

Sustainable Finance Outlook 2025

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Agenda

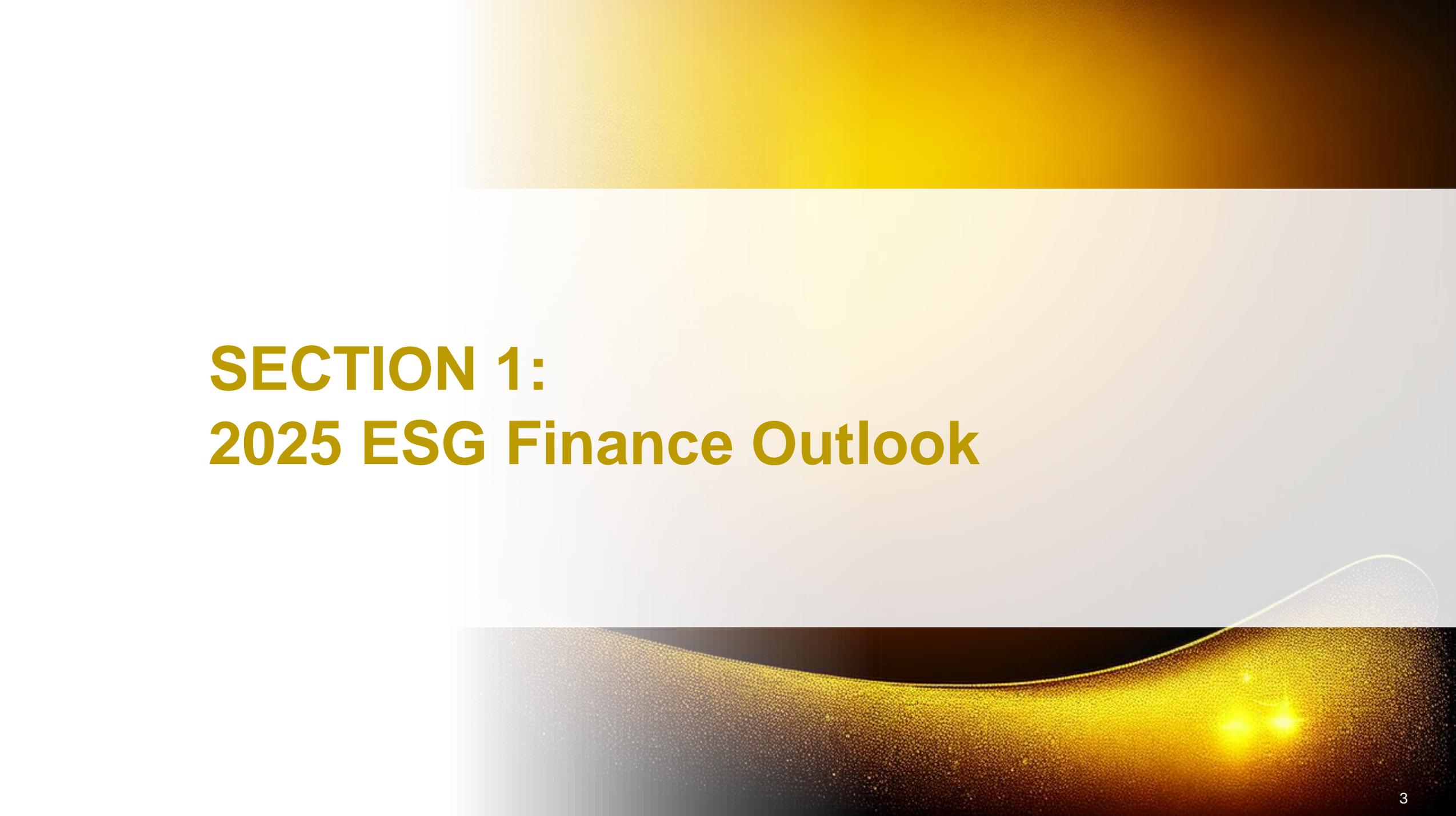
2025 ESG Finance Outlook

SECTION 1

BOT Directional Paper - The 5 building blocks+

SECTION 2

APPENDIX



SECTION 1: 2025 ESG Finance Outlook

2025 GLOBAL CLEAN ENERGY AND NET ZERO POLICIES



Donald Trump
President of USA



Ursula Gertrud von der Leyen
President of European Commission



Xi Jinping
President of China

Pursuing Energy Independence

- **America First:** Pulling Back from the Paris Agreement

Committing to Net Zero by 2050 and Global Cooperation

- Empowering developing nations - fueling climate action with **global climate funds**

Leading Green Transition and EV Growth

- China targets **carbon neutrality by 2060**, leading in **clean energy** and **new energy vehicles (NEVs)** expansion.



MUFG's Perspective on Global Leader's Actions

- **Too early to assess impact.** APAC stays committed to increase renewable capacity in the power mix from 22% to nearly 40% by 2035
- Domestic carbon pricing evolves, set to launch in key Asian markets - driven by EU CBAM & CORSIA
- APAC's renewable push drives growth in critical minerals, EVs & grid infrastructure
- EVs to reach 50% of new car sales by 2050.

SUSTAINABLE BOND ISSUANCE IN ASEAN+3 REMAINS ROBUST

Sustainable finance continues to grow, with ASEAN+3 sustainable bonds now accounting for 19% of the global sustainable bond market as of Sep 2024.



ASEAN+3 accounted for **19%** of global sustainable bonds as of September 2024, ranking second after the EU-20 (36%)



ASEAN+3's sustainable bonds make up **2.3%** of its bond market, far below the EU-20's 7.9% as of September 2024.



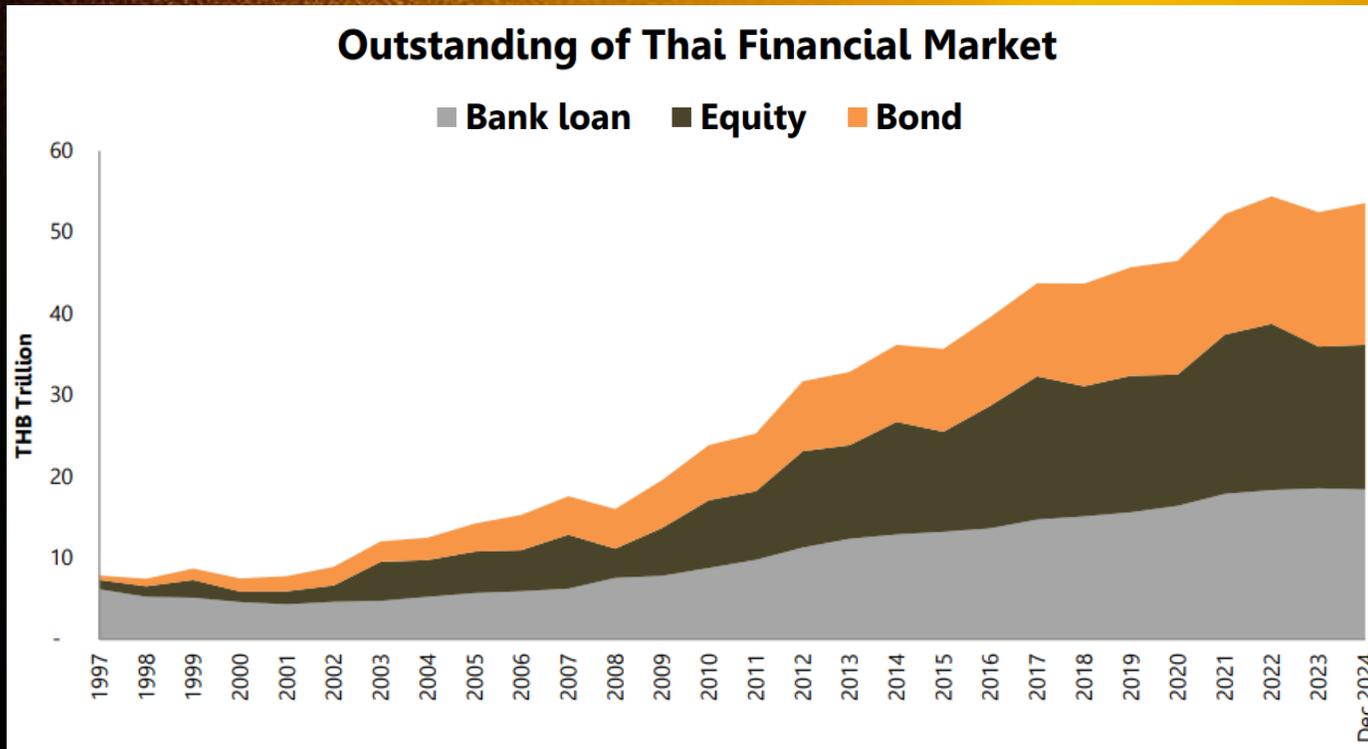
Green bonds made up **60%** of ASEAN+3's sustainable bonds, followed by social bonds (19%), sustainability bonds (15%), SLBs (4%), and transition bonds (3%).



