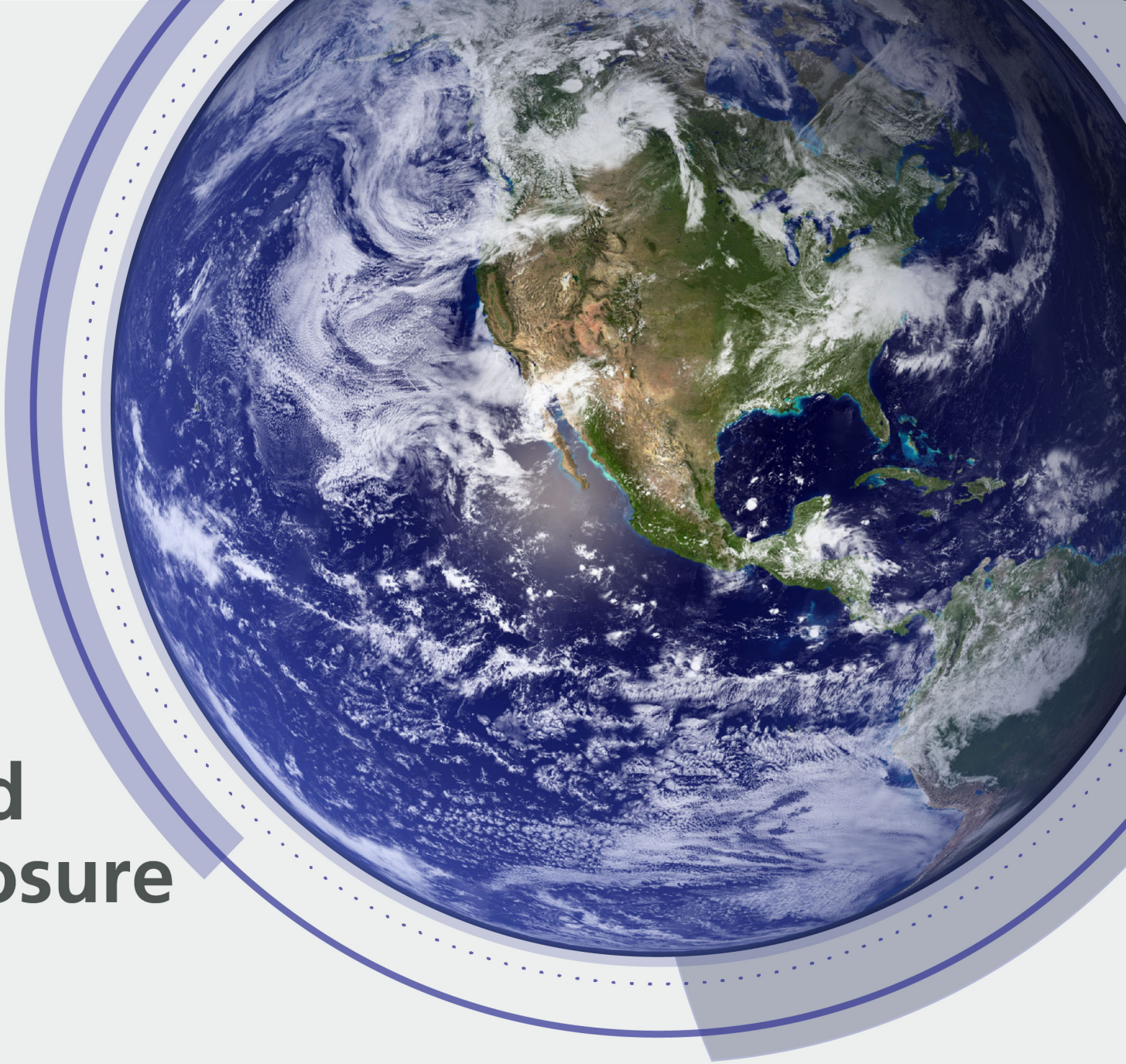
Making Today
a Better Tomorrow



Charoen Pokphand Group

Task Force on Climate-related Financial Disclosure (TCFD) Report 2022

ซีพี...เพื่อความยั่งยืน

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

TABLE OF CONTENTS

INTRODUCTION

CLIMATE COMMITMENT

Climate change is a critical global challenge with significant devastating impacts to economy, society and the environment. Tackling the climate crisis requires full cooperation from all sectors from every country.

Charoen Pokphand Group (C.P. Group), as a private company operating in diverse manufacturing and services sectors, is aware of its role in the emissions of greenhouse gases and recognized that it has a responsibility to tackle problems posed by climate change. Recognizing the urgency of the climate crisis, Charoen Pokphand Group joined United Nations "Race to Zero" campaign and signed the "Business Ambition for 1.5°C Commitment Letter", the global movement of leading companies aligning their businesses with the most ambitious aim of the Paris Agreement, to limit global temperature rise to 1.5°C above preindustrial levels and reach net-zero by 2050 for the best chance of avoiding the worst impacts of climate change.

"CARBON NEUTRAL" Goal by 2030

"Net Zero" Goal by 2050

Climate change is now a widely established and socialised concept within financial markets – as a financial risk, due to transition and climate-related transition and physical risks, and as an investment imperative, because the way we direct capital will support climate change targets.

We are committed to conducting low-carbon and sustainable businesses. Accordingly, our affiliates adhere to the Three Benefit Principle which focuses on creating benefit for the country in the economic, social and environmental dimensions, while building networks and cooperation with the public, private and civil sectors. To help drive impacts throughout the entire value chain, the Group disseminates information and know-how, evaluates technological solutions, develops tools and sources innovations in the area of climate.

CLIMATE RESILIENCE JOURNEY

C.P. Group is committed to conducting business responsibly, reducing the climate change impact that may occur, protecting the environment, using natural resources and energy efficiently and moving towards "Low Carbon Economy".

2009

- Participated in the United Nations Climate Change Conference (UNFCCC) as Thailand's private sector delegates, from COP15 until present.

United Nations Framework Convention on Climate Change

2015

- Appointed Chief Sustainability Officer and established Sustainability, Good Governance and Corporate Communication Office (SGC)
- Launched "We Grow" Project and Application to raise awareness and promote tree-planting.
- Participated in Thailand's Voluntary Emission Reduction Program (T-VER) Developed by TGO

We Grow Application

T-VER

2016

- Announced C.P. Group's 2020 Sustainability Strategy and set a 10% GHG intensity reduction by 2020.
- Participated in setting up and became founding member of the United Nations Global Compact Network Thailand.

WE SUPPORT UN GLOBAL COMPACT

2017

- Awarded Asia's Best First Time Sustainability Report Awards 2017 organized by CSR Works International.
- Received Outstanding Newcomer Award from CSR Club and ThaiPat Institute.

asrа

2020

- Committed to Carbon Neutrality in organization by 2030.
- Pledged United Nation (UN) "Race to Zero" campaign and signed "Business Ambition for 1.5°C Commitment Letter".
- Committed to Science-based Targets Initiatives (SBTi).

BUSINESS AMBITION FOR 1.5°C

SCIENCE BASED TARGETS

2021

- Published the first climate risk disclosure TCFD report "C.P. Group's Towards Net Zero Report"
- Announced C.P. Group's Environmental Sustainability Policy and Guideline and Climate Resilience Policy
- Voluntarily disclosed information on corporate climate change management through the CDP

CDP

2022

- Published "C.P. Group's TCFD report"
- Became a TCFD supporter

TCFD

2023

- Published "C.P. Group's TCFD report 2023"
- Set a near-term Science-based Target by SBTi

"NET ZERO" Goal by 2050

Charoen Pokphand Group has previously set an internal target to become a Carbon Neutral Organization by 2030, covering Scope 1 and 2 emissions. This goal has motivated greenhouse gas emissions reduction by expanding renewable energy programs, encouraging all employees, stakeholders and business partners to implement emission reduction programs, in order to minimize carbon emissions from the organization. Charoen Pokphand Group requires all business units in all countries and economies to set a common goal to achieve carbon neutrality from operations that are owned or controlled by the company, by the year 2050.

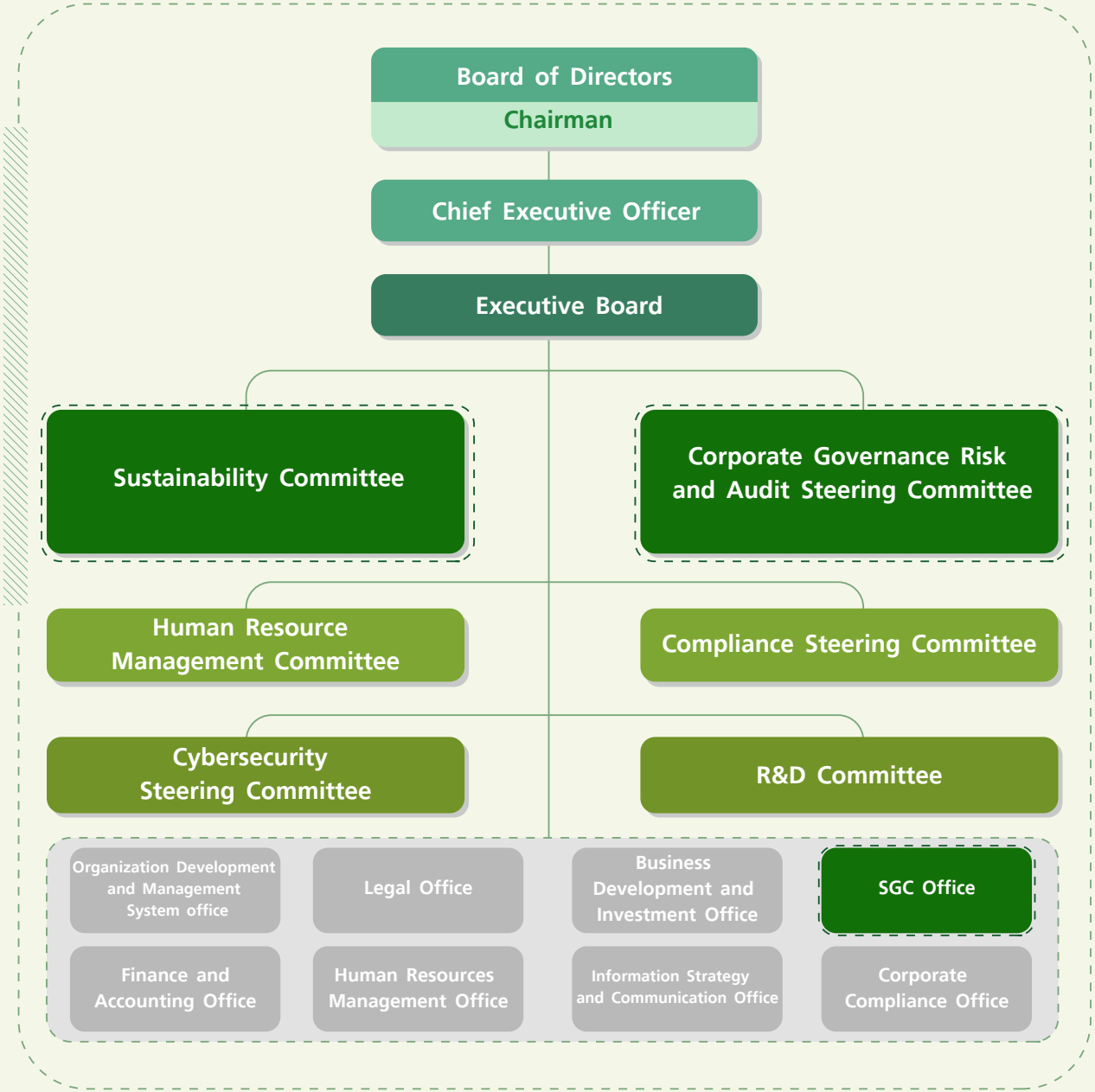
Net Zero

GOVERNANCE

GOVERNANCE STRUCTURE

C.P. Group's corporate governance structure consists of the Board of Directors (BOD) leads by the Chairman, and the Executive Board which is chaired by the Chief Executive Officer (CEO). In addition, C.P Group has established Sustainability Committee and Corporate Governance Risk and Audit Steering Committee. These two committees play a vital role in managing nature-related risks and opportunity and driving the implementation of nature climate strategies to all business units.

