on a quarterly basis, which will be a materiality for RMC in risk strategy planning.



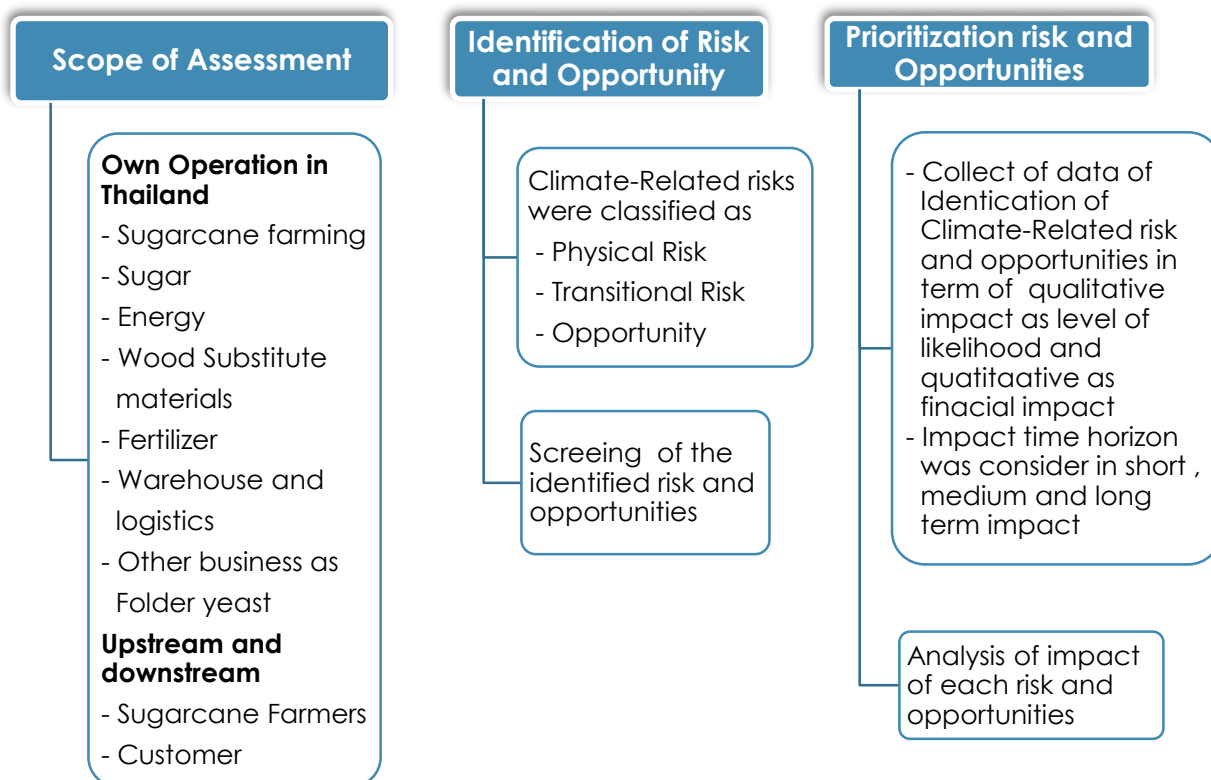
**Pic3:** Mittr Phol Group organization chart that related-in climate risks and opportunities

For more information: [https://www.mittrphol.com/pdf/Sustainability\\_Report\\_2021.pdf](https://www.mittrphol.com/pdf/Sustainability_Report_2021.pdf)

## 2. Strategy

### 2.1 Short, Medium and Long-term The climate-related risks and opportunities

Mitr Phol Group has assessed the climate-related risk and opportunities in associated to TCFD recommendations. We conducted assessment in order to identify, analyze and evaluate major climate-related risks and opportunities. To this end, risk has been categorized into physical risk and transitional and analyzed and evaluated of opportunities, accounting for difference time horizons and difference climate change scenarios. The scope of assessment includes the major operation on Thailand such as sugarcane farming, sugar business, energy business, wood substitute materials, fertilizer, warehouse and logistics and other business as folder yeast etc.



**Pic 4:** Climate Related Risk Assessment Approach

#### 2.1.1 Scope of Climate related risk assessment

The assessments of climate related-physical and transition risk were developed including own operation, upstream and downstream with following detail;

### **Physical Risk:**

All assets in Thailand and all business units were covered under in this assessment (**context-specific assessment**) of the physical impacts of climate change. In addition, Physical risk (drought, storm, flood, temperature) are evaluated using four physical indicators based on **qualitative and quantitative** analysis under two climate scenarios (**RCP 2.6 and RCP8.5**). In addition, this assessment was conducted based on **short (2030), medium- (2040), and long-term (2050)** by considering asset's expected lifetime and activities

### **Transition Risk:**

Assessment of transition risk is based on **legislation and policy** condition based on **short- (2030), medium- (2040), and long-term (2050)** based qualitative and quantitative climate-related scenario analysis. The assessment is developed for 2 aspects (indirect and direct impact). In addition, the evaluation of transition risk will be analyzed under World Energy Outlook (WEO) scenarios recommended by IEA, including: **STEPS: State Policy, AP: Announced Policies Scenario, SDS: Sustainable Development Scenario and NZE: Net Zero Emissions by 2050 Scenario**



Time Horizon	IPCC Scenario – Physical Risk	Aspect of Impact of Transitional Risk	Scenario –Transitional Risk
Short term - 2030	<b>RCP 2.6 :</b> Global temperature well below 2°C	<b>Direct impact:</b> Focusing on financial impact of carbon tax  Noted: As per today's carbon tax in Thailand, in the phase of policy study, the carbon tax structure of Signore is applied for financial impact analysis instead, with the reason that Singapore is considered the closest peer who has adopted carbon tax as a policy instrument to mitigate GHG in the Asian region.	<b>STEPS: State Policy</b> Current policy and previously announced policies announced by Thai governments (Implemented in 2015 after COP21)
Medium Term 2031-2040			<b>AP : Announced Policies Scenario</b> /All climate commitments of Thai governments, including Nationally Determined Contributions (NDCs) and longer-term net zero targets, will be met in full and on time (Announced at COP26 in 2021)
Long Term 2041-2050	<b>RCP 8.5 :</b> Global temperature rising above 4°C	<b>Indirect impact:</b> Focusing on increase in purchased electricity prices due to strict policy and regulation.  Noted: To analysis indirect impact, the China's carbon price scenario was applied since China is the closest related country referring to International Energy Association (IEA) forecast report	<b>SDS : Sustainable Development Scenario</b> Allied with Paris Agreement but without any net negative emissions, this scenario is consistent with limiting the global temperature rise to 1.65 °C  <b>NZE: Net Zero Emissions by 2050 Scenario</b> Setting out a narrow but achievable pathway for the global energy sector to achieve net zero emissions by 2050

## 2.1.2 Overview of Physical Risk

Risk type	Description	Impact on Business
<b>Drought</b>	<ul style="list-style-type: none"> <li>• A period of dryness with no rain or unusually low levels of typical rainfall or other precipitation.</li> <li>• The projection of drought use the SPEI index (The standardized Precipitation Evapotranspiration Index or Mean Drought Index)</li> <li>• The SPEI is designed to take into account both precipitation and potential evapotranspiration (PET) in determining drought. Positive values indicate positive water balance (or wet) conditions and negative values indicate negative water balance (or dry) conditions.</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>• Raw materials (sugarcane and cassava) are in shortage due to decreased yield per area.</li> <li>• Insufficient quantity of raw water for farmer and supplier</li> <li>• Potential of infestation of pests such as longhorn beetle</li> </ul> <p><u>Own operation</u></p> <ul style="list-style-type: none"> <li>• Change in the product quality as sweetness that may impact sale production and income</li> <li>• Increase in operational cost due to water shortage</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>• The risk of pre-made prices causes no products to deliver to customers and may cause monetary damage in repurchase from the market</li> </ul>

Risk type	Description	Impact om Business
<p><b>Flood</b></p>	<ul style="list-style-type: none"> <li>• A period of high precipitation which results in an overflowing of a large amount rainfall or an unexpected of water over land</li> <li>• The projection of rainfall data conduct by The <b>Average Largest 5-day cumulative Rainfall</b> refers to maximum of cumulated precipitation over consecutive 5-day periods.</li> <li>• This index is applied at the international level in climate projections for the hazard mapping of large basin floods more likely to be caused by lengthy periods of heavy precipitation over a large region. This index is significantly related to a flooding event, which has the potential to cause flooding at small local scales and widespread flood disasters<sup>1</sup>.</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>• Decrease in agricultural raw materials due to delay of growth period of sugarcane and cassava</li> <li>• Reduction in sugarcane planting area</li> <li>• Increase in sugarcane borer due to high humidity</li> <li>• The transport of raw materials was interrupted</li> </ul> <p><u>Company's Operation (Own operation)</u></p> <ul style="list-style-type: none"> <li>• Reduction in fermentation efficiency for the ethanol product</li> <li>• Production interruption</li> <li>• Damaged buildings</li> <li>• Employee unable to travel to work</li> <li>• Product damaged during transportation</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>• Late delivery causing customers to stop their production line</li> <li>• Insufficient products for customers and monetary damage</li> </ul>

Risk type	Description	Impact on Business
<b>Strom</b>	<ul style="list-style-type: none"> <li>An extreme weather with strong winds, lighting and hailing</li> <li>The <b>Sustained Wind Speed</b> refers to an average wind speed in an average period of one, three, or ten minutes, depending upon the regional practices<sup>2</sup>. It is the basis for the Tropical Cyclone Warning Signals<sup>3</sup> and has been integrated as a part of many critical tropical storm or important hurricane indexes.</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>Decrease in agricultural raw material due to uproot which result from extreme wind speed</li> <li>Increase in accident case of farmer due to lighting</li> <li>Increase in possibility of wild-fire due to lighting and wind speed</li> </ul> <p><u>Own operation</u></p> <ul style="list-style-type: none"> <li>Increase the frequency of power outage due to damaged transmission line</li> <li>Production interruption</li> <li>Unable to sell renewable electricity due to the damaged high-voltage transmission line</li> <li>Hail can damage solar panels</li> <li>Damaged buildings</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>Insufficient products for customers and monetary damage</li> </ul>



