



TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES REPORT (TCFD) 2022

PREPARED IN ACCORDANCE TO THE RECOMMENDATIONS OF THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD)

OUR VISION: TO BECOME A LEADER IN THE ALTERNATIVE ENERGY BUSINESS



CONTENT

	Page
1. Climate-related Risk and Opportunity Assessment in Accordance with the Task	3
Force on Climate-related Financial Disclosures (TCFD)	
1.1 Governance	4
1.2 Strategy	5
1.3 Risk Management	10
1.4 Metrics and Target	12
2. Climate Risk Adaptation	15
3. Climate - Related Management Incentives	16

1. CLIMATE-RELATED RISK AND OPPORTUNITY ASSESSMENT IN ACCORDANCE WITH THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD)

INTRODUCTION

3

The Company has set up the Corporate Governance and Sustainability Committee to consider potential risks, impacts, and opportunities relating to climate change which may affect our business. We have analyzed and assessed both potential risk and opportunities from climate-related issues according to the Task Force on Climate-related Financial Disclosures (TCFD) framework which includes four core elements of organizational operation: governance, strategy, risk management and metrics and targets as shown in the Figure 1 below.

Figure 1: Core Element of Recommended Climate-Related Financial Disclosures



Governance

The organization's governance around climate-related risks and opportunities

Strategy

The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

Risk Management

The processes used by the organization to identify, assess, and manage climate-related risks

Metrics and Targets

The metrics and targets used to assess and manage relevant climate-related risks and opportunities

Recommendations and Supporting Recommended Disclosures

Governance	Strategy	Risk Management	Metrics and Targets
Disclose the organization's governance around climate- related risks and opportunities.	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	Disclose how the organization identifies, assesses, and manages climate-related risks.	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

Source: Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures, October 2021



1.1 GOVERNANCE

The Company realizes the significance of having management structure that is aligned with the long-term strategy of driving the Company's business so that it can operate efficiently, transparently, business operation and maintain a balance of care for stakeholders. The Company has determined the management structure that is appropriate for the size, type and complexity of the business, as well as checks and balances to ensure the stakeholder's involving in the management of the Company's business.

The Board of Directors provide visions, missions, directions, and operational strategies with climate-related risks and opportunities directly and additionally through the Corporate Governance and Sustainability Committee (CGC). The Board's resolution and oversight are implemented accompanied by operating result targets, monitoring and assessing the results at CGC's meeting (4 times per year).

EA Group has appointed the Corporate Governance and Sustainability Committee to be in charge of planning strategies, management approaches, overseeing of climate-related issues, implement and follow up sustainability and climate strategies to achieve the sustainability goals. Moreover, we have the Risk Management Committee which they are responsible for assessing, and managing climate-related risks and opportunities, as well as preventing potential impacts.

Figure 2: The Organization Chart



Remarks : Vice President Climate Change Strategy & Sustainability Department Responsibilities to manage Climate related issues within EA Group, as well as monitoring and reporting of sustainability performance (including climate change initiatives, GHG emissions) to ensure that the company's environmental management practices achieve the targets and enhance effectiveness.



1.2 STRATEGY

EA has committed to develop the standard of business operations and general management to be in line with our Sustainable Environment Management Policy. The focuses will be on safety environmental and health in workplaces including the social responsibility. The policy will cover all Company>s operations which emphasize on resource management covering all business activities products, services, transportation and distribution, as well as waste management. Furthermore, this commitment is the direct responsibility of all executives, employees, business partners, contractors and the relevant stakeholders.

Additionally, We have set up a framework for climate change management covering our entire supply chain including management commitment, assess the impact of risks and opportunities according to the TCFD framework, define targets and policies, implement, measure results, and communicate with stakeholders.

