TVO

Task Force on Climate-Related Financial Disclosure (TCFD) Report 2023

Introduction

To fulfill our mission of “entering into the food business and sustaining leadership in the vegetable oil and animal feed ingredients business”, TVO is dedicated to responsible operations guided by principles of sustainable development. In order to do this, TVO set the objective of preparing the organization to achieve carbon neutrality by the year 2045 and becoming a net-zero emission entity by the year 2060 as a crucial mission for everyone in the company.

In 2023, TVO was invited by the Stock Exchange of Thailand to participate in a Climate Chang Management Role Model program. This initiative aimed to prepare and elevate organizational greenhouse gas management in accordance with the Task Force on Climate-Related Financial Disclosures (TCFD) standards. At the end of the program, we have set short-term targets to reduce greenhouse gas emissions by 20% by 2035 and are ready to disclose information on governance, strategy, risk management, and metrics and targets, in line with TCFD best practices.

We anticipate that this TCFD disclosure will not only bring benefits but also inspire confidence among all stakeholders, affirming TVO's commitment to mitigating risks and addressing the challenges of climate change, fostering sustainable business growth.

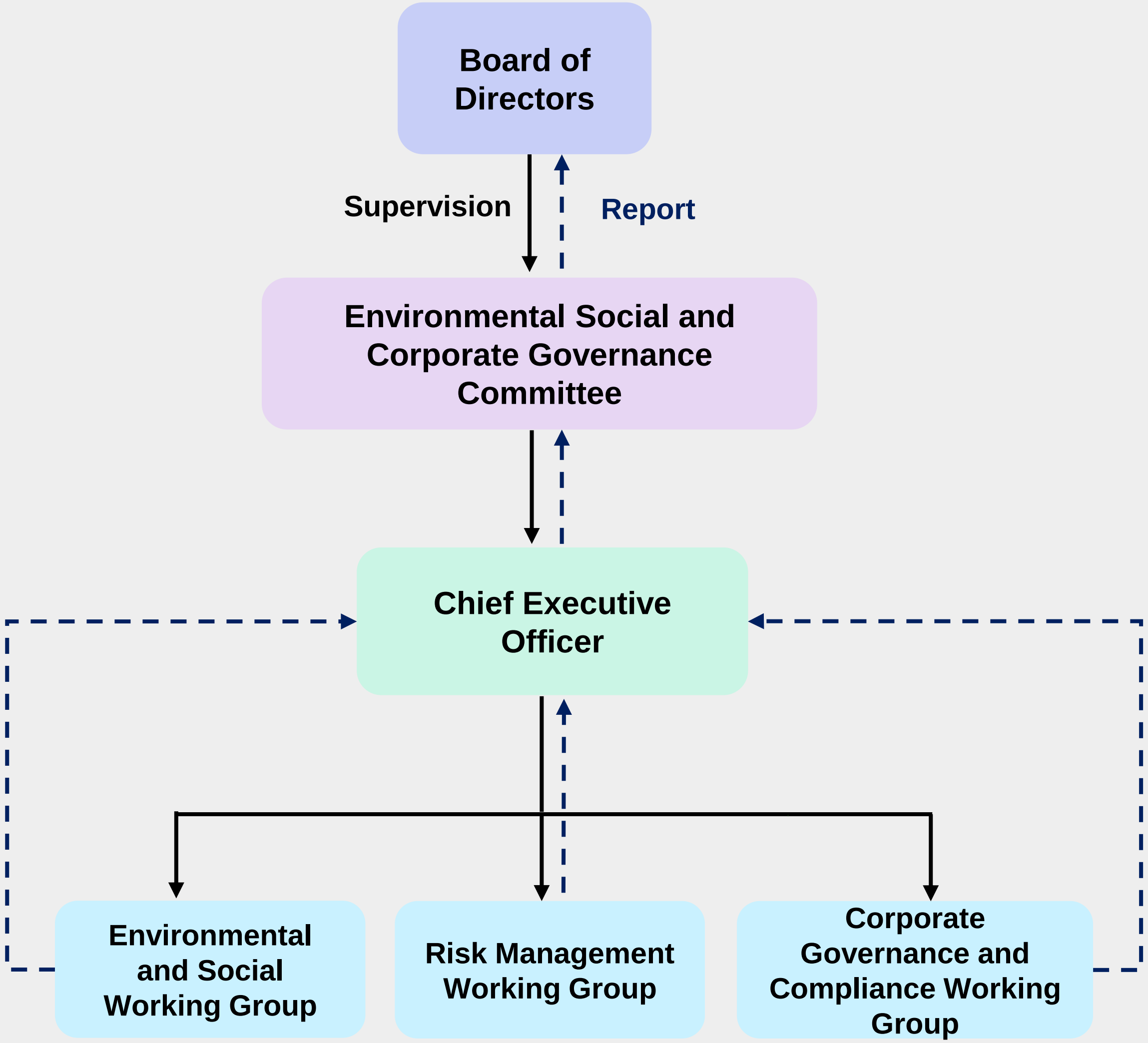
Content

1. Governance

1.1 Board's Oversight of Climate-Related Risks and Opportunities

TVO has designated responsiveness to climate change as a key strategy in conducting business under the ESG framework to foster sustainable growth for the future. This is steered through the Environment, Social, and Governance Committee (ESG) at three levels: policy, management, and operational levels. The committee oversees and ensures that activities related to climate change align with the set objectives and adhere to global operational standards.

The Board of Directors determines the policies and targets related to the company's ESG operations and assigns the Environmental, Social, and Governance Committee (ESG Committee) with crucial responsibilities in driving strategies for climate change. This includes managing risks and opportunities arising from climate change in accordance with international standards. The Chief Executive Officer (CEO) is further tasked with promoting and supporting improvements and developments in climate change operations. The CEO delegates responsibilities to the Risk Management Working Group, Environmental and Social Working Group, and Corporate Governance and Compliance Working Group to operate at the operational level. All three groups provide performance reports to the CEO for acknowledgment and recommendations, which are subsequently reported to the ESG Committee.



Policy level
Establishing policies, goals, and providing feedback

Management Level
Consider sustainability factors, formulate a strategic plan, set key performance indicators, monitor operational outcomes, provide recommendations, review the plan, and disseminate to the operational level

Operational Level
Identify needs and expectations of stakeholders, gather information relevant to operations, and report to management.

