



CPF's Journey to Net-Zero SBT

Charoen Pokphand Foods PLC (CPF)

October 2023



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Solar Panel
at Roi Phet shrimp farm,
Chanthaburi Province.



Net-Zero

Key to survival

Not optional



Setting the Scene

ACT!ON

Net-Zero for Society

CPF strives to produce products with minimal greenhouse gas emissions to ensure food security through our low-carbon manufacturing while committing to high quality food for all.

ACT!ON

Net-Zero for Economics

CPF invests in clean and green technology while maintaining vital business growth. We believe our green adoption and implementation have a pivotal role to play in our business success in the long run.

ACT!ON

Net-Zero for Environment

CPF undertakes transition towards decarbonising our buildings by committing to more renewable energy used, higher energy efficiency, sustainable sourcing to name a few, all of which help preserve natural resources and protect the environment to maintain a sustainable balance.



A Message from Our CEO



“
Net-Zero is humanity's only chance to survive. It is the only solution to climate change.
”

All walks of life across the globe are now feeling the wrath of climate change which will only intensify as time passes if left unattended.

Charoen Pokphand Foods

understands the role our business can play in the battle against climate change and has committed ourselves to the Net-Zero across the Value Chain by 2050, ensuring alignment with the Science Based Targets initiatives, the world-class standard to tackle climate change, with an aim to lead the agriculture and food sector towards a Net-Zero industry.

Our passion lies with the technology, science and innovation which we use to create food that is not only safe and nutritious for human health but also green and clean for the earth. By pledging our net-zero commitment, we take responsibility for the carbon emissions from farms where we source our raw materials to where our packages are disposed. We also apply blockchain technology to track products from the place of origin to consumers ensuring transparency throughout the entire food system while delivering high-quality and low-carbon products to consumers across the globe.

Our extraordinary journey has just begun. CPF together with our stakeholders, need to continuously drive the shift towards a low-carbon economy. Although the path may be unclear and inconvenient at times, our goal remains solid and certain.

Mr. Prasit Boondoungprasert

Chief Executive Officer
Charoen Pokphand Foods Public Company Limited



Scope



Feed Business



Farm and Primary Processing Business



Food Business

15 countries where Charoen Pokphand Foods Public Company Limited ("CPF") and its subsidiaries have an operational control.

America



USA

Europe



UK



Türkiye



Poland



Russia



Belgium

Asia



Thailand



Philippine



China



Cambodia



Vietnam



Laos



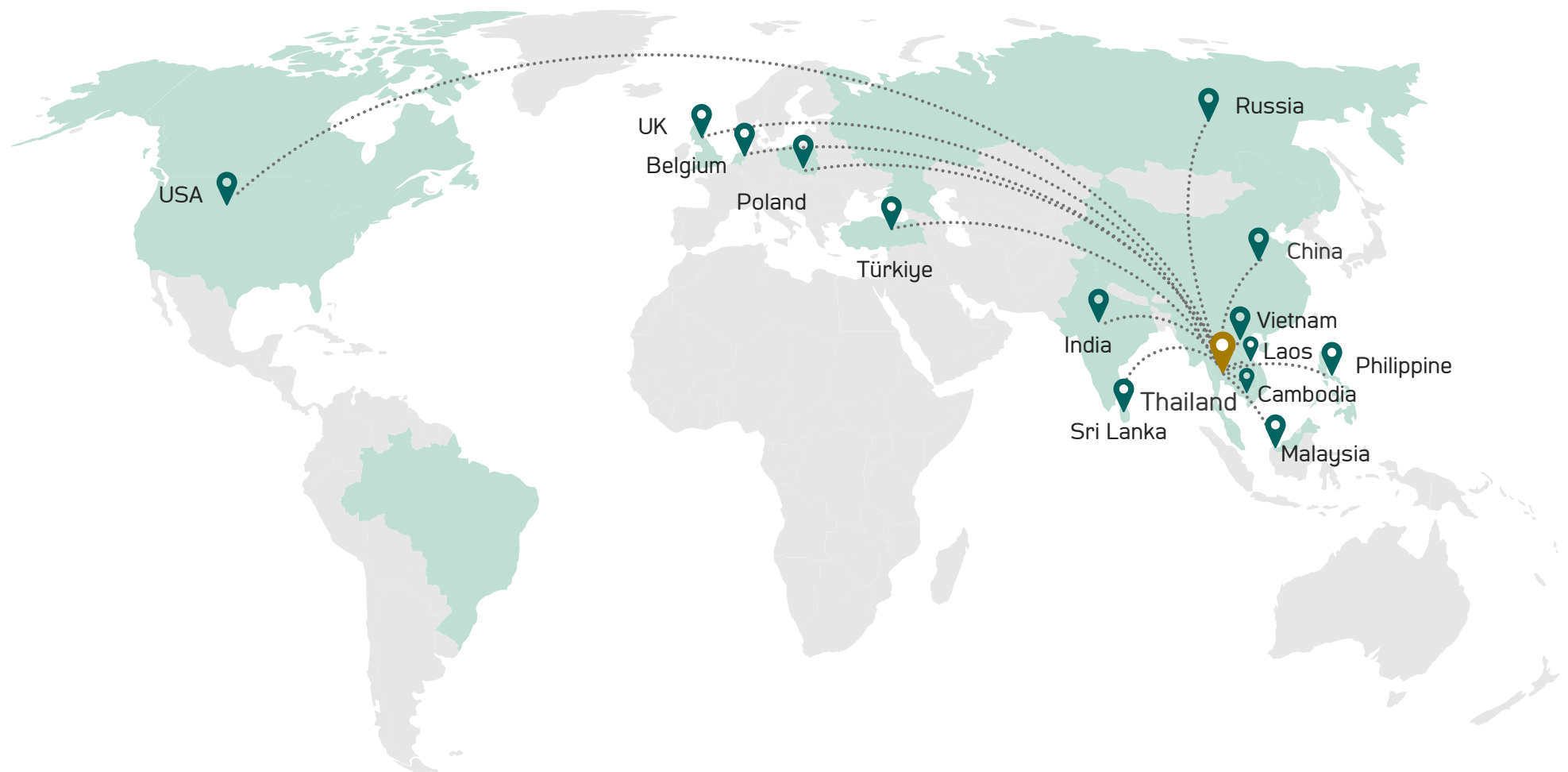
India



Sri Lanka



Malaysia





We Commit to Net-Zero across the Value Chain by 2050

CPF is the first food processing company in the world with near- and long-term FLAG SBT validated by the SBTi

We are also among the first companies to set specific targets relating to forests, land and agriculture (FLAG).

With 2020 as the base year, Charoen Pokphand Foods PLC commits to 42% reduction and 90% reduction of all 3 scopes of greenhouse gas non-FLAG emissions by 2030 and 2050, respectively.

We further commit to 30.3% reduction and 72% reduction of Scope 1 and Scope 3 greenhouse gas FLAG emissions by 2030 and 2050, respectively. We also commit to zero deforestation across our primary deforestation-linked commodities by the fiscal year 2025.



C P F

Grow - Share - Protect
Mangrove Forestation Project,
Paknam Prasae, Rayong Province



Biogas at Layer Chicken Complex,
Chana District, Songkhla Province.

SBTi-Approved Target Statements



Overall Net-Zero Science Based Targets (SBT)

“Charoen Pokphand Foods Public Company Limited (CPF) commits to reach net-zero greenhouse gas emissions across the value chain by 2050.”

Near-term Targets

Energy and industrial: CPF commits to reduce absolute scope 1 and 2 GHG emissions 42% by 2030 from a 2020 base year.* CPF also commits to reduce absolute scope 3 GHG emissions from purchased goods and services, capital goods, fuel- and energy-related activities, upstream and downstream transportation and distribution, waste generated in operations, business travel, employee commuting, processing of sold products, use of sold products, end-of-life treatment of sold products and franchises 42% within the same timeframe.

FLAG: CPF commits to reduce absolute scope 1 and 3 FLAG GHG emissions 30.3% by 2030 from a 2020 base year.**

Long-term Targets

Energy and industrial: CPF commits to reduce absolute scope 1 and 2 GHG emissions 90% by 2050 from a 2020 base year.* CPF also commits to reduce absolute scope 3 GHG emissions 90% by 2050 from a 2020 base year.

FLAG: CPF further commits to reduce absolute scope 1 and 3 FLAG GHG emissions 72% by 2050 from a 2020 base year.**

*The target boundary includes land-related emissions and removals from bioenergy feedstocks.

**Target includes FLAG emissions and removals.



Methodology

CO₂CH₄N₂O

HFCs

PFCs

SF₆NF₃

Based on the GHG protocol, CPF has accounted emissions from activities of our operations in 15 countries. All CPF's fossil-based emissions are reported as **Non-FLAG emissions**, and forests, land and agriculture related emissions are counted as **FLAG emissions**.

SCOPE 3 Indirect

8



Leased assets

7



Employee commuting

6



Business travel

5



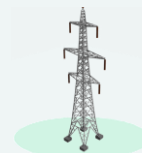
Waste from operation

SCOPE 1 Direct



Company Facilities & Vehicles

SCOPE 2 Indirect



Purchased Electricity, Steam Heat and cooling

SCOPE 3 Indirect

9



Transportation & distribution

10



Processing of sold products

11



Use of sold products

12



End-of-life treatment of sold products

13



Leased assets

14



Franchises

15



Investments

Scope 1:

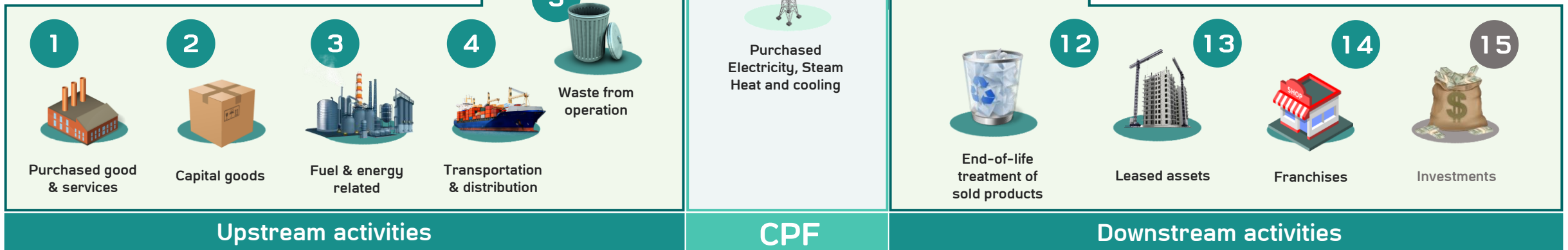
- **Non-FLAG:** Energy usages through our operations
- **FLAG:** Land-use change and land management in our farms

Scope 2:

Purchased electricity and power in our operations

Scope 3:

Relevant emissions across our supply chain





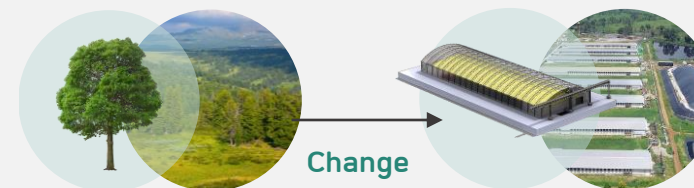
Forest, Land and Agriculture Guidance (FLAG)

Complying to SBTi requirements for companies in land-intensive sectors to set the Forest, Land and Agriculture Guidance (FLAG) targets, CPF classifies emissions from our operations as follows:

- **FLAG Scope 1 Emissions:**
emissions related to land-use change and land management from our farms.
- **FLAG Scope 3 Emissions:**
emissions from our supply chain (e.g., contract animal farms, purchased agricultural products, etc.)

FLAG Guidance

Land Use Change
(from forests to farms)



Forest

Farm

Land Management
(animals and plantations)



Enteric
Fermentation



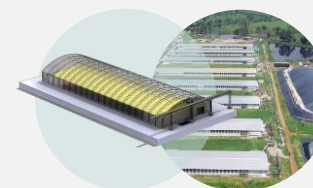
Manure
Management



Fertilization

CPF FLAG Emissions

CPF FLAG Scope 1
(Own Operations)



CPF Own
Animal Farms



CPF Own Grown
Agricultural Products

CPF FLAG Scope 3
(Supply chain)



CPF's Contract
Animal Farms



Purchased
Agricultural Products



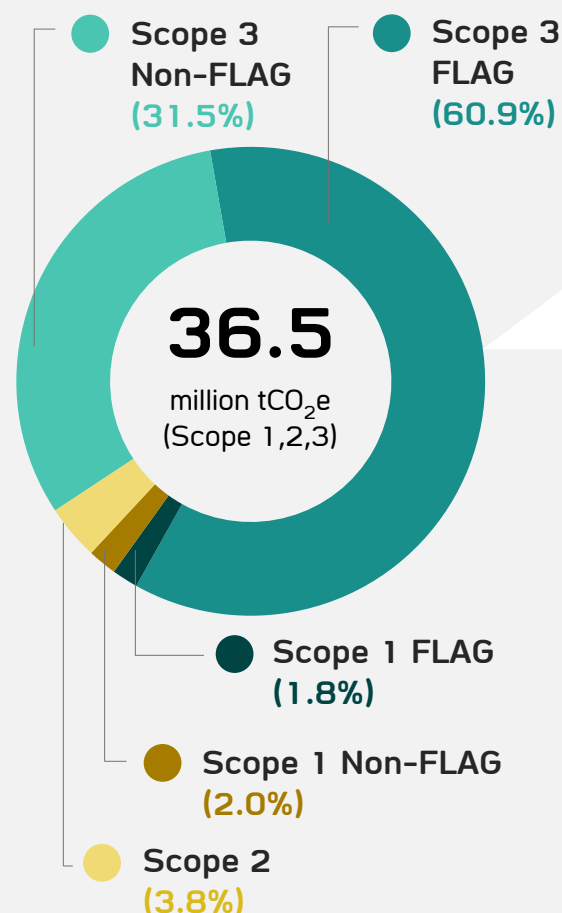
Our Global Greenhouse Gases (GHG) Inventory

Our total emissions of the 2020 base year were recorded at 36.5 million tCO₂e.

Scope 3 emissions accounted for approximately 92.4% of the total emissions, while Scope 1 and Scope 2 emissions accounted for the remaining 7.6%.

Within Scope 3, the top emission hotspot was Category 1: purchased goods and services (PG&S), representing approximately 76.6% of the total Scope 3 emissions.

Emission Breakdown by Scope



Scope 3 Breakdown

●● **92.4%** Scope 3

Purchased Goods and Services (PG&S)
(mainly from agricultural raw materials)

● FLAG 60.8% ● Non-FLAG 15.8%

76.6%

Upstream Transportation and Distribution

9.1%

The Remaining Scope 3

● FLAG 0.1% ● Non-FLAG 6.6%

6.7%

Emission Breakdown	2020 Base Year Emissions (million tCO ₂ e)			
	Scope 1	Scope 2	Scope 3	Total
FLAG	0.7 (1.8%)	- -	22.2 (60.9%)	22.9 (62.7%)
Non-FLAG	0.7 (2.0%)	1.4 (3.8%)	11.5 (31.5%)	13.6 (37.3%)
Total	1.4 (3.8%)	1.4 (3.8%)	33.7 (92.4%)	36.5 (100%)

*The GHG inventory calculated according to GHG Protocol was 38 million tCO₂e



Passion 2030 & Future 2050

According to SBT boundary, CPF commits to taking part in the global effort to achieve global net zero by emission reduction in an attempt to limit global warming to 1.5°C.

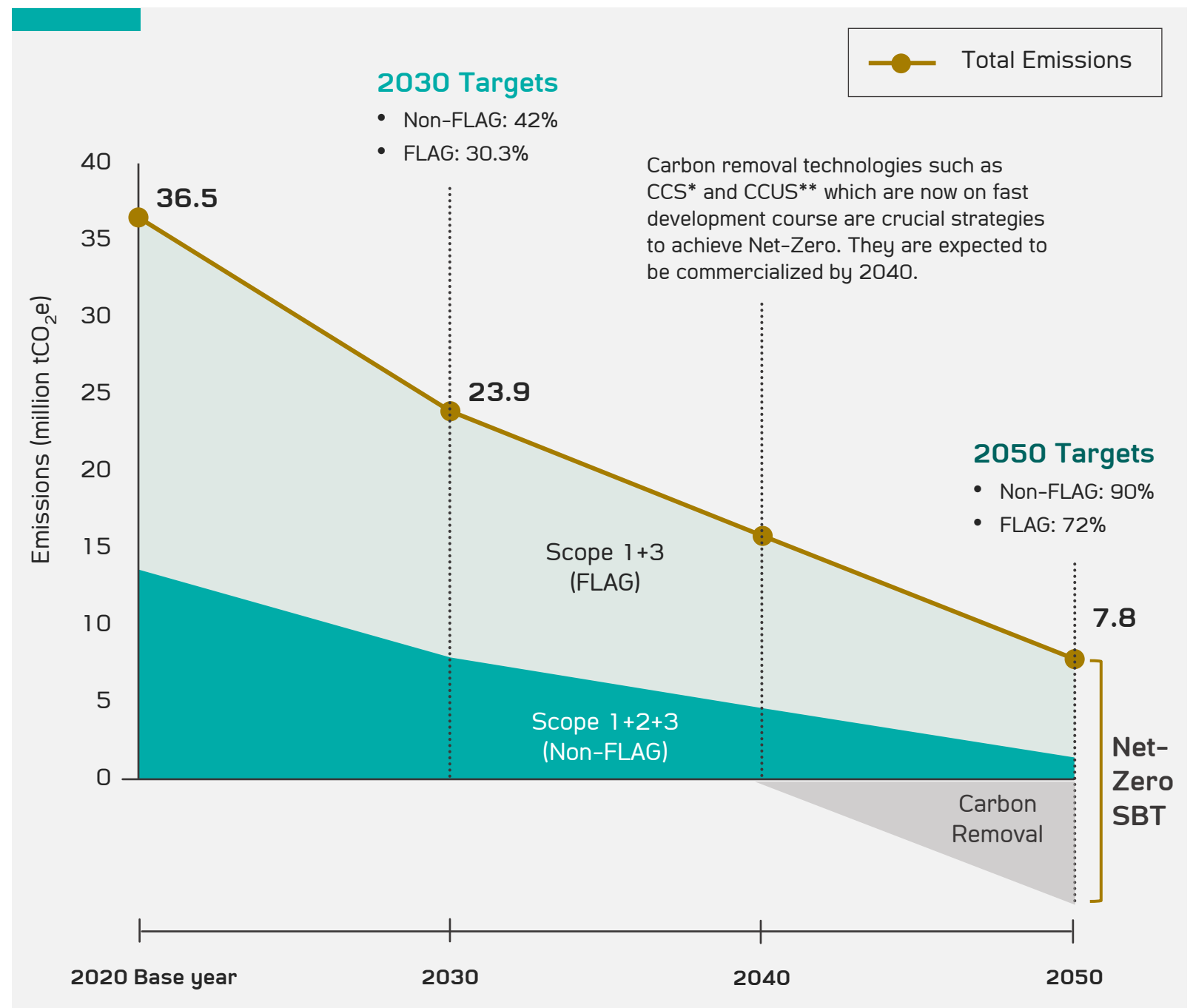
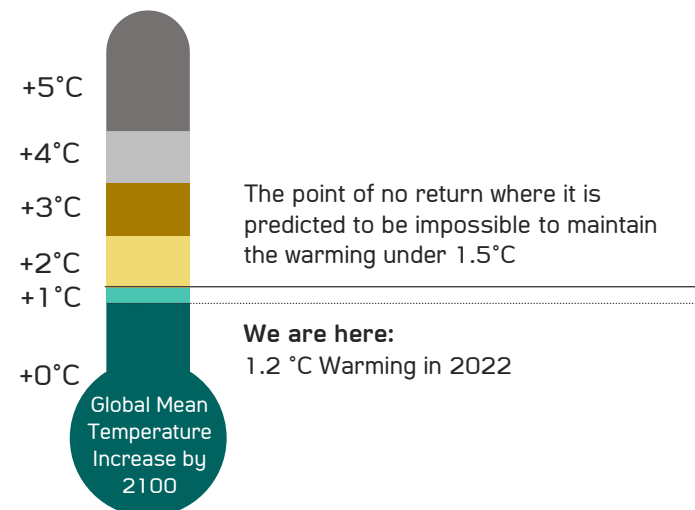
• Near-term Targets by 2030:

Total reduction of **42% for Non-FLAG** emissions and **30.3% for FLAG** emissions

• Long-term Targets by 2050:

Total reduction of **90% for Non-FLAG** emissions and **72% for FLAG** emissions

Emission reduction targets are in line with SBTi Net-Zero Standards, given existing emission reduction technology.



*Carbon Capture and Storage (CCS)

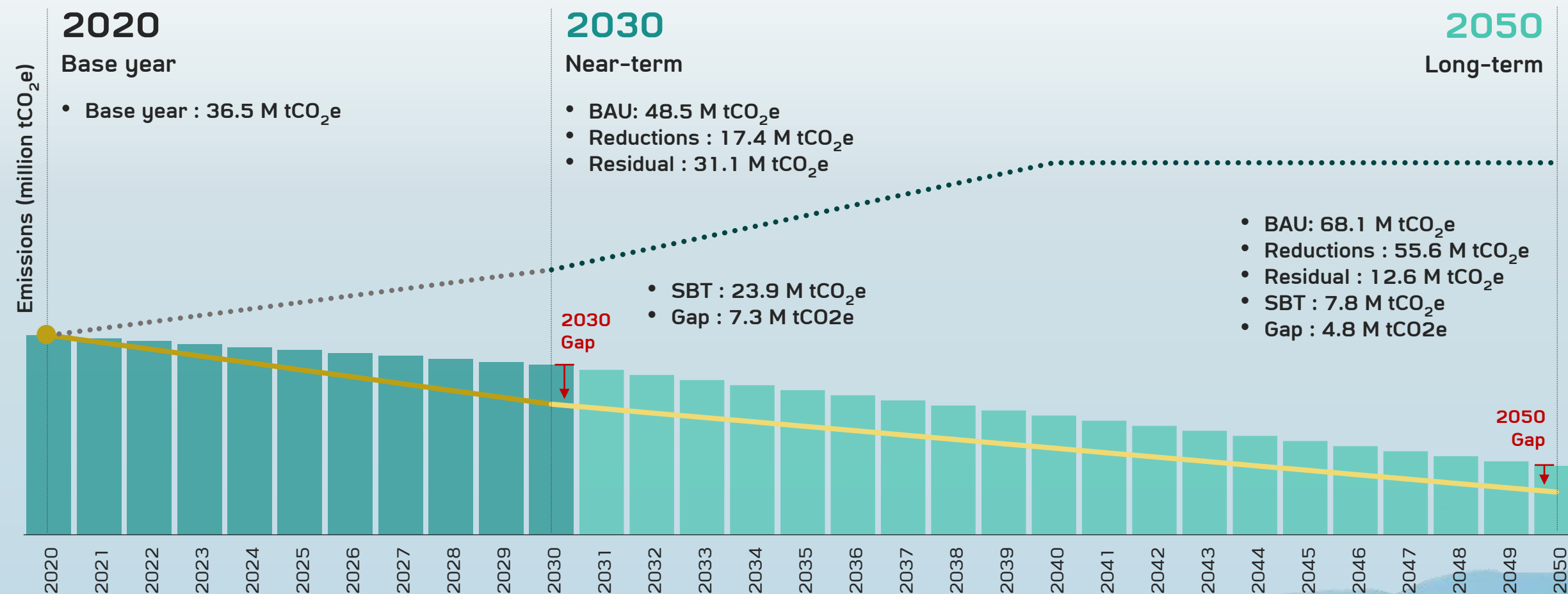
**Carbon Capture, Utilization, and Storage (CCUS)



CPF's Net-Zero SBT Pathway

*Business as Usual (BAU)

..... Near-term BAU* Long-term BAU* — Near-term Target — Long-term Target ● Near-term Residual ● Long-term Residual



Solar Panel
at Roi Phet shrimp farm,
Chanthaburi Province

CPF's Journey to Net-Zero SBT

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Net-Zero SBT Transition Strategy

Deforestation-free Supply Chain



Zero deforestation sourcing by traceability system using blockchain and satellite photos



Corn



Soy



Palm Oil



Cassava

Circularity



Biomass Energy



Biogas Energy

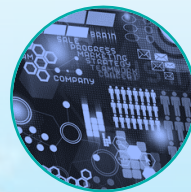


Solar Energy



Zero food waste & 100% recyclable plastic packaging for food products

Digitalization



Smart Data



Smart Feedmill



Smart Farm



Smart Food

Climate Technology



Green Building



EV Transportations



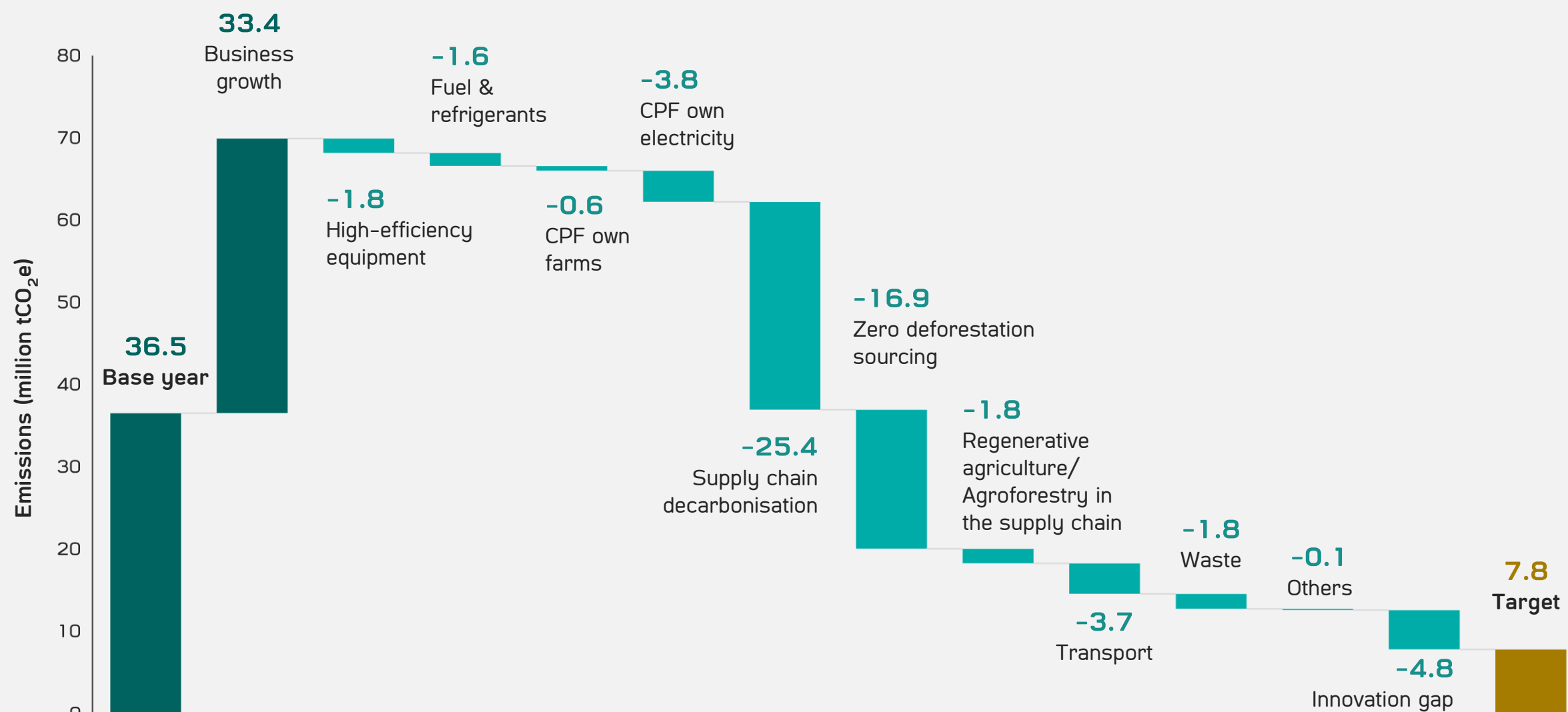
Hydrogen from animal manures

Floating solar panel at a sausage production plant in Chokchai District, Nakhon Ratchasima Province.



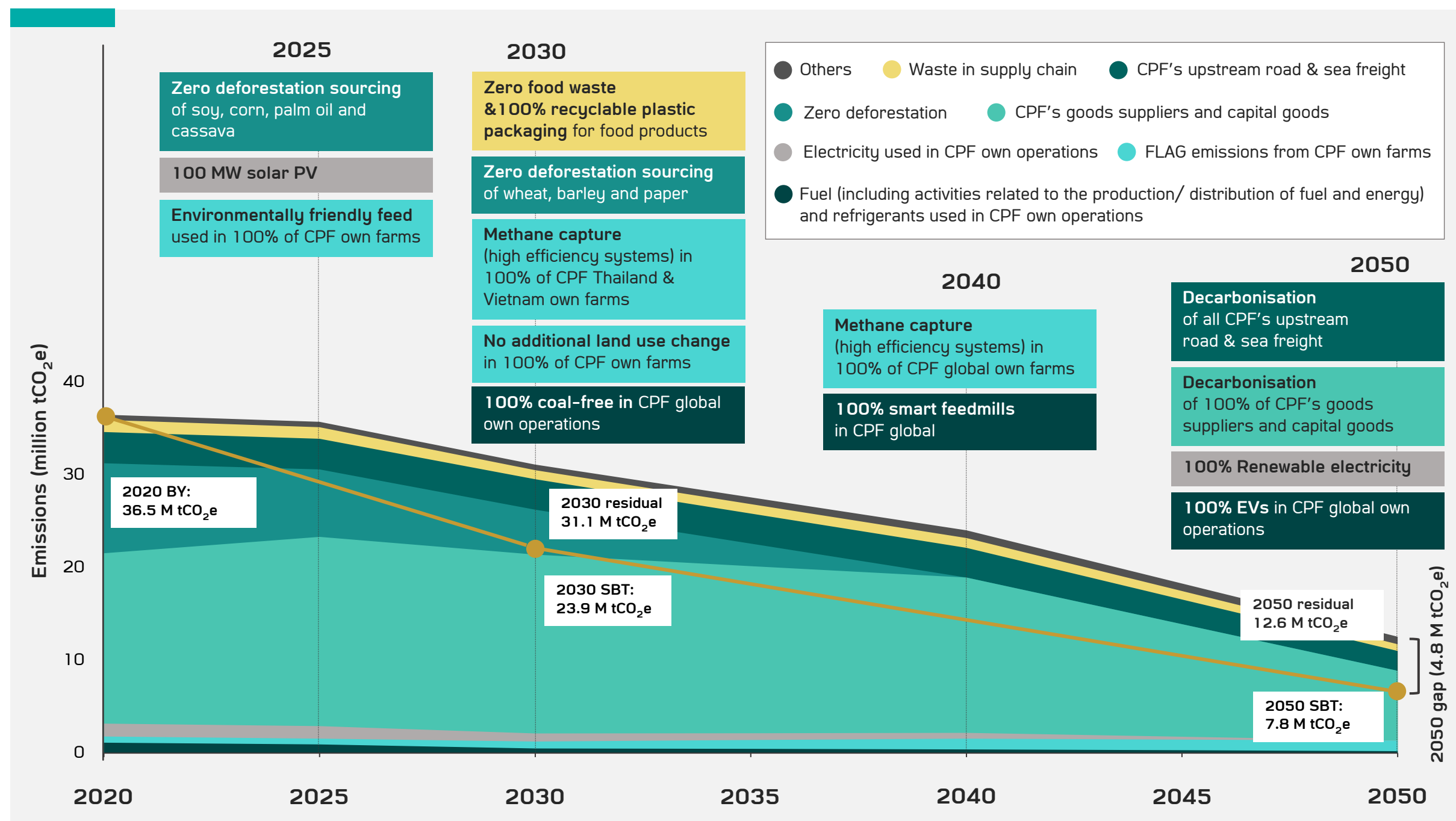
Key Decarbonisation Levers to Achieve Net-Zero SBT

Supply chain decarbonisation and zero deforestation sourcing are the most impactful interventions





Roadmap to Net-Zero SBT





Roadmap to Net-Zero SBT : **by 2025**



Zero deforestation sourcing
of soy, corn, palm oil and cassava



100 MW
solar PV



Environmentally friendly feed
used in 100% of CPF own farms



Roadmap to Net-Zero SBT : **by 2030**



Zero food waste & 100% recyclable plastic packaging for food products



Zero deforestation sourcing of wheat, barley and paper



Methane capture (high efficiency systems) in 100% of CPF Thailand & Vietnam own farms



No additional land use change in 100% of CPF own farms



100% coal-free in CPF global own operations

Roadmap to Net-Zero SBT : **by 2030**



Methane capture

(high efficiency systems)
in 100% of CPF own farms



100% smart feedmills

in CPF global

Roadmap to Net-Zero SBT : **by 2050**



Decarbonisation
of all CPF's upstream
road & sea freight



Decarbonisation
of 100% of CPF's goods
suppliers and capital goods



**100% renewable
electricity**



100% EVs
in CPF global own operations

Key Actions

CPF strives to achieve our targets through real action throughout our operations and supply chain including our suppliers and customers. We focus on our key drives to reduce carbon emissions which include smart sourcing from areas with zero deforestation, energy efficiency & renewable energy use in our processes, and eco-friendly products & sustainable packaging.



Smart Sourcing

Zero Deforestation by 2025:

Corn, soy, palm oil and cassava



Corn



Soy



Palm Oil



Cassava

Smart Production



Smart Feedmill



Renewable Energy



Waste to Value:
Biogas and Biomass



Coal Free



EV Truck

Smart Consumption



Sustainable
Packaging



Carbon Footprint
Product Labelling



Environmentally
Friendly Feed



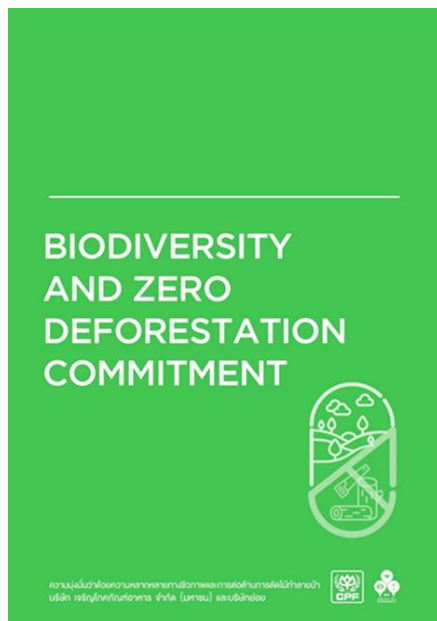
Upstream : Smart Sourcing

Biodiversity and Zero Deforestation Commitment

CPF is determined to work towards achieving the Sustainable Development Goals as a commitment to improve environmental practices, maintain natural resource efficiency, and achieve sustainable economic, social and environmental progress. To help deliver on the SDGs 14 of Life under Water, SDGs 15 of Life on Land and CPF's Strategy of creating Balance of Nature, CPF is committed to protect and preserve biodiversity. since 2020.

Our ambitions are :

- to have a positive effect or outcome on biodiversity relative by 2030
- to achieve zero deforestation by 2025 for corn, soy, palm oil and cassava



Corn



Soy



Palm Oil



Cassava



Thailand :

CPF sources 100 percent of corn from deforestation-free areas

Since 2020,

100 percent of the corns (accounting for approximately 2.17 million tons) used in feed business has been traced back to its origin ensuring that the raw ingredients come from plantations with zero deforestation which account for over 2 million rai (320,000 hectare).



Upstream : Smart Sourcing



Monitoring and
advising on
plantation

Climate
warning

Corn disease
checking and
disease and
insect management

Agricultural product
daily prices

Agricultural
knowledge
resources

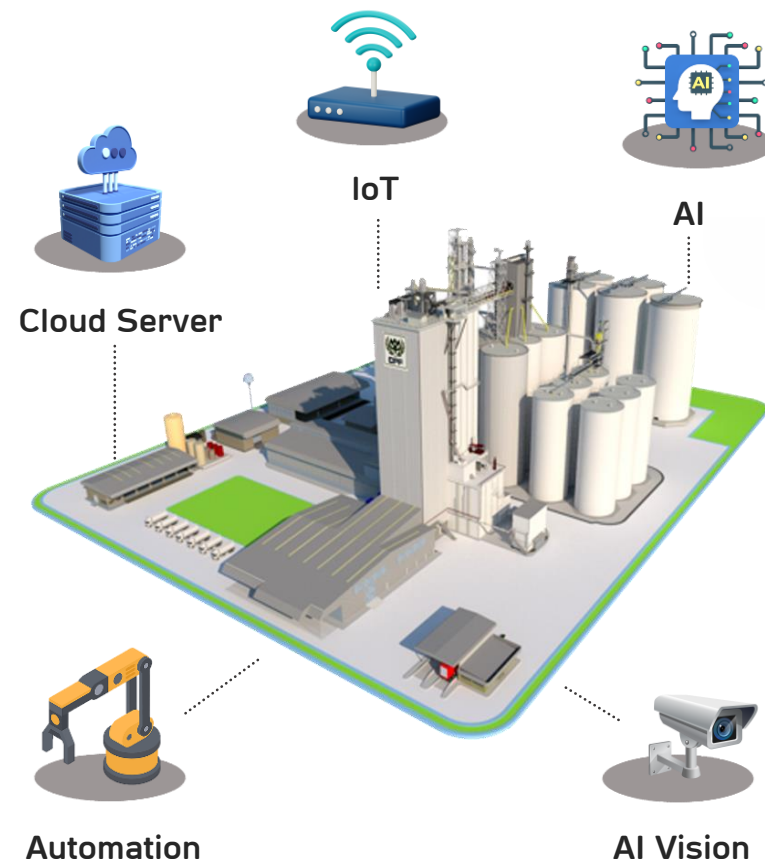
VDO



Own Operations : Smart Production

Smart feedmill is one of CPF's successful initiatives in applying innovation and advance technology in the operations which entails

- Using AI to evaluate various operating parameters.
- Integrating IOT and automation to command the machines to work automatically.
- Controlling the systems and machines via dashboards for better energy efficiency.



Applying technology and enforcing digital transformation through development of AI-controlled automated systems for every process throughout all operations

Implementation outcomes

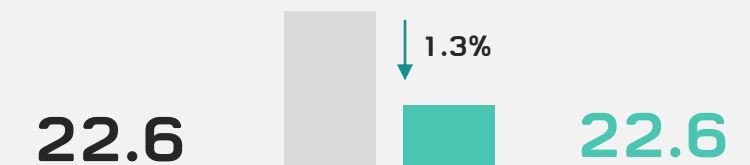
- Improving feed quality
- Enhancing production efficiency
- Reducing production costs
- Minimizing workload
- Elevating the production system



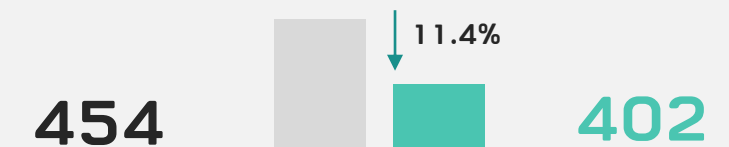
Electricity Consumption Reduction

2018 Digital Transformation 2022

Electricity Consumption (unit) per Ton of Feed



Energy Consumption (MJ) per Ton of Feed





Own Operations : Smart Production

In 2022,

30%

of total CPF energy consumption in Thailand operations were renewable, leading to 600,000 tCO₂e of GHG emissions reduction, an equivalent of approximately 64 million trees or 320,000 Rai (51,200 hectare).



Chicken Processing Plant
in Chok-Chai District, Nakhon Ratchasima Province.

Ratio of Renewable Energy Consumption

(CPF Thailand Operations)



30%

Biogas

The biogas systems generate electricity for over 100 swine and layer complex farms.



68%

Biomass

The energy from biomass is utilized across 18 factories.



2%

Solar

CPF solar panels with the capacity of 20 MW have been installed at 38 factories and farms. Furthermore, CPF aims to utilize the target of 100 MW solar power by 2025.



CPF Coal Free By The Year 2022

Own Operations : Smart Production

CPF has remained 100% coal-free in Thailand operations since 2022.

- Switching to biomass usage accounting for **145,000 tons**
- Reducing GHG emissions by **220,000 tCO₂e**



Own Operations : Smart Production

EV Trucks

CPF conducts a pilot project using the first-ever CPF's EV truck from CP Foton at CPF Layer Farm in Saraburi.

5.6 tCO₂e

GHG emissions reduced

220 km

average distance on one charge

81.14 kWh

EV battery capacity



Layer Chicken Manure to Hydrogen

Under the collaboration between CP and Toyota, CPF is spearheading research on

“layer chicken manure to hydrogen conversion”

The resulting hydrogen will then be converted to electricity and stored in fuel cells installed in trucks, further taking part in the effort to reduce GHG emissions.



Downstream : Smart Consumption

Sustainable Packaging

In our effort to reduce unnecessary use of packaging and to alleviate packaging waste problems as well as to promote the use of environmentally friendly materials that can reduce GHG emissions according to our Sustainable Packaging Policy and Principle, CPF is committed and has been dedicated to leading initiatives in alternative packaging innovations.

100%

Target by 2025
(Thailand)

99.9%

2022 Performance
(Thailand)



99.39%
Recycle



0.32%
Reusable



0.20%
Compostable



0.09%
Hard to Recycle

PET
5.79%



Egg Tray and Transparent Tray

PVC
0.005%



Plastic Wrap

PP
30.92%



Tray, Cup and Lid

Multi-Materials
17.80%



Film, Pouch and Bag

HDPE
23.14%



Bottle and Lid

LDPE
21.71%



Bag

PS
0.41%



Tray

PLA
0.20%



Transparent Tray

Alufoil
0.09%





Downstream : Smart Consumption

CPF is committed to producing green products certified with environmental labels.

2022 Performance

- **818 products** have undergone the carbon footprint assessments and certified with the Carbon Footprint Label
- **56 products** are classified as low-carbon products with the Carbon Footprint Reduction Label verified by the Greenhouse Gas Management Organization (TGO).



Chicken Eggs 30%

GHG emissions
below average



Fresh Chicken Meat 50%

GHG emissions
below average



Fresh Pork 13%

GHG emissions
below average





Downstream : Smart Consumption

Environmentally Friendly Feed

CPF has developed environmentally friendly livestock feeds that enhance nutrient absorption and digestion for quality growth and good health.



Excess Nitrogen Reduction



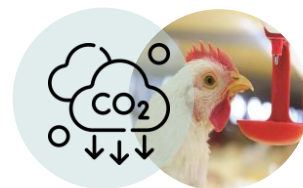
20-30%

From swine manure

12-13%

From layer
chicken manure

GHG Emission Reduction



74,700

tCO₂e

Balanced-diet Feeds:



Gilt and Sow



Meat Duck



Pullet and
Laying Hen



Measuring Performance

CPF is committed to annual performance reports on GHG reduction. The report will be in accordance with the following international requirements and standards.

- The SBTi's requirements,
 - The Global Reporting Initiative (GRI) Standards,
 - International Financial Reporting Standards (IFRS), and
 - The United Nations Sustainable Development Goals (UN SDGs).
- We are working with an enterprise software provider to digitize our GHG activity data and emissions. By doing this, not only we can enhance our data quality, but we can monitor data real-time which can then ensure prompt measures and actions to reduce GHG emissions.

Animal Feed Mill
Phitsanulok Plant,
Phitsanulok Province.



Glossary



Charoen Pokphand Foods Philippines Corporation
Tarlac Feedmill, Gerona, Philippines.



Term	Details	References
AI	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.	IBM
BAU	Business as usual (BAU) refers to the usual operations of a business	
Blockchain	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.	IBM CPF
CCS	Carbon capture and storage (CCS) is an integrated suite of technologies, including capture, transport and storage that can prevent large quantities of carbon dioxide (CO ₂) from being released into the atmosphere.	Global CCS Institute
CCUS	Carbon Capture, Utilization, and Storage (CCUS) encompasses methods and technologies to remove CO ₂ from the flue gas and from the atmosphere, followed by recycling the CO ₂ for utilization and determining safe and permanent storage options.	AICHE
EV	Electric vehicle (EV) has an electric motor instead of an internal combustion engine.	U.S. Department of Energy
FLAG	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.	SBTi
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 ₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PCFs), sulphur hexafluoride (SF ₆) and nitrogen trifluoride (NF ₃).	Greenhouse Gas Protocol
GRI	Global Reporting Initiative is a global leader for sustainability reporting standards (GRI).	GRI



Term	Details	References
IFRS	International Financial Reporting Standards (IFRS) are globally accepted accounting and sustainability disclosure standards	IFRS
IoT	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.	IBM
Long-term	Long term targets cover more than 10 years from the date of submission. CPF committed the long-term targets by 2050.	SBTi
Near-term	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.	SBTi
Non-FLAG	"Non-FLAG" target covers all of the company's other fossil-based emissions	South Pole
PPA	A Power Purchase Agreement (PPA) is an arrangement in which a third-party developer installs, owns, and operates an energy system on a customer's property.	U.S. Department of Energy
REC	Renewable Energy Certificate (REC) represents the environmental attributes of the generation of a one-megawatt hour (MWh) of energy produced by renewable sources.	The International REC Standard
SBT	Science Based Targets	
SBTi	The Science Based Targets initiative (SBTi) drives ambitious climate action in the private sector by enabling organizations to set science-based emissions reduction targets	SBTi
TGO	Thailand Greenhouse Gas Management Organization	TGO



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Climate Action for Sustainability
Charoen Pokphand Foods PLC.



<https://www.cpfworldwide.com>