Figure 3: Climate Change Management Framework



EA Group has identified the climate-related risks and opportunities, and impact on the organization and finance according to the TCFD framework in two scenarios, including above 2 °C scenario such as IEA STEPS, IEA CPS, RCP 8.5 and below 2 °C scenario such as NDC, IEA 2DS, IEA 450, RCP 2.6 as follows:

Climate	Scenario	Description	Impact to Business	Time
Related Risks				horizon*
Transition Risk				
Policy & Legal	Business as	Thailand committed to reach carbon	Reputation and recognition	Medium and
	Usual (BAU)	neutrality by 2050 and net zero emissions	from environmentally conscious	long-term
		by 2065. Thailand also pledged to	consumers.	
		enhance the NDC to reduce Greenhouse		
		Gases (GHG) emissions by 30-40% in		



Climate	Scenario	Description	Impact to Business	Time
Related Risks				horizon*
		2030 from the previous target of 20-25%, in order to attain carbon neutrality and net zero goals. This may have to take part in the efforts to reduce GHG emission to support the government's commitment to achieve net zero emissions.		
	Well below 2 °C	 Increased operational costs from mandatory climate change regulations or changes in environmental legislation Implementation of cap-and-trade or carbon tax in jurisdictions in which the company operates Carbon pricing policies / Mechanism Enhanced emissions reporting obligations 	Increased Operating Cost of climate change operations throughout the supply chain.	All time frames
Technology	BAU	Existing technologies or no change in decarbonizing to reduce GHG emissions that unsuccessful investment in new technologies.	Lose opportunities to invest in new energy technologies to reduce GHG emissions.	Medium-term
	Well below 2 °C	New technologies that can reduce GHG emissions more effectively and disrupt Markets such as Hydrogen and carbon capture, utilization, and storage (CCUS).	 Higher costs of conducting studies and investing new technologies, which must be implemented earlier than anticipated. Increased cost for develop lower emission technologies. 	Medium-term
Market	BAU	Changing customers behavior.	Revenue from customers decreases through lower carbon competitors.	Short-term
	Well below 2 °C	Changes in consumer preferences from high carbon intensive to low carbon technologies	Increase cost of production or raw materials.	Medium-term



Climate	Scenario	Description	Impact to Business	Time
Related Risks				horizon*
Reputation	BAU Well below 2 °C	Stakeholder concern and expect the company to conduct activities to reduce GHG emission. Increase Stakeholder expectations for the business to achieve GHG emissions reduction targets or conduct activities to	Recognition from environmentally conscious consumers and risk of loss of trust and confident in management. Reputation, brand value or revenue may decrease if the company does not have a	All time frames All time frames
		reduce climate change impact.	clear direction to drive climate change goals.	
Physical Risk				
Acute	BAU	Increase severity and frequency of extreme weather events such as cyclones and floods etc.	 Business interruption may loss estimated 488 million baht. Impact on the Company's assets, cost of repairing or replacing damaged equipment my loss estimated 2,998 million baht. 	Short and medium-term
	Well below 2 °C	Abrupt physical impacts, natural disasters, damages to equipment.	Decreased revenues.	Short and medium-term
Chronic	BAU Well below	More frequent of severe extremes events, Equipment damages due to climatic conditions and variability leading to business disruption Risk of sea level rise and riverine flooding	Damages from business disruption. Cost of preventive measures or	Medium and long-term Medium and
	2 °C	for sites located in high-risk areas.	new technologies.	long-term



Climate Related	Scenario	Description	Impact to Business	Time horizon
Opportunities				
Resource Efficiency and Energy Source	BAU	Improve resource and energy efficiency.	Increase in revenues and production capacity.	Medium and long-term
	Well below 2 °C	Use of new technologies, reduce waste disposed and use circular economy solutions.	Reputation and Reduce operating costs.	Medium and long-term
Products and Service	BAU	Promote and develop more low- carbon products and services.	 Increase revenues from the carbon credit markets. Earn a reputation for the business. 	Medium and long-term
	Well below 2 °C	Develop new low-carbon products and services through R&D and innovation.	 Development of climate-related innovations. Improve competitive position on shifting consumer preferences Gain a good reputation for the business and Increased brand value. 	Medium and long-term
Markets	BAU Well below	Market interest in low-carbon products and services.	Increase reputation and brand value.	Medium-term
	2 °C	of public-sector incentives.	access to new markets	long-term
Resiliency	BAU	Prepare for climate adaptation plan.	Investment in construction to against impacts of climate change such as flooding, storm.	Medium and long-term
	Well below 2 °C	Government's regulations related to climate change adaptation.	Increased reliability throughout supply chain and prevent business disruption from climate change.	Medium and long-term