1. Governance

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

	Governing body	Role and Responsibilities	Meeting Frequency
Policy Level	**Board of Director**	Establish ESG operational policies and significant goals for conducting sustainable business. Evaluate and endorse policies related to climate change, and provide recommendations for the development of climate change initiatives	Twice a year
	Environmental Social and Corporate Governance Committee	Incorporate policies from the Board of Directors to establish and drive the climate-related strategy, including the management of risks and opportunities arising from climate change following international standards. Present to the Board of Directors for approval and feedback, and oversee and monitor the implementation of the climate change strategy to ensure alignment with the company's policies	Twice a year
Management Level	**Chief Executive Officer**	Manage and oversee risks and opportunities arising from climate change that may impact business operations. Evaluate the outcomes of implemented plans, approve key performance indicators, and assess the organization's performance in addressing climate change. Promote and support improvements in operations. Present findings to the Environmental, Social, and Governance Committee	Twice a year

1. Governance

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

	Governing body	Role and Responsibilities	Meeting Frequency
Operational Level	**Risk Management Working Group**	Establish and review risk management policies, oversee organizational risk management, including risks and opportunities related to climate change. Evaluate and review internal and external risk factors that impact the organization. All of this is to determine measures for managing climate change risks that are appropriate for the organization's context. The Managing Director is appointed as the chairman, responsible for this committee, and tasked with reporting the operational results to the CEO	Twice a year
	Environmental and Social Working Group	Develop environmental and social responsibility action plans, propose them to the management for consideration, and ensure that operations align with the company's policies, business plans, and ESG initiatives. This includes overseeing environmental operations, covering climate change, resource conservation (electricity, energy, water, and waste), as well as reducing environmental impacts such as air, water, odor, and dust. Additionally, monitor the environmental performance to ensure compliance with the plan. The Technical Director serves as the chairperson of this committee and reports the operational results to the management executive.	Twice a year
	Corporate Governance and Compliance Working Group	Monitor laws, regulations, directives, practices, and standards related to climate change, both domestically and internationally, that impact the organization's operations. The Assistant Manager Director- Production department in charge of production serves as the chairperson of this committee and reports the operational results to the management executive	Twice a year