Under Executive Board, there are the working level which comprise of 8 functions including Sustainability, Good Governance, and Corporate Communication (SGC) Office and Corporate Compliance Office which are the main functions that implement the C.P. Group sustainability strategies and ensure that the nature climate related risks are managed appropriately under risk management framework model.



ROLE AND RESPONSIBILITY

The Board of Directors

The Board of Directors oversees the overall business operations to ensure the adherence to C.P. Group 2030 Sustainability Framework and Goals. Sustainability performance against the Group's goals and targets (including climate and other nature-related topics) are periodically reported to the Board members as a part of monitoring process.

The Executive Board

The Executives are delegated by the BoD to oversee the C.P. Group's operations. The Management's role is to establish policies, targets, strategies, management approaches, and performance indicators for nature-related issues, including climate, water, circularity, and biodiversity. The Management also provides the strategic advices and decision-making for Net Zero transition and nature positive pathway.

Sustainability Committee

The Sustainability Committee drives sustainability goals and strategies by determining key performance indicators, overseeing the sustainability governance, and monitoring the establishment of communication channels, and assessing key issues on sustainability. In addition, The Committee determines acceptable ESG risks including nature and climate, and set up a risk management approach. The committee meets on quarterly basis to discuss the progress sustainability performance.

Corporate Governance, Risk, and Audit Steering Committee

The Corporate Governance, Risk, and Audit Steering Committee comprises of executives with expertise in risk management. The role is to oversee the enterprise risk management and monitor the implementation of the policies and regulation to ensure that the business are operated in accordance with corporate governance principles, as well as the effectiveness of the risk management, internal controls and audits.

The Sustainability, Good Governance, and Corporate Communication office

The main function to execute the sustainbility strategy framework, which include the process of climate and nature-related risk assessment and management. The assessment outcomes are factored in the group-wide policy, strategy, and risk management framework which are leveraged across all business units

GOVERNANCE FRAMEWORK

Under a complex business environment and fast-changing uncertainties, Charoen Pokphand Group aims to drive corporate governance in a systematic manner across the Group. In doing so, the Group focuses on the structure and process of governance. We has established the group-wide level policies and guidelines related to the protecting, preserving, and enhancing natural capital and ecosystem services which are the framework for all business units to implement across our entire value chain.

We also assess nature-related dependency, impact, risks and opportunities according to the recommendations of the Task Force on Nature-related Financial Disclosures (TNFD), Task Force on Climate-related Financial Disclosures (TCFD) and develop comprehensive risk management plans that include physical, technology, market, policy, legal, and reputational risks. The climate targets, goal, and risk management are set and communicated to our employees and other stakeholders through various channels.

In addition, building capacity and raise awareness for nature actions, the appropriate trainings are provided to employees and stakeholders. The implementation of action plan is depended on the the dependency and impact of the business on the nature capital and ecosystem services. The nature-related performances are monitored and reported through the various channels including Sustainability Report, corporate website, the Communication on Progress to the UN Global Compact, and CDP's disclosure programs.

- Environment Policy
- Climate Resilience Policy
- Circular Economy Policy
- Water Stewardship Policy
- Ecosystem & Biodiversity Protection
- Deforestation commitment
- Sustainable Packaging
- Hazardous Chemicals & Substance Management
- Air Quality Management

ALIGNMENT WITH TCFD FRAMEWORK

Charoen Pokphand Group intends to drive corporate governance in a methodical manner across the Group in the face of a complex business environment and rapidly changing uncertainties. In doing so, the Group focuses on governance structure and process. As a result, we have established Group-level corporate governance principles and procedures, as well as a framework for climate change management across our whole value chain.

We have established policies and targets that cover energy efficiency, renewable energy use, waste management, and plastic packaging use reduction. We further assess climate-related risks and opportunities, conduct scenario analysis accoring to the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), which is globally recognized for climate-related risk management from the perspective of financial institutions, and develop comprehensive risk management plans that include physical, technology, market, policy, legal, and reputational risks.

C.P. Group has implemented the sustainability framework that drives the Group's operations and established the Sustainability Committee, and Sustainability, Good Governance and Corporate Communication Office (SGC Office), which takes responsibility for outlining management approaches, monitoring, verifying, and ensuring confidence that C.P. Group's overall sustainability performance is efficient and in line with its targets and vision.

In addition, the Group communicates our performance on climate change impact management and mitigation to our stakeholders through various channels. These include our Sustainability Report, the Communication on Progress to the UN Global Compact, and CDP's climate change disclosure program.

Core Element of Recommended Task Force on Climate-related Financial Disclosures

GOVERNANCE
Established management committees at the Group and Business Group levels to govern climate-related risks and opportunities.

STRATEGY
Implemented a business strategy for climate change management that aligns with the Group's financial strategies and plans.

RISK MANAGEMENT
Integrated risk and opportunity assessment results, and the operational contexts of each country, into climate change management approaches.

METRICS & TARGETS
Adopted indicators and targets to assess and manage climate-related risks and opportunities that align with the Group's financial risk management.

STRATEGY

C.P. GROUP SUSTAINABILITY

To understand the impact of climate change on our businesses, C.P. Group has assessed and identified the risks and opportunities throughout the value chain (Direct operations, Upstream, and Downstream) including short-, medium-, and long-term risks and opportunities; their financial, strategic, and overall business impacts; and evaluated the company's resilience in coping with various climate scenarios according to the recommendations of the TCFD, and developed comprehensive risk management plans.

The assessment period is designed in line with the Group's Sustainability Framework when there are significant environmental / climate-related changes to the organization

- **Short-**term to be 3 to 5 years
- **Medium-**term to be 10 to 15 years
- **Long-**term to be 30 years, out to 2050.

Risks		Financial Impact	Time Period	Possible Outcomes
Transition Risks	**Policy and Legal**	<1% impact to the business	1-3 years > 15 years	Introduction of international policies, requirements, and mechanisms to strengthen the control of overall GHG emissions according to UN requirements, where all countries will have to change their GHG emissions policies to align with current conditions.
	Technology	Spending on technology earlier than anticipated	1-7 years	New climate change technologies emerge that could impact current marketing efforts, and lead to advance spending on energy technologies to meet targets.
	Market	Increased investment budget and R&D budget for sustainability-related products	1-3 years	Policies or investments in low-carbon businesses or products, and reduced demand for high-carbon products. This could result in higher investments in R&D to speed up products for introduction to market.
	Reputation	Low reputational risks	> 15 years	Higher stakeholder expectations lead to lower revenues, poorer reputation, and brand value. Although reputational risks are low, the Group remains committed to building a low-carbon economy.
Physical Risks	**Acute**	10% increase in investments for key facilities	1-10 years	Natural disasters, changing sea levels, coastal erosion, higher incidents of drought due to rising temperatures, human fatalities from heat, and spread of infectious diseases among plants and animals.
	Chronic	<1% impact to the business	4-7 years	Changes to product management stages, production planning, and agricultural outputs that are raw materials for the Company. This could cause minor impacts to business operations.

Opportunities	Financial Impact	Time Period	Possible Outcomes
Resource Efficiency and Energy Sources	3-5% increase in revenue from energy efficiency	1-7 years	Efficient renewable energy use, reduced energy costs, more diverse energy sources for production – all leading to more alternatives for energy use.
Products/Services	10-15% increase in revenue from sustainability-related products and services in 10 years	1-3 years	Increased development of new low-carbon products to market to respond to the changing needs of consumers.
Markets	5-10% increase in revenue from sustainability-related products and services in 10 years	1-3 years	Alignment with climate change trends will stimulate and increase competitiveness, and support access to new consumer markets for more diverse types of products.
Resilience	Determined to have no financial impact	1-10 years	Investments in sustainable products, services, and infrastructure could promote more sustainability in the Company's business model, should any change occur.

CLIMATE-RELATED RISKS AND OPPORTUNITIES

Charoen Pokphand Group has defined a framework to address climate change throughout the supply chain and conducted climate-related risks and opportunities assessment. The Group has also prepared the Climate-related Risk Management Report according to the guidelines of the Task Force on Climate-related Financial Disclosure (TCFD).

Risks

Transition Risks

Policy and Legal
- Carbon pricing and commitments
- Regulations and rules of goods and services
- Complaints and breach of contract

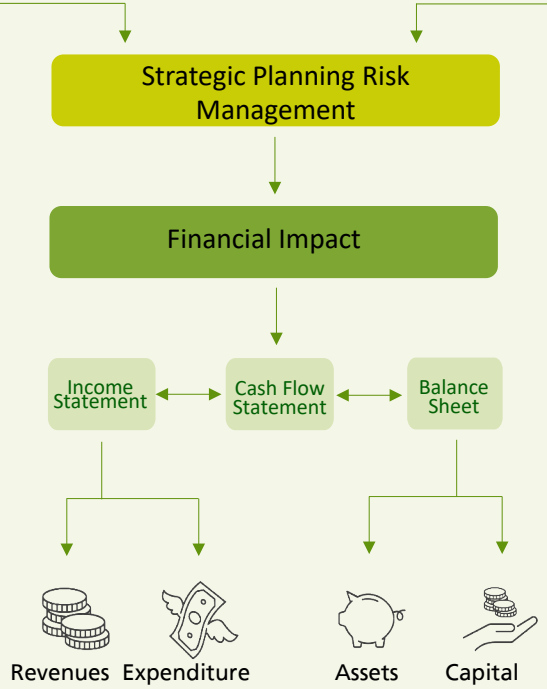
Technology
- Replace existing goods and services with products with lower emissions
- Unsuccessful investment in new technology

Market
- Changed customer behavior, uncertainty in market signals
- Rising raw material costs

Reputation
- Negative news and business image
- Negative stakeholder sentiment

Physical Risks

Acute: Extreme weather events
Chronic: Changing weather patterns and rising as global temperature and sea levels rise



Opportunities

Resource Efficiency
- Increase efficiency and reduce energy consumption in all activities
- Use of recycling
- Reduce water consumption

Energy Source
- Use of low-emission energy sources
- Use of modern technology
- Participation in the Carbon Market

Products/ Services
- Development of low-carbon products and services
- New business models related to climate adaptation, such as carbon credit trading and insurance business

Markets
- New carbon markets
- Increasing market share
- Support from related stakeholder