Risk type	Description	Impact on Business
<p><b>Increasing Temperature</b></p>	<ul style="list-style-type: none"> <li>• The slightly increase in temperature at Earth's surface due to heatwave.</li> <li>• The <b>Average maximum temperature</b> refers to average of maximum temperature of certain area on yearly basis.</li> <li>• This index is used to determine the highest temperature that represent the most severe damage as a result of climate change.</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>• Raw material shortage (sugarcane &amp; cassava) due to increase in soil salinity and disease, in sects and weeds</li> <li>• Quality control problems of raw material due to faster deterioration rate</li> <li>• Increase in possibility of wild-fire</li> </ul> <p><u>Own operation</u></p> <ul style="list-style-type: none"> <li>• Decreased in quality of product due to the Shorter self-life than its typical self-life</li> <li>• Shortened equipment life (Electronic equipment, motor)</li> <li>• Higher evaporation of the raw water</li> <li>• Higher evaporation of ethanol in the storage tank</li> <li>• Higher the temperature of fuel pile, risking of fire.</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>• Insufficient products for customers and monetary damage</li> </ul>

<sup>1</sup> Detectable Human Influence on Changes in Precipitation Extremes Across China - Xu - 2022 - Earth's Future - Wiley Online Library

<sup>2</sup> <https://severeweather.wmo.int/tc/wnp/acronyms.html>

<sup>3</sup> [Gust vs Sustained Wind \(hko.gov.hk\)](http://www.hko.gov.hk)

<sup>4</sup> Technical Documentation: Tropical Cyclone Activity (epa.gov)

## 2.1.3 Overview of Transition Risk

Transitional Risk	Description	Impact on Business
<b>Market</b>	<ul style="list-style-type: none"> <li>Shifts in supply and demand for certain commodities, products and services as climate-related risks and opportunities are increasingly taken into account.</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>Farmer and supplier receive more pressure to to change farm management to be the same line with Bonsucro certification</li> </ul> <p><u>Own operation</u></p> <ul style="list-style-type: none"> <li>Higher investment cost of production and research on low carbon products</li> <li>Higher cost of quality control</li> <li>Reduce in sale of ethanol as pre the change behavior of customer in fossil fuel</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>Customer changing behavior from fossil car to EV will effect demand in ethanol</li> <li>Increase in customer request for Carbon Label and Bonsucro Certification</li> </ul>

Transitional Risk	Description	Impact on Business
<b>Technology</b>	<ul style="list-style-type: none"> <li>▪ Technological improvements or innovations that support the transition to lower-carbon, energy-efficiency</li> <li>▪ The disruption caused by the displacement of old systems by new technology</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>• Increase in raw material cost such as biomass fuel due to the more demand in clean energy</li> </ul> <p><u>Own operation</u></p> <ul style="list-style-type: none"> <li>• technologies that rely on unclean energy may not be able to part of operate due to obsolescence or lack of fuel</li> <li>• Higher cost of developing technology due to the investment in new technologies of low emission</li> <li>• Higher cost due to fuel shift from high emission fossil fuel to biomass</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>• Increase in expectation of the customer and business partner for the adaptation of clean technology which may result in higher prices of the product</li> </ul>

Transitional Risk	Description	Impact on Business
<p><b>Policy - Legal</b></p>	<ul style="list-style-type: none"> <li>▪ Policy actions that attempt to constrain actions that contribute to the adverse effects of climate change</li> <li>▪ Policy actions that seek to promote adaptation to climate change</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>• Higher raw material costs due to strict regulations</li> </ul> <p><u>Own operation</u></p> <ul style="list-style-type: none"> <li>• Decrease demand of Ethanol in next 10 years due to Thailand EV roadmap 2030 that target to increase Electricity Vehicle by using tax incentive for both the car makers and buyers.</li> <li>• Thailand's energy policies and regulations may enforce a charge on such emissions fuels, so it will have an indirect impact on business energy costs.</li> <li>• Increase the cost for improvement the organization to be in accordance with the law</li> <li>• Increase in EU strictness on importing timber products, according to EU Green deal and implementation of BIO-Diversity and Deforestation law.</li> <li>• Higher cost due to the modification of the transport fleet or being fined for fossil fuel</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>• Obstacle to expanding the business due to violation of the law</li> </ul>

Transitional Risk	Description	Impact on Business
<b>Reputation</b>	<ul style="list-style-type: none"> <li>Changing customer or community perceptions of an organization's contribution to or detraction from the transition to a lower-carbon economy</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>Farmers shift cultivation from sugar cane to other agricultural products more profitable due to the impact of climate change</li> </ul> <p><u>Own operation</u></p> <ul style="list-style-type: none"> <li>Reputation and recognition from customer conscious on product and organization</li> <li>Reputation on brand value may effect on decreasing of revenue</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>Higher complexity in trading with partners such as the GHG reduction assessment in purchase conditions</li> <li>Obstacle to expanding the business due to the lack of confidence of stakeholders in environmental protection of the organization</li> </ul>

## 2.1.4 Overview of Opportunity

Transitional Risk	Description	Impact on Business
<p><b>Renewable energy:</b></p> <p><b>(Resource Efficiency, Energy source, Products and services, Market)</b></p>	<ul style="list-style-type: none"> <li>In the future, the increase in demand of renewable due to net zero policy and progression of technology energy positively impact on bio-energy business of Mitr Phol (Bio-mass power plant and Bio-fuel). Thus, the cost saving and revenue from renewable energy trend to increase.</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>Increase in saving cost of farmer due to renewable energy</li> </ul> <p><u>Own operation</u></p> <ul style="list-style-type: none"> <li>Increased revenue from the demand of clean energy such as bio-mass power plant</li> <li>Cost reduction on renewable energy technology</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>Increase in capability to encourage customers to achieve carbon target in 2050 by reducing GHG emission scope 1 and 2.</li> </ul>
<p><b>Low carbon product</b></p> <p><b>(Products and Services, Market and Resilience)</b></p>	<ul style="list-style-type: none"> <li>According to the increase in demand of low carbon product due to changing in customer behavior, Mitr Phol has potential to increase portion of sustainable and low carbon market production. The product diversification can encourage resilience of Mitr Phol's business in the future</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>Increase in quantity and quality of low carbon raw material</li> </ul> <p><u>Own operation</u></p> <ul style="list-style-type: none"> <li>Increase in income from environmentally friendly products have an upward trend</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>Increase in capability to encourage customers to achieve carbon target in 2050 by reducing GHG emission scope 3.</li> </ul>

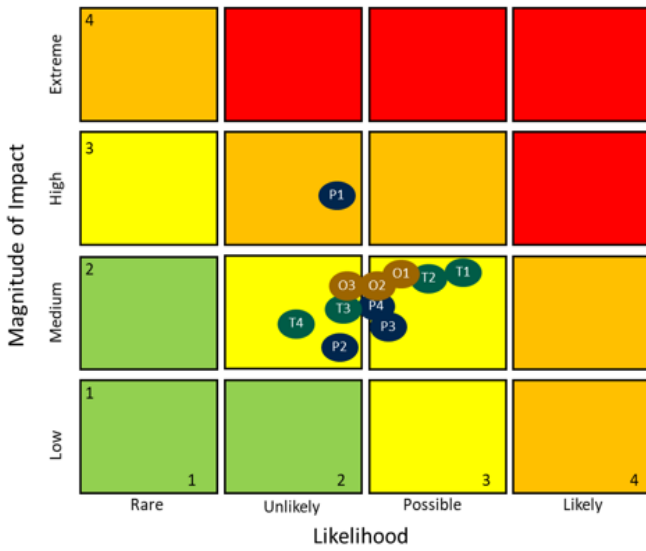
Transitional Risk	Description	Impact on Business
<b>Carbon market:</b>  <b>(Products and Services, Market)</b>	<ul style="list-style-type: none"> <li>▪ According to COP26 and global trend, several companies commit to achieve carbon neutral in 2030 and net zero emission in 2050. Therefore, the carbon credit in the market will not sufficient. This can result in the extremely increase in carbon credit's price in 2050 (SBTi scenario).</li> </ul>	<p><u>Upstream</u></p> <ul style="list-style-type: none"> <li>• New income from the carbon removal for the farmer and sustainable supplier from selling carbon credit or RECs</li> </ul> <p><u>Own operation</u></p> <ul style="list-style-type: none"> <li>• Generate profit from selling RECs and carbon credit</li> <li>• Create a new market for trading</li> <li>• Create brand image and an opportunity to compete in the market from low carbon products</li> </ul> <p><u>Downstream</u></p> <ul style="list-style-type: none"> <li>• Increase in capability to encourage customers to achieve carbon neutrality target</li> </ul>

## 2.2 The impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

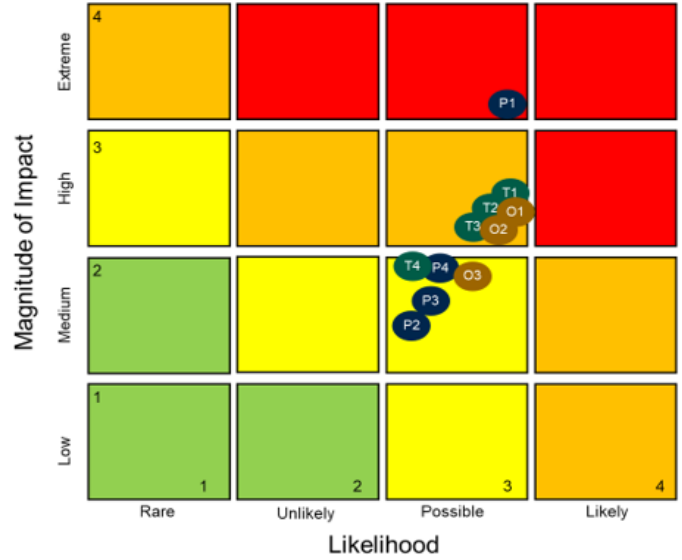
Consideration of materiality which is related to climate change, risk assessment was conducted based on climate change scenarios through all business units. The impact on operation and financial were identified as well as the opportunities. The screening result of physical risk, drought is prioritized to be the most likelihood and generate impact on business units in all time frame, and the regulation is the most concerning of transitional risk.



