

### CPF's

### Sustainability Journey Passion towards Net-Zero

Charoen Pokphand Foods PLC (CPF) January 2025



2

3

4

5

Methodology

4 Intelligences Strategies

16

17

18

20

25

33

#### **Table of Content**

#### Environment Passion Towards 2030

Transitioning Towards Sustainable Economy

Environmental Sustainability: GHG Water Waste

Our Commitment in Achieving Environmentally Sustainable Value Chain in 2030

#### Setting the Scene

Net-Zero SBT Targets A Message From Our CEO Our Scope

#### Methodology

Our Global GHG Inventory

The Greenhouse Gas Protocol (GHG Protocol)

FLAG Guidance (Forest, Land and Agriculture Guidance)

Long-Term Roadmap to Net-Zero SBT

Reduced Emissions Evaluation

6	4 Intelligences
	Strategies
7	4 Intelligences-Driven
8	Net Zero Strategies
9	C – Carbon Reduction from Sustainable Sourcing
	P – Power Circulation
	F - Future Generation
11	Net-Zero Network
12	Measuring Performance
13	
	Glossary
14	
15	6



Environment Passion Towards 2030

Setting the Scene

Methodology

Glossary

### Environment "Passion Towards 2030"

#### **Transition towards Sustainable Business**

Our vision is to achieve long-term business growth alongside sustainable and responsible management of natural resources and the environment. By utilizing world-class technology and digital system, we are able to reduce impacts on the society and the environment.



#### **Environmental Sustainability**

CPF are committed in conducting sustainable business; protecting the environment with the use of digital technologies, data management, and artificial intelligence to address environmental issues in three key areas:



and Artificial Intelligence Data Science

Innovation and Technology CPF is steadfast on **three industry-leading goals** built `on our on-going journey to reduce the environmental impact:

#### Achieve Net-Zero Emissions

Near-term target for 2030

- Reduce GHG emissions from energy use by 42.0%
- Reduce GHG emissions from land use change and management by 30.3%

Long-term target for 2050

- Reduce GHG emissions from energy use by 90.0%
- Reduce GHG emissions from land use change and management by 72.0%

#### Plan for water risk

Develop a plan to manage the impacts of flooding, drought, and water scarcity in all high-risk areas, with a commitment to achieving zero liquid discharge at food processing plants. The pilot plant will be completed by 2025.

#### Move to zero waste to landfill

We embrace circular economy principles by maximizing the use of organic raw materials in production, transforming by-products into valuable resources, and eliminating single-use plastics across all CPF operations. Additionally, we are committed to achieving zero waste

to landfill by 2030.

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4 Intelligences Strategies



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Glossary



### Setting the Scene

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### Roadmap to Net-Zero SBT



Methodology

Mr. Prasit Boondoungprasert

Chargen Pokphand Foods Public Company Limited

Chief Executive Officer







#### A Message from Our CEO

CPF commits to reach Net-Zero greenhouse gas emissions across the value chain by 2050.

#### GHG Reduction Target against Base Year 2020

Near-term Targets 42%

30.3%

by 2030 from energy usage

from land use change and management

Long-term Targets By 2050 **90%** from energy usage fr

from land use change and management

72%

**Charoen Pokphand Foods** 

is the first food processing company in the world

with near- and long-term FLAG SBT validated by the SBTi in an attempt to limit global warming to **1.5** °C\*

\*above pre-industrial levels

Methodology

#### **Our Scope**

Charoen Pokphand Foods Public Company (CPF) operates agricultural and food industry in

**1**4 countries

**America** USA

Europe UK, Poland, Belgium, Türkiye, Russia

#### Asia

Thailand, China, Vietnam, India, Cambodia, The Philippines, Malaysia, Laos, Sri Lanka





\*<u>Remark</u> : Since 2024, the subsidiary in Poland has been restructured as a joint venture, therefore adjusting the scope and recalculating the base year. Methodology