2. Strategy

2.1 The Climate-related Risks and Opportunities Identified over the Short, Medium and Long Term

The company assesses risks and opportunities associated with climate conditions, following the guidelines of the Task Force on Climate-Related Financial Disclosure (TCFD) in the short, medium, and long term. This includes both the physical impacts of climate change and the transition towards a low-carbon society, considering the landscape as follows

Risk/ Opportunity	Driver	Scenario	
		Below 2 Degree	**Above 2 Degree**
Physical Risk	Flood	SSP1-2.6	SSP5-8.5
Transition Risk	Carbon Tax	Net Zero Emissions by 2050 Scenario (NZE)*	Stated Policies Scenario (STEPS)
Transition Opportunity	Low Carbon Products		

* A normative IEA scenario that shows a pathway for the global energy sector to achieve net zero CO2 emissions by 2050

2. Strategy

2.2 Physical Risks

TVO conducts the climate-related physical risk assessment using a qualitative assessment methodology

1. Anticipate physical changes in short ,medium and long term	- Evaluate baseline data in the Nakhon Chai Si District using https://thinkhazard.org/ - Anticipate the severity of flooding events
2. Assess financial impact	- Assess financial impact using company’s criteria
3. Evaluate risk Level	- Evaluate risk level based on Severity*Likelihood * Details of risk level assessment are presented in the Risk Management section
4. Determine Strategies and Response to Emerging Risks	- Establish strategies to respond to various risks according to the company's enterprise risk management criteria

2. Strategy

2.2 Physical Risks

Climate related physical risk in each time horizon

Climate related risk	Time Horizon			Impacts on TVO Business	Strategies
	Short	Medium	Long		
Floods				- Discontinuation of raw material shipments to the factory via the river. - Temporary shutdown of the production process. - Delay of finished goods delivered to customers.	- Monitor and evaluate risks related to natural disasters, and formulate Business Continuity Plans and Business Continuity Management (BCP/BCM) for potential flooding scenarios. - Prepare a list of alternative raw material transporters capable of delivery during a crisis, particularly when the primary source country (for soybeans) is unable to supply materials due to the repercussions of natural disasters.

Risk Level

Extreme

High

Medium

Low

Definition of Time Horizon
Short term : 0-2 years (2023-2025)
Medium term : 2- 10 years (2025-2035)
Long term 2035-2060

2. Strategy

2.3 Transition Risks

TVO conducts the climate-related physical risk assessment using a qualitative assessment methodology

1. Anticipate physical changes in short ,medium and long term

- Evaluate the organization's greenhouse gas emissions in accordance with global guidelines.
- Assess the carbon tax cost based on forecasted carbon tax data from the World Energy Outlook 2022, covering two scenarios: the Stated Policies Scenario (STEPS) and Net Zero Emissions by 2050 Scenario (NZE)

2. Assess financial impact

- Assess financial impact using company's criteria

3. Evaluate risk Level

- Evaluate risk level based on Severity*Likelihood

* Details of risk level assessment are presented in the Risk Management section

4. Determine Strategies and Response to Emerging Risks

- Establish strategies to respond to various risks according to the company's enterprise risk management criteria

2. Strategy

2.3 Transition Risks

Climate related transition risk in each time horizon

Climate related risk	Time Horizon			Impacts on TVO Business	Strategies
	Short	Medium	Long		
Law and Regulations (Carbon Tax)	High	High	High	- Elevated operating expenses resulting from carbon tax enforcement. - Increased capital expenditures due to machinery investments for carbon emission reduction. - Reduced profits stemming from the escalated operating costs.	- Consistently review the company's policies and measures to ensure that they align with existing and new laws and regulations. - Assess the organization's carbon footprint to anticipate future scenarios and develop plans for reducing greenhouse gas emissions - Study technologies and projects aimed at reducing carbon emissions

Risk Level

Extreme	High
Medium	Low

Definition of Time Horizon
Short term : 0-2 years (2023-2025)
Medium term : 2- 10 years (2025-2035)
Long term 2035-2060

2. Strategy

2.4 Transition Opportunities

Climate related transition Opportunity in each time horizon

Climate related risk	Time Horizon			Impacts on TVO Business	Strategies
	Short	Medium	Long		
Low Carbon Products				- Development and market expansion of low-carbon products (1-liter grape-seed oil)	- Evaluate the carbon footprint of product to anticipate future scenarios and develop plans for reducing greenhouse gas emissions - Study technologies and projects aimed at reducing carbon emissions