China accounted for about **40%** of ASEAN+3's sustainable bonds, followed by Japan (25%), Korea (20%), and ASEAN markets (9%), with **Thailand** at **2.5%** or approximately THB 750 bn.

DEVELOPMENT OF THAI FINANCIAL MARKET

As of Dec 2024, Thailand's bond market hit THB 17.1 trillion, or 92% of GDP, accounting for one-third of funding sources.



Funding Sources	Outstanding (THB trillion)	% of Financial Market	% of GDP
Bond	17.1	32.3%	92%
Equity	17.4	33.9%	94%
Bank Loan	18.4	34.8%	99%
Total	52.9	100.0%	284%

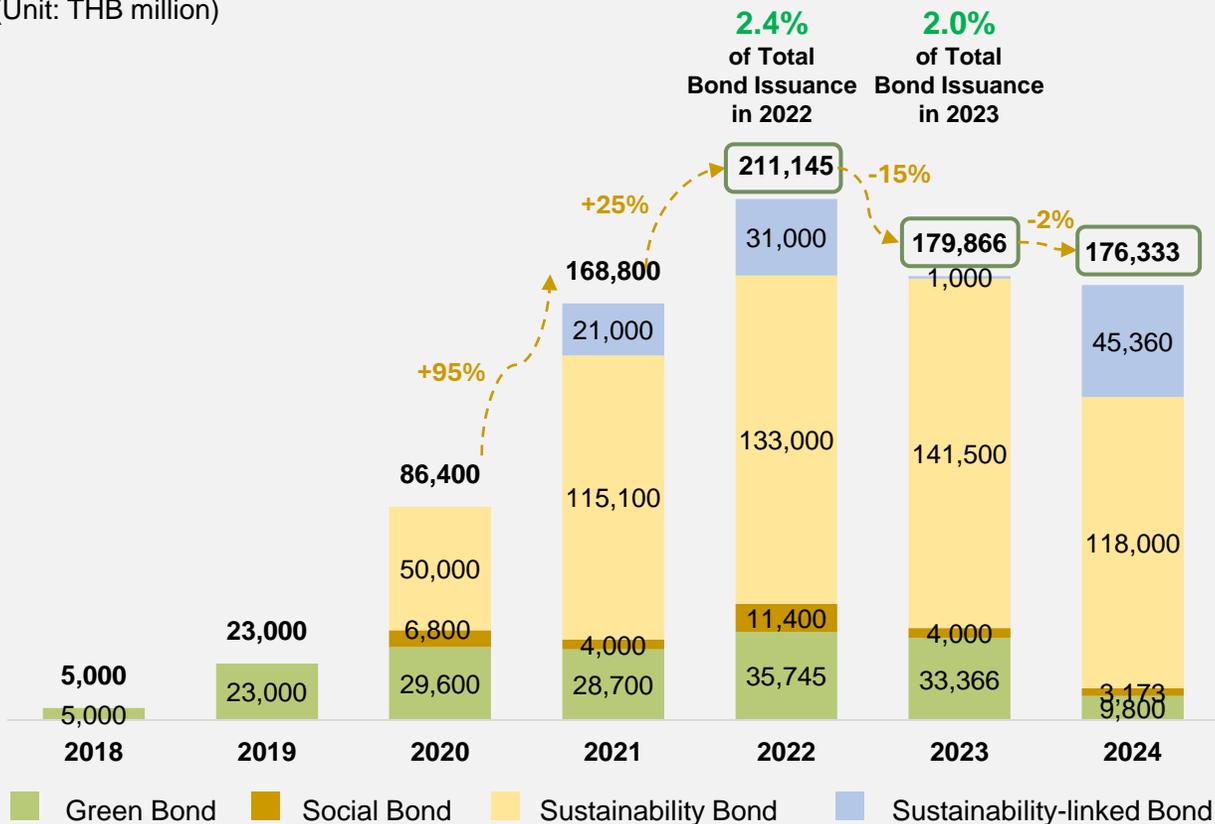
Note: GDP in 2024 = THB 18.6 trillion

SUSTAINABLE BOND ISSUANCE IN THAILAND REMAINS ROBUST

Thai Sustainable Bond Market remains conducive, with an increasing variety of ESG bond types, particularly Sustainability-Linked Bonds issued by both corporates and the Thai government.

SUSTAINABLE BOND ISSUANCE BY PRODUCT TYPES

(Unit: THB million)

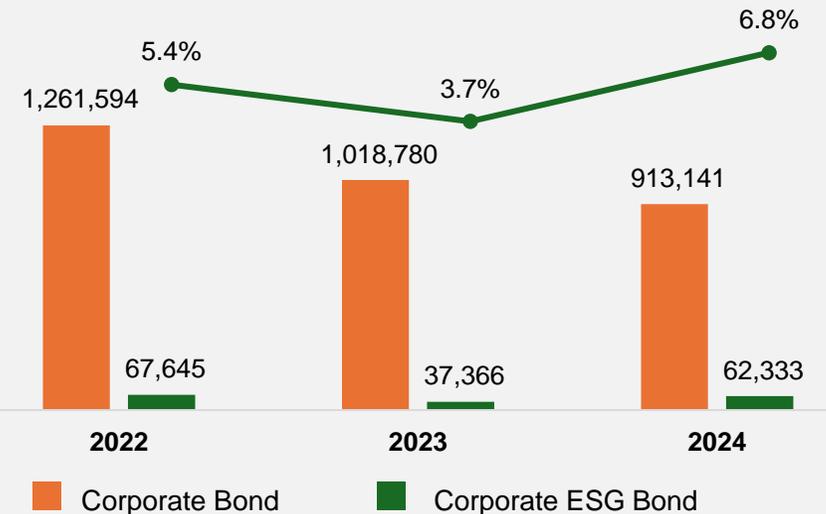


CORPORATE BOND ISSUANCE

As of Dec 24, corporate ESG bond issuance surged by 67% while long-term corporate bond issuance declined by 10%.

Corporate ESG bonds accounted for 6.8% of total corporate bond issuance, up from 3.7% in the previous year.

(Unit: THB million)