### Methodology

Methodology

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#### CPF's **Global GHG Emissions** Scope 1 Scope 1 FLAG Non-FLAG 1.8% 2.0% Scope 2 Scope 3 3.8% FLAG 60.9% CPF

#### More than 60%

of GHG emissions are FLAG

Scope 3 Non-FLAG **31.5%** 



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#### **FLAG** Guidance

(Forest, Land and Agriculture Guidance)

Covers Scope 1, Scope 3.1: Purchased Goods and Services Emissions, and Scope 3.11: Use of sold products (FLAG)





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Setting the Scene

Methodology

4 Intelligences Strategies

Measuring Performance

Glossary

⊙ ⊘

#### **Key Actions**



#### 2020 Base Year

2025



100 MW Solar PV in Thailand's operations

**Environmentally Friendly Feed** in 100% of CPF own farms

Scope1+3 (FLAG)

Scope 1+2+3 (Non-FLAG)

CHA



No Additional Land Use Change in 100% of CPF own farms

2030

**Coal-Free** In 100% of CPF own global operations



Zero Food Waste 100% of CPF own global operations



Sustainable Packaging 100% of CPF own global operations

Zero Deforestation Sourcing

for wheat, barley and paper of CPF

Methane Capture (High-Efficiency

100% of CPF own farms in Thailand and

own global operations

**Biogas System**)

#### Target

• Non-FLAG: 42% • FLAG: 30.3%





**Methane Capture** in 100% of CPF own global farms



**100% Smart Feedmills** in CPF global operations

#### 2050

Decarbonization in all of CPF upstream road & sea freight



**Renewable Electricity** 100% of CPF own global operations



**Electric Vehicles** in 100% of CPF own global operations



**Net-Zero SBT** Target

> • Non-FLAG: 90% • FLAG: 72%

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#### In achieving GHG Emissions Reduction Targets by 2030



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### 4 Intelligences Strategies

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Methodology

4 Intelligences Strategies

Glossary

#### **CPF** Net-Zero Strategies Driven by 4 Intelligences



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Setting the Scene

Methodology

4 Intelligences Strategies

Measuring Performance

Glossary

C - Carbon Reduction from Sustainable Sourcing

Methodology

4 |

4 Intelligences Strategies

#### Traceability System

#### **Our Ambitions**

- Achieve zero deforestation sourcing goals for corn, soy, palm oil and cassava by 2025
- Expand zero deforestation sourcing towards wheat, barley and paper by 2030
- Create positive impacts on biodiversity by 2030

#### Key raw materials sourcing





Soy



Palm Oil



Cassava



GET IT ON

Google play



### 1

#### **Operation in Thailand**

#### 100%

of corn sourced by CPF comes from deforestation-free areas

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Setting the Scene

Methodology

4 Intelligences Strategies

Measuring Performance

Glossary

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### P – Power Circulation



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### Smart Energy

CPF Centralized Monitoring Center





# CPF Centralized Monitoring Center **1.Solar Power** Phase 1-4 & With Guff PPA CONCENSION SOL ALERVIN COULD





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#### **Renewable Energy**

2024

Ratio of renewable energy consumption **33%** 



65% Biomass GHG emissions reduced by 710,000 tC0<sub>2</sub>e

**32%** Biogas



Equivalent to installing

solar power system of

**980** MW



Since 2022 100%

coal-free

switching to biomass usage in Thailand and Vietnam operations and expanding globally by 2030 4 Intelligences Strategies

#### 100% Renewable Energy Farm (RE100 Farm)

by 2030 in 7 Complex Layer Farms

Pilot Project Complex Layer Farm in Chanthaburi Province

#### Source of Electricity



**70%** Biogas Energy



25% Solar Power 5% Renewable Energy Certificate: REC

# GHG Emissions Reduction over **16,500** tCO<sub>2</sub>e /year

\*<u>Remark</u>: Purchase RECs to offset external electricity usage for emergency case.