Risk Level

Extreme

High

Medium

Low

Definition of Time Horizon
Short term : 0-2 years (2023-2025)
Medium term : 2- 10 years (2025-2035)
Long term 2035-2060

TVO explores opportunities arising from the shift in consumer trends towards environmentally-friendly consumption, resulting in increased potential for higher sales of low-carbon products. This aligns with the company's goal to significantly reduce the carbon footprint of its 1-liter Angoon oil product and also seek carbon footprint reduction certifications for other products.

3. Risk Assessment

3.1 The Organization's Processes for Identifying and Assessing Climate-Related Risks.

Enterprise Risk Management (ERM) is a key component of Good Corporate Governance, fostering sustainable development. It has the potential to enhance the business value, instill confidence in all stakeholders, reduce the likelihood of adverse impacts on the organization, and aid in achieving set objectives. ERM not only minimizes unexpected events and various risks in operations but also enables organizations to promptly and efficiently capitalize on positive opportunities. Therefore, the risk management process is outlined in three steps as follows:

1. Identification of Risk
Assess the risks that encompass all units across the organization to analyze overall risk and manage it comprehensively."

2. Prioritization of Risk
Prioritize the significance of risks to efficiently allocate limited resources for managing various risks

3. Enterprise Risk/Opportunity Management Process
Provide confidence to the company's board and management in controlling operations according to the business plan, with an acceptable level of residual risks

The company recognizes the importance of risk management arising from climate change, impacting both short-term and long-term aspects of the business. The company is committed to managing risks by adopting the COSO ERM Framework, which involves identifying, assessing, managing, and monitoring risks associated with climate change. This approach aims to reduce the likelihood and severity of potential impacts on future business operations. Action plans related to climate change are integrated into business management, with continual improvement of policies and working standards related to corporate governance, risk management, internal controls, and regulatory compliance. A comprehensive risk management guide is developed and enforced across all departments, comprising 6 key components.

Risk Identification and Assessment

1. Objective Setting → 2. Risk Identification → 3. Risk Assessment →

Risk Management

4. Risk Response → 5. Control Activities → 6. Monitoring

3. Risk Assessment

3.1 The Organization’s Processes for Identifying and Assessing Climate-Related Risks.

The process of identifying and assessing risks related to the company's weather conditions can be illustrated in 3 steps;

1. Objective Setting

Objective setting is divided into 2 levels as follows:

1. **Entity-Level Objectives**: the objectives of the overall operations of the organization, specified in the company's strategic plan.
2. **Activity-Level Objectives**: the objectives specific to each activity defined by the organization to achieve the overall objectives. Activity-level objectives must support and align with the organization's objectives.

2. Risk Identification

Risk identification will be considered as follows:

1. Risk factors from all aspects that may arise, such as risks related to strategy, finance, personnel, operations, legal, taxation, and the environment.
2. Sources of risks from both within and outside the organization
3. The relationship between events that may occur

3. Risk Assessment

Risk assessment consists of two dimensions as follows:

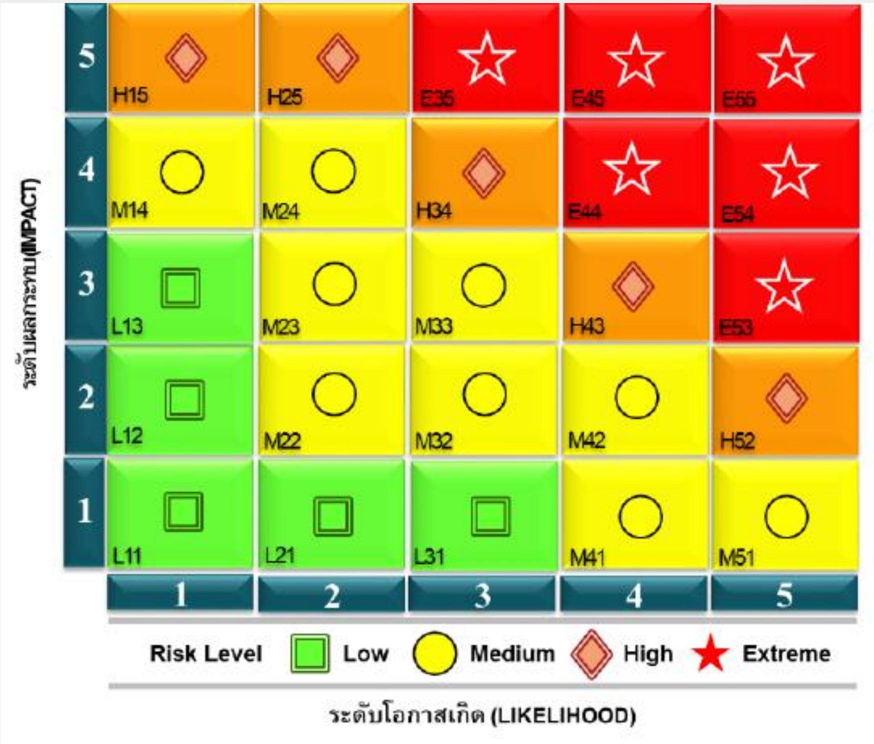
1. Likelihood: the probability of events occurring.
2. Impact: the evaluation of consequences if the identified events occur. For example, impacts on finances and investments, operations, organizational image, and safety and environment.“

Risk assessment can be conducted through both qualitative and quantitative approaches, considering events from both within and outside the organization. It should be performed both before risk management (Inherent Risk) and after risk management has taken place (Residual Risk). The assessed risks will then be used to determine the subsequent risk levels.

3. Risk Assessment

3.1 The Organization’s Processes for Identifying and Assessing Climate-Related Risks.

The Risk Levels can be assessed by evaluating the likelihood and impact of the risk, assigning scores ranging from 1 to 5. The company utilizes a 5x5 matrix as the criteria for assessing the severity level of risks, resulting in four levels of risk severity.



<u>Extreme Level :</u> Intolerable risks, immediate action is required through the Corporate risk management.

<u>High Level :</u> Unacceptable risks, urgent management is required through the Functional risk management.

<u>Medium Level</u> Acceptable level, close monitoring is required.

<u>Low Level</u> Acceptable level, an annual review is required.

3. Risk Assessment

3.1 The Organization’s Processes for Identifying and Assessing Climate-Related Risks.

Risk Registration

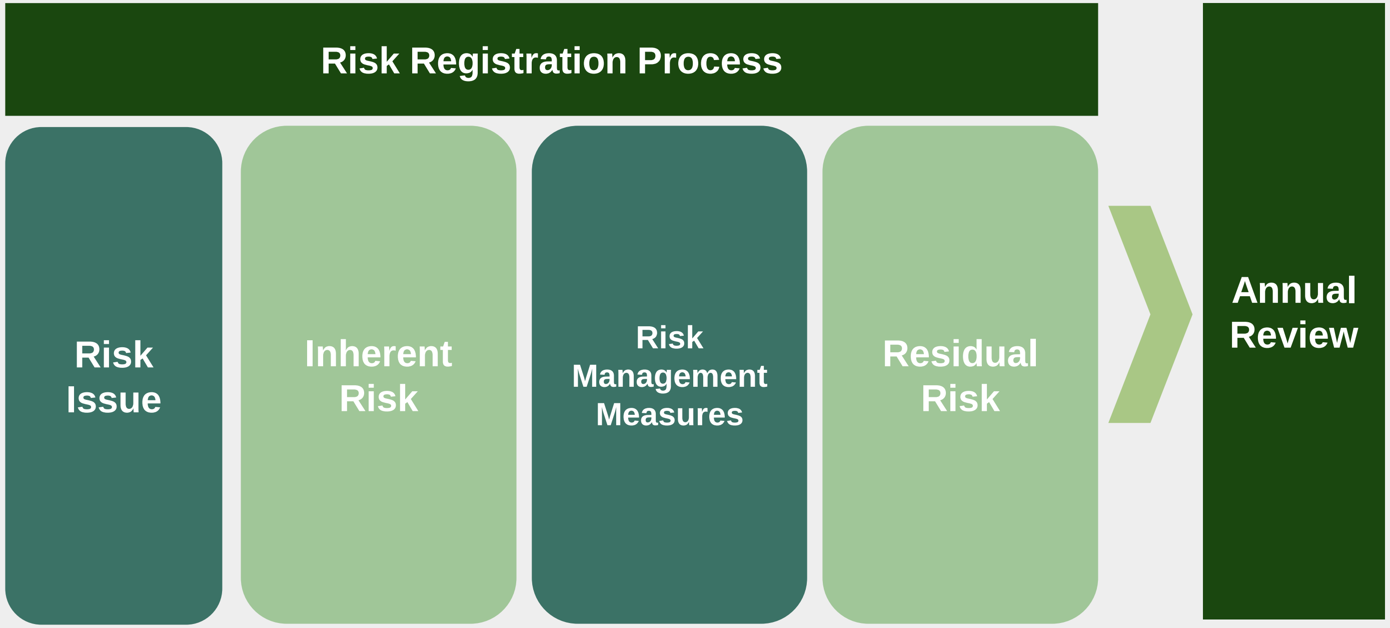
The Risk Owner is responsible for presenting whether the climate-related risk is a **functional or corporate** risk to the risk management committee for consideration and approval, following the company's risk management criteria.