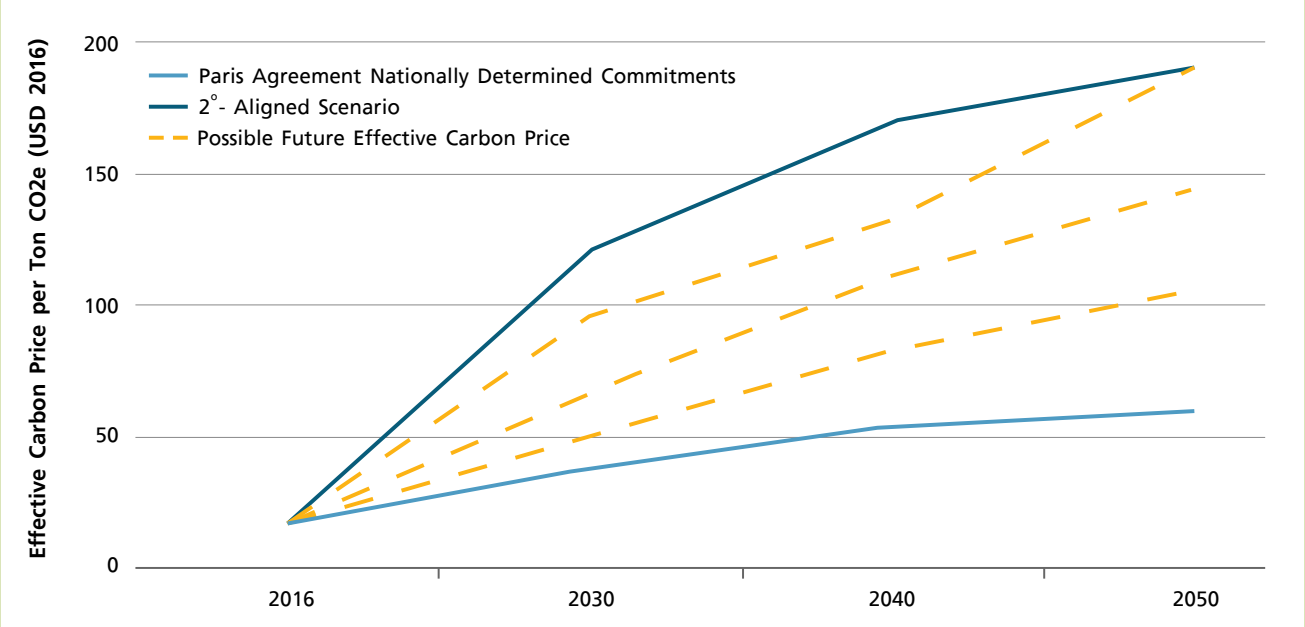
Resilience
- Participating in renewable energy projects and energy saving
- Renewable resources and diversity

CARBON PRICING

Scenario Analysis

Energy prices and the cost-of-living crisis were major factors driving price trends and influencing the design and implementation of carbon taxes and emissions trading systems (ETSs) over 2022. Despite this, these policies appear to be weathering the challenging political and economic circumstances relatively well. While some countries directly intervened to keep carbon tax or ETS prices low, most prices remained relatively stable, and in some jurisdictions, notably in Europe, they increased. Some ETSs experienced more volatility in 2022 as a result of fluctuating energy prices and to a lesser extent government responses to the energy crisis. High-income countries still see the highest direct carbon pricing coverage, prices, and revenues. In the meantime, there is a growing interest especially among low- and middle-income countries, especially in light of the potential for careful design and targeted use of carbon pricing revenue to support development goals.

Carbon Prices Scenario Analysis to Meet 2°C Paris Agreement Target



Source: OECD & IEA (2017); Trucost Analysis. Data as of June 2017. Chart is provided for illustrative purposes.

The forecast effective carbon prices (the cumulative effect of regulations such as carbon taxes and emissions trading schemes) in countries that are part of the Organization for Economic Co-operation and Development under different climate change policy scenarios. Average carbon prices could increase more than sevenfold to USD 120 per metric ton by 2030, as regulations are introduced to achieve the Paris Agreement goal to limit global warming to 2°C.

Carbon price makes it possible to gain insights into how various operations may be impacted by taxes and emissions trading and opportunities to exploit the low-carbon transition.

C.P. GROUP Carbon Pricing

Shadow price valuation in the development of energy and renewable energy projects to reduce greenhouse gas emissions of Charoen Pokphand Group

Charoen Pokphand Group has a total greenhouse gas emissions of 73.35 million tons of carbon dioxide equivalent. In 2022, We can reduce greenhouse gas emissions by 1.32 million tons of carbon dioxide equivalent from Energy Efficiency & Renewable energy projects. We has studied, analyzed and estimated investments in 2022. The Group has assessed and determined the Shadow Pricing in order to consider investment decisions in energy-saving, productivity & efficiency and greenhouse gas emissions reduction project within the organization.

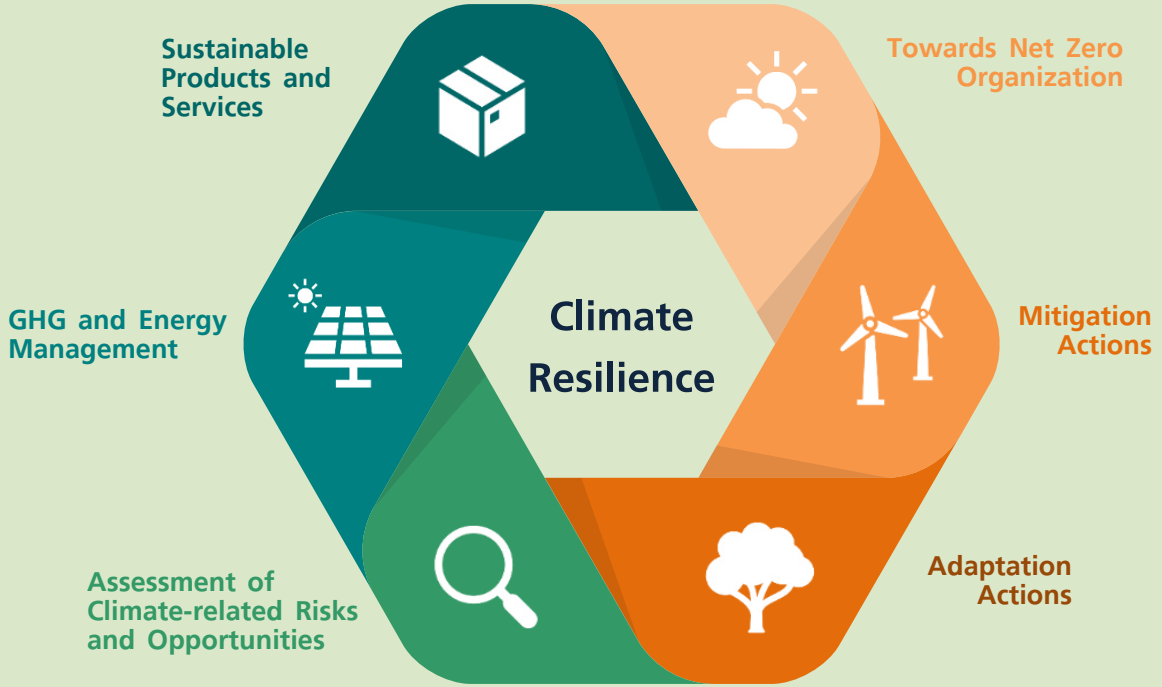
CLIMATE RISK MANAGEMENT

C.P. Group has identified the short-, medium-, and long-term climate-related risks and opportunities. We also assessed the probability and impacts of those risks and opportunities to the Group. These climate-related issues have been integrated into C.P. Group's Sustainability Framework and Climate Change Management to enhance the Group's resilience to climate change.

C.P. Group has in place a framework for managing climate change that covers our entire supply chain. We determine policies and targets that encompass energy efficiency, renewable energy use, waste management, and reductions in plastic packaging. From the Group's climate risks and opportunities assessment, we developed comprehensive risk management plans as well as established C.P.Group Climate Resilience Management Approaches.

In addition, the Group communicates our performance on climate change impact management and mitigation plan to stakeholders through various channels including, our Sustainability Report, the Communication on Progress to the UN Global Compact, and CDP's climate change disclosure system.

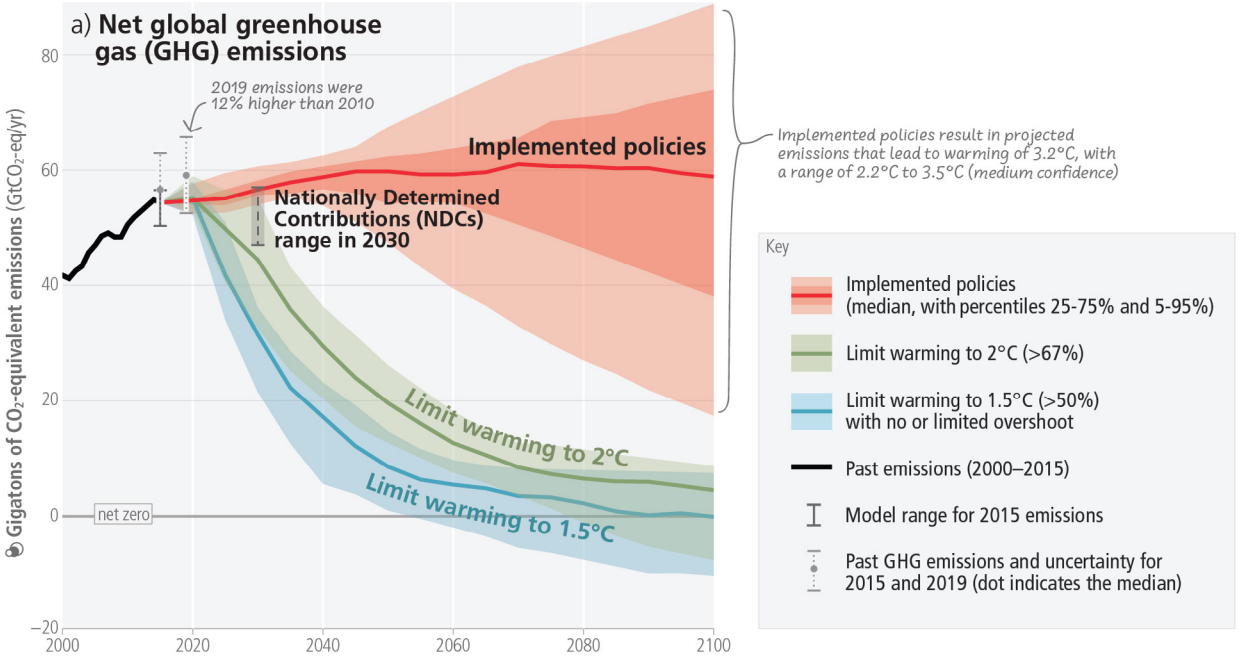
C.P. GROUP Climate Resilience Management Approaches

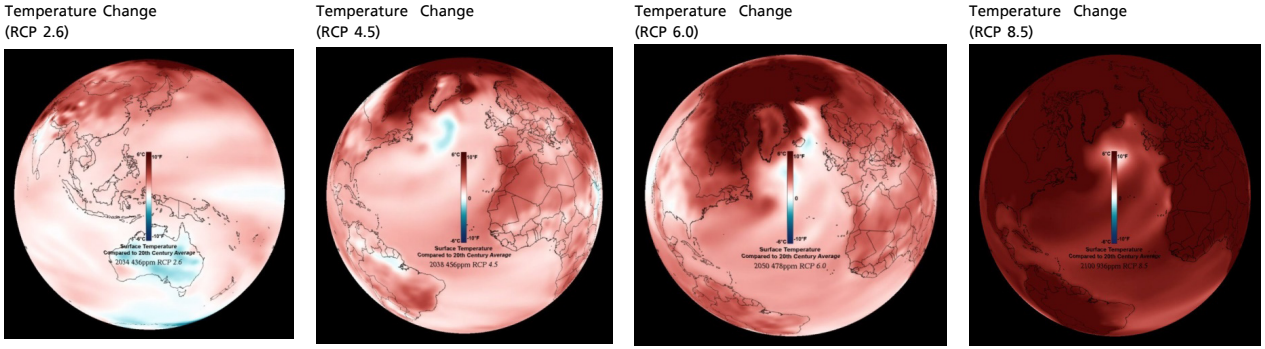


CLIMATE MODELS: THE STUDY OF DYNAMICS OF THE WEATHER AND PROJECTIONS OF FUTURE CLIMATE

Global emissions pathways consistent with implemented policies and mitigation strategies. Limiting warming to 1.5°C and 2°C involves rapid, deep and, most case, immediate greenhouse gas emission reductions. Therefore, Net zero GHG emissions can be achieved through reduction across all sectors.