Methodology

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12

4 Intelligences Strategies

a man 65

#### **EV** Trucks

By 2030 CPF aims to use > 300 EV trucks

#### **Pilot Project** First EV truck in CPF by CP Foton

More than  $4.7 \text{ tCO}_2 \text{e}$  / year GHG emissions reduced

More than **220** kilometers average distance per single charge

The Track is 100% Electric 4 Intelligences Strategies

### **F- Future** Generation



Methodology

4 Intelligences Strategies



#### Sustainability at One Click

Connecting value chain-wide data on digital platforms in order to manage and report environmental sustainability information

#### End-to-end Sustainability Modules

- EM Environmental Management
- SFM Sustainability Footprint Management
- SCT Sustainability Control Tower
- SAC Sustainability Analytics Cloud





#### **Net-Zero Intelligence Platform**

Glossary

The world's first company to implement SAP Sustainability solutions for real-time record, analysis, and report of carbon emissions.



Methodology

4 Intelligences Strategies

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#### **Smart Feedmill**



#### Machine to Machine : Smart Boiler

The program controls smart boilers which produce steam of sufficient quality and volume necessary to the production. It is controlled by AI which communicates Machine to Machine to maximize efficient energy use.



Improved livestock feed quality

Enhanced production efficiency

Reduce energy use

25% per ton of feed



- Reduced production costs
- Reduced waste
- Reduced electricity consumption
- Minimized workload

Methodology

4 Intelligences Strategies

Measuring Performance

Glossary

♠ ⓒ ⊘

#### Smart Factory

Concept : All that are visible are manageable

#### **Use of Visualization** Technology

#### **Production Process**

- Increase efficiency
- Reduce idle time
- Reduce GHG emissions



#### **Operational Data Visualization : MES**

(Manufacturing Execution System)

The solution software connects data from equipment, machines and organization-level application which allows users to see overall production and helps increasing efficiency and control the entire production.



#### On-Floor Management :

Edge AI & Machine Learning (Manufacturing Execution)

The machine system which uses cameras to process picture data and control operations to enhance production efficiency.

#### **Smart Factory and Building**

#### **Building Information Modeling (BIM)** for design and construction

**Digital Twin** for building operations and management

#### Augmented Reality (AR/VR)

for buildings audit





Reduce GHG emissions Reduce expenditure 



Improve indoor environmental quality

Methodology



Measuring Performance

#### Smart Building Green Building

#### **Refrigerants Usage Measure**



Limit Refrigerants for Business Operations

According to Kyoto Protocol to the United Nations Framework Convention of Climate Change



Carbon Dioxide

Hydrocarbon



 $\land$ 

Ammonia



HFOs and certain HFC

#### Environmentally Friendly Construction Materials

- Low carbon materials
- Environmentally friendly refrigerants
- Low Volatile Organic
   Compounds (Low VOCs)
   materials

#### Energy Efficient Building





Hygiene and Safety

- Interior air quality
- Sufficient lighting
- Increasing green areas

### Safety



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#### **Smart Building** 7 Green Building Projects









#### Khon Kaen Office Building

#### Si Sa Ket Swine Slaughtering Plant

#### Samut Prakan Laboratory

Nong Chok Center of Engineering Excellence



Nakhon Ratchasima 5 Star Factory



Lopburi Swine Slaughtering and Processing Plant



Phanom Sarakham Duck Slaughtering Plant

Methodology

4 Intelligences Strategies

#### Upcycling Products from Plastic Waste

upcycling plastic waste from production processes into products such as furniture, decorative panels, and restroom partitions.



#### Furniture

#### **Decorative Panels**

#### **Restroom** Partitions

#### Eco-Friendly Plastic Roads

A pilot project utilizing plastic as a substitute for asphalt at the Center of Engineering Excellence.



Extruded

**Plastic Sheets** 

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Setting the Scene

Methodology

4 Intelligences Strategies

Measuring Performance

Glossary

# Net-Zero

### Network



#### **Employee Engagement**

#### Net-Zero SBT 101

The course aims to build basic understandings of our Net-Zero journey to create awareness among all our employees.