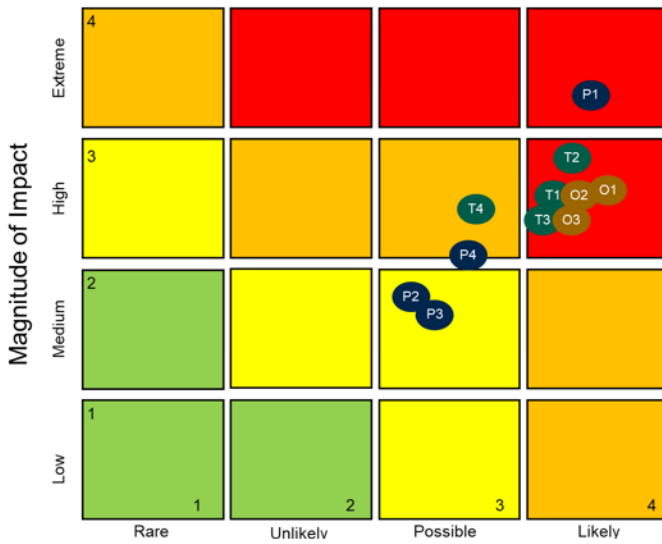
## 2.2.1 Risk Prioritization



Short term: 2023-2024



Medium term: 2025-2027



Long term: 2028-forward

### Physical Risks:

- P1 Drought (acute)
- P2 Storm (acute)
- P3 Flood (acute)
- P4 Increase in mean temperature (chronic)

### Transition Risks:

#### Market

- T1 Changing in customer behavior

#### Technology

- T2 Changing in technological innovation

#### Policy / Legal

- T3 Changing in Regulations/policies

#### Reputation

- T4 Changing in Stakeholder mindset

### Opportunities:

- O1 Renewable energy: Increase in demand of renewable energy
- O2 Low carbon product: Increase in demand of Low-emission products and service
- O3 Carbon market: Increase in demand of carbon offset

### Risk Type and Opportunity





## 2.2.2 Difference of Time Horizon of risk prioritization and Scenarion

Time Horizon applied in risk prioritization is differ from the time horizon on scenario as follow;

Time Horizon	Short term	Medium Term	Long Term	Remark
<b>Risk Prioritization</b>	2023-2024	2025-2027	≥2028	Risk Prioritization was approached based on historical data and then foreseen for an up-coming risk in the near future. Therefore, the timeframe will be shorter than Climate Risk Assessment.
<b>Scenario Analysis</b>	2030	2040	2050	Scenario Analysis was approached based on scientific information which demonstrates the climate-related impact overtime. In order to cover expected lifetime of the assets or activities, the timeframe is longer than Risk Prioritization.

## 2.2.3 Climate Risk Analysis

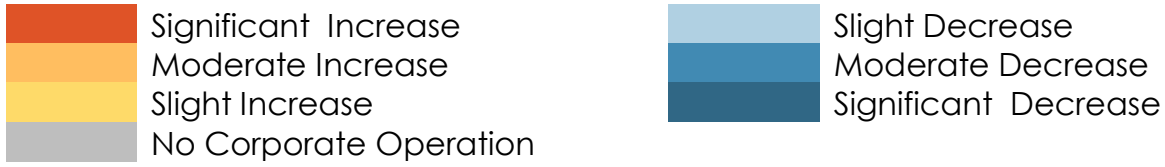
### 2.2.3.1 Physical Risk Scenario Analysis

Type of Physical Risk	Physical Risk Scenario Analysis
	<ul style="list-style-type: none"> <li>▪ RCP2.6: In 2030 and 2040, a slight drought will occur in all provinces where Mitr Phol sites, upstream and downstream are located, while the drought will lessen in 2050.</li> <li>▪ RCP8.5: In 2030, all provinces will experience a slight drought while the drought impacts will lessen in 2040 and 2050.</li> </ul>
	<ul style="list-style-type: none"> <li>• RCP2.6: During 2030-2050, a significant increase in floods is found in all provinces, especially in central provinces, while floods in Khon Kaen province, where is situated in the north earthen part of Thailand, will slightly decrease.</li> <li>• RCP8.5: During 2030-2050, floods will significantly increase in western and southern provinces</li> </ul>
	<ul style="list-style-type: none"> <li>▪ RCP2.6: Intensity of storms will slightly increase in 2030, 2040, and 2050.</li> <li>▪ RCP8.5: Intensity of storms will moderately increase in 2030, 2040 and 2050.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ RCP2.6: During 2030-2050, the mean temperature of almost provinces will increase, especially in Khon Kaen and Kalasin province, where is situated in the north earthen part of Thailand, that where are the highest mean temperature rise.</li> <li>▪ RCP8.5: Mean temperature of all provinces slightly increases in 2030 and moderately increases during 2040-2050.</li> </ul>

## 2.2.3.2 Result of Physical Risk Scenario Analysis

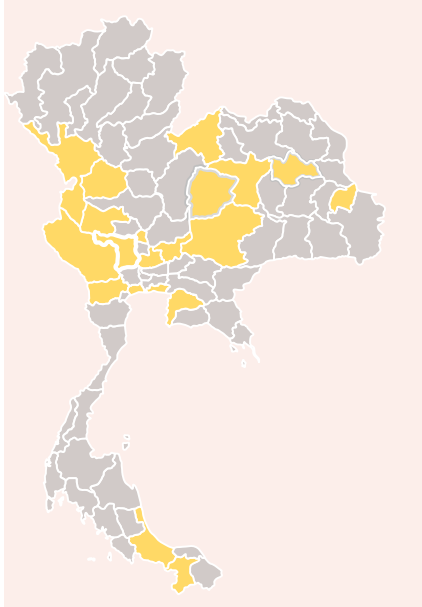
### Drought:

#### Impacts Heat Map

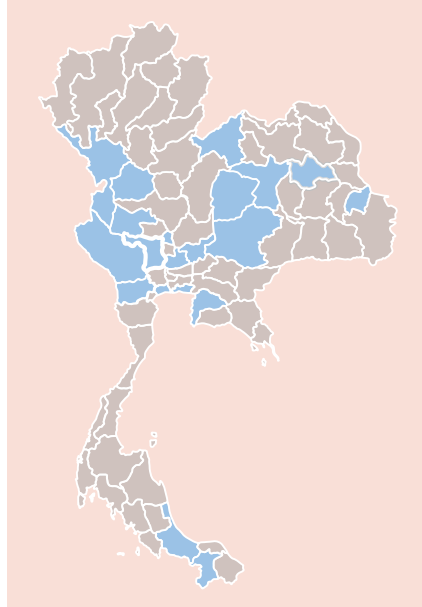


#### RCP 8.5

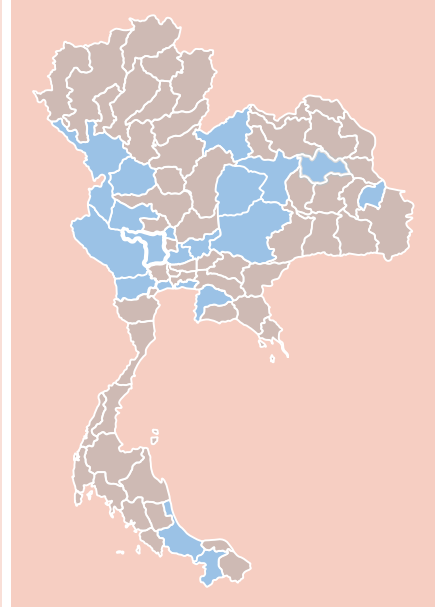
Baseline: 1986-2005



Short term - 2030



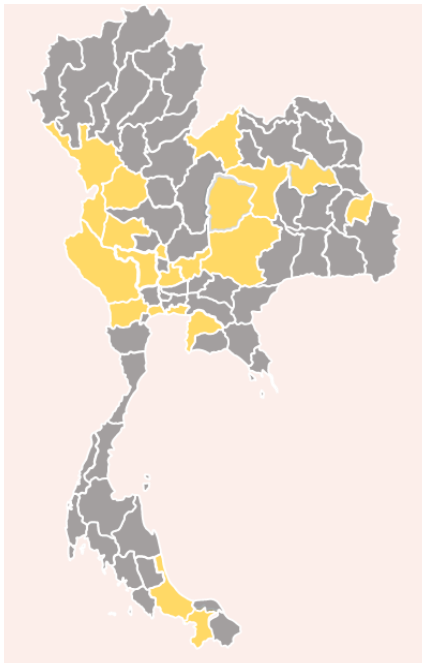
Medium Term - 2040



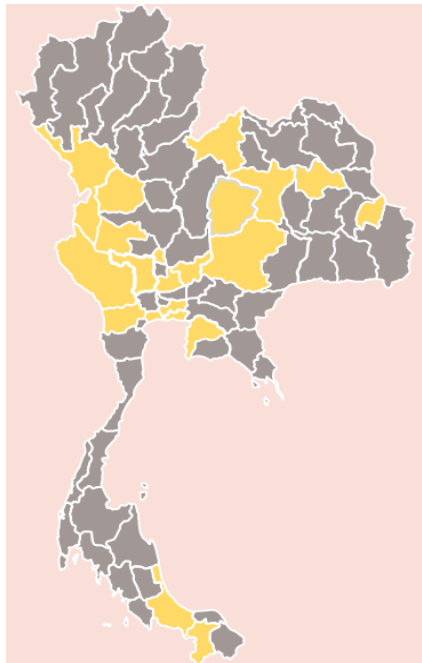
Long Term - 2050

#### RCP 2.6

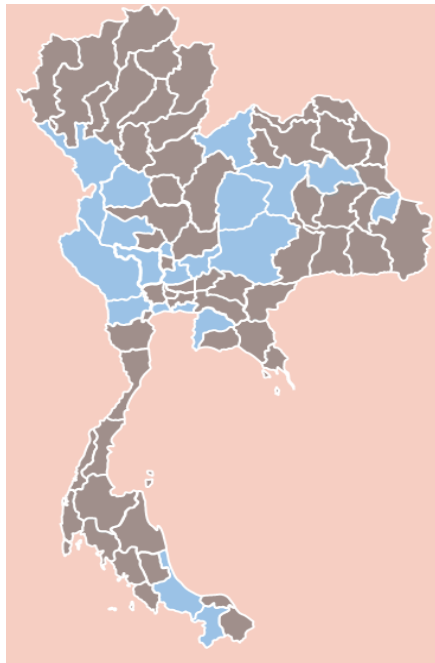
Baseline: 1986-2005



Short term - 2030



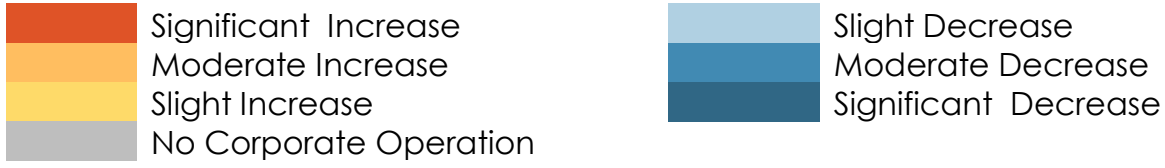
Medium Term - 2040



Long Term - 2050

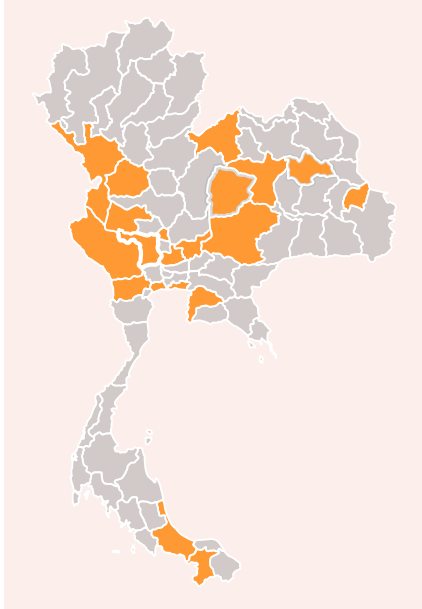
**Storm:**

**Impacts Heat Map**

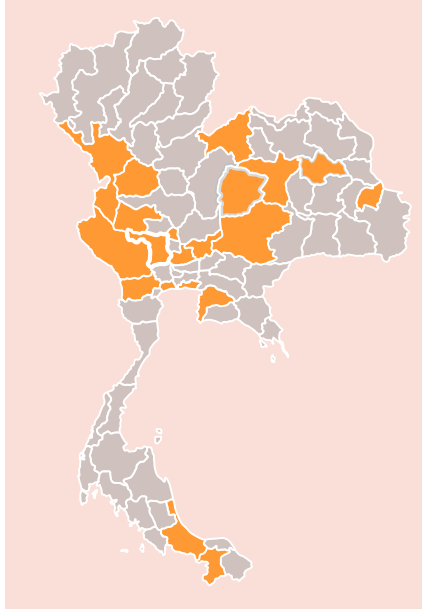


**RCP 8.5**

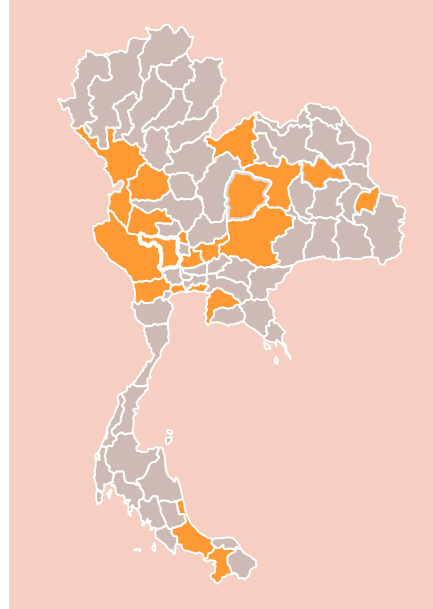
Baseline: 1986-2005



**Short term - 2030**



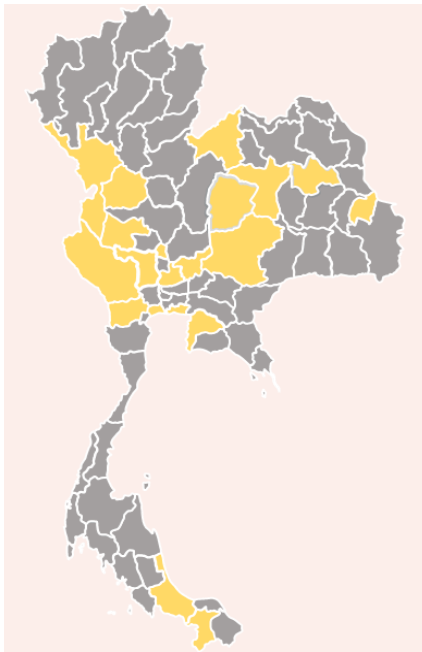
**Medium Term - 2040**



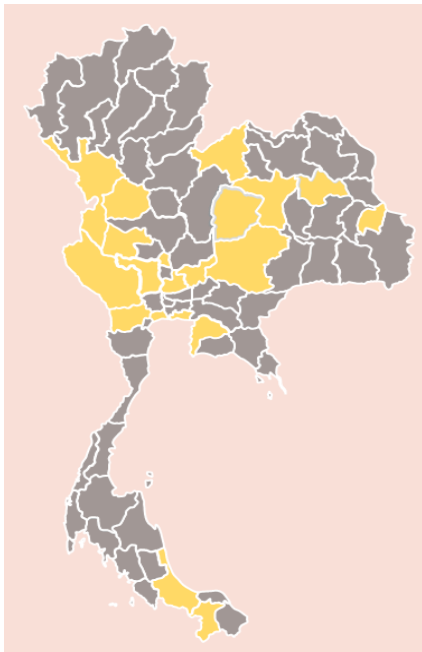
**Long Term - 2050**

**RCP 2.6**

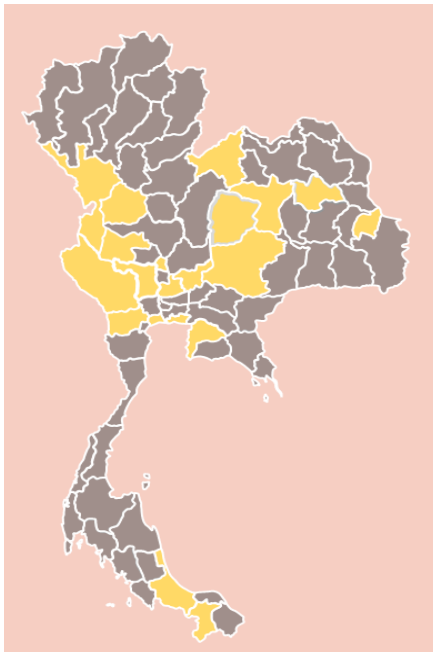
Baseline: 1986-2005



**Short term - 2030**



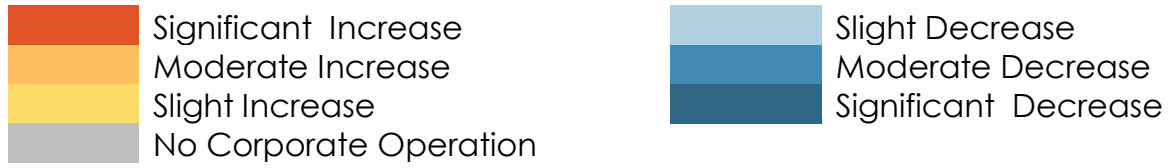
**Medium Term - 2040**



**Long Term - 2050**

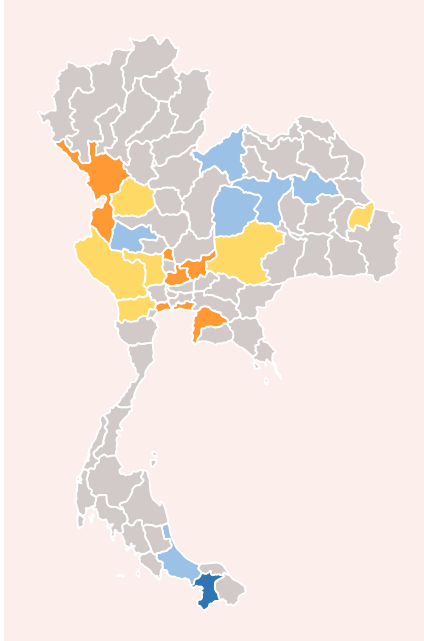
**Flood:**

**Impacts Heat Map**

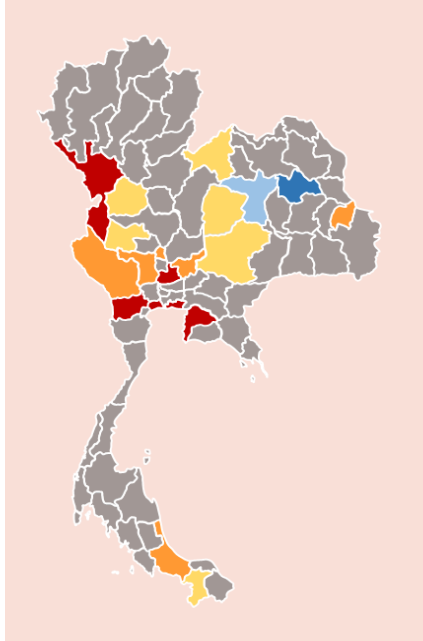


**RCP 8.5**

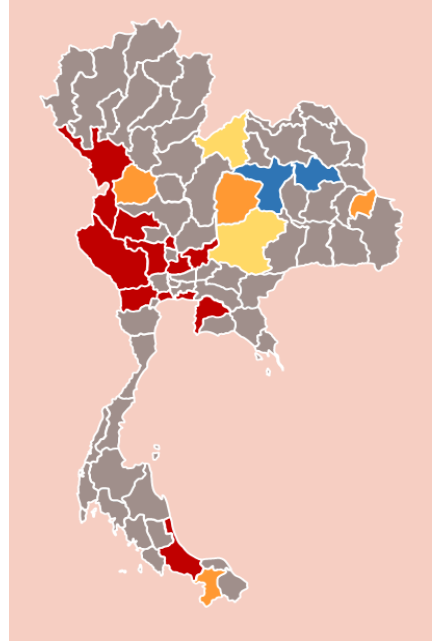
Baseline: 1986-2005



Short term - 2030



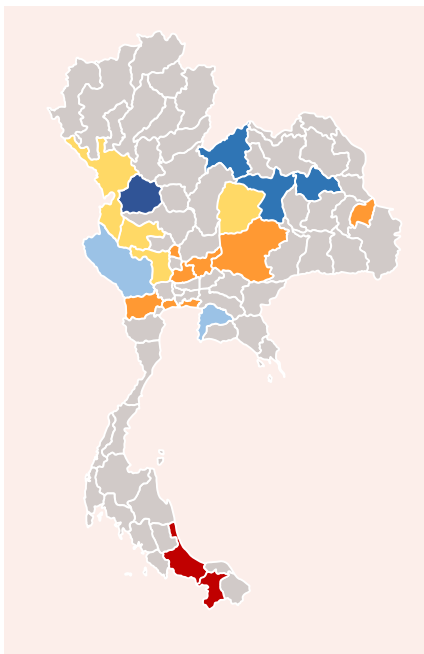
Medium Term - 2040



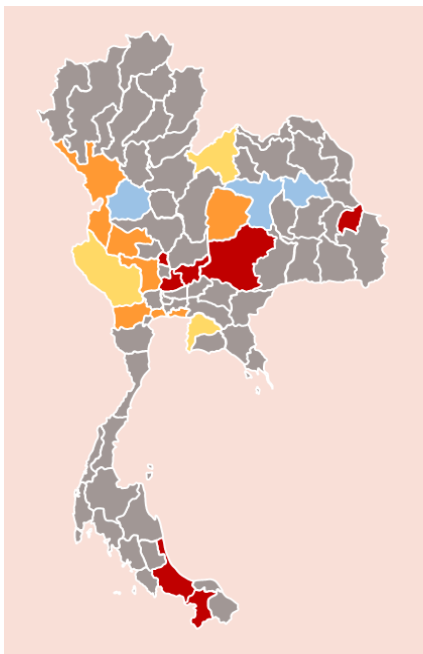
Long Term - 2050

**RCP 2.6**

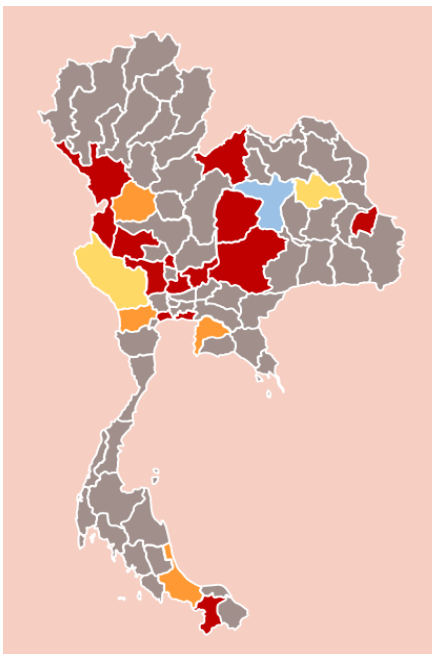
Baseline: 1986-2005



Short term - 2030



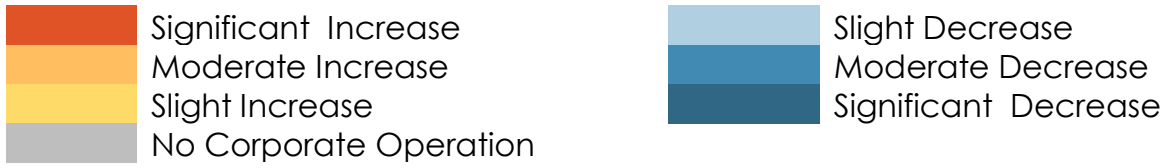
Medium Term - 2040



Long Term - 2050

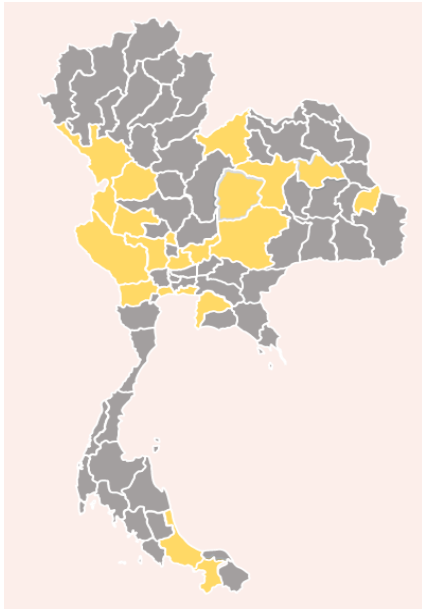
**Increased Mean Temperature:**

**Impacts Heat Map**

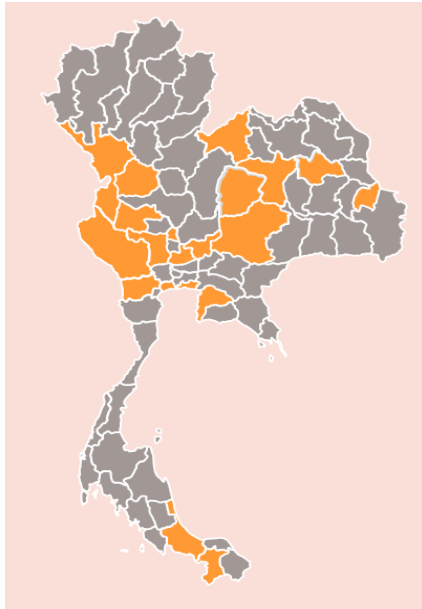


**RCP 8.5**

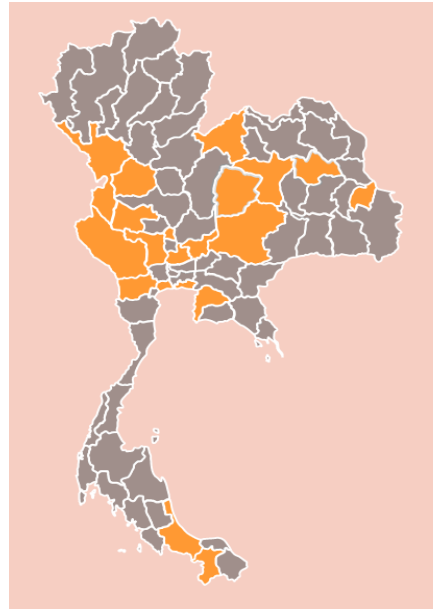
Baseline: 1986-2005



**Short term - 2030**



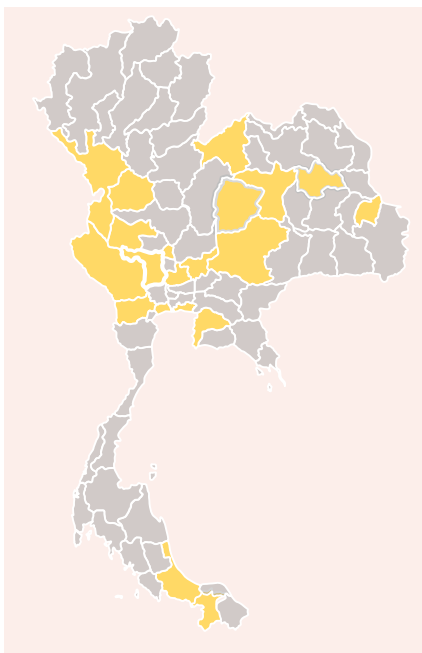
**Medium Term - 2040**



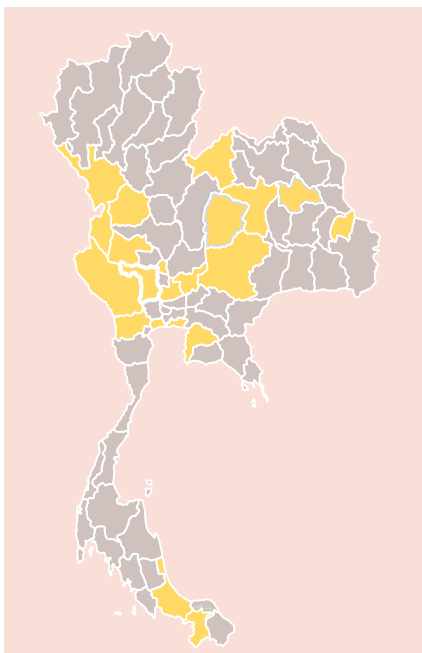
**Long Term - 2050**

**RCP 2.6**

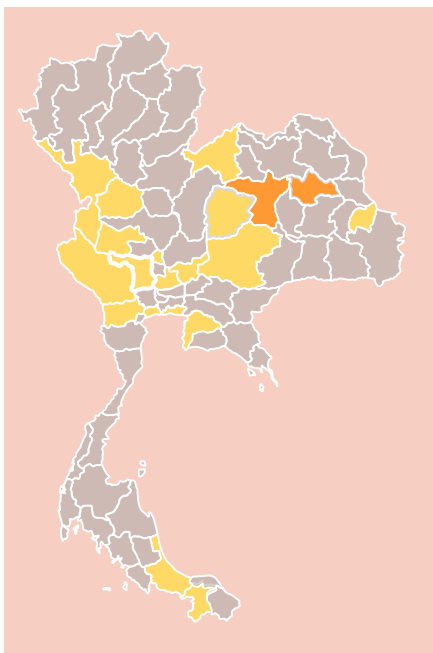
Baseline: 1986-2005