Future emissions and concentrations of greenhouse gases are difficult to predict and depend on future developments such as population growth. economic growth, power consumption, use of renewable energy, technological change, deforestation and land use. The climate modeling community (RCPs) have projected future global warming scenarios that are likely to occur from changes in future greenhouse gas concentrations and pollution arising from different activities.





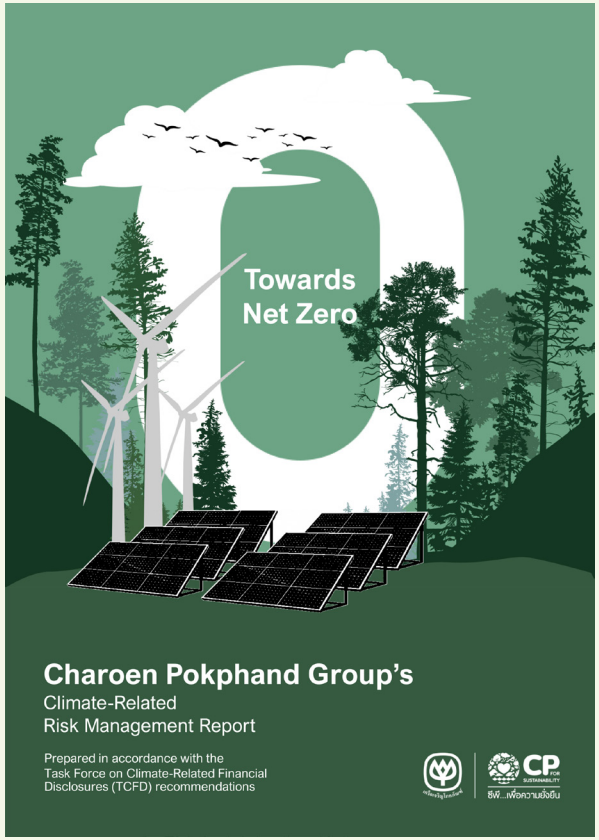
SCENARIO ANALYSIS

C.P. Group uses scenario analysis to understand climate-related risks and opportunities for its operations and assess how climate change may affect the businesses, covering both transition and physical risks.

There are many climate change scenarios conducted by various organizations. The most commonly used scenarios are developed by the Intergovernmental Panel on Climate Change (IPCC), which mainly focuseson physical scenarios, and the International Energy Agency (IEA), which focus on transition scenarios. Using both types of scenario analysis allows C.P. Group to account for full range of implications of climate change to inform suitable short-term, medium-term to long-term strategic thinking, assess and incorporate climate-related risks and opportunities into an organization's broader risk management strategy, as well as identify financial impact from those scenarios.

The impacts of climate-related risks and opportunities on businesses were assessed using 2DS, IEA 450, NDCs, RCP2.6 and RCP8.5 scenarios. The results of this analysis illustrate the importance of climate impacts on our businesses, and further motivate our business commitment toward climate stewardship. Based on theses results, we developed action plans to reduce GHG emissions, mitigate, and adapt to the impacts of climate change.

Further details are explained in our C.P. Group's Climate-Related Risk Management Report.



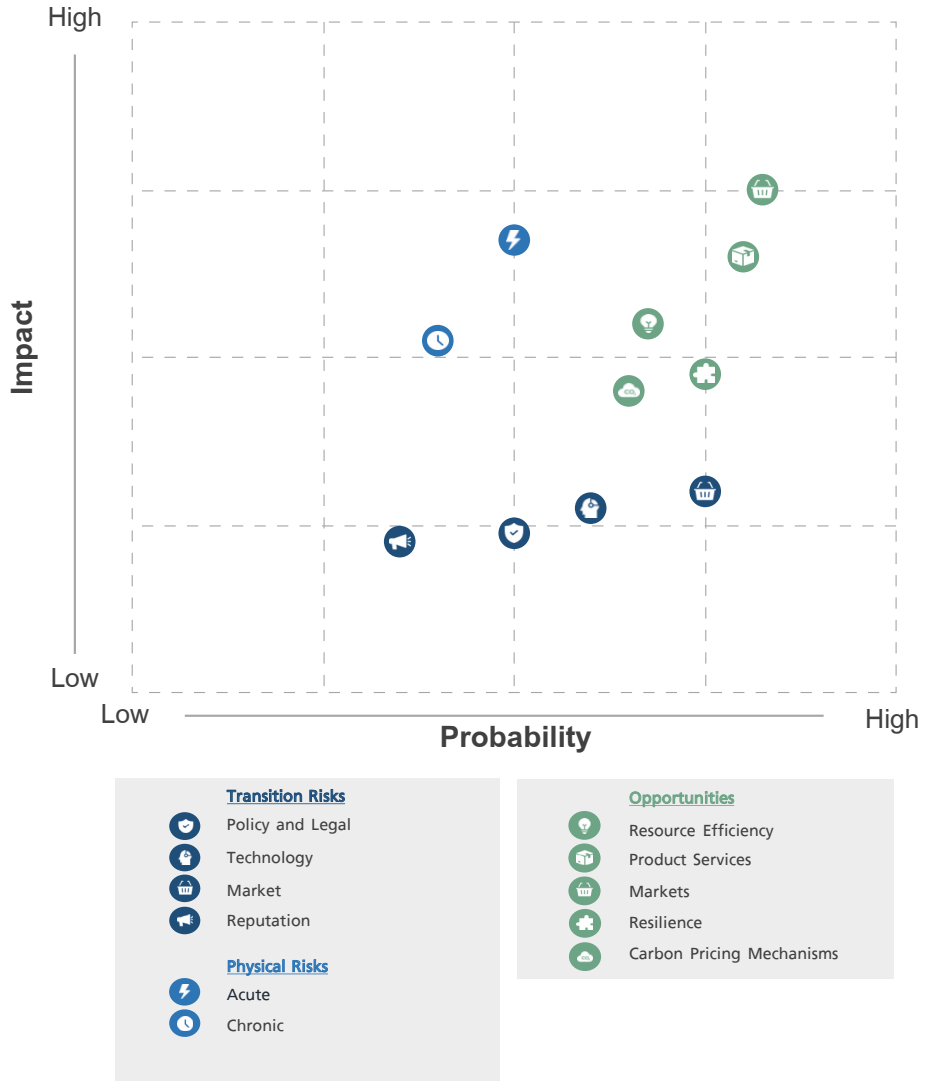
CLIMATE-RELATED RISKS AND OPPORTUNITIES

The climate-related risk assessment helps C.P. Group understand the impacts of climate-related risks and opportunities on businesses, recognize potential financial impacts on revenues, expenditures, values of assets and liabilities, and capital and financing, assign ownership to drive specific actions around them and take relevant steps to address those risks and opportunities.

Climate-related Risks and Opportunities	Short-term (2021-2023)		Medium-term (2024-2030)		Long-term (2030-2050)	
	Risks	Opport unities	Risks	Opport unities	Risks	Opport unities
Transition Risks						
Policy and Legal						
Technology						
Market						
Reputation						
Physical Risks						
Acute						
Chronic						

Risk Low High
Opportunity Low High

Assessment Matrix: Climate-related Risk and Opportunity



C.P. GROUP Climate-related Risks and Potential Financial Impact

Risk Type	Climate-related Risks	Time Horizon	Potential Financial Impact	Financial Impact
Transition Risks	**Policy and Legal**			
	• Carbon pricing mechanisms, Carbon Tax, Cap-and-trade • Enhanced emissions reporting obligations • Exposure to litigation • Mandates on and regulation of existing products and services • Increasingly rigorous actions by national government to reduce GHG emissions • Increased costs associated with carbon-intensive products and minimizing embodied carbon in the supply chain, especially if commodities are sourced overseas • Increased expenditure associated with the use of non-renewable energy	Medium–term	• Increased operating costs from mandatory climate change regulations. This increases the implementing cost environmental projects by 118 million USD. • Increased operating cost for high carbon activities (e.g. higher compliance costs, increased insurance premiums). The carbon tax penalty to be offset by 92 million USD. • Asset impairment, early retirement of existing assets due to policy changes • Increased costs, reduced demand for products and services resulting from fines and judgments • Threats to securing license to operate for carbon-intensive activities • Emerging concern about liabilities • Regulations on plastics make increased expenses of 6.21 million USD for procuring raw material substitutes	Medium
	To minimize the impact from emerging regulation risks which include the risk from policies and regulations change, C.P. Group will need to set and apply internal carbon pricing and platform, climate-related and low carbon certification and verification to ensure that our operations are complied with those changes. Failure to mitigate this risk may impact our operating costs, cash flow, asset impairment, early retirement of existing assets due to policy and regulation changes, financial position, business and reputation.			
	Technology			
	• Cost to transition to lower emission technologies • Unsuccessful investment in new technologies • New technologies that disrupt markets	Short–term	• Increased cost for developing lower emission technologies 142 million USD • Decreased revenues • Increased energy consumptions costs due to greater electrification • Development and use of renewable energy, energy efficiency	Medium
	To achieve the target to become a Carbon Neutral Organization by 2030, C.P. Group will need to shift from the energy and electricity consumption towards low emission energy and renewable resources, and we plan to increase the renewable consumption to 85% by 2030. We see the opportunities in development of new products such as renewable energy and renewable electricity which not only can be used for emission reduction in the direct operations, but also increase our revenues through access to new and emerging markets. Failure to develop and adopt new technologies and innovation may lead to the organization falling behind the competition, unable to meet future regulations and consumer preference for products and services with stronger environmental performance.			
	Market			
	• Changing customers behavior towards low carbon products • Uncertainty on market trend • Increased demand for energy efficient, lower-carbon products and services which might need more verification and third-party certification. • Reduced market demand for carbon-intensive products and services	Medium–term	• Reduced demand for certain products and services due to shift in customers preferences • Increased production costs due to changing input prices (such as energy) • R&D investment for sustainability-related products increased by 846 million USD • Marketing research expenses on sustainable product development increased by 188 million USD.	Large
	C.P. Group is implementing more environmental, low-carbon and sustainable labels and certifications, replacing old equipment and investing in high-technology and low-carbon emission machinery, increasing R&D budget for low-carbon, environmentally-friendly and sustainable products and services. As a result, financial implication of market risks from customer behavior changes are estimated to be no more than 5% of the Group's revenue. Failure to keep up with evolving consumer and market preferences may lead to negative impacts on overall business performance and financial impact.			