Remark: Short-term (0-3 years), Medium-term (3-6 years), Long-term (6-10+ years)



GHG Emission Reduction and Low-Carbon Strategies

The Company has implemented plans to reduce GHG emissions and low carbon projects as below;

Research and development of raw materials to replace the main raw materials in the future Developing value-added products such as Green Diesel or applying environmentally friendly technologies to increase energy efficiency.



Expanding the infrastructure network of the charging station to contribute to the success of the new S-Curve electric vehicle industry



Joined as a founding member of the "RE100 Thailand Club" (RE100TH) in order to show the intention of determination and become a key driver of energy efficiency, including aiming to solve the global warming problem and maintain the capability in enhancing Thailand's competitiveness



EA operates businesses that embrace social and environmental sustainability which lead to the development of Green Bond Framework to refinance projects which generate clean energy with environmental benefits. **Raw materials**

Electric Vehicle (EV)

Infrastructure

Energy storage

systems



Expanding investments in lithium-ion battery

plants and energy storage systems and electric

Application of energy storage systems in renewable energy power plants. reduce the fluctuation of electricity less and create more stable power supply It also helps push Thailand into a Low Carbon Society. In particular, reducing pollution and global warming to achieve goals according to COP26.





Company continued to install renewable energy as solar farm and wind farm to reduce GHG emission. In 2022, the following renewable energy projects can reduce GHG emissions by 738,087 ton CO_2e

Green bond





1.3 RISK MANAGEMENT

The Company has put in place organization risk management covering risk identification, risk assessment, determination of risk management plan, as well as monitoring and management of key risks in overall to ensure efficiency and effectiveness of its risk management. The Risk Management Committee has prepared risk management handbook so that the Risk Management Working Group will understand the risk assessment guidelines and perform risk monitoring, status report, and consistent review of the adequacy and efficiency of risk management measures to allow for the Company's timely and appropriate risk management.

The Company recognizes and gives importance to management of risks in all perspectives under changing circumstances from both internal and external factors which may affect its business operation. This aims to build confidence among its stakeholders, and enable smooth and continuous operation as planned, and with highest efficiency according to the objective of being a leader in alternative energy business by using the modern technology and environmentally friendly for the best benefit of consumers, shareholders, partners, and fairness to employees. Major risks in the year in subject which may affect business operation of the Company and its group of companies can be divided into 7 areas as follows:

- 1. Strategic Risk
- 2. Operational Risk
- 3. Financial Risk
- 4. Compliance Risk

- 5. Business Operation Risk
- 6. Social Risk
- 7. Emerging Risk







Risk Assessment Matrix

Risk Assessment Matrix		Likelihood					
		Very Low	Low	Medium	High	Very High	
		1	2	3	4	5	
	Very High	5					
Impact	High	4					
	Medium	3					
	Low	2					
	Very Low	1					

Description table of risk management according to the level of the company's risk.

Risk Level	Color Represent	Risk Description
Very High		Risk Level that significantly exceeds the level of organization risk appetite
		with urgent risk mitigation required.
High		Unacceptable risk level that require immediate risk mitigation to an
		acceptable level.
Medium		Acceptable level but must be vigilant. Internal control may be
2	······	implemented for more enforcem.
Low		Acceptable of risk, no attention required.