**Short term - 2030**



**Medium Term - 2040**



**Long Term - 2050**

## 2.2.4 Financial Impact due to Physical Risk

Even though the impact of climate change results in slight decrease in financial impact of drought over short- medium- and long- timeframe, the percentage of financial impact due to drought when compared with EBT over three timeframes are high. Therefore, the financial impact due to drought is categorized as extreme risk-level regarding risk criteria of Mitr Phol Group.

### Farm and Sugar

- Decrease in raw material (sugar cane) due to drought impact

### Logistic

- Increase in opportunity costs due to a decrease in bulk-raw sugar in the warehouse



### Energy

- Increase in alternative fuels to maintain the production of electricity
- Increase in opportunity costs due to a decrease in ethanol production
- Increase in opportunity costs due to a decrease in steam production
- Increase in opportunity costs due to a decrease in yeast production

### Fertilizer

- Increase in opportunity costs due to a decrease in fertilizer production

**Pic 5:** Financial Impact due to Physical Risk

**Remark:** Drought does not impact significantly on other business units such as wood substitute and tapioca starch.

Total Financial Impact due to Drought (Million Baht)	Year		
	2030 (Short term)	2040 (Medium Term)	2050 (Long Term)
RCP2.6 (temp rising below 2°C)	10,535	9,815	9,096
RCP8.5 (temp rising below 4°C)	9,972	8,862	7,773

Percentage of financial impact when compare with EBT (%)	Year		
	2030 (Short term)	2040 (Medium Term)	2050 (Long Term)
RCP2.6 (temp rising below 2°C)	19.20%	17.89%	16.58%
RCP8.5 (temp rising below 4°C)	18.18%	16.51%	14.71%



## 2.2.5 Financial Impact due to Transition Risk

Among those 4 transitional risks, the regulation was the highest consideration as it will create financial impact. The assessment aspects have done in regarding to:

- **Direct impact:**

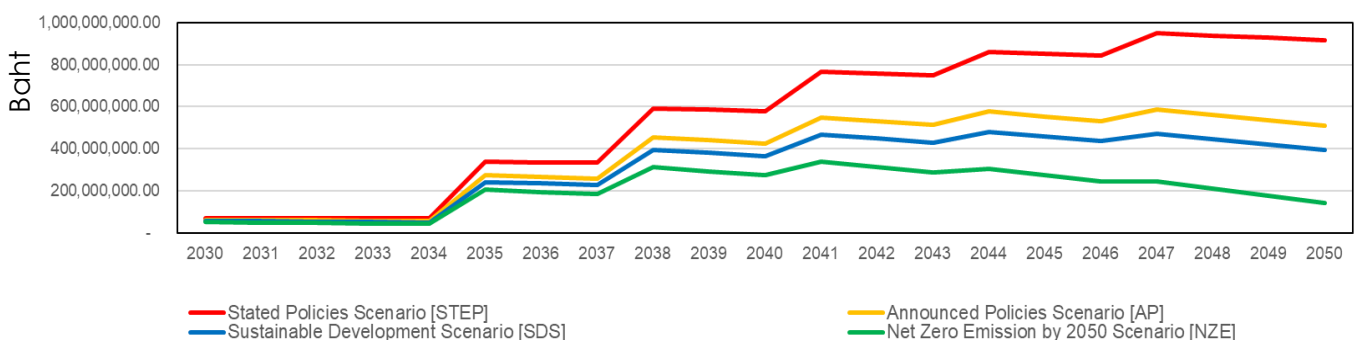
Focusing on a financial impact due to carbon tax. Singapore's carbon tax is applied as a reference policy due to the fact that Thailand has no policy on carbon tax currently.