MORE ISSUERS EVOLVE WITH ESG COMMITMENTS

2024 **15** issuers

NEW ISSUER / NEW FRAMEWORK



EXISTING ISSUER / FRAMEWORK



2023 **10** issuers



2022 **16** issuers



2021 **9** issuers



2020 **6** issuers



2019 **2** issuers

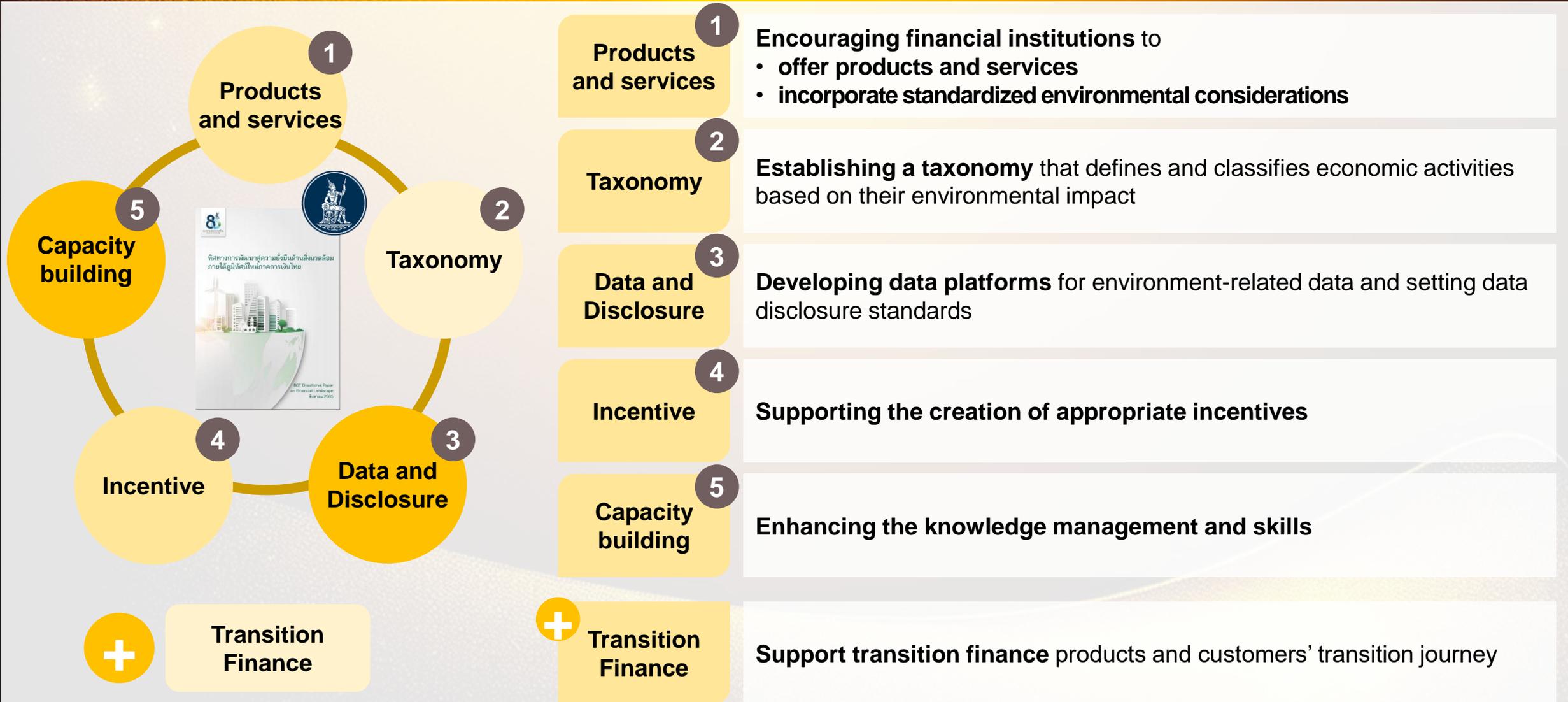


2018 **2** issuers



**SECTION 2:
BOT Directional Paper –
The 5 building blocks+**

BOT DIRECTIONAL PAPER | THE 5 BUILDING BLOCKS+



BOT DIRECTIONAL PAPER | THE 5 BUILDING BLOCKS+



1 PRODUCTS & SERVICES

CUSTOMIZED SOLUTIONS FOR CORPORATE & INVESTMENT BANKING CLIENTS



GREEN/ BLUE LOANS/ BONDS
Renewable energy, clean transportation, green buildings, energy efficiency, water management



SUSTAINABILITY LOANS/ BONDS
Funding for new or existing eligible green and social projects



SOCIAL LOANS/ BONDS
Essential services, affordable housing, and socioeconomic advancement



SUSTAINABILITY-LINKED LOANS/ BONDS/ FX/ DERIVATIVES
Incentivizing the achievement of sustainability objectives

PRODUCT PROGRAMME FOR SME CLIENTS



LOAN FOR PPA OPERATOR
• Borrowers invest in solar cell installations.
• Sell solar-powered electricity under a Power Purchase Agreement (PPA).



LOAN FOR GREEN BUSINESSES
• Borrowers operate in environmentally friendly businesses.

FINANCING THE TRANSITION FROM BROWN TO LESS-BROWN BUSINESS



LOAN FOR GREEN ACTIVITIES AND TRANSITION LOAN
• Borrower in general businesses who would like to invest in sustainability projects

1 PRODUCTS & SERVICES | KINGDOM OF THAILAND'S SUSTAINABILITY ASPIRATION

Krungsri is honored to be a trusted partner in issuing Sustainability Bonds and Sustainability-Linked Bonds for the Ministry of Finance, contributing to the nation's growth and financial stability.

Feb 2025	Re-open THB 29 billion Sustainability-Linked Bond (SLB406A)
Nov 2024	THB 30 billion Sustainability-Linked Bond (SLB406A) <ul style="list-style-type: none"> Asia's First Sovereign Sustainability-Linked Bond
Dec 2022	Re-open THB 30 billion Sustainability Bond (SLB376A)
Sep 2022	THB 35 billion Sustainability Bond (SLB376A)
Apr 2021	Listed the Sustainability Bond on the Luxembourg Green Exchange (LGX) 
Nov 2020	Re-open THB 20 billion Sustainability Bond (SLB35DA)
Aug 2020	THB 30 billion Sustainability Bond (SLB35DA) <ul style="list-style-type: none"> ASEAN's First Sovereign Sustainability Bond

Key Performance Indicators

- KPI 1:** Total GHG emissions (excluding removals from LULUCF) (ktCO₂e)
- KPI 2:** Annual registrations of Zero Emission Vehicle (ZEV) passenger cars and pick-up trucks

Sustainability Performance Target

- SPT 1:** Achieve 30% reduction from the BAU scenario by 2030.
- SPT 2:** Increase annual registrations of ZEV passenger cars and pick-up trucks by 476% to 440,000 cars by 2030



Sustainability-Linked Financing Framework
(Oct 2024)

Second Party Opinion report


Awards

 Country Awards 2025 Best Sustainability-Linked Bond - Sovereign	 Regional Awards 2024 Domestic Bond	 Best Bond Awards 2024 Government Sector ESG Bond of the Year
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BOT DIRECTIONAL PAPER | THE 5 BUILDING BLOCKS+



2 TAXONOMY | THAILAND TAXONOMY DEVELOPMENT (1/2)

THAILAND TAXONOMY DEVELOPMENT



2023



In Progress



In Progress

Thailand Taxonomy Phase I

2 Sectors:



Energy sector



Transportation sector

Thailand Taxonomy Phase I – Revised Version

Example of revisions:



Energy sector

- + CCS, CCUS
- + Smart meters
- + Carbon emissions calculation technologies
- + Waste to Energy from Municipal Solid Waste (MSW)



Transportation sector

- + Motorcycles, motor rickshaws
- + Infrastructure for Sustainable aviation fuel (SAF)
- + Passenger and freight aircrafts

Thailand Taxonomy Phase II (draft)

4 Sectors:



Agriculture sector



Building and real estate sector



Manufacturing sector



Waste management sector

2 TAXONOMY | THAILAND TAXONOMY DEVELOPMENT (2/2)

Thailand's Taxonomy Phase I and II will address activities responsible for 347,129 GgCO₂e (95.8%) of the country's 2019 GHG emissions, with Phase I covering 53.8% and Phase II covering 42.0%.

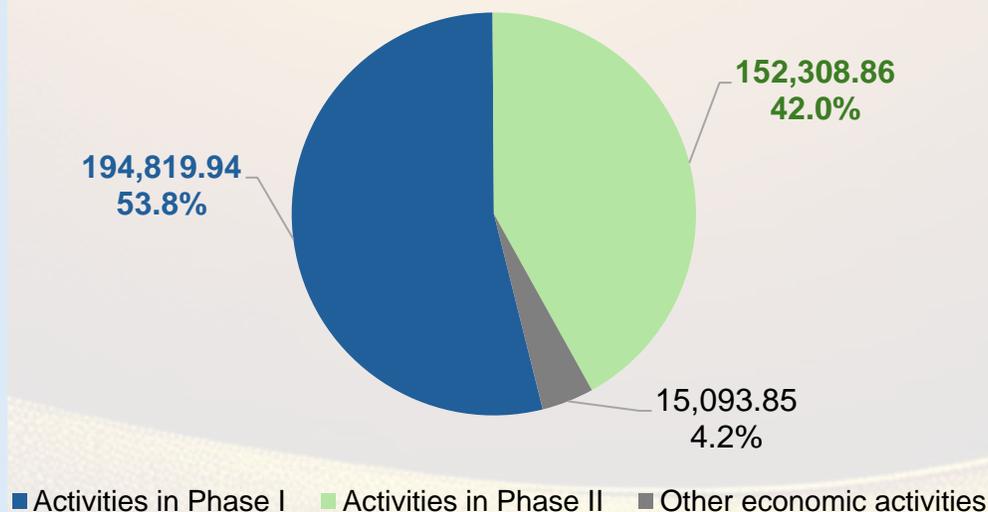
THAILAND TAXONOMY GHG EMISSIONS COVERAGE



Key Activities in Phase I

- Energy Industries
- Transport
- Fugitive Emissions from Fuels
- Oil and Natural Gas

Thailand GHG emissions in 2019 (GgCO₂e)



Key Activities in Phase II

- Manufacturing Industries and Construction
- Cement Production
- Petrochemicals and Carbon Black Production
- Rice Cultivation
- Enteric Fermentation
- Direct N₂O Emission from Managed Soils
- Indirect N₂O Emission from Managed Soils
- Manure Management
- Solid Waste Disposal
- Wastewater Treatment and Discharge
- Incineration and Open Burning of Waste

Source: Bank of Thailand, Thailand Taxonomy

Note: 1. This data uses a sector classification according to Thailand's NDC, which lists sectoral emissions based on the IPCC's 2006 code. This classification system is different from the ISIC system that forms the basis of the Thailand Taxonomy.

2 TAXONOMY | THAILAND TAXONOMY PHASE II

4 KEY ECONOMIC SECTORS COVERED IN THAILAND TAXONOMY PHASE II



Agricultural Sector

The agriculture and forestry sectors are highly vulnerable to climate impacts and challenges



Building and Real Estate Sector

Affected by energy inefficiency, use of non-sustainable materials, and vulnerability to extreme weather.



Manufacturing Sector

High levels of GHG emissions with significant costs in adopting GHG reduction technologies.



Waste Management Sector

Significant challenges with emissions, pollution, and environmental contamination.