Functional Risk Registration

The risk owner is responsible for identifying and assessing risks that may impact the objectives of departments, units, and divisions within the organization, as well as establishing guidelines for maintaining risk management at an acceptable level.

Corporate Risk Registration

Risk coordinators or risk owners are responsible for conducting risk assessments that may impact the company's business strategy. They are tasked with developing risk mitigation plans to address extreme and high-level risks, monitoring the progress of organizational risk management measures, and presenting their findings to the Risk Management Committee (RMC), Chief Executive Officer (CEO), and the Board of Directors (BOD), respectively.



The Risk Management Committee assesses the risk level based on the aforementioned criteria, referred to as Inherent Risk, and establishes risk management measures appropriate to the risk level. The RMC also identifies the remaining risk, known as Residual Risk, after implementing risk management measures. This process serves as a framework and guideline for reviewing risk levels in the subsequent year

3. Risk Assessment

3.2 The Organization’s Processes for Managing Climate-Related Risks.

TVO’s Risk Management process can divide into 3 steps.

4. Risk Response

Risk Response has four approaches as follows:

1) Avoidance (Avoid, Terminate): Taking actions to avoid events that may lead to risks.
2) Sharing (Share, Treat): Collaborating or sharing responsibility with others in managing risks.
3) Reduction (Reduce, Transfer): Undertaking additional actions to decrease the likelihood or impact of risks to a level acceptable to the organization.
4) Acceptance (Accept, Take): Acknowledging the remaining risks at the current level, which is within the desired and acceptable range, without further action to reduce the likelihood or consequences that may occur.

5. Control Activities

Control activities involve establishing policies, operational procedures, and assigning responsibilities to personnel within the organization to ensure that risk management is systematically controlled. Personnel with assigned responsibilities perform the following tasks:

1) Evaluate the effectiveness of current risk management activities.
2) Consider necessary additional actions to enhance the effectiveness of risk management.

6. Monitoring

Corporate risk

1) Risk Coordinator or Risk Owner monitors the progress of risk management measures and reviews the risk level according to the specified timeframe.
2) The Secretary of the Risk Management Committee (RMC) monitors the Corporate risk level from Risk Coordinators or Risk Owners in each department at least twice a year.
3) The RMC summarizes and compiles reports and present to the Chief Executive Officer for overall review every six months. The CEO then presents the summary report to the Board of Directors for acknowledgment.
4) The Secretary of the RMC informs relevant parties about the policies and opinions of the CEO. The Risk Committee acknowledges and takes appropriate actions based on the information provided.

Functional risk

1) The Risk Owner prepares and reports the results of risk management to the management following the chain of command, along with reviewing the progress of operations according to the risk management plan. They also adjust and reduce the risk level as outlined in the plan, presenting it to the RMC for consideration at least twice a year.
2) The Secretary of the RMC monitors the risk level of each department, tracks the progress of operations according to the risk management plan and ensuring timely reporting. This information is promptly submitted to the Risk Committee, either immediately or in advance of the Risk Committee meeting, within 7 days

3. Risk Assessment

3.2 The Organization’s Processes for Managing Climate-Related Risks.

TVO includes the process of identifying, assessing, and managing climate-related risks within the organization's risk management framework. The Secretary of the ESG Committee is assigned the primary responsibility.