Remark : Risks
(Degree of positive Impact, Financial Impact Values)

Small <50 million USD | Medium 50 million USD to 1,000 million USD | Large > 1,000 million USD

C.P. GROUP Climate-related Risks and Potential Financial Impact

Risk Type	Climate-related Risks	Time Horizon	Potential Financial Impact	Financial Impact
Transition Risks	**Reputation**			
	• Growing expectation from stakeholders on climate responsibility and awareness on climate issues. • Shifts in consumer preferences • Failure to meet stakeholders and consumers need	Short–term	• Reduce revenues, reputation and brand value • Risk of loss of trust and confidence in management	Small
	C.P. Group's reputation and brand values are our key asset. Meeting customers' preference towards low carbon economy can have significant impact to C.P. Group's. Failure to deliver on our promises might damage the corporate reputation and trust as a sustainability-minded business, therefore, we have set clear KPIs, strategies and action plans in order to achieve those ambitious goals.			
Physical Risks	**Acute**			
	• Increased severity and frequency of extreme weather events such as floods, droughts, cyclones, higher temperatures, change in precipitation • Increased likelihood and severity of wildfires • Operational disruption	Short- to medium-term	• Increased raw material costs • Increased operating costs e.g. We have implemented a Business Continuity Plan (BCP) to analyze potential water risks and epidemic risks by 381 million USD. • Decreased revenues and asset values e.g. 7-Eleven stores to withstand damage from floods. Decreased income of 127 million USD due to fewer sales at 7-Eleven stores. • Direct damage to assets and property, infrastructure malfunction • Indirect impacts from supply chain disruption	Medium
	If we cannot limit the global temperature increase to well-below 2`C or not to exceed 1.5`C, then we would face significant changes in precipitation patterns and extreme variability in weather patterns. These factors can adversely impact the continuity of our operations and the well-being of our employees, customers, and the communities which our operations depend on. C.P. Group has assessed the impacts from these acute risks and plan for mitigation actions covering our own operations as well as along the value chain.			
	Chronic			
	• Long-term shifts in climate patterns • Changes in precipitation patterns and extreme variability in weather patterns • Higher frequency of severe weather events • Increasing extreme temperature, hot days, sea level rise, coastal erosion, water scarcity, drought, floods • Increased spread of infectious diseases	Medium– to long-term	• Increased business interruption and damage across operations and supply chains. Therefore we have implemented a management plan to prevent damage from long-term water risks. The value of damage that may occur is 1,577 million USD. • Increased operating costs and increased insurance claims • Decreased revenues due to reduced production capacity and disrupted supply chain of raw materials and reduces asset values • Reduced agricultural productivity and availability and quality of raw materials. • Impacts on terrestrial and aquatic ecosystems	Large
	According to the IPCC 5thAssessment Report (AR5), the global temperature is likely to increase and exceed 1.5`C by the end of the 21$^{st}$century, accompanied by more frequent extreme weather events. From the review, studies show that a 2`C rise in global average temperature can lead to a 3% loss in agricultural production, while change in precipitation pattern can also cause water stress and water shortage, with some areas suffering up to 30% shortage of water. Chronic risks can have financial implications for our businesses, from reduced sales revenue/output, increased capital and operating expenses, more frequent business interruption, damages across operations and supply chains with consequences for the availability, quality, and cost of raw materials and threaten our ability to ensure food security throughout the value chain.			

Remark : Risks
(Degree of positive Impact, Financial Impact Values)

Small <50 million USD | Medium 50 million USD to 1,000 million USD | Large > 1,000 million USD

C.P. GROUP Climate-related Opportunities and Potential Financial

Efforts to mitigate and adapt to climate change can also provide opportunities for businesses. Examples of climate-related opportunities include resource efficiency, energy source, products/ services, markets and resilience.

Opportunities Type	Climate-related Opportunities	Time Horizon	Potential Financial Impact	Financial Impact
Resource Efficiency	• Use of more efficient production and distribution processes and more sustainable raw material • Use of more efficient mode of transport • Reduce waste and use circular economy solutions • Reduced water consumption • Improve resource and energy efficiency	Long–term	• Reduced operating costs, including energy costs • Increased production capacity to reduce costs from innovation projects and process improvements by 108 million USD • Increased revenues	Medium
Energy Source	• Use of low emission energy sources such as solar, wind, hydro or biofuels • Use of new low-emission technologies • Participation in carbon markets, carbon reduction mechanisms	Long–term	• Reduced operation cost by 55 million USD • Reduced exposure to volatility of prices of fossil fuels • Return on investment on low emission technologies • Enhanced competitive advantage through energy cost saving and alignment with customer preferences	Medium
Products And Services	• Development of new low-emission products and services • Shift in consumer preferences • Development of new products and services through innovation and R&D	Medium–term	• Improve competitive position on shifting consumer and producer preferences such as low carbon products, carbon footprint labeling • Increased revenue from demand for low-emission products and services by 1,012 million USD	Large
Markets	• Organizations that proactively seek opportunities in new markets may be able to diversify their activities and better position themselves for the transition to a lower carbon economy.	Medium–term	• Increased revenues through access to new markets e.g. Investment in alternative energy or renewable energy business able to generate a profit of 44 million USD • Increased reputation and brand value	Small
Resilience	• Organization capability to respond to transition risks and physical risks • Participate in renewable energy programs • Adopt energy efficiency measure • Join climate mitigation and adaptation projects and activities	Long–term	• Increased revenue through new products and services related to ensuring climate resilience • Increased market valuation • Increased organization reputation • Increased reliability of supply chain and ability to operate under various conditions	Small

Remark : **Opportunities** (Degree of positive Impact, Financial Impact Values)

Small <50 million USD | Medium 50 million USD to 1,000 million USD | Large > 1,000 million USD

ANALYSIS OF CLIMATE-RELATED RISK AND OPPORTUNITIES

Risks: Transition Risk (Carbon Tax)

Based on the Nationally Determined Contribution (NDC) roadmap, a carbon price will be implemented in the power sector to accelerate a transition to low-carbon energy in Thailand. The carbon tax would shift the electricity production cost and result in the risk to our financial statement, particularly when the electricity consumption is increasing. The sensitivity analysis is conducted to evaluate the impact of the carbon prices to our operations (electricity cost inflation) in 2030.

Scenario 1

Business as Usual (Electricity cost inflation 4-25% without the impact of carbon prices)

	Electricity Cost inflation (%) in 2030 without impact of carbon price				
Energy Consumption Growth (kWh)	4%	12%	16%	20%	25%
4%	29,044	31,278	32,395	33,512	34,909
8%	30,161	32,481	33,641	34,801	36,251
16%	32,395	34,887	36,133	37,379	38,937

Scenario 2

Estimation with Carbon Price Impact = 360 THB/tCO_2e (Electricity cost with 2.02% increase in 2030)

	Electricity Cost inflation (%) in 2030 without impact of carbon price				
Energy Consumption Growth (kWh)	4%	12%	16%	20%	25%
4%	29,629	31,908	33,048	34,187	35,612
8%	30,768	33,135	34,319	35,502	36,981
16%	33,048	35,590	36,861	38,132	39,721

Scenario 3

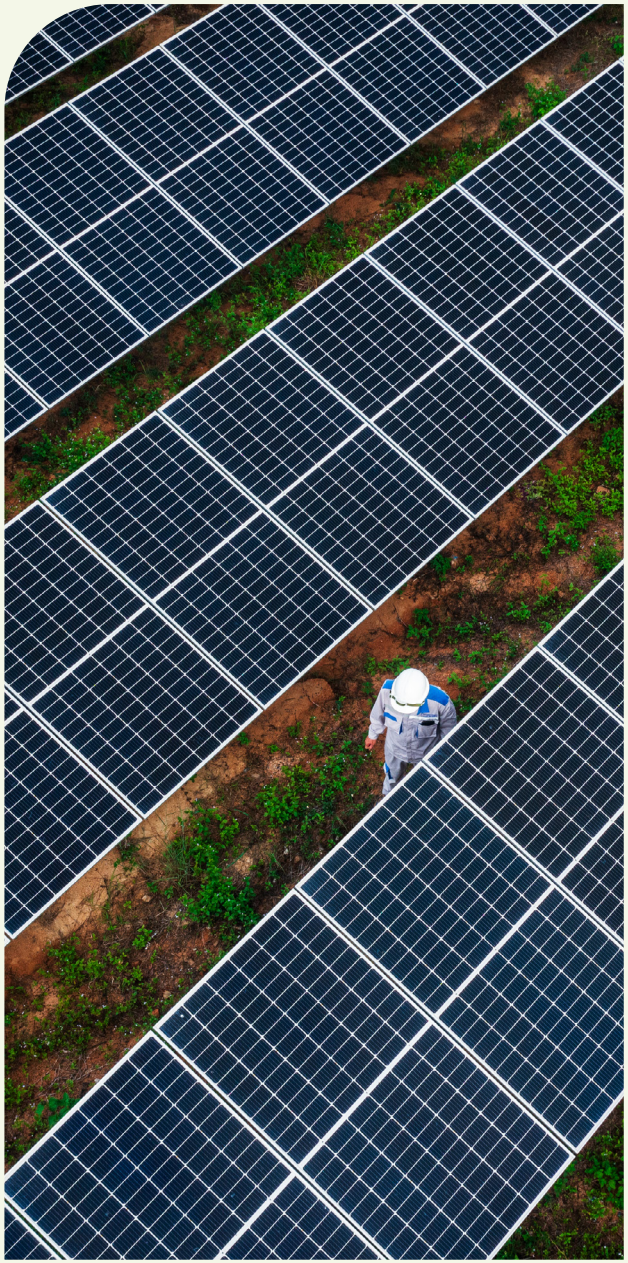
Estimation with Carbon Price Impact = 1,080 THB/tCO_2e (Electricity cost with 6.30% increase in 2030)

	Electricity Cost inflation (%) in 2030 without impact of carbon price				
Energy Consumption Growth (kWh)	4%	12%	16%	20%	25%
4%	30,873	33,247	34,345	35,622	37,107
8%	32,060	34,526	35,759	36,992	38,534
16%	34,435	37,084	38,408	39,733	41,388

Remark:

- The carbon price levels in our study is based on International Energy Agency (IEA) report "The potential role of carbon pricing in Thailand's power sector. The electricity consumption rate (7,206,285,245 kWh) and prices in FY 2019 (3.73 THB/kWh) is used as a baseline for analysis.