Examples of Proposed Activities

Agriculture (2 options)

Option 1: Preparation of Integrated Farm Management Plan (IFMP)

- Cultivation of sugarcane
- Cultivation of rubber trees
- Aquaculture production

Option 2: Credible international or national certification

Forestry

- Sustainable forest management
- Forestry plantation



- Construction of new buildings
- Renovation of the existing buildings
- Acquisition or ownership of buildings
- Installation, maintenance and repair of special purpose building equipment.
- Early warning systems
- Demolition and site preparation



Hard-to-abate activities

- Manufacturing of Petrochemicals
- Manufacturing of Cement
- Manufacturing of Aluminium
- Manufacturing of Iron and Steel

Interim activities

- Manufacturing of Plastic

Enabling activities

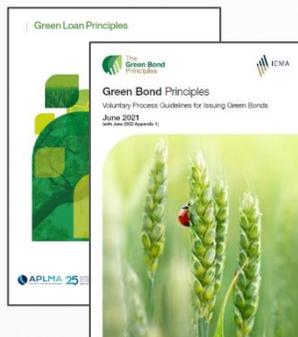
- Manufacturing of Batteries
- Manufacturing of Renewable energy technologies and products

- Anaerobic digestion or composting of bio-waste/ sewage sludge
- Collection and transport of waste
- Depollution and dismantling of end-of-life products
- Waste to Energy
- Landfill gas capture and utilization
- Sorting and material recovery from non-hazardous waste
- Treatment of hazardous waste
- Wastewater collection and treatment

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GREEN BONDS AND LOANS

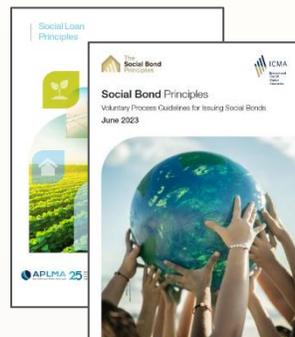


Feb 2023 June 2021

A bond / loan where the **proceeds** are exclusively to finance existing or eligible future **Green Projects for climate and environmentally-sustainable investments**

The Green Bond Principles (“GBP”) by ICMA and the Green Loan Principles by LMA are broadly aligned with each other and are a set of voluntary guidelines for the key components that should be included in a credible Green Bond / Loan

SOCIAL BONDS AND LOANS



Feb 2023 Jun 2023

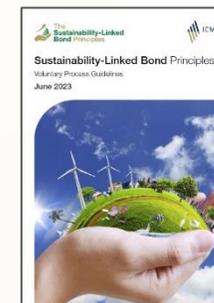
Instruments that raise funds for new and existing projects with **positive social outcomes** for especially, but not exclusively, target populations (e.g. populations living below the poverty line, aging populations, unemployed, and other vulnerable groups)

Social Bonds/Loans may also have environmental co-benefits, thus the classification of the bonds should be at the discretion of the issuer

SUSTAINABILITY-LINKED BONDS AND LOANS



Jun 2023



Jun 2023

Sustainability-Linked Bonds / Loans are instruments where the **financial and/or structural characteristics** can vary depending on whether the issuer achieves ambitious, **predefined Sustainability/ESG objectives**

These are forward-looking performance-based instruments, proceeds of which are intended to be used for **general purposes**

The ‘link’ can be to a widely defined characteristic like a public ESG risk score, or can be narrowly defined around one or more specific KPIs of an issuer

For credibility it is important that the measurement used is meaningful, significant and challenging to achieve

TRANSITION FINANCE



Jun 2023



Oct 2024

The Transition Finance seeks to provide clear guidance and common expectations to capital markets participants on the practices, actions and disclosures to be made available when raising funds in debt markets for climate transition-related purposes

- 1) Use of proceeds instruments, defined as those aligned to the Green and Social Bond Principles or Sustainability Bond Guideline
- 2) General Corporate Purpose instruments aligned to the Sustainability-Linked Bond Principles

SUSTAINABILITY BOND



Jun 2021

Sustainability Bonds are bond instruments with the proceeds used to finance or re-finance a **combination of both Green and Social Projects**

As with Social Bonds, when the benefits of the bond overlap both Green and Social categories, the classification of the bonds should be at the discretion of the issuer, depending on the primary objectives for the underlying projects

Covid-19 related financing is well suited to Sustainability Bonds

3 DATA AND DISCLOSURE | IFRS S1 & IFRS S2 DEVELOPMENT & ENFORCEMENT

**IFRS S1:
General Requirements for Disclosure of
Sustainability-related Financial Information**

**IFRS S2:
Climate-related Disclosures**

**Effective Date
(under public consultation Aor Sor Yor.
50/2567)**



Annual reporting periods beginning 1 Jan 2026 for SET50 Index to report in 2027.

Governance

Oversight, controls, and processes for managing sustainability-related risks and opportunities.

Strategy

Approach to addressing sustainability-related risks and opportunities.

Risk Management

Identification, assessment, and monitoring of sustainability-related risks.

Metrics and targets

Performance measurement, including progress toward sustainability goals.

3 DATA AND DISCLOSURE | IFRS S1 & S2 REPORTING TIMELINE



Sustainability Reporting Timeline (TCFD & IFRS S1/S2)

The trend in enhancing sustainability-related information disclosure across jurisdictions follows a **phased-in approach, tailored to entity size.**

2021	TCFD: SEC mandates ESG disclosure (including climate risks) in 56-1 One Report for listed companies.	
2023	SEC published the Thai translation of the TCFD recommendations to support local businesses in understanding and implementing climate-related financial disclosures.	
2026	IFRS S1 & S2: SET50 companies must start reporting.	SET50
2027	IFRS S1 & S2: SET100 companies required to comply.	SET100
2029	IFRS S1 & S2: All SET-listed companies & IPOs must adopt the standards.	SET
2030	IFRS S1 & S2: mai-listed companies, REITs, Infrastructure Trusts, Property & Infrastructure Funds must comply.	SET mai



IFRS S1/S2 Reporting Timeline



Japan

2027	Tokyo Stock Exchange (TSE) with market capitalization ≥ JPY 3 trillion (~THB 690 bn)
2028	TSE with market capitalization ≥ JPY 1 trillion (~THB 230 bn)
2029	TSE with market capitalization ≥ JPY 500 billion (~THB 115 bn)



Malaysia

2025	Large-listed issuers
2026	Other Main Market listed issuers
2027	Listed issuers on the ACE Market and large non-listed companies



Singapore

2025	Both listed and non-listed companies
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Hong Kong

2025	Both listed and non-listed companies
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Source: SEC ([hearing502567en.pdf](https://www.sec.gov/readingroom/hearings/hearing502567en.pdf))
JPY/THB = 0.23

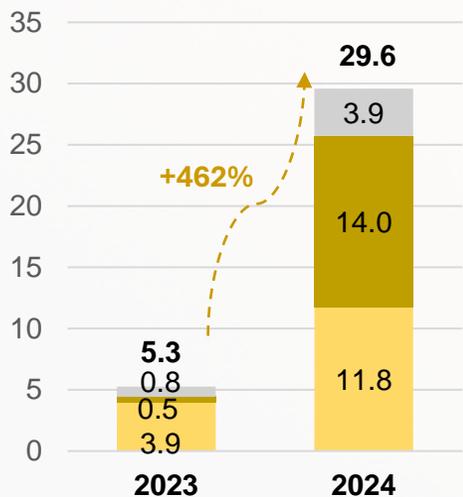
BOT DIRECTIONAL PAPER | THE 5 BUILDING BLOCKS+



4 INCENTIVE | THAILAND ESG FUND

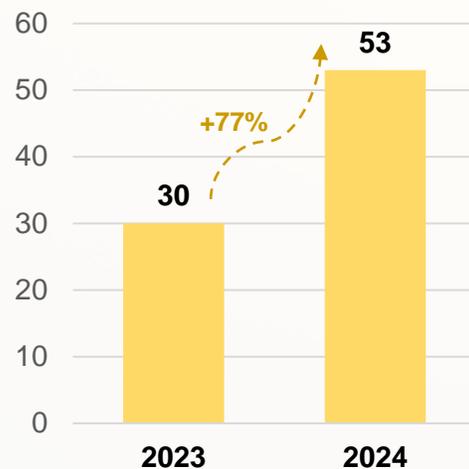
THAI ESG FUNDS EXPANSION AND ASSET GROWTH

Net Asset Value (THB billion)



■ Equity ■ Fixed Income ■ Mixed

No. of Thai ESG Funds



- As of Dec 2024, Thai ESG funds rose to 53 funds from 30 funds (77% increase).
- The Net Asset Value grew to THB 29.6 billion (462% increase), with fixed income funds reaching THB 14.0 billion (47%) in 2024.



In 2023, the Ministry of Finance and investment management industry launched **Thai ESG Fund**.

Tax Period: 10 year (2023-2032)



SET/MAI listed stocks that are recognized as being environmentally outstanding



SET/MAI listed stocks that disclose information about greenhouse gas emissions



Green Bonds, Sustainability Bonds, Sustainability-Linked Bonds



Green Bonds, Sustainability Bonds, Sustainability-Linked Bonds issued by the Government or Guaranteed by the Government



Green Project Token, Sustainability Project Token, Sustainability-Linked Project Token

4 INCENTIVE | CMDF'S ESG BOND ISSUANCE GRANT SCHEME

The Thailand Capital Market Development Fund (CMDF) supports actual expenses of up to THB 2 million per type of ESG bond until 30 Jun 2027.