Risk Identification

Identify risk issues to cover aspects related to climate change risks, including physical risks, transition risks, and transition opportunities that may impact the company's operations in the short, medium, and long term. Analyze potential impacts that may arise.

Risk Assessment

Consider the likelihood and impact of climate change risks derived from the risk identification process, using the same criteria as the company's severity level assessment. Analyze the impacts of the assessment in both financial and non-financial formats to formulate response measures to mitigate the risks.

Risk Response & Control Activities

The climate-related risks and opportunities will be managed according to the company's risk management criteria.

Monitoring

The Secretary of the ESG Committee presents the results of the assessment the Risk Management Committee meeting for consideration. The summarized outcomes are further presented to the CEO and the ESG Committee at least once a year.

4. Metric and Target

4.1 Green House Emissions

TVO commits to being Carbon Neutral by 2045 and a Net Zero Emission Organization by 2060, achieving at least a 20% reduction in GHG emissions by 2035 compared to the base year 2021. TVO has collected and disclosed GHG Scope 3 emissions in alignment with the GHG Scope 3 standard. All of the company's GHG emissions are annually verified and certified by the Thailand Greenhouse Gas Management Organization (Public Organization or TGO).

	Unit	2021	2022	2023*
Direct emission of GHG (scope 1)	Ton CO_2e	9,986	9,188	9,080
Indirect emission of GHG (scope 2)**	Ton CO_2e	41,054	38,744	35,488
Others emission of GHG (scope 3)	Ton CO_2e	722,072	749,920	694,933
Concentration of greenhouse gas emission (scope 1 and 2)	Ton CO_2e/Ton Soybean	0.0356	0.0321	0.0329

*The verification process for the greenhouse gas emissions data of 2023 is currently being conducted.


Certificate Number:
TGO CFO FY23-02-389

THAILAND GREENHOUSE GAS MANAGEMENT ORGANIZATION (Public Organization) TGO

CERTIFICATE

Awarded to

Thai Vegetable Oil Pubic Company Limited

Company address verified: 149 Ratchadapisek Road (Thapra-Taksin) Bukkhalow Thonburi Bangkok 10600 Thailand

Thailand Greenhouse Gas Management Organization certifies that the quantity of Greenhouse Gas of the above organization has been verified by ECEE Co., Ltd. and found to be in accordance with the requirements of the standard detailed below.

Standard

TGO Guidance of the Carbon Footprint for Organization

Verification Period: [01/01/2022 - 31/12/2022]

Total Greenhouse Gas Emission (Scope 1&2): 47,932 tonCO_2e/year

Direct GHG emissions	9,188	tonCO_2e/year
Energy Indirect GHG emissions	38,744	tonCO_2e/year
Other Indirect GHG emissions	749,920	tonCO_2e/year

The agreed level of assurance is: Limited, at materiality of 5%

Registration Date: 28 August 2023

Mr.Kiatchai Maitriwong

Executive Director

Thailand Greenhouse Gas Management Organization (Public Organization)

4. Metric and Target

4.2 Climate Related-Target

2021	2035	2045	2060
Base Year	**20% reduction from base year 2021**	**Carbon Neutrality**	**Net Zero**

Strategies and shared goals that support climate-related initiatives

Research & Development

Incorporate new innovations to design, enhance, and develop production processes to reduce the carbon footprint of products.

Resource Efficiency

- Reducing water and energy consumption, as well as waste generation, through the implementation of the 3R principles: Reduce, Reuse, Recycle
- Increase the proportion of waste utilization based on the principles of the Circular Economy

Renewable Energy

Enhance the share of renewable energy sources through the utilization of biomass, the installation of solar roofs, and the increase in the proportion of electricity sourced from renewable energy, including Renewable Energy Certificates (RECs)

Carbon Footprint of Product
"Received carbon reduction labels for the ANGOON in the 1-liter size, within the year 2025.

Waste utilization > 95%
2023 Performance
100%

Water consumption
< 0.85 m^3/ton Soybean
2023 Performance
0.90 m3/ton Soybean

Energy Consumption
< 1.47 GJ/ton Soybean
2023 Performance
1.50 GJ/ton Soybean

Proportion of Renewable Energy > 85%
2023 Performance
85%

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