#### 100%

of Thailand's office employees completed courses in April 2024 and overseas expansion to achieve 100% by 2030.



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## Supplier Engagement

Enhance our SMEs partners' capabilities through seminars and excursions in

- Increasing production efficiency according to Lean Six Sigma,
- Resources and energy management,
- GHG emissions reduction,
- Cost reduction,

We are committed to resonate sustainability-oriented global trades with over 100 partner companies.






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## Announcement of Collaboration to Enhance Personnel and Organizational Capabilities

#### in Climate Change and Environmental Management

Between the Faculty of Engineering, Chulalongkorn University, Department of Climate Change and Environment, Carbon Institute for Sustainability and Partner Networks







### **Partner for GHG Reduction**

#### Sustainable Packaging

CPF designs and develops environmentally friendly food packaging to encourage reusing, recycling and reducing GHG emissions.

### In 2024

(Thailand Operations)

### 85.1% "

of our plastic packaging for food products is reusable, recyclable and composable.









E Constanting of the second se





Dalahi Dalahi Isinglilin



(1) Not including mixed plastic and Alufoil

\*The 2024 data will be revised to cover CPF own global operation by June 2025

Plastic and Paper Food Packaging (Thailand Operations)				
Paper + P	lastic (Thousand	d Tons)	GHG Emis	ssion (tCO <sub>2</sub> e)
95,370	<b>78,623</b> (-18%)	<b>69,243</b> (-27%)	<b>78,493</b> (-18%)	<b>80,362</b> (-16%)
51.8	43.9	40.2	41.7	42.9
2020	2021	2022	2023	2024
		ging		
0,703	tons			
$\overline{\mathbf{Q}}$	23		<b>C</b>	
<b>D.16%</b> Reusable			<b>0.14%</b> Composable	<b>14.91%</b> Hard to Recycle
	ailand Oper Paper + Pl 95,370 51.8 2020 astic Foc nailand Ope 0,703 0.16%	ailand Operations) Paper + Plastic (Thousand 95,370 78,623 (-18%) 51.8 43.9 2020 2021 astic Food Packa hailand Operations) 0,703 tons 0,703 tons 0,16% 84.79	ailand Operations) Paper + Plastic (Thousand Tons) 95,370 51.8 43.9 40.2 2020 2020 2021 2022 astic Food Packaging hailand Operations) 0,703 tons 0,16% 84.79%	ailand Operations) Paper + Plastic (Thousand Tons) $\longrightarrow$ GHG Emis 95,370 78,623 69,243 (-18%) (-18%) (-27%) 78,493 (-18%) (-27%) 78,493 (-18%) (-18%) (-27%) 78,493 (-27%) 78,493 (-18%) (-18%) (-27%) 78,493 (-18%) (-18%) (-27%) 78,493 (-18%) (-27%) 78,493 (-27%) 78,493 (-18%) (-18%) (-27%) 78,493 (-18%) (-18%) (-18%) (-27%) 78,493 (-18%) (-18%) (-18%) (-18%) (-27%) 78,493 (-18%) (-1

Setting the Scene

Methodology

4 Intelligences Strategies

Glossary

### **Partner for GHG Reduction**

**Converting used packaging to energy** Collaborating with Boehringer Ingelheim (Thailand) to convert used packaging to Refuse Derived Fuel (RDF)

#### In collaboration with





#### **GHG Emissions Reduction over**

**2.4** tons  $CO_2e$  / ton of Packaging

### Refuse Derived Fuel replacing Coal

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### **Communication with Clients and Consumers**

#### **Environmentally Friendly Livestock Feed**

Protein-balanced and age-appropriate enzyme-selected livestock feeds for swine and layer chicken

- Increase food digestion and nutrient absorption
- Contribute to livestock's hygienic growth and welfare
- Reduce excess nitrogen from livestock manure which affects GHG emissions





#### **Excess Nitrogen Reduction**



20-30% From swine manure 12-13% From layer chicken

manure

#### **GHG Emission Reduction**



**74,700** tC0<sub>2</sub>e We control portion and quality of livestock feeds to ensure that all animals receive sufficient and appropriate amount of nutrient.