- **Indirect impact:**

Focusing on increase in purchased electricity prices due to strict policy and regulation. China's carbon price scenario is applied according to IEA forecast report 2021.

### 2.2.5.1 Direct Impact from Carbon Tax

Under the STEP, AP, and SDS scenarios, the financial burden of the carbon tax will rise in 2030, 2040, and 2050, however it will decline from 2040 to 2050 under the NZE scenario, if Mirt Phol's GHG emissions policy, follow the NZE scenario. Comparing the outcomes of the various scenarios, STEP or the state policy resulted in the highest financial cost in all timeframes, amounting to 203 million baht in the short term, 580 million baht in the middle, and 916 million baht in the long term, while Net Zero emission 2050 (NZE) resulted in the lowest financial cost in all timeframes, amounting to 52 million baht in the short term, 274 million baht in the middle term, and 143 million baht for long term. The result of the financial impact of each scenario is illustrated below:



**Pic 6:** Direct Impact from Carbon Tax

**Noted:** Carbon price is projected based on China's carbon price scenario since China is the closest related country referred by IEA

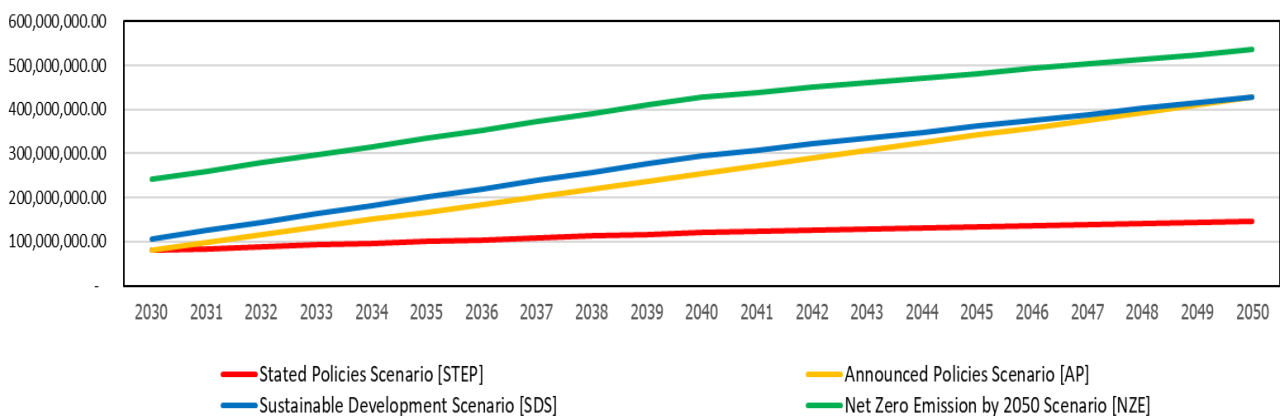
Financial Impact due to Carbon Tax (Million Baht)	Year		
	2030 (Short term)	2040 (Medium Term)	2050 (Long Term)
Projected BAU GHG emissions	203	1,830	3,253
Stated Policies Scenario [STEP] (> 2.0 °C)	72	580	916
Announced Policies Scenario [AP] (1.75 -2.0 °C)	63	426	511
Sustainable Development Scenario [SDS] (1.5 - 1.7 °C)	56	366	396
Net Zero Emission by 2050 Scenario [NZE] (<1.5 °C)	52	274	143

**Noted:** Carbon price is projected based on Singapore carbon tax structure

### 2.2.5.1 Indirect Impact from increasing the electricity cost

Under the STEP, AP, and SDS scenarios, the indirect financial burden of the electricity will rise in 2030, 2040, and 2050. Comparing each scenario, the state policy (STEP) resulted in the lowest financial cost in all time horizons, amounting to 80 million baht in the short term, 120 million baht in the middle, and 147 million baht in the long term, while Net Zero emission 2050 (NZE) resulted in the highest financial cost in all timeframes, amounting to 241 million baht in the short term, 428 million baht in the middle term, and 548 million baht for long term. The result of the financial impact of each scenario is illustrated below:

#### Result of Electricity Cost impact (Baht)



**Pic 7:** Indirect Impact from increasing the electricity cost

**Noted:** Carbon price is projected based on China's carbon price scenario since China is the closest related country referred by IEA

Financial Impact due to increase in electricity cost (Million Baht)	Year		
	2030 (Short term)	2040 (Medium Term)	2050 (Long Term)
Stated Policies Scenario [STEP]	80	120	147
Announced Policies Scenario [AP]	80	254	428
Sustainable Development Scenario [SDS]	107	294	428
Net Zero Emission by 2050 Scenario [NZE]	241	428	548

**Noted:** Carbon price is projected based on China's carbon price scenario since China is the closest related country referred by IEA.

### 2.2.5.2 Percentage of total financial impact compared with EBT

The percentage of financial impact due to transition risk both direct and indirect when compared with EBT over all timeframes and all scenarios are low. Therefore, the financial impact due to transition risk is categorized as low risk-level regarding risk criteria of Mitr Phol Group.

#### Direct Financial Impact

[Direct] Percentage of total financial impact when compare with EBT (%)	Year		
	2030 (Short term)	2040 (Medium Term)	2050 (Long Term)
Stated Policies Scenario [STEP]	0.13	1.06	5.93
Announced Policies Scenario [AP]	0.11	0.78	0.93
Sustainable Development Scenario [SDS]	0.10	0.67	0.72
Net Zero Emission by 2050 Scenario [NZE]	0.09	0.50	0.26

## Indirect Financial Impact

[Indirect] Percentage of total financial impact when compare with EBT (%)	Year		
	2030 (Short term)	2040 (Medium Term)	2050 (Long Term)
Stated Policies Scenario [STEP]	0.15	0.22	0.27
Announced Policies Scenario [AP]	0.15	0.46	0.78
Sustainable Development Scenario [SDS]	0.20	0.54	0.78
Net Zero Emission by 2050 Scenario [NZE]	0.44	0.78	0.98

### 2.2.5.4 Summary of direct and Indirect impact of transition risk

Transition risk can cause financial impacts due to climate-related regulations and policies, including:

- Direct impact due to carbon tax : Financial impact due to carbon tax will increase under STEP, AP, and SDS scenarios in 2030, 2040, and 2050 while decreasing from 2040 to 2050 under NZE scenario. If GHG emission of Mitr Phol is in line with NZE scenario
- Indirect impact due to increase in electricity cost: Financial impact due to increase in electricity cost will increase under STEP, AP, SDS and NZE scenarios in 2030, 2040, and 2050 due to the increase in ambition level of the national

### Both direct and indirect impact will cause total financial impact as

[Total Financial Impact due to transition risk Direct + Indirect impact (Million Baht)	Year		
	2030 (Short term)	2040 (Medium Term)	2050 (Long Term)
Stated Policies Scenario [STEP]	152	700	1063
Announced Policies Scenario [AP]	143	680	939
Sustainable Development Scenario [SDS]	164	660	825
Net Zero Emission by 2050 Scenario [NZE]	293	702	678

Percentage of total financial impact when compare with EBT (%)	Year		
	2030 (Short term)	2040 (Medium Term)	2050 (Long Term)
Stated Policies Scenario [STEP]	0.28	1.28	6.91
Announced Policies Scenario [AP]	0.26	1.24	1.94
Sustainable Development Scenario [SDS]	0.30	1.20	1.50
Net Zero Emission by 2050 Scenario [NZE]	0.53	1.28	1.24

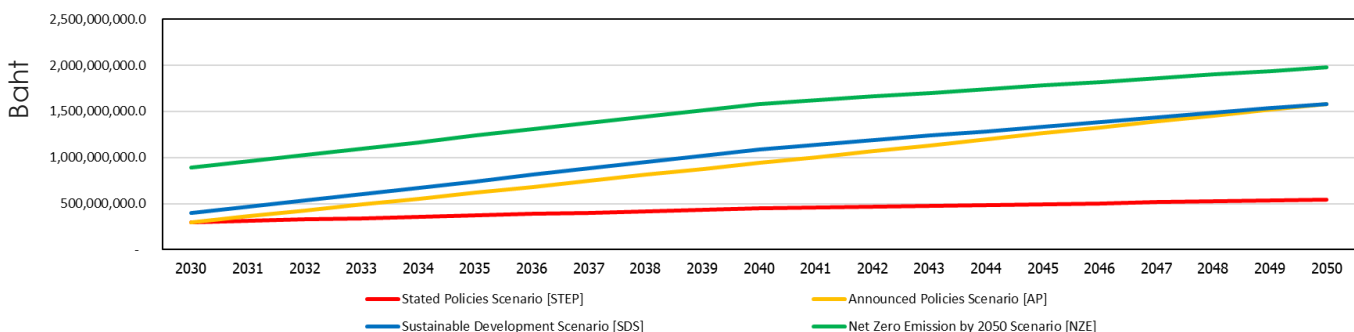
## 2.2.6 Summary of Opportunity related to climate change

Renewable energy was considered as the highest prospect compared to the others, such as low carbon products, because we can utilize raw materials from sugar cane factories for raw materials in renewable energy. Furthermore, increased demand for renewable energy will have a direct impact on the price of renewable electricity. In addition, the increase in electricity costs due to higher ambition can raise the prices of renewable electricity products from the Mitr Phol Group. According to the NZE scenario, the positive financial impact due to the increase in the price of renewable electricity will be 3.61% when compared with EBT in 2050, while the positive financial impact in the STEP scenario will be 0.99% when compared with EBT. Therefore, the higher level of ambition on the climate change issue results in a positive impact on renewable electricity generation of the Mitr Phol Group of Business.