ANALYSIS OF CLIMATE-RELATED RISK AND OPPORTUNITIES



Opportunities: New Alternative Energy Business

Based on our business strategy for transition to low carbon economy, C.P. Group is planning to increase the capacity of solar rooftop installed for the operation from 184 MW in 2021 to more than 1,200 MW in 2030. The service provider is one of our subsidiaries (Altervim) and its investment cost is approximately 3.8 Baht/kWh in 2021. Theoretically, the efficiency of solar cell will be reduced approximately 0.55% every year. At the same time, the electricity generated may not meet C.P. Group planning at 1,172 MW and we will need to allocate the budget for electricity from the grid. Thus, this analysis is conducted to estimate the financial impact to Altervim operation. The scope of analysis electricity cost saving (million THB) is based on 3 scenarios as follows;

Scenario 1

Business as Usual

	Solar PV Installation Capacity (MW)				
Efficiency Solar Cell (%)	294	513	733	952	1,172
-1%	1,071	1,872	2,673	3,474	4,275
-2%	1,027	1,794	2,562	3,329	4,097
-3%	982	1,716	2,450	3,184	3,919

Scenario 2

Electricity cost estimates will be increased by 10%

	Solar PV Installation Capacity (MW)				
Efficiency Solar Cell (%)	294	513	733	952	1,172
-1%	1,178	2,059	2,940	3,821	4,703
-2%	1,129	1,974	2,818	3,662	4,507
-3%	1,080	1,888	2,695	3,503	4,311

Scenario 3

Electricity cost estimation will be increased by 20%

	Solar PV Installation Capacity (MW)				
Efficiency Solar Cell (%)	294	513	733	952	1,172
-1%	1,286	2,247	3,208	4,169	5,130
-2%	1,232	2,247	3,074	3,995	4,916
-3%	1,178	2,059	2,940	3,821	4,703

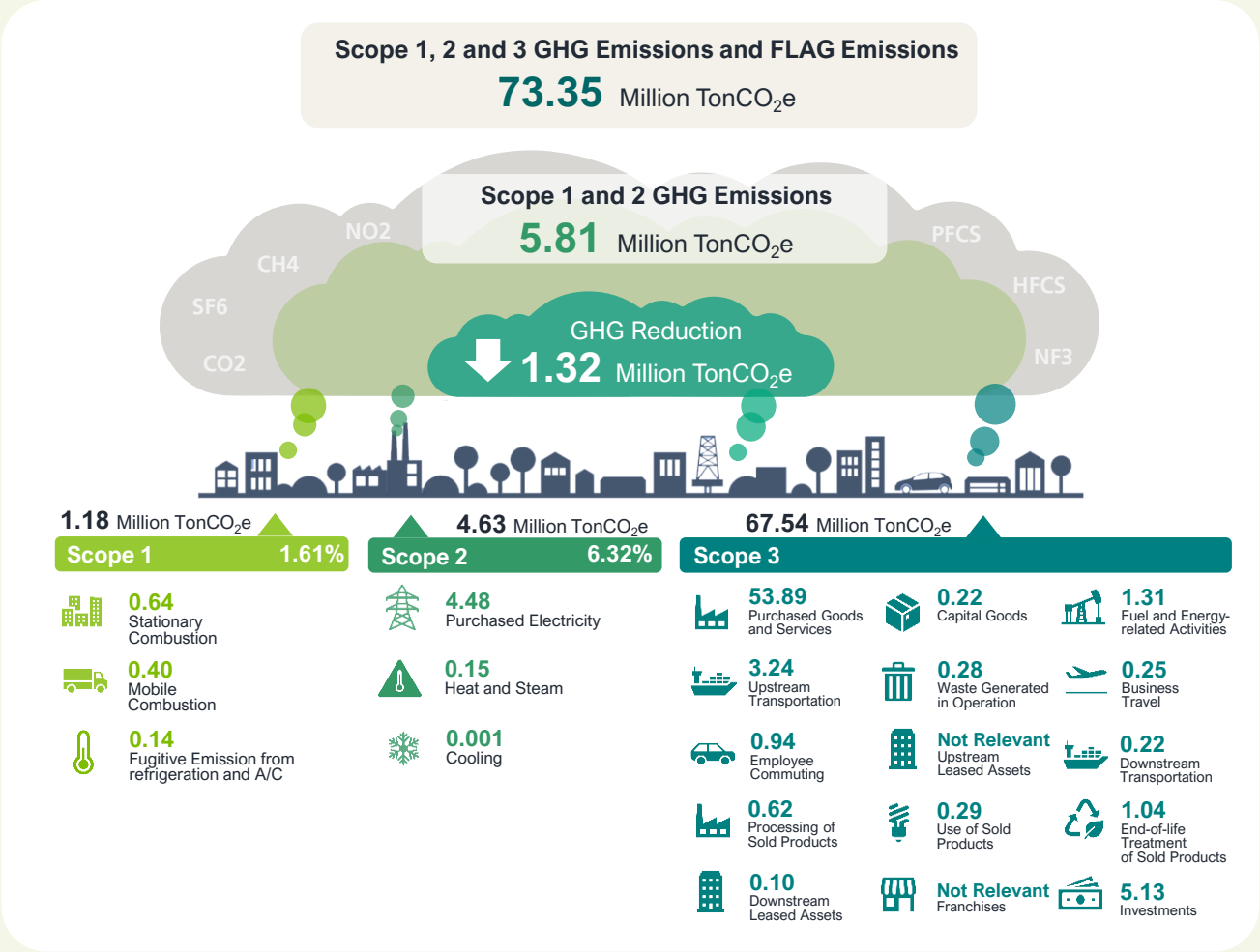
METRICS AND TARGETS

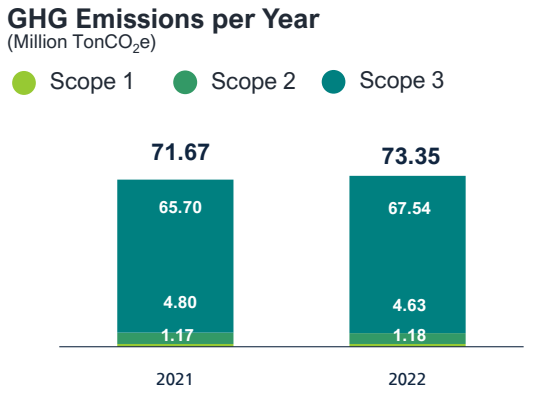
C.P. Group supports the Paris Agreement and UN “Race to Zero” campaign, commits to set Science-based Targets (SBT) and announced to become a Carbon Neutral Organization by 2030. The Group requires all business units in all countries and econnomies to set a common goal to achieve carbon neutrality from operations owned or controlled by the company by the year 2030.

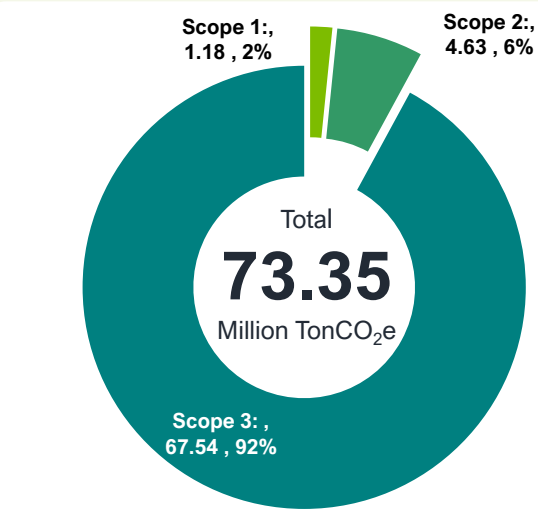
Given the challenge of the climate crisis today, C.P. Group recognizes the opportunity to inspire change and raise the level of ambition for the next phase of our climate commitment. The Group is firmly committed to reducing both direct and indirect GHG emissions, particularly through expansion of renewable energy and reduction of fossil fuel-based energy. We also look beyond the scope of our operations to support external GHG reduction mechanisms and initiatives, such as prioritizing procurement of low-carbon products and services.

OUR GHG EMISSIONS

Scope 1, 2, 3 emissions for the past four years are presented in the table below. All emissions are listed in metric tonnes CO_2e. Emissions are calculated based on guidance from the GHG protocol. Limited assurance over Scope 1, Scope 2 and Scope 3 emissions figures is provided by a third party to evaluate the accuracy and reliability of our methods and data and to promote accountability, as shown in our LRQA Independent Assurance Statement.







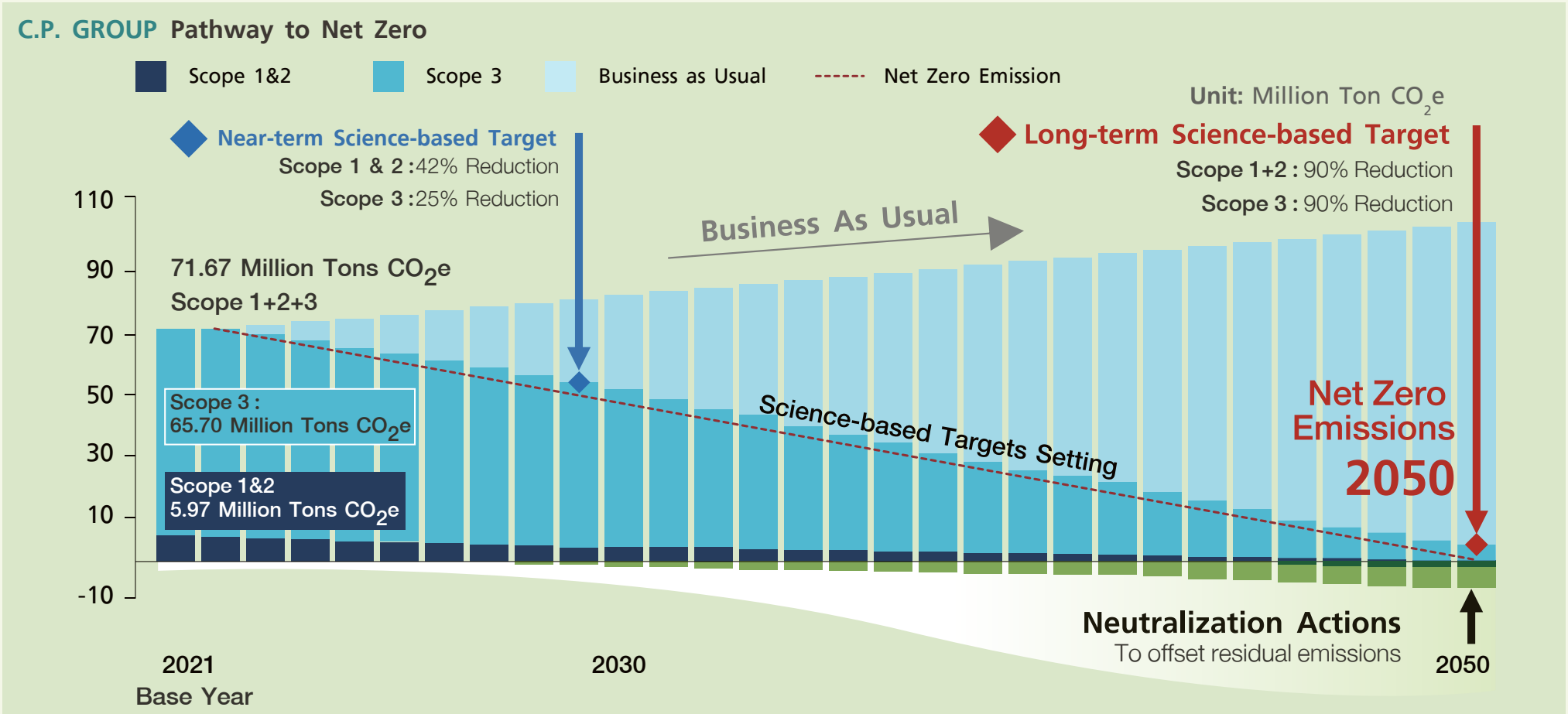
C.P. GROUP PATHWAY TO NET ZERO

C.P. Group aims to achieve Net Zero emissions by 2050 (including Scope 3), commit to setting science-based emissions reduction targets in line with 1.5°C emissions scenarios, and submit the targets to the Science-based Targets initiative (SBTi) for approval to ensure the strongest ambition and align with trajectories that lead to net-zero value chain emissions by 2050 for the best chance of avoiding the worst impacts of climate change.