Swine



### Duck



### Layer Chicken

4 Intelligences Strategies

### **Communication with Clients and Consumers**



### **Eco-Friendly Food**

CPF is committed to producing environmentally certified green products.

### 2024 Performance



#### **890** Products

have undergone the carbon footprint assessments and certified with the Carbon Footprint Label by Thailand Greenhouse Gas Management Organization (Public Organization) or TGO

#### **88** Products



#### are classified as low-carbon products with the Carbon Footprint Reduction Label verified by TGO

\*<u>Remark</u>: Information as of 31<sup>st</sup> December 2024



#### Our Products which Emits GHG Below Average\*



Fresh Chicken Meat below average 50%



**Chicken Eggs** 

below average

30%



Fresh Pork below average 13%

\*<u>**Remark**</u>: Average of each product's GHG emissions in Thailand

Setting the Scene

Methodology

4 Intelligences Strategies

Glossary

♠ ⓒ ⊘

## **Cooperation with Network and Alliances**

**Internal Carbon Pricing** 





- Internal Carbon Pricing in Preparation for EU CBAM
- Covering both Non-FLAG and FLAG GHG
- Taking CPF global investment decisions into account

### **Cooperation with Network and Alliances**





มหาวิทยาลัยมหิดล ดณะสาธารณสุขศาสตร์





JUN

### **Technology and Efficiency Enhancement**



SCG

**MAN Energy Solutions** 

CONSULTING

**BUILDING & LIVING CARE** 



**Education** 



# Measuring Performance

### **CPF's Total GHG Emissions Across All Scopes**

Unit : m	nillion tons CO <sub>2</sub> e	2020 Base year	2023	2023 Compared with base year
	Thailand	14.51	17.76	
*	Vietnam	9.91	10.52	+0.61
C*	Turkiye	2.09	1.09	-1.00
	Malaysia	1.67	1.41	-0.26
	Russia	1.61	1.94	+0.33
	India	1.59	1.08	-0.51
	Philippines	1.26	1.66	
	Taiwan	1.16	1.32	
	Cambodia	0.9	1.38	+0.48
	United States	0.68	0.21	-0.47
*	China	0.58	0.35	-0.23
	Laos	0.31	0.32	
	United Kingdom	0.09	0.28	
	Sri Lanka	0.02	0.005	-0.015
	Belgium	0.003	0.01	
	Total	36.38	39.34	

Proportion of GHG Emissions by Country in 2023



### **Proportion of CPF's GHG Emissions in 2023 by Country Zone**



### CPF's Global GHG Emissions in 2023



### GHG Emissions by Scope

Unit : million tons CO<sub>2</sub>e



### CPF's Global Scope 3 GHG Emissions in 2023

% Compared to Scope 3

Scope 3 Emissions	100%
Cat 01: Purchased good & services	84.0%
Cat 02: Capital goods	0.6%
Cat 03: Fuel & energy related (Excluded from Scope 1 and 2)	1.3%
Cat 04: Transportation & distribution	7.8%
Cat 05: Waste from operation	0.2%
Cat 06: Business travel	0.1%
Cat 07: Employee commuting	1.5%
Cat 08: Leased assets	0.1%
Cat 09: Transportation & distribution	0.1%
Cat 10: Processing of sold products	1.4%
Cat 11: Use of sold products	0.1%
Cat 12: End-of-life treatment of sold products	2.8%
Cat 13: Leased assets	0.0%
Cat 14: Franchises	0.1%



Remark: Cat15: Investments are not within the scope of SBT's near-term target.