### 2.2.6.1 Opportunity: Increase in renewable electricity price

#### Assumption:

% increase in electricity cost = % increase in price of renewable electricity product of Mitr Phol group



**Pic 8:** Increase in renewable electricity price

Positive financial impact due to increase in renewable electricity price (Million Baht)	Year		
	2030 (Short term)	2040 (Medium Term)	2050 (Long Term)
Stated Policies Scenario [STEP] (> 2.0 °C)	297	445	543
Announced Policies Scenario [AP] (1.75 -2.0 °C)	297	940	1,582
Sustainable Development Scenario [SDS] (1.5 - 1.7 °C)	396	1,088	1,582
Net Zero Emission by 2050 Scenario [NZE] (<1.5 °C)	890	1,582	1,978

### Positive Impact of Increase in renewable electricity price with EBT (%)

Percentage of total financial impact when compare with EBT (%)	Year		
	2030 (Short term)	2040 (Medium Term)	2050 (Long Term)
Stated Policies Scenario [STEP]	0.54	0.81	0.99
Announced Policies Scenario [AP]	0.54	1.71	2.88
Sustainable Development Scenario [SDS]	0.72	1.98	2.88
Net Zero Emission by 2050 Scenario [NZE]	1.62	2.88	3.61

In the case of opportunity, the result of each scenario of an increase in renewable electricity prices creates positive impact in terms of increased revenue. The financial impact that most creates value is the Net Zero Emission by 2050 (NZE), but the least impact on financial gain is the state policies (STEP). In the illustrated table above, the financial impact of NZE in all timeframes are 890 million baht in the short term, 1,582 million baht in the middle term, and 1,978 million baht for the long term, 1.62% in the short term, 2.88 % in the middle term, and 3.61% for the long term, according to the impact on EBT (%) of the same scenario. The financial impact of the STEP in all timeframes are 297 million baht in the short term, 1,445 million baht in the middle term, and 543 million baht in the long term, or 0.54% in the short term, 0.81% in the middle term, and 0.99% in the long term, according to impact with EBT (%).

Beside of the renewable energy, Mitr Phol Group have developed the low carbon products as illustrate in table below;

### Low Carbon Products

Products/ Services	volume in 2021	Estimated total avoided emissions / year (met.ton. CO <sub>2</sub> e)	Revenues from product (s) in FY 2021 (THB)	Remark
Refined sugar - CFR label (ton)	1.4 M	34,438.15	19,113 M	GHG reduction = 0.0247 kgCO <sub>2</sub> e/kg product*
Natural cane sugar - CFR label (ton)	0.08 M	1,489.84	3,009 M	GHG reduction = 0.0198 kgCO <sub>2</sub> e/kg product*
Syrup - CFR label (ton)	0.3 M	8,213.04	10,864 M	GHG reduction = 0.0252 kgCO <sub>2</sub> e/kg product*
Biomass electricity used in the sugar mill and ethanol production plant (Kwh)	469 M	227,077.93	Revenue across Power plant BU and sugar/ethanol BU THB.	- EF for biomass electricity = 0.0158 kg CO <sub>2</sub> e/kWh** - EF grid mix: EF = 0.4999 kg CO <sub>2</sub> e/kWh
Biomass steam used in the sugar mill and ethanol production plant (ton)	8 M	1,355,924.29	Revenue across Power plant BU and sugar/ethanol BU THB	- EF for biomass steam = 2.8874 kgCO <sub>2</sub> e/ton **** - EF for natural gas = 56100 kgCO <sub>2</sub> e/TJ (IPCC), Eff = 0.85 *****
<b>Total</b>		<b>1,627,143.25</b>	<b>32,987 M</b>	
<b>% of total revenues from product (s) in FY 2021 = 55.10%</b>				

**Remarks:**

- \* certified by Thailand Environment Institute
- \*\* specific factor from TVETs project assessed by TGO
- \*\*\* Thai National LCI Database, TISMTEC-NSTDA, AR5 (with TGO electricity
- \*\*\*\* CFO project assessed by TGO
- \*\*\*\*\* TVER project



## 2.3 Summary of Risk Adaptation & Mitigation Plan and Opportunity

### 2.3.1 Physical Risk

Focus on physical risk aspect, draught is considered as a key impact for Mitr Phol Group's business as most of farm site located in water stress area. Although the mean drought index of Thailand showed slightly decrease due to lower annual precipitation vary to the climate change, drought has been defined as the highest risk rating to Mitr Phol operations in short-, medium- and long term. Especially the long period of water scarcity can lead to the decreasing of sugarcane production, that might impact on shortage of raw material through the value chain and resulting in decrease in quantity and quality of the product. Therefore, Mitr Phol should ensure to have management plan in place to reduce risks and increase resilience. These are, for examples Oasis project, make collaboration with government authorities, promote 4Rs project to reduce the intake water and upgrade wastewater treatment reuse/recycle system (e.g. reverse osmosis system).

### 2.3.2 Transition Risks

- Technological advancement can result in the company to gain the high position in the market and enable to generate low carbon product. Mitr Phol shall proactively prepare a fuel switching plan to increase portion of renewable energy (e.g. biomass, hydrogen fuel) in investment plan (e.g. low carbon technology and high-efficient machine), and engineering plan (process improvement to reach high efficiency with less consumption e.g. smart farm and factory). Therefore, collaboration with partner, suppliers and invest in the start-ups must be promoted.
- Customer behavior have been changing by increase in demand on renewable energy and low carbon product especially in long-term. Thus, Mitr Phol encouraged R&D capabilities to develop the low carbon product. This can able the company to generate additional values and increase company's sustainability overtime.
- Monitoring on changing in policy and legal may lead the company to avoid penalty, increase company reputation and enable to retain customer. Mitr Phol already prepared the policy to achieve carbon neutrality in 2030 and net zero emission in 2050 to deal with

upcoming climate-related regulations and is able to support national/ international commitment at the same time.

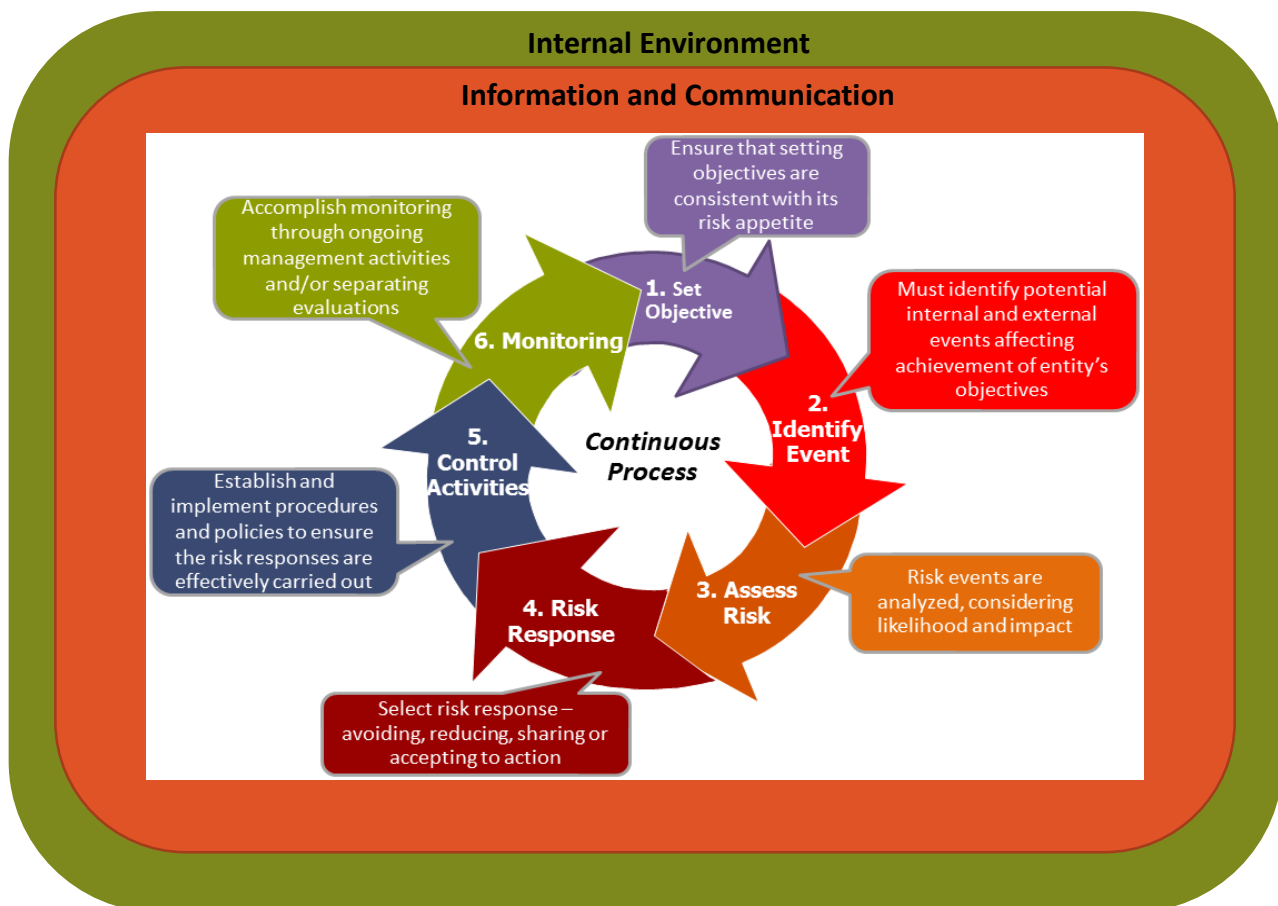
### 2.3.3 Opportunities

- It is an opportunity to Mitr Phol to improve both existing infrastructure and new projects to be **flexible and resilience against the changing of physical risks** in overall. These can include strengthening infrastructure and machine to endure physical risk impacts, improve water circularity/install internal water supply production and pick-up locations for new operation in the low-risk areas (e.g. high elevation).
- The **increase in demand of renewable energy** can provide Mitr Phol with growth of revenue from renewable energy (such as biomass power plant and bio-ethanol). Moreover, the electricity generation by biomass can reduce the implementation cost of renewable energy project to improve the efficiency of production (e.g. hydrogen fuel).
- Mitr phol has the potential for **product diversification by developing several low carbon product** such as chemical product (e.g. carboxylate product), bio-packaging and biopolymer. Also, value-added approach can be adapt by upgrading the ethanol product to bio-fuel jet and SAF. In addition, the improvement of production efficiency and portion of renewable energy can lead to lower GHG emission in production line (low carbon sugar).
- Increase in customers demand on **carbon offsets and determination 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

The Mitr Phol Group's risk management system and policy have been approved by the risk management committee (RMC). Since 2012, the enterprise and operational risk management department has been established to function on a day-to-day risk management basis in all business units. This department conducted business risk assessment, managed risk, promoted safety and complied with law and regulation. The risk policy and assessment are reviewed by the risk department and RMC once a year. Enterprise risk has been classified into the areas of strategic, operational, financial, legal, and regulatory compliance risk. In addition, climate change is classified as part of operational risk, and the risk description is clearly stated and embedded in all business units.

The risk system and management are carried out in accordance with the COSO Enterprise Risk Management, which is integrated into the ESG-related risk management. The process of risk identification is done on an ongoing basis, such as workshop 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.