1.4 METRICS AND TARGET

The company has set sustainability goals according to the UN Sustainable Development Goals (SDGs). The climate-related target is under environmental dimension. We have set a goal to reducing GHG emissions at least 25% by 2027 and 50% by 2037 compared to base year 2020. The long-term goal of achieving carbon neutrality by 2045 and net-zero emissions by 2060. However, we are considering the target to be adjust in order to better align with global aspirations to achieve carbon neutrality by 2040 and Net Zero by 2050 according to its goal of limiting global warming to well below 2, preferably to 1.5 degrees Celsius, which is in line with the Paris Agreement, the UN Sustainable Development Goals (SDGs).

Figure 5: Sustainability Goals



Creating long-term sustainable returns for investors and all stakeholders The company adheres to and complies with the laws and regulations related to business operations strictly, including the importance of good governance or good corporate governance, such as the Securities and Exchange Commission and the Stock Exchange of Thailand, in order to have an efficient, transparent, auditable management system that will help to creating long-term sustainable returns for investors and all stakeholders.





GHG Emissions

CLIMATE-RELATED PERFORMANCE

To determine the GHG emissions of EA Group, the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) was used on Global Warming Potential (GWP). The Company conducted assessment according to ISO14064-1:2018 and the guidelines of Thailand Greenhouse Gas Management Organization (TGO). The data was verified by Bureau Veritas Certification (Thailand) Co., Ltd.

Reduction Target long term :	Become carbon neutrality by 2045 and net zero GHG Emissions by 2060.
Reduction Target short term :	Reduce 25% by 2027 (from base 2020) (Scope 1 & 2)
	Reduce 50% by 2037 (from base 2020) (Scope 1 & 2)
Reduction Target 2022 :	Reduce 15% by 2022 (from base 2020) (Scope 1 & 2)
Reduction Target 2022 :	287,004 tCO2e (from base 2021 because of increasing in productivity)
	(Scope 3)

	Unit	2019	2020	2021	2022	Target 2022
Direct GHG emissions (Scope 1)	tCO2e	44,201	45,305	39,326	40,854	44,009.25
Energy Indirect GHG emissions (Scope 2)	tCO2e	10,882	12,965	13,559	25,977	26,020.25
Other Indirect GHG emissions (Scope 3)	tCO2e	55	68	143,502	247,867	287,004.00
Direct and Indirect GHG emissions (Scope1,2)	tCO2e	55,083	58,270	52,885	66,831	
Direct, Indirect and Other Indirect GHG emissions (Scope1,2,3)	tCO2e	55,138	58,338	196,387	314,698	
Total Revenue	Million Baht	14,955	17,199	20,558	27,547	
GHG emissions intensity of the Group (Scope1,2)	tCO2e/Million baht of revenue	3.68	3.39	2.57	2.43	
GHG emissions intensity of the Group (Scope1,2,3)	tCO2e/Million baht of revenue	3.69	3.39	9.55	11.42	
GHG Emission without battery business scope						
Scope 1 (Without battery business scope)	tCO2e	44,201	45,305	39,326	35,514	
Scope 2 (Without battery business scope)	tCO2e	10,882	12,965	13,559	12,651	
Scope 3 (Without battery business scope)	tCO2e	55	68	143,502	247,112	
Scope 1&2 (Without battery business scope)	tCO2e	55,083	58,270	52,885	48,165	
%GHG Emissions compare with base year 2020 (Without battery business scope)	%		base year	9%	17%	15%



GHG EMISSION REDUCTION ACTIVITIES 2022

Activity	Objective	Scope	GHG Emission Reduction (tonCO ₂ e/Year)
Solar rooftop project to generate electricity for office buildings in Nakhon sawan project.	Reduce the purchase of electricity from the Provincial Electricity Authority (PEA) and use electricity from renewable solar energy.	Scope 2	47.9904
Work from anywhere of employee head office.	Reduce employee travel and reduce emissions.	Scope 3	1.5981
Adjust the cooling fan speed according to the temperature.	Adjust the angle of the fan blades. Change the type of propeller to be lighter. Adjust to reduce the fan speed faster. Able to reduce electricity consumption from the original 216,000 kilowatt- hours (kWh) to only 137,808 kilowatt-hours (kWh).	Scope 2	39.0882
Monthly meeting of departments between head office and subsidiaries by online channel.	Reduce travel time and reduce emissions.	Scope 1	32.5748
	<u>121.2515</u>		



2. CLIMATE RISK ADAPTATION

The climate change situation has intensified and affected many continents of the world, which is partly a result of greenhouse gas emissions from human activities. Many countries have turned their attention and are aware of the disaster, which can reduce the severity of climate change by collaborating to reduce GHG emissions.