\*Data collection and calculation methods have been adjusted since 2022 onwards \*\*The 2024 data will be revised by June 2025 4 Intelligences Strategies

Scope 1 GHG Emissions

### CPF's Global Scope 1 Non-FLAG and Scope 2 GHG Emissions (2020 - 2024)Scope 2 GHG Emissions

Unit : million tons  $CO_2e$ 



\*Data collection and calculation methods have been adjusted since 2022 onwards \*\*The 2024 data will be revised by June 2025

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### CPF's Global Scope 3 Non-FLAG GHG Emissions (2020-2024)

Unit : million tons CO<sub>2</sub>e

Scope 3 Non-FLAG GHG Emissions

--- Forecasted GHG Emissions

Scope 3 Non-FLAG SBT Target



\*Data collection and calculation methods have been adjusted since 2022 onwards \*\*The 2024 data will be revised by June 2025

### CPF's Global Scope 3 FLAG GHG Emissions (2020-2024)

Unit : million tons CO<sub>2</sub>e

Scope 3 FLAG GHG Emissions – – – Forecasted GHG Emissions

Scope 3 FLAG SBT Target



\*Data collection and calculation methods have been adjusted since 2022 onwards

\*\*The 2024 data will be revised by June 2025 Copyright © 2025. Charoen Pokphand Foods PLC. All rights reserved.

## CPF's Thailand Scope 1 Non-FLAG and Scope 2 GHG Emissions (2020 - 2024)

Scope 1 GHG Emissions Scope 2 GHG Emissions SBT Target Unit : thousand tons CO<sub>2</sub>e



**GHG Reduction Through:** 

42%

- Scope 1:
  - 100% coal-free by switching to biomass usage
  - Enhancing machine efficiency.

Scope 2:

 Expanding the use of electricity from solar power.

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### CPF's Thailand Scope 3 FLAG GHG Emissions (2020-2024)

Scope 3 FLAG GHG Emissions

- Scope 3 FLAG SBT Target ---
- --- Forecasted GHG Emissions
- GHG Emissions reduced through Traceability to the cultivation fields of key raw materials using the Net-Zero Intelligence Platform
- GHG Emissions reduced by
- other methods

#### Unit : million tons CO<sub>2</sub>e





Environment Passion Towards 2030

Setting the Scene

Methodology

4 Intelligences Strategies

Measuring Performance

Glossary

Term	Details	References
Artificial Intelligence (AI)	<ul> <li>Artificial Intelligence (AI) is the science and engineering of making intelligent machines, especially intelligent computer programs. AI algorithms seek to create expert systems which make predictions or classifications based on input data.</li> </ul>	<u>IBM</u>
Augmented Reality/Virtual Reality (AR/VR)	• Immersive technologies that blur the lines between the physical and digital worlds. They offer unique experiences by overlaying digital elements onto the real world or transporting users into entirely computer-generated environments.	IEEE
BAU	<ul> <li>Business as usual (BAU) refers to the usual operations of a business</li> </ul>	
Blockchain	<ul> <li>Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. The traceability system with Blockchain Traceability technology is widely accepted in numerous industries including banking, sourcing and procurement, and supply chain.</li> </ul>	<u>CPF</u>
Building Information Modeling (BIM)	<ul> <li>Building Information Modeling (BIM) involves the creation and management of data for constructing buildings. Through the BIM platform, structural data is integrated to create intelligent models that represent information throughout the building's lifecycle, from planning and design to construction and operation.</li> </ul>	<u>Autodesk</u>
Digital Twin	• A digital twin is a virtual simulation designed to accurately reflect the physical structure, with real-time data updates. It simulates machine learning processes and provides reasoning to assist in making informed decisions.	<u>IBM</u>
Electric vehicle (EV)	• Electric vehicle (EV) has an electric motor instead of an internal combustion engine.	U.S. Department of Energy
Environmental Management (EM)	<ul> <li>A cloud solution with integrated waste management, a flexible and auditable emissions calculator, and real-time analytical tools for ESG reporting.</li> </ul>	<u>SAP</u>