Charoen Pokphand Group is Certified according to the Science-based Targets Initiative (SBTi)

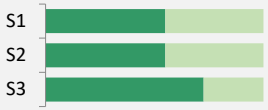
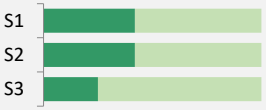
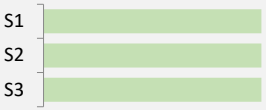
The Group is committed to reduce greenhouse gas emissions from our operation, both Scope 1 and 2, by 42%, and 25% for Scope 3 within 2030, compared to base year 2021

C.P.GROUP
SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION
BUSINESS AMBITION FOR 1.5°C
OUR ONLY FUTURE



NET ZERO TARGET

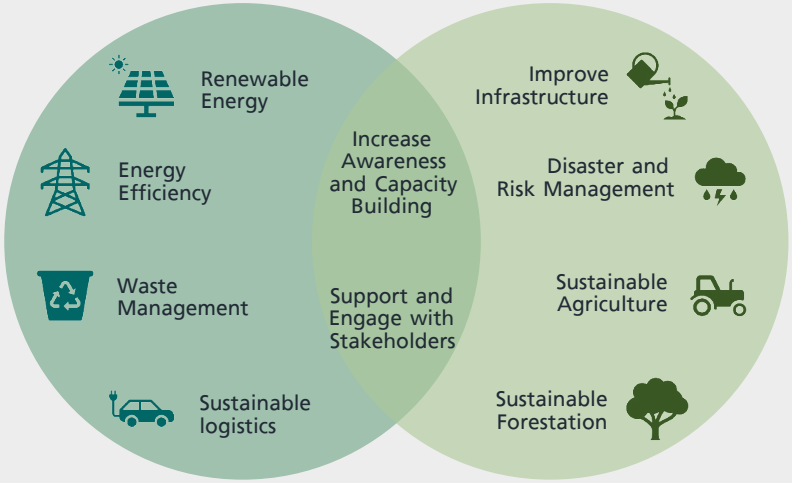
C.P. Group, as a signatory to the "Business Ambition for 1.5 °C" campaign, promoted by the United Nations and other institutions, is committed to setting a long-term goal to achieve net-zero emissions across the entire value chain by 2050, including both direct emissions (Scope 1) and indirect emissions (Scope 2 and 3), together with science-based targets in all relevant areas and in line with the criteria and recommendations of the Science-based Targets initiative (SBTi).

	GHG Target	Scope	Climate Scenario	Key Mitigation and Adaptation Actions	Total GHG Emission Reduction Target (million TonCO_2e)
Short Term (2023)	- **9%** GHG Scope 1 and 2 Reduction compare with 2021 - **5.5%** GHG Scope 3 Reduction compare with 2021		 1.5°C	• Energy Efficiency • Solar PV • Bio Energy • EV for Logistic • Green Refrigerant • Sourcing Low-carbon Products	**1.98**
Medium-Long Term (2030)	- **42%** GHG Scope 1 and 2 Reduction compare with 2021 - **25%** GHG Scope 3 Reduction compare with 2021		 1.5°C SBTi certifies	C.P. Group is committed and prioritized related to mitigating the impacts of climate change through projects and activities where possible. Mitigation and adaptation action projects to achieve the goal of becoming a Net Zero 2050 organization • Sustainable Energy • Sustainable Operations • Sustainable Agriculture • Sustainable Consumption • Carbon Removal	**17.80**
Long Term (2050)	- **90%** Total GHG Scope 1, 2, and 3 Reduction compare with 2021 - **10%** Offset by DAC , CCS		 1.5°C		**171.51 (Net Zero)**

MITIGATION AND ADAPTATION ACTIONS

Severe climate change may affect business operations, if resources are used inefficiently or are not prepared for impacts such as severe droughts, extreme weather. Hence, C.P. Grouphas taken actions to mitigate the impacts of climate change through various projects and activities, including Mitigation Actions and Adaptation Actions.

C.P. GROUP Climate Mitigation and Adaptation Actions

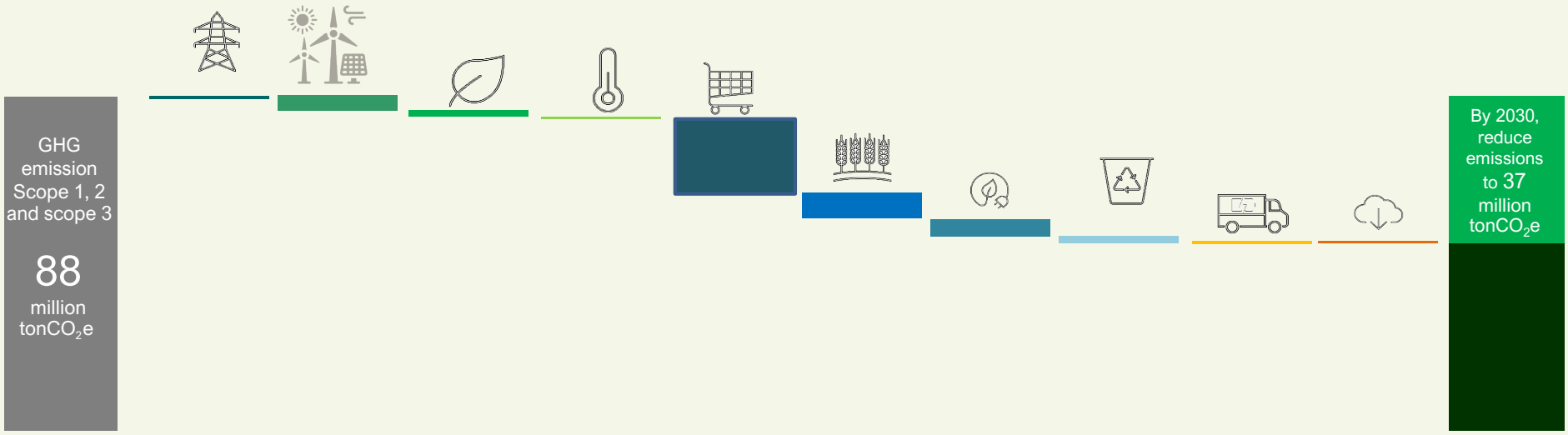


Mitigation Plans and Actions	Adaptation Plans and Actions
Reduce GHG emissions from operations	Support and engage with stakeholders to develop adaptation action plans
Improve energy efficiency e.g. • Cogeneration System • High Efficiency Chiller • Waste Heat Recovery and Utilization • High Efficiency Lighting	Increase awareness and capacity building along value chain
Increase renewable energy use e.g. • Solar Energy • Wind Energy • Biomass Energy • Biodiesel, Biomethane	Promote regenerative agriculture and Nature-based Solution projects • Reducing Emissions from Livestock • Good Fertilization Practices • Carbon Sequestration
Support stakeholders to mitigate and reduce GHG emission along value chain	Develop disaster and risk management plans
Reduce waste in supply chain • GHG Capture and Utilization • Production of Compost from organic waste • Recycling	Improve infrastructure to cope with events that might occurred from climate change
Promote sustainable logistics • High Speed Rails Systems • Mass Rapid Transit Project • Electric Vehicles & Charging Stations • Lightweight Pallets • Fuel Switch	Promote sustainable forestation and reforestation • Sustainable Forestation • REDD+ • Zero Deforestation

KEY GHG REDUCTION MEASURES FOR ALL SCOPE EMISSIONS

With the global attention set on the trend to become a Zero Carbon Organization, Charoen Pokphand Group considers this a great challenge for the Group. Therefore, the Group has defined the Carbon Neutral Target and pledged to reduce greenhouse gas emissions according to SBTi (Science-based Targets initiative) by 2030. Such target and commitment serve as the guideline in managing climate change, which corresponds to the Paris Agreement's ultimate goal of limiting global warming to no more than 1.5°c

Charoen Pokphand Group focuses on climate change management and attaches importance to promoting the use of renewable energy, upgrading machinery to render maximum efficiency in all activities, developing modern, fast and non-polluting transportation systems, sourcing sustainable and low-carbon raw materials that do not destroy forests, and planting trees, increasing green space and investing in Carbon Sequestration, which are the key driving factors in achieving our established goals.



Projected 2030 business-as-usual plus our forecast company growth

Energy Efficiency

Improve energy in all parts of the production process.

Renewable Power

Replace conventional fossil-based power generation with renewable and purchased REC

Bio-Energy

Replace fuels with lower or zero-carbon sources, such as biomass and biogas

Natural Refrigerant

Switch to low GWP refrigerants that are environmentally friendly

Carbon Footprint Products

Support partners to reduce carbon footprint sold products as low emission products

Sustainable Agriculture

Sourcing low-carbon raw feed materials

Avoided Emission from use of our Products

Reducing GHG emissions from use of sold products

Zero Waste to Landfill

Reducing methane emissions from landfills, and pulling carbon out of the atmosphere