According to one of the Task Force on Climate-related Financial Disclosures (TCFD)'s key recommended disclosures focuses on the resilience of an organization's strategy, taking into consideration different climate-related scenarios. Therefore, the Company has set up process to assessed both physical risks and transition risks associated with climate change. According to the physical risk assessment, We have prepared an adaptation plan to prevent or minimize the damage of climate-related as below;

Responses	Timeline
1. Study on feasibility of investment by choosing the plant location that is least	All time frames
vulnerable to climate change. There is a comprehensive plan to prevent the high	
impacts of future climate change risks.	
2) Storm:	Medium-term
• Solar Farm Business: Install wind speed device in 3 locations to detect the wind	(3-6 years)
speed as well as set the wind speed rate at 15 (m/s) in order to sending a signal	
to the sensor to put the tracker is in sleep mode and help to reduce the damage	
of the PV panel from the storm.	
• Wind Power Business: Install the sensor to adjust the turbine when the wind	
speed reaches a certain point that is expected to pose a danger to turbine.	
3) Flood: Construction of drainage systems around the plant, floodgates, drainage	Medium-term
canals, etc.	(3-6 years)



3. CLIMATE - RELATED MANAGEMENT INCENTIVES

The Company has encouraged new work challenges through "EA Inside EA Program," a creative work and innovation competition which aims at multi-faceted improvement, such as faster delivery, improved quality, higher productivity, and sustainability.

Project	Objective	Benefit	Reward	KPI
Adjust the cooling	Reduce the use of	Reduce the cost of using electricity	То	Energy
fan speed	electricity from the	Down 254,370.24 baht/year, when	Manager	reduction
according to the	cooling tower as the	deducting the VSD investment cost	40,000	
temperature to save	fans are overloaded	of 150,000 baht, will reduce the	Baht	
energy.	and waste energy.	actual cost by 104,370.24 baht/year.		
Coating width	Reduce the amount of	Reduce waste, increase the amount	То	Efficiency
reduction	waste and add value to	of cells produced per the same	Employee	
	the waste that will be	amount of chemicals produced.	20,000	
	discarded in the coating		Baht	
	process.			
Improve and	1. Develop ways of	1. Increase efficiency in working	То	Emission
develop work	working to be more	better convenient to work easier and	Manager	reduction
methods to	convenient and safer	faster	3,000 Baht	
preserve the use oil	2. Preserve and	2. This can reduce the working time		
filling machine work	prolong the service life	by about 15 minutes per Flush line		
	of the Filling machine.	1 time.		
	3. To reduce the risk of	3. Preserving and prolonging the		
	maintenance of the	service life of the Filling machine,		
	filling machine	reducing the risk and cost of		
		Maintenance of the Filling machine.		
		4. Reduce CO2 emissions		
Reduce production	1. Reduce steam in the	1. Reduce the amount of steam	То	Efficiency
costs by replacing	production of RBD oil	used in the production process by	Manager	
Function Coil heat	2. Increase the	271 kg/hr.	100,000	
C-1301 tank	temperature in the	2. Reduce the color intensity of	Baht	
(RBD/CPO)	bleaching process,	RBD oil.		
	reduce the color	3. Save fuel in production.		
	intensity of RBD oil.			





th Floor, AIA Capital Center Building 89 Ratchadaphisek Road, Dindaeng Bangkok 10400 el : 0-2248-2488-92 , 0-2002-3667-9 Fax : 0-2248-2493