Methodology

4 Intelligences Strategies

Measuring Performance

Glossary

Term	Details	References
EU CBAM	• A carbon tariff on certain carbon-intensive goods imported into the European Union. It aims to prevent carbon leakage and ensure a level playing field for EU producers by ensuring that imported products face a similar carbon price as those produced domestically.	European Commission
FLAG	<ul> <li>Forest, Land and Agriculture (FLAG) is the world's first standard method for companies in land- intensive sectors to set science-based targets that include land-based emission reductions and removals</li> </ul>	<u>SBTi</u>
GHG	• Greenhouse gas (GHG) based on the corporate standard, Greenhouse Gas Protocol, covers the accounting and reporting of seven greenhouse gases that are carbon dioxide ( $CO_2$ ), methane ( $CH_4$ ), nitrous oxide ( $N_2O$ ), hydrofluorocarbons (HFCs), perfluorocarbons (PCFs), sulphur hexafluoride ( $SF_6$ ) and nitrogen trifluoride ( $NF_3$ ).	<u>Greenhouse Gas Protocol</u>
Global Reporting Initiative (GRI)	• Global Reporting Initiative is a global leader for sustainability reporting standards (GRI).	<u>GRI</u>
Long-term	<ul> <li>Long term targets cover more than 10 years from the date of submission. CPF committed the long-term targets by 2050.</li> </ul>	<u>SBTi</u>
Manufacturing Execution System (MES)	<ul> <li>Tracks and controls production processes, optimizing efficiency and data-driven decision-making. It is essential for regulated industries ensuring compliance, traceability, and product recall capability.</li> </ul>	<u>SAP</u>
Near-term	<ul> <li>Near-term targets must cover a minimum of 5 years and a maximum of 10 years from the date the target is submitted to the SBTi for validation. Since CPF submitted the base year of 2020, our near-term targets are by 2030.</li> </ul>	<u>SBTi</u>
Non-FLAG	<ul> <li>"Non-FLAG" target covers all of the company's other fossil-based emissions</li> </ul>	South Pole

Environment Passion Towards 2030

Methodology

4 Intelligences Strategies

คำย่อ	รายละเอียด	แหล่งข้อมูลอ้างอิง
RE100	The use of 100% electricity from renewable energy sources.	CLIMATE GROUP RE100
Refuse Derived Fuel (RDF)	• A type of fuel obtained by modifying both the chemical and physical properties of waste materials.	<u>Willshee's</u>
Renewable Energy Certificate (REC)	• A certificate that represents the generation of 1 megawatt-hour of clean energy.	The International REC Standard
SAP Analytics Cloud (SAC)	• Combines AI-driven insights, mission-critical analytics, and unified planning to automate reporting, enhance decision-making, and integrate financial, supply chain, and operational planning.	<u>SAP</u>
SBT	Science Based Targets	
SBTi	<ul> <li>The Science Based Targets initiative (SBTi) drives ambitious climate action in the private sector</li> <li>by enabling organizations to set science-based emissions reduction targets</li> </ul>	<u>SBTi</u>
Sustainability Footprint Management (SFM)	<ul> <li>Utilize an ERP-centric cloud solution to measure, manage, and integrate detailed carbon footprint insights into business processes, ensuring transparency and efficiency.</li> </ul>	<u>SAP</u>
Sustainability Control Tower (SCT)	<ul> <li>Capture actual ESG data, report audit-ready metrics, and act on goals with insights, forecasts, and planning embedded in business processes.</li> </ul>	<u>SAP</u>
TGO	Thailand Greenhouse Gas Management Organization	<u>TGO</u>
The Internet of Things (IoT)	<ul> <li>The Internet of Things (IoT) refers to a network of physical devices, vehicles, appliances and other physical objects that allows them to collect and share data.</li> </ul>	<u>IBM</u>



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