**Pic 9:** Risk Management Framework

### 3.1 Risk List of Mirt Phol Group

Mitr Phol Group have category risk into 5 group as :



**Pic 10:** Risk Categories

To ensure consistency with international standards, Mitr Phol Group has adopted the Business Continuity Management System (BCMS), with reference to ISO 22301:2012, as an operational framework at the head office and its seven leading factories. In addition, the company has integrated the crisis communication procedure to ensure accuracy and suitability of the communication, both internal and external, in any incident to minimize the impact on the reputation and image of the company. All these measures have been implemented with the aim of building trust among our customers, business partners, and all stakeholders in the business continuity of the company. Mitr Phol Group has always placed a premium on the acquisition of business continuity management knowledge and understanding among our directors and employees, so that they can apply the knowledge for evaluating situations and suitably link the business continuity management with the company's business operations.

## 4. Metrics and Targets

To create sustainable business, we realize the importance of environmental protection by implementing environmental management in all aspects, which cover sustainable resource consumption, and the management of water, energy, climate change, air quality, and selection of environmentally friendly machineries. Concept of ‘From waste to value’ is also adopted to initiate value-added products and create value for a sustainable life.

Mitr Phol has set environmental goals for our operations and working toward our ambition to strive for environmental impact in our operations. Climate-related risk is our own operational performance. It has been disclosure in sustainability report since 2013. It is measured by the GHG emissions that generally vary due to energy consumption. In the measurement of GHG emissions, the collection and calculation have been developed, so the data accuracy has been steady and ongoing from year to year. At the beginning of disclosing emission data, we covered mainly the emissions in scope 1 and scope 2. For scope 3, we began calculation in categories 4, 6, and 9 (emissions from upstream transportation and distribution, business travel, and downstream transportation and distribution) in the year 2021 and aim to cover the collection and calculation of all 15 categories in the year 2022.

### 4.1 Mitr Phol GHG emission

In 2018-2019, Mitr Phol identified and disclosed only data of scope 1 and Scope 2 emission and In year 2021 Scope 1, Scope 2, and Scope 3 category 4, 6 and 9 (emission from an upstream transportation and distribution, a business travel and a downstream transportation and distribution) are identified and disclosed. In year 2022, we will make effort to disclosed information cover all category of scope 3 of the major operations in Thailand

#### GHG emissions of Mitr Phol Group

Data	Unit	2018	2019	2020	2021
Direct GHG emissions (Scope 1)	tCO <sub>2</sub> e	994,512.89	572,237.12	673,502.21	775,801.22
Energy indirect GHG emissions (Scope 2)	tCO <sub>2</sub> e	112,601.66	105,491.72	78,321.81	78,537.42
Other indirect GHG emissions (Scope 3)	tCO <sub>2</sub> e	397,520.50	163,644.75	105,225.66	65,840.96

Breakdown by business unit see link : [https://www.mitrphol.com/pdf/Sustainability\\_Report\\_2021.pdf](https://www.mitrphol.com/pdf/Sustainability_Report_2021.pdf)

## Energy Consumption of Mitr Phol Group

Data	Unit	2018	2019	2020	2021
Total non-renewable energy consumption	MWh	228,014.07	244,850.20	238,505.75	243,797.42
Total renewable energy consumption	MWh	16,553,421.58	16,676,418.90	12,658,868.46	14,575,864.44

Remarks: Mitr Phol Group generates electricity and steam produced from biomass to use within Mitr Phol Group, and electricity produced from biomass to sell to outside Mitr Phol Group. Additionally, we purchase non-renewable electricity from outside organization to use within Mitr Phol Group. For the proportion of energy consumption within the organization per revenue and per total sugar production was included only energy consumption of fuel, electricity, steam and solar power. Energy consumption outside the organization includes energy consumption for raw material transportation by third-party organization, product transportation by third-party organization, and employee's ground transportation and air travel. Biomass fuel includes bagasses, wood chips, etc.

Breakdown by business unit see link : [https://www.mitrphol.com/pdf/Sustainability\\_Report\\_2021.pdf](https://www.mitrphol.com/pdf/Sustainability_Report_2021.pdf)

## 4.2 Climate change-related target

### 4.3.1 GHG Emission Target and Performance 2019-2021

Mitr Phol Group's GHG reduction emission target is set as in year 2021

- Reduce 15% off the emission Scope 1 of emission in year 2018
- Reduce 10% off the emission Scope 2 of emission in year 2018

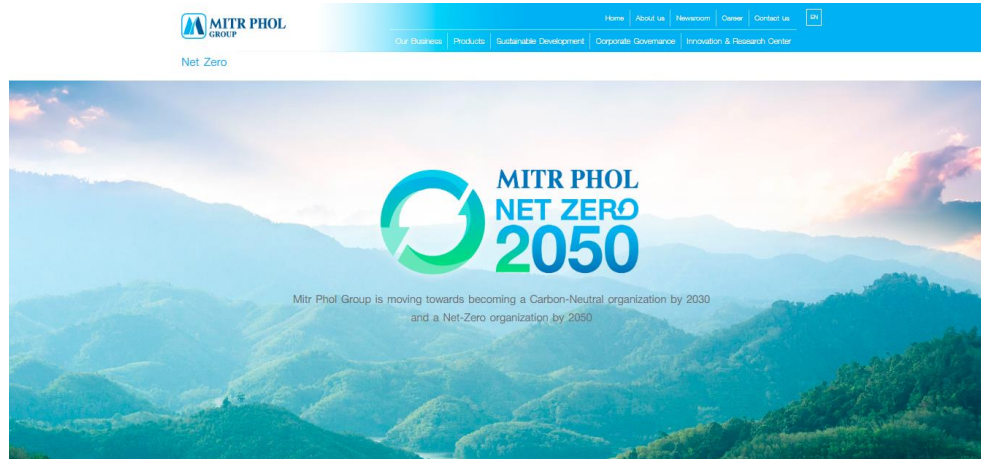
Detail		Indicators		
		Reduce GHG Scope 1 / revenue : 15%	Reduce GHG Scope 2 / revenue : 10%	Emission Scope 1 and 2
<b>2018</b>				
<b>Base Year</b>	Absolute (tCO <sub>2</sub> e)	994,512.89	112,601.66	1,107,114.55
	Intensity (tCO <sub>2</sub> e / million THB)	13.7681	1.5589	15.33
<b>2019</b>				
<b>Target</b>	Absolute (tCO <sub>2</sub> e)	-5%	-3.33%	
		944,786	108,854	1,053,639.92
	Intensity (tCO <sub>2</sub> e / million THB)	-5%	-3.33%	
		13.0797	1.507	14.59
<b>Performance</b>	Absolute (tCO <sub>2</sub> e)	<b>Achieved</b>	<b>Achieved</b>	
		572,237.12	8.1957	677,728.84
	Intensity (tCO <sub>2</sub> e / million THB)	<b>Achieved</b>	<b>Achieved</b>	
		105,491.72	1.5109	9.71
<b>2020</b>				
<b>Target</b>	Absolute (tCO <sub>2</sub> e)	-10%	-6.67%	
		895,060	105,093	1,000,153.39
	Intensity (tCO <sub>2</sub> e / million THB)	-10%	-6.67%	
		12.39	1.45	13.85
<b>Performance</b>	Absolute (tCO <sub>2</sub> e)	<b>Achieved</b>	<b>Achieved</b>	
		673,502.21	78,321.81	751,824.02
	Intensity (tCO <sub>2</sub> e / million THB)			
		11.1112	1.2921	12.4
<b>2021</b>				
<b>Target</b>	Absolute (tCO <sub>2</sub> e)	-15%	-10%	
		845,334	101,344	946,678.11
	Intensity (tCO <sub>2</sub> e / million THB)	-15%	-10%	
		11.7	1.4	13.11
<b>Performance</b>	Absolute (tCO <sub>2</sub> e)	<b>Achieved</b>	<b>Achieved</b>	
		775,801.22	78,537.42	854,338.64
	Intensity (tCO <sub>2</sub> e / million THB)	<b>Not Achieved</b>	<b>Achieved</b>	
		12.958	1.3117	14.27

For more information:

[https://www.mitrphol.com/zadmin/ckimage/file/Sustain/TH%202022/final/Sustainable\\_Performance\\_Information\\_on\\_Environment\\_2021\\_EN.pdf](https://www.mitrphol.com/zadmin/ckimage/file/Sustain/TH%202022/final/Sustainable_Performance_Information_on_Environment_2021_EN.pdf)

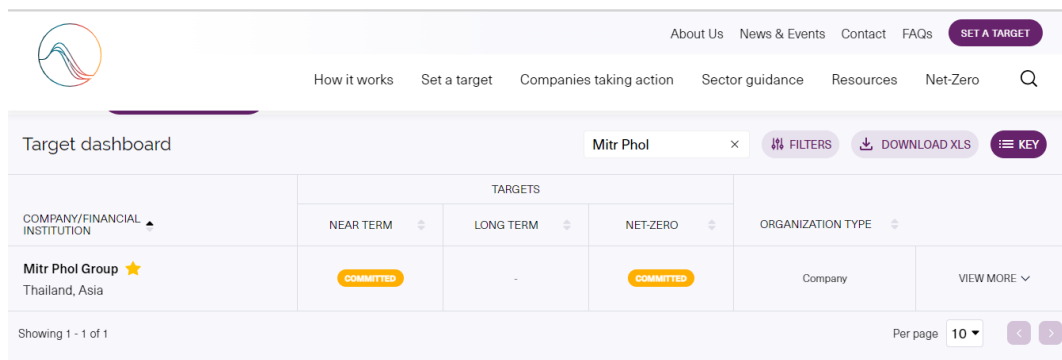
### 4.3.2 Net Zero Target by 2050

Mitr Phol Group set Carbon Neutral Organization by 2030 and Net Zero Organization by 2050 that commit with Science based Target Initiative.



**Pic 11:** Mitr Phol Group set Net Zero Target by 2050

For more information: <https://www.mitrphol.com/sustainability/net-zero>



**Pic 12:** Mitr Phol Group has committed with SBTi

For more information: <https://sciencebasedtargets.org/companies-taking-action>



## TCFD Disclosures Index

Elements	Details	page
<b>Governance</b>	a) Describe the board's oversight of climate-related risks and opportunities.	7-8
	b) Describe management's role in assessing and managing climate-related risks and opportunities.	8-9
<b>Strategy</b>	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	10-12
	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	13-36
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	23-38
<b>Risk Management</b>	a) Describe the organization's processes for identifying and assessing climate-related risks.	39
	b) Describe the organization's processes for managing climate-related risks.	39
	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	40
<b>Metrics and Targets</b>	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	41
	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	41-42
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	43-44



**Mitr Phol Group**  
**Creating Value for Sustainable Life**