1.Green 2. Social 3.Sustainability and 4. Sustainability-linked bonds in any currencies



Raising funds and registered in Thailand



Minimum funding of THB 100 million per issue



Pre-Issuance: Verified by External Reviewer
Post-Issuance: Published reports (first 3 years or until bond maturity) every year and/or verified by External Reviewer

*CMDF and ThaiBMA will refer to Reporting Section in Framework



Bond maturity \geq 1 year



Receipt Date within 30 June 2027 and submit to ThaiBMA by 5 July 2027



CMDF
Thailand Capital Market Development Fund



ThaiBMA

ELIGIBLE BOND TYPE

- ESG Bonds with maturity \geq 1 year ✔
- ESG Bonds with maturity \leq 1 year ✘
- Government Bonds ✘
- State Owned Enterprise Bonds Guaranteed by MOF ✘
- State Owned Enterprise Bonds (non-MOF Guarantee) with Filing Submission ✔
- Bonds with PP10 offering ✘
- Bonds issued outside Thailand ✘
- FCY bonds issued in Thailand ✔
- Transition Bond ✘
- Crowdfunding Bond ✘

BOT DIRECTIONAL PAPER | THE 5 BUILDING BLOCKS+



5 CAPACITY BUILDING

In 2024, Krungsri ESG Team with support from MUFG engage in capacity building, with more than 2,900 Participants

Q1

Jan 24

- The 39th ASEAN+3 Bond Market Forum (ABMF): Driving transparency Through sustainability disclosures and net-zero strategies



Feb 24

- Krungsri Business Exclusive Talk: Corporate Sustainability in Action
- ASEAN-Japan Young Leadership Summit



Q2

Apr 24

- Asian Banking & Finance Forum Sustainable Finance in Banking



May 24

- Thai Bond Market Association Corporate Financial Decisions & Fund Raising in Bond Market: ESG Bond Issuance
- Krungsri-MUFG Symposium: Sustainable Business for Carbon Neutrality



Q3

Jul 24

- Nova Symposium 2024



Aug 24

- Net Zero Transition Seminar
- ESG in Focus: Understanding the Basics

Sep 24

- Sustainability Expo 2024: ESG Symposium 2024 - CEO Forum



Q4

Oct 24

- Sustainable Building Collaboration Event
- Krungsri Business Forum: The Business Titans



Nov 24

- 30 years of ThaiBMA: Towards a fair and efficient bond market: Challenging for the next decade
- IB Club Seminar: Debt Instruments: Regulatory Update & ESG Bond Trends



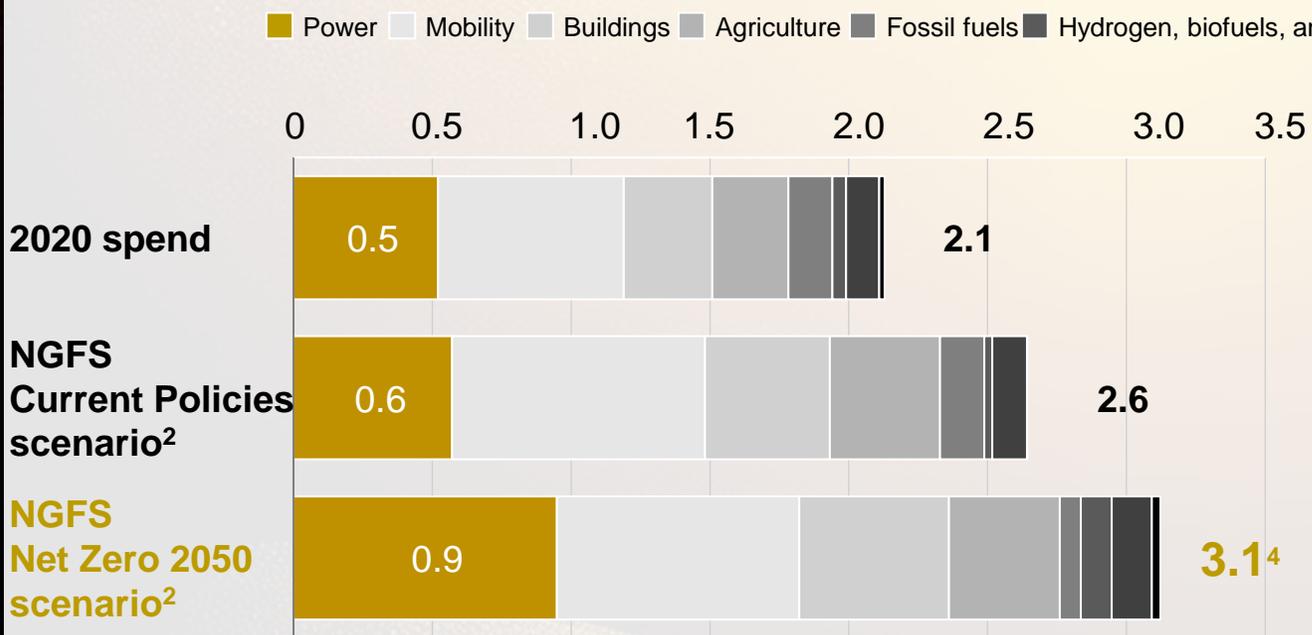
BOT DIRECTIONAL PAPER | THE 5 BUILDING BLOCKS+





ANNUAL SPENDING ON PHYSICAL ASSETS IN APAC: USD 3.1 TRILLION BY 2050 IN A NET ZERO SCENARIO

APAC¹: Average annual spend on physical assets for energy and land-use systems 2021-50, USD trillion



Annual spending on physical assets in APAC would rise to **USD 3.1 trillion (THB 103.9 trillion)** under a Net Zero 2050 scenario



Achieving Thailand's clean energy targets and broader development goals will also demand significant financing

- Investment in New Renewable Power (2022–2037): Estimated at **THB 779 billion**
- Energy Efficiency Improvements (Industrial, Commercial, Residential, and Agricultural): Projected at **THB 974 billion**



1. All countries in Asia Pacific region excluding Australia and New Zealand
 2. The Network of Central Banks and Supervisors for Greening the Financial System (NGFS)
 3. Multi-lateral Development Banks
 4. USD 1.7 trillion p.a. required for APAC (excl. China)
 5. Data as of Jan 2022

Source: Clean Energy Finance and Investment Roadmap of Thailand | OECD



krungsri
กรุงศรี

A member of MUFG
a global financial group



**Best Bank for ESG
Thailand**



**Best Sustainable Bank
Thailand**



**Country Awards 2022 & 2023 & 2024
Best Bank for Sustainable Finance, Domestic**

THANK YOU

Appendix

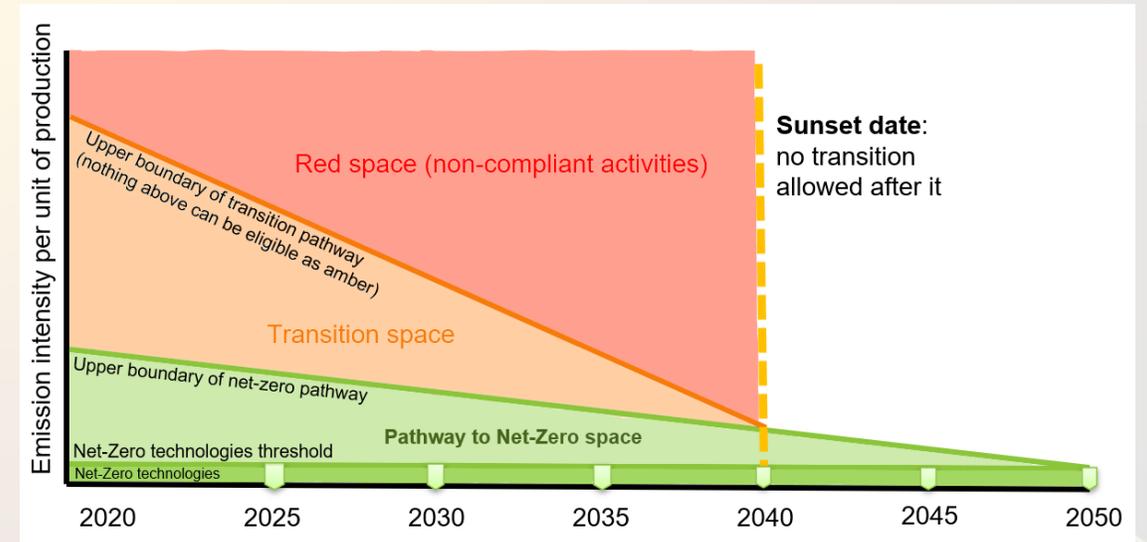
APPENDIX | THAILAND TAXONOMY OVERVIEW

THAILAND TAXONOMY OBJECTIVE

- The Bank of Thailand (BOT) defines green taxonomy as a “**guide to climate-aligned projects and assets**”.
- It serves as a tool for bond issuers, financial institutions, investors, governments, and municipalities.
- Helps stakeholders make informed decisions on investments in activities that contribute to a low-carbon economy.

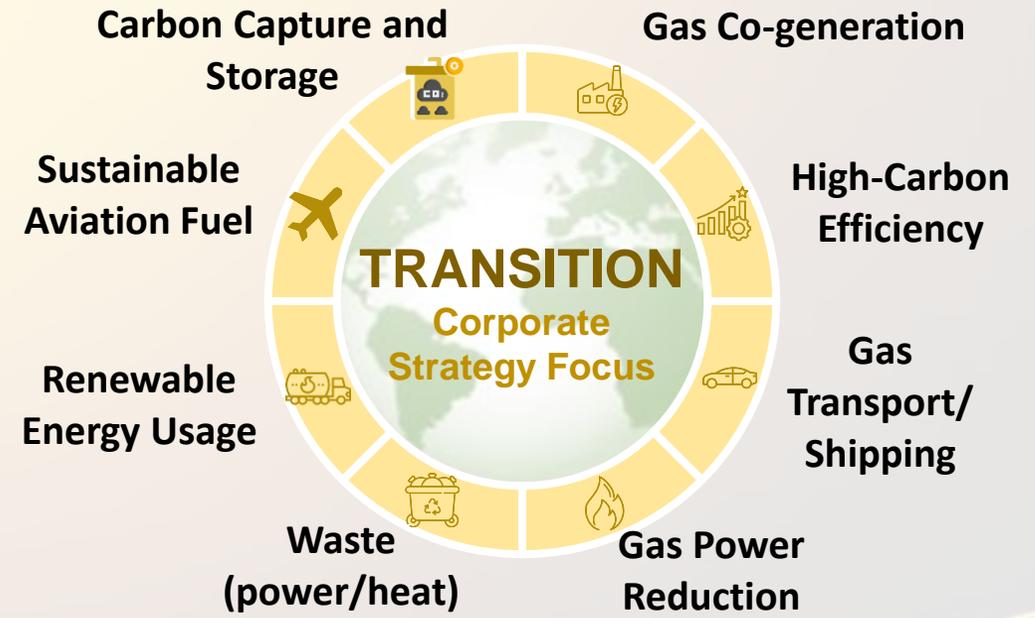


MODEL FOR ACTIVITIES ASSESSMENT



- Green:** Sustainable and closely aligned with climate goals.
- Amber:** Transitioning requires improvements to meet climate goals.
- Red:** Unsustainable and harmful to climate goals.

APPENDIX | TRANSITION FINANCE



- ✓ Meet the CO₂ emission criteria/threshold as determined green project e.g., Thailand Taxonomy, GBP, etc.
- ✓ CO₂ Direct Emission and Fossil Fuel Free in the system
- ✓ Substantial reduction of energy use and other environmental categories

- ✓ The transition target (low carbon and decarbonisation) aligned with Paris Agreement and/or the widely recognized standard e.g., international standard, Thailand taxonomy
- ✓ Not CO₂ emission Free due to BAU, technical, economical, local and geographical reason.

APPENDIX | THAILAND CLIMATE CHANGE ACT | DEVELOPMENT IN THAILAND

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE: UNFCCC



UNFCCC
1994



Kyoto Protocol
2005



PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

Paris Agreement
2016

MAIN GOALS OF THE THAILAND CLIMATE CHANGE ACT ALIGNED WITH THE UNFCCC

- Limit global temperature rise to well below 2°C, aiming for no more than 1.5°C above pre-industrial levels.
- Foster participation from all sectors in developing a low-carbon, sustainable economy.
- Mobilize capital for low-carbon development and climate resilience.
- Develop a system for monitoring and evaluating GHG reduction and climate change adaptation efforts.

Thailand Climate Change Act Draft



Objective

- Article 1: General Provisions
- Article 2: Thailand's Climate Change Operational Goals
- Article 3: National Climate Change Policy Committee
- Article 5: National Climate Change Master Plan



Climate Change Adaptation

- Article 12: Climate Change Adaptation



GHG reduction

- **Article 6: Greenhouse Gas Data**
- Article 7: Greenhouse Gas Reduction
- **Article 8: GHG Emissions Trading System (ETS)**
- Article 9: Carbon Border Adjustment Mechanism (CBAM)
- **Article 10: Carbon Tax System**
- **Article 11: Carbon Credits**



Enabling Environment

- Article 4: Climate Change Fund
- Article 13: Taxonomy
- Article 14: Penalties

APPENDIX | THAILAND CLIMATE CHANGE ACT (1/2)

Article 1: General Provisions

Right to public participation:

- Receive Information
- Express Opinions
- Receive Support
- Etc.



Article 2: Thailand's Climate Change Operational Goals

- Set climate change goals in alignment with international commitments (e.g., Net Zero 2065).
- Integration of climate goals across government.



Article 3: National Climate Change Policy Committee

- The committee sets **climate goals**, recommends regulations, allocates resources, promotes international cooperation, and monitors progress

Article 4: Climate Change Fund

- Establishment, Income and Expenditures of Climate Change Fund



Article 5: National Climate Change Master Plan

- **Plan Components:** Timeline, emission reduction targets, methods for monitoring, evaluating, and reporting.
- **Review Timeline:** Every five years but can do so earlier if necessary.



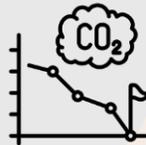
Article 6: Greenhouse Gas Data

- Submit the national GHG inventory to the UNFCCC.
- Legal entities must report GHG emissions for transparency and accountability.
- Data collection helps implement the Emissions Trading System (ETS).

APPENDIX | THAILAND CLIMATE CHANGE ACT (2/2)

Article 7: Greenhouse Gas Reduction

- The committee is tasked with **establishing operational guidelines** for government agencies to **align with the National Climate Change Master Plan**.



Article 8: GHG Emissions Trading System (ETS)

- Implement mandatory measures to drive the low-carbon transition.
- Set up a cap on emissions and create a system for allocating allowances, ensuring businesses stay within emissions limits.



Article 9: Carbon Border Adjustment Mechanism (CBAM)

- Importers must report GHG emissions within five months of the calendar year's end.
- Pay for carbon pricing certificates equal to reported emissions.

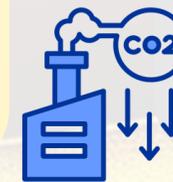
Article 10: Carbon Tax System

- Implement taxes on **oil and petroleum products** to reduce GHG emissions in the first phase.



Article 11: Carbon Credits

- Carbon credits are tradable assets** that can be transferred, bought, sold, or traded.
- Credits for domestic or international use must come from **certified GHG reduction projects in Thailand by TGO**.



Article 12: Climate Change Adaptation

- Develop and publicly share climate information and assessing risks and impacts.

Article 13: Taxonomy

Article 14: Penalties

APPENDIX | THAILAND CLIMATE CHANGE ACT | CARBON PRICING MECHANISM

Carbon Pricing Mechanism is an economic tool used to manage GHG emissions by assigning a cost to emissions. This price encourages polluters to take responsibility for the environmental and societal impacts. Carbon pricing can take various forms, depending on the policies and goals of each country or organization.

Type of Carbon Pricing Mechanism in Thailand

- **Internal Carbon Pricing** is when an organization sets a price on its emissions to guide decisions on sustainability.
- **External Carbon Pricing** is set by governments or regulators through mechanisms like carbon taxes or emissions trading systems to incentivize emissions reductions.

1. External Pricing: Compliance

- Carbon Tax System (Article 10)
- Emissions Trading System (Article 8)

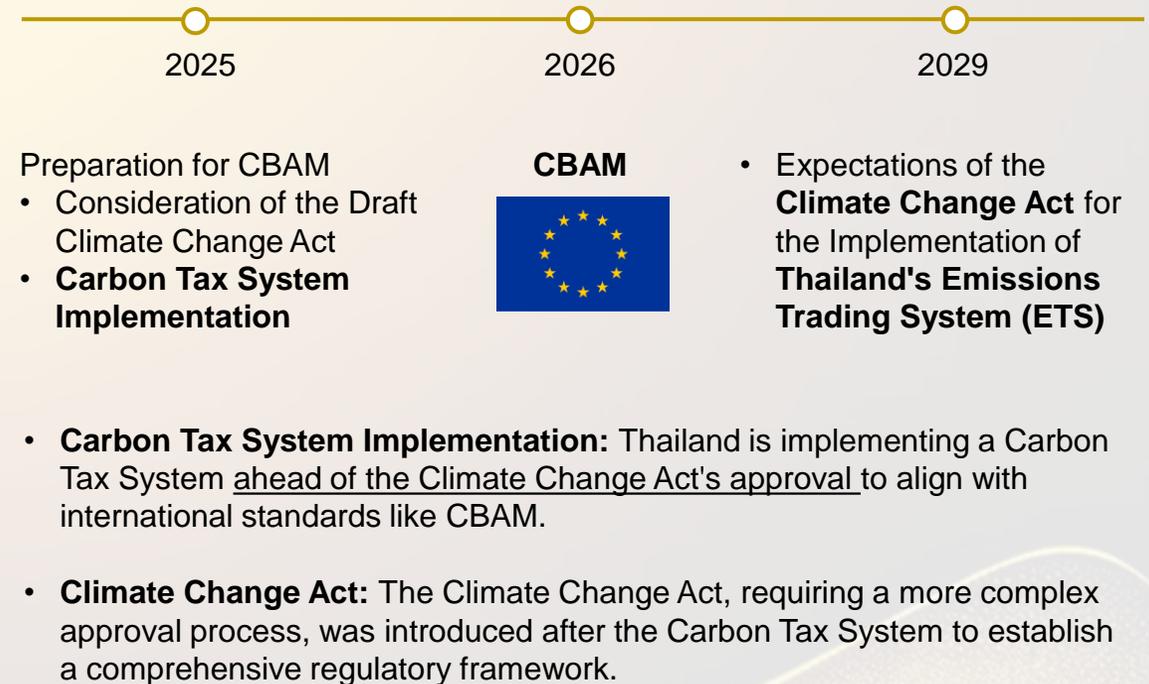
Voluntary

- Carbon Credit (Article 11)

2. Internal Pricing: Voluntary

- Internal Carbon Pricing

Timeline for Carbon Pricing Mechanism in Thailand (Compliance)



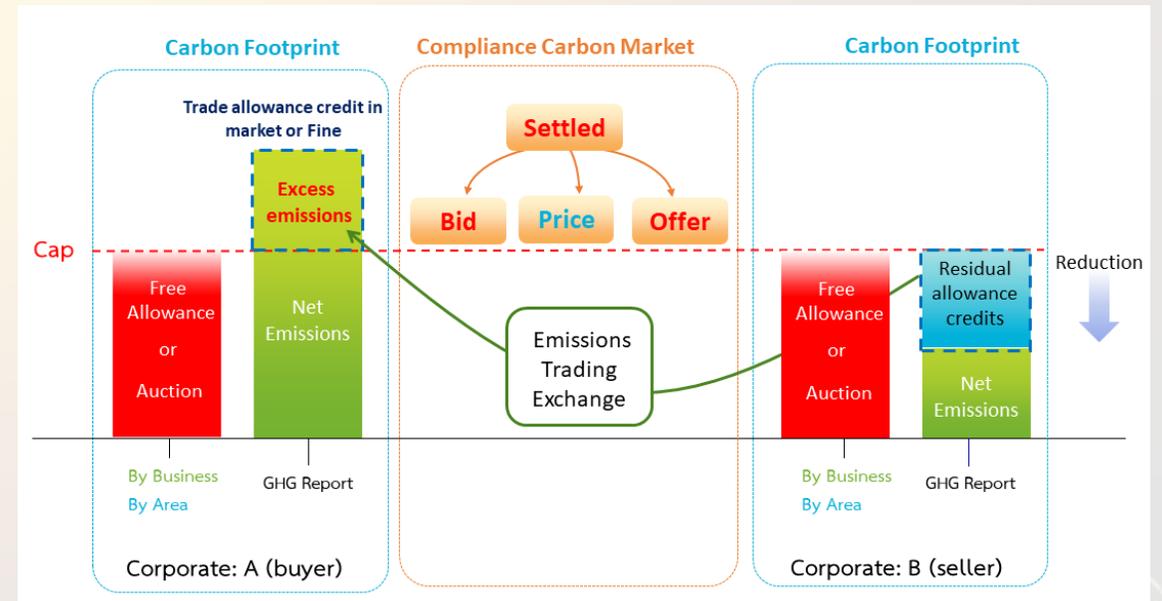
APPENDIX | THAILAND CLIMATE CHANGE ACT | ARTICLE 8: GHG EMISSIONS TRADING SYSTEM (ETS)

ETS Overall

The Emissions Trading System (ETS) is a market-based economic instrument designed to reduce greenhouse gas emissions. It operates under the broader carbon market mechanism, allowing businesses or entities to buy and sell allowances for emitting CO₂ and other GHG.

- **Cap Setting:** The government sets the overall GHG emission cap for regulated organizations.
 - Absolute Cap
 - Intensity-based Cap
- **Allowance:** The government issues emission allowances (1 allowance = 1 tCO₂e) for regulated organizations.
- **Allocation:** Organizations receive allowances either:
 - Free allowance
 - Through auctions during specific auction rounds.

Role of Buyer and Seller in ETS



Company A (Buyer)

- Purchases carbon allowances if emissions exceed the allocated cap.
- Can buy allowances from Company B or other market participants.
- Ensures compliance with emission limits set by regulators.

Company B (Seller)

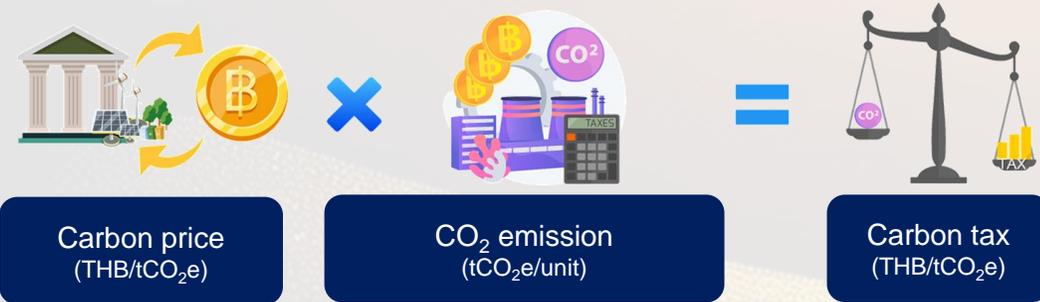
- Sells surplus carbon allowances if emissions are below the allocated cap.
- Generates revenue from selling excess allowances.

APPENDIX | THAILAND CLIMATE CHANGE ACT | ARTICLE 10: CARBON TAX

THE PRINCIPLES AND CONCEPTS OF CARBON TAX

- **Carbon Pricing:** A fee is charged for each tCO₂e emitted to encourage reducing emissions.
- **Polluter Pays Principle:** Those who emit carbon are taxed to help cover environmental damage.
- **Encouraging Solutions:** The tax motivates the development of cleaner, low-carbon technologies.

CALCULATION OF CARBON TAX



THAILAND'S EXCISE TAX RELATED TO GHG EMISSIONS REDUCTION

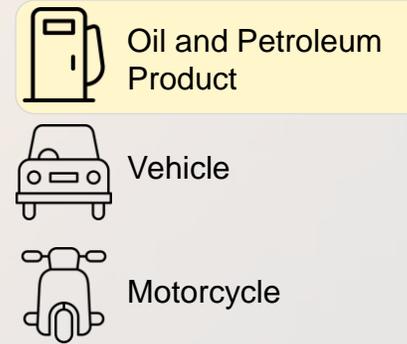
Environment

- Adhering to the Polluter Pays Principle (PPP)

Energy

- Supporting the use of alternative energy
- Supporting the efficient use of energy

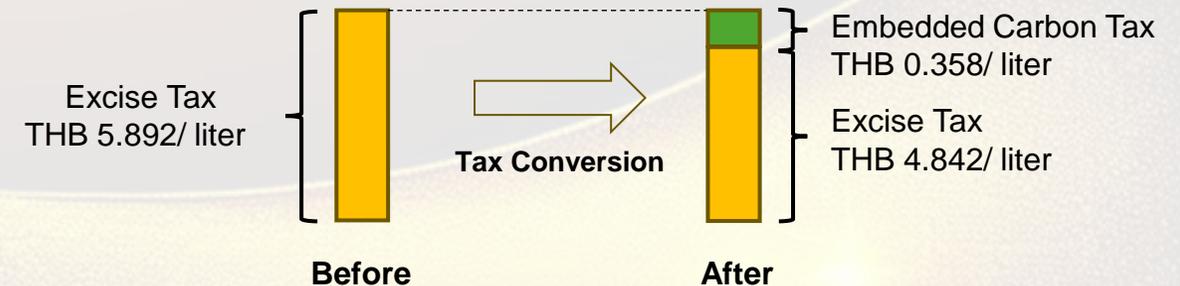
Embedded Carbon Tax
THB 200/
tCO₂e



CARBON TAX EMBEDDED WITH OIL AND PETROLEUM PRODUCT

- The carbon tax will be embedded within the current excise tax structure on oil and petroleum products without affecting consumers

Diesel's Excise Tax



APPENDIX | THAILAND CLIMATE CHANGE ACT | ARTICLE 11: CARBON CREDIT

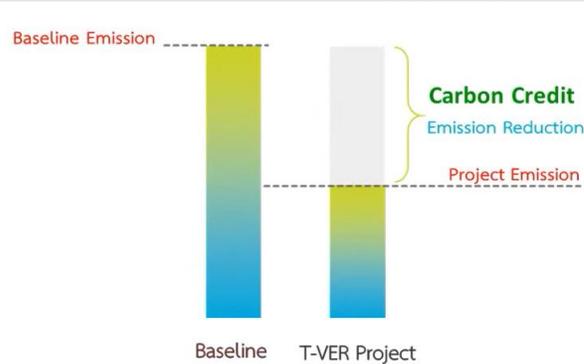
- **Carbon credits** enable organizations or individuals to **offset emissions** through GHG reductions in **certified projects** that exceed baseline expectations in a business-as-usual (BAU) scenario.
- These **credits can be traded on a carbon market**, allowing entities to benefit from excess emissions reductions.
- Measurement unit in **tCO₂e**

Carbon Credit – GHG Reduction Projects in Thailand

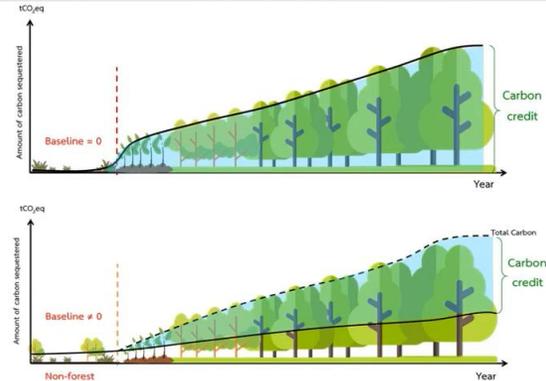
Thailand Voluntary Emissions Reduction Program (T-VER): A domestic standard for voluntary emission reductions in Thailand, allowing entities to generate T-VER credits for use in voluntary carbon markets..



Carbon credit from Reduction



Carbon credit from Removal



T-VER Project Types

	Renewable Energy <ul style="list-style-type: none"> • Renewable energy or energy used to replace fossil fuels • Improving the efficiency of electricity generation and heat production 		Factory <ul style="list-style-type: none"> • Transitioning to alternative refrigerants • Using materials to replace clinker in cement
	Transport <ul style="list-style-type: none"> • Using public transportation systems. • Using electric vehicles. • Improving engine efficiency. 		Waste <ul style="list-style-type: none"> • Waste management. • Community/industrial wastewater management. • Reusing methane gas for energy.
	Energy Efficiency <ul style="list-style-type: none"> • Improving energy efficiency in buildings, factories, and households. 		Land Use (Agriculture & Forestry) <ul style="list-style-type: none"> • Reducing, absorbing, and storing greenhouse gases from the forestry and agricultural sectors
	CCUS <ul style="list-style-type: none"> • Capturing, storing, and/or utilizing GHG 		

APPENDIX | THAILAND CLIMATE CHANGE ACT | ARTICLE 11: CARBON CREDIT

Standard T-VER and Premium T-VER Comparison

**Standard
T-VER
(2014)**



**Premium
T-VER
(2022)**



- Domestic and international transactions
- OTC and FTIX platform trading
- Offset for organizations and individuals.

Carbon Credit Trading

- Domestic and international transactions
- OTC and FTIX platform trading
- Offset for organizations and individuals.
- Premium T-Ver credits can be used for international purposes (with the required carbon credit usage authorization letter).

• BAU

Baseline Scenario

• Beyond BAU

- ISO 14065 or Clean Development Mechanism (CDM)

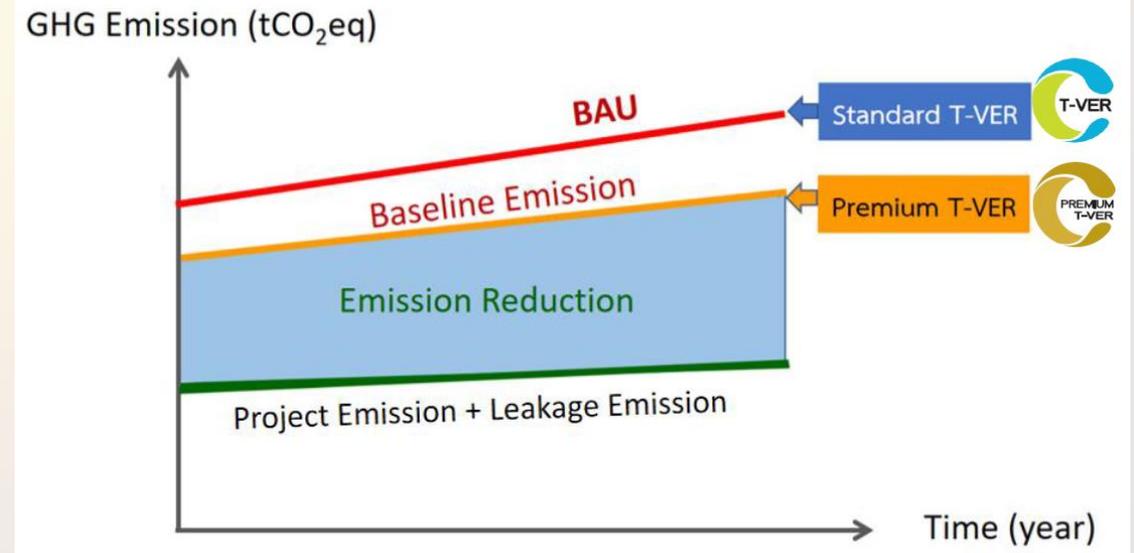
Validation and Verification Body (VVB)

- ISO 14065 or Clean Development Mechanism (CDM)

- New project or less than 3 years in duration

Project Timeframe

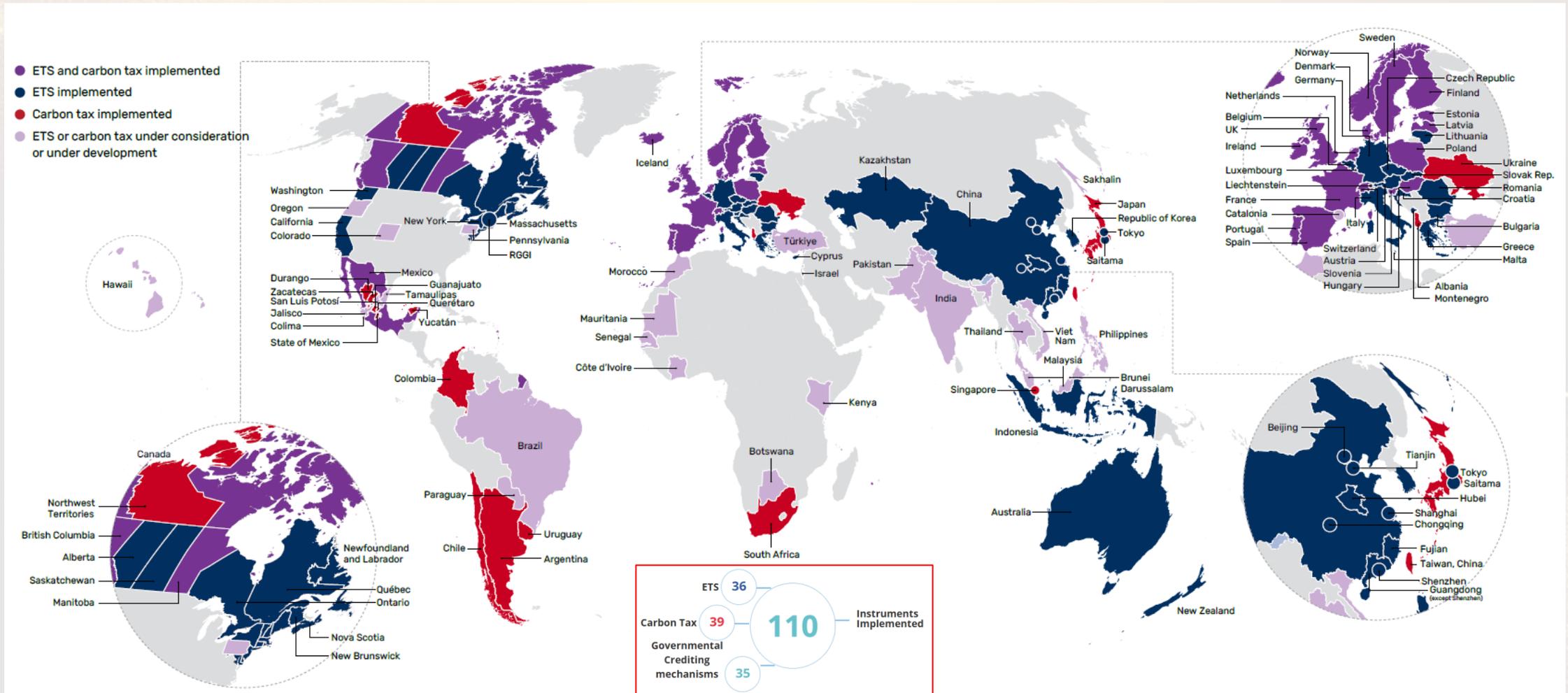
- Only new project