EV Logistic

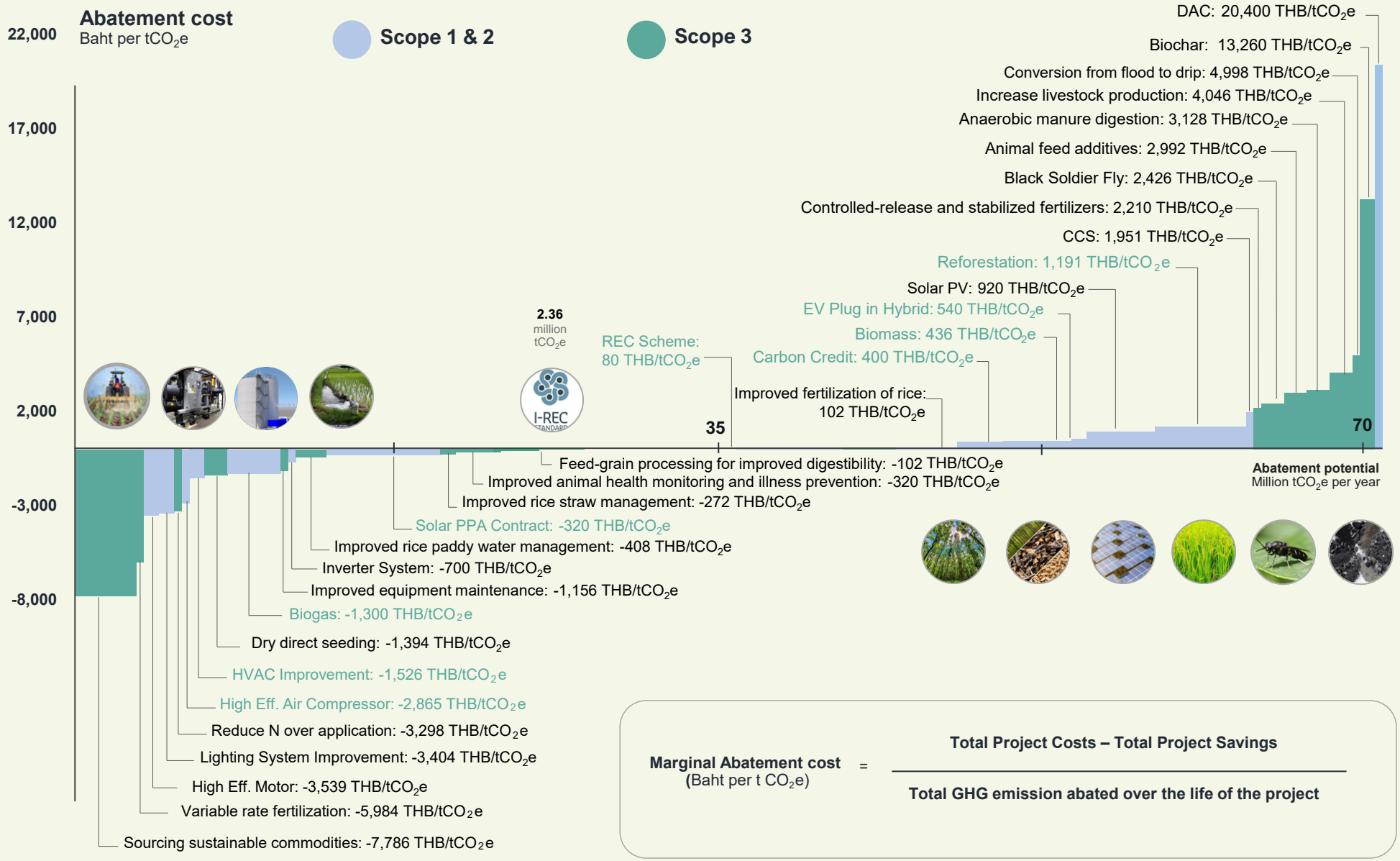
Improve fuel economy, lower fuel costs, and reduce emissions

Carbon Offset

Increase in carbon storage through land restoration or tree planting and purchased carbon credits

Target Year 2030

USING MAGINAL ABATEMENT COST CURVE TO REALIZE THE GHG REDUCTION



Marginal Abatement cost (Baht per t CO_2e) = $\frac{\text{Total Project Costs – Total Project Savings}}{\text{Total GHG emission abated over the life of the project}}$

REFERENCES

TCFD Guidelines

TCFD (2017), Final Report Recommendations of the Task Force on Climate-related Financial Disclosures,
https://www.fsb-tcfd.org/publications/final-implementing-tcfd-recommendations

TCFD (2017), The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities,
https://www.fsb-tcfd.org/publications/final-technical-supplement/

TCFD (2017), Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures
https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Annex-062817.pdf

TCFD (2021), Task Force on Climate-related Financial Disclosures Overview,
https://www.fsbtcfd.org/wp-content/uploads/2020/03/TCFD_Booklet_FNL_Digital_March-2020.pdf

TCFD (2022), Task Force on Climate-related Financial Disclosures Overview,
https://assets.bbhub.io/company/sites/60/2022/12/tcfd-2022-overview-booklet.pdf

Scenario Analysis

IEA (2019), World Energy Outlook 2019,
https://www.iea.org/reports/world-energy-outlook-2019

EA (2021), World Energy Model Documentation 2020 version (full report),
https://iea.blob.core.windows.net/assets/bc4936dc-73f1-47c3-8064-0784ae6f85a3/WEM_Documentation_WEO2020.pdf

World Energy Investment 2023,
https://iea.blob.core.windows.net/assets/8834d3af-af60-4df0-9643-72e2684f7221/WorldEnergyInvestment2023.pdf

IEA (2022), World Energy Outlook 2022,
https://www.iea.org/reports/world-energy-outlook-2022

IPCC (2014): Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.,
https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf

IPCC (2018), Global Warming of 1.5 degree,
https://www.ipcc.ch/site/assets/uploads/sites/2/2018/07/SR15_SPM_version_stand_alone_LR.pdf

IPCC (2013), Climate Change 2013: The Physical Science Basis,
https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf

IPCC (2014), Climate Change 2014: Impacts, Adaptation, and Vulnerability, Part A: Global and Sectoral Aspects,
https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-PartA_FINAL.pdf

IPCC (2014), Climate Change 2014: Mitigation of Climate Change, Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change,
https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_full.pdf

European Commission (2014), JRC Technical Reports, CAPRI Long-term Climate Change Scenario Analysis: The Ag MIP
https://op.europa.eu/en/publication-detail/-/publication/53560864-e7ee-4e31-916c-3c38a8f0fb46/language-en

European Commission (2020), Taxonomy: Final report of the Technical Expert Group on Sustainable Finance, EC, Brussels
https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/20%200309-sustain-

WRI (2020), WRI Aqueduct,
https://www.wri.org/resources/websites/aqueduct

WRI (2019), WRI Setting Site Water Targets Informed By Catchment Context,
https://www.wri.org/publication/setting-site-water-targets-informed-catchment-context

WBCSD (2019), TCFD Chemical Sector Preparer Forum, WBCSD, Geneva
https://docs.wbcsd.org/2019/07/WBCSD_TCFD_Chemical_Sector_Preparer_Forum.pdf

Climate Model: Temperature Change
https://sos.noaa.gov/catalog/datasets/climate-model-temperature-change-rcp-26-2006-2100/
Internal Carbon Pricing: Stress Testing Business for Climate Change Risk

(OECD & IEA (2017); Trucost Analysis. Data as of June 2017)

ASSURANCE STATEMENT

LRQA Independent Assurance Statement

Relating to Charoen Pokphand Group Company Limited's Sustainability Report

for the calendar year 2022

This Assurance Statement has been prepared for Charoen Pokphand Group Co, Ltd in accordance with our contract but is intended for the readers of this Report.

Terms of engagement

LRQA Thailand Ltd. was commissioned by Charoen Pokphand Group Co, Ltd (CPG) to provide independent assurance on its Sustainability Report for the calendar year 2022 ("the report") against the assurance criteria below to a limited level of assurance and at the materiality of the professional judgement of the verifier using LRQA's verification procedure. LRQA's verification procedure is based on current best practice, is in accordance with ISAE 3000 and ISAE 3410 and uses the following principles of - inclusivity, materiality, responsiveness, Impact and reliability of performance data.

Our assurance engagement covered only CPG's global operations and specifically the following requirements:

- Confirming that the report is in accordance with GRI Standard (2021).
- Reviewing the integrity of CPG's (GRI 2-24) Embedding policy commitments, (GRI 2-25) Processes to remediate negative impacts and (GRI 2-26) Mechanism for seeking advice and raising concerns and supplier assessment process.
- Evaluating the reliability of data and information for only the selected indicators listed below: GRI 301-1 Packaging material used by weight, GRI 301-2 Recycled input packaging material used, GRI 302-1 Energy consumption within the organization,GRI 303-3 to 5 Water withdrawal, discharge and consumption, GRI 305-1 Direct (Scope 1) GHG emissions (1), GRI 305-2 Energy indirect (Scope 2) GHG emissions, GRI 305-3 Other Significant indirect (Scope 3) GHG emissions – excluded cat. 8 and 14 which not relevant, GRI 305-7 Significant air emissions – VOC only, GRI 306-3 to 5 Waste generated, diverted from and directed to disposal included food loss and food waste and GRI 403-9 and 10 Work related injury and ill health.

Notes: 1. Reporting scope of direct GHG emission excluded emission from flaring of biogas, fugitives and all vented from CPF

2. Reporting scope of waste disposal excluded electronic waste from Ascend Group The information for these selected indicators is available at https://www.cpgroupglobal.com/storage/document/additional-topicspecific-reports/2023/sustainability-performance-report-2022-en.pdf

LRQA's responsibility is only to CPG. LRQA disclaims any liability or responsibility to others as explained in the end footnote. CPG's responsibility is for collecting, aggregating, analysing and presenting all the data and information within the report and for maintaining effective internal controls over the systems from which the report is derived. Ultimately, the report has been approved by, and remains the responsibility of CPG.

LRQA's Opinion

Based on LRQA's approach nothing has come to our attention that would cause us to believe that CPG has not, in all material respects:

- Met the requirements above
- Disclosed reliable performance data and information for the selected indicators as no errors or omissions were detected
- Covered all the issues that are important to the stakeholders and readers of this report.

The opinion expressed is formed on the basis of a limited level of assurance and at the materiality of the professional judgement of the verifier.

Notes: The extent of evidence-gathering for a limited assurance engagement is less than for a reasonable assurance engagement. Limited assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

[1] *GHG quantification is subject to inherent uncertainty.*

LRQA's approach

LRQA's assurance engagements are carried out in accordance with our verification procedure. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Assessing CPG's approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this by reviewing documents and associated records.
- Reviewing CPG's process for identifying and determining material issues to confirm that the right issues, with no bias, were included in their Report and updated overtime.
- Auditing CPG's data management systems to confirm that there were no significant errors, omissions or mis-statements in the Report. We did this by reviewing the effectiveness of data handling processes and systems, including collaborating information from third party assurance engagements done for CPG subsidiaries included CPF (Global), CPAll and True Corp.
- Sampling evidence presented verification to CPG's subsidiaries included Ascend, Chai Tai, CPLand, CPPC, CP Intertrade, CPCrop and Lotus's operations in People's Republic of China, Malaysia and Thailand to confirm the reliability of the selected indicators. We also spoke with key people in various facilities responsible for compiling the data and drafting the Report.

Notes: LRQA did not verify the data back to its original sources, nor did it assess the accuracy and completeness of the data reported by individual locations. focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

Observations

Further observations and findings, made during the assurance engagement, are:

- Stakeholder Inclusivity: We are not aware of any key stakeholder groups that have been excluded from CPG's engagement process.
- Materiality: We are not aware of any material aspects concerning CPG's sustainability performance that have been excluded from the Report.
- Responsiveness: CPG has processes for responding to various stakeholder groups. We believe that future reports should further explain the climate actions being taken by CPG and its supply chains.
- Impact: CPG should extend the supplier assessment process to address related ESG impacts through its supply chains.
- Reliability: CPG should maintain those subsidiary companies' third-party verification as CPG has collaborated its data

LRQA's standards, competence and independence

LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

This verification, together with verification for CPG subsidiaries are the only work undertaken by LRQA for CPG and as such does not compromise our independence or impartiality.

Signed **Dated: 3 June 2023**

Opart Charuratana
Lead Verifier
LRQA (Thailand) Limited
No.9. G Tower Grand Rama 9. FL.30, Room H14
Rama 9 Rd., HuayKwang, Bangkok 10310 THAILAND

LRQA Reference: BGK600000865

Charoen Pokphand Group Co., Ltd.

18 True Tower, Ratchadaphisek Road, Huai Khwang, Bangkok 10310, Thailand

Tel : +66(0)-2766-8000

Email: prcpgroup@cp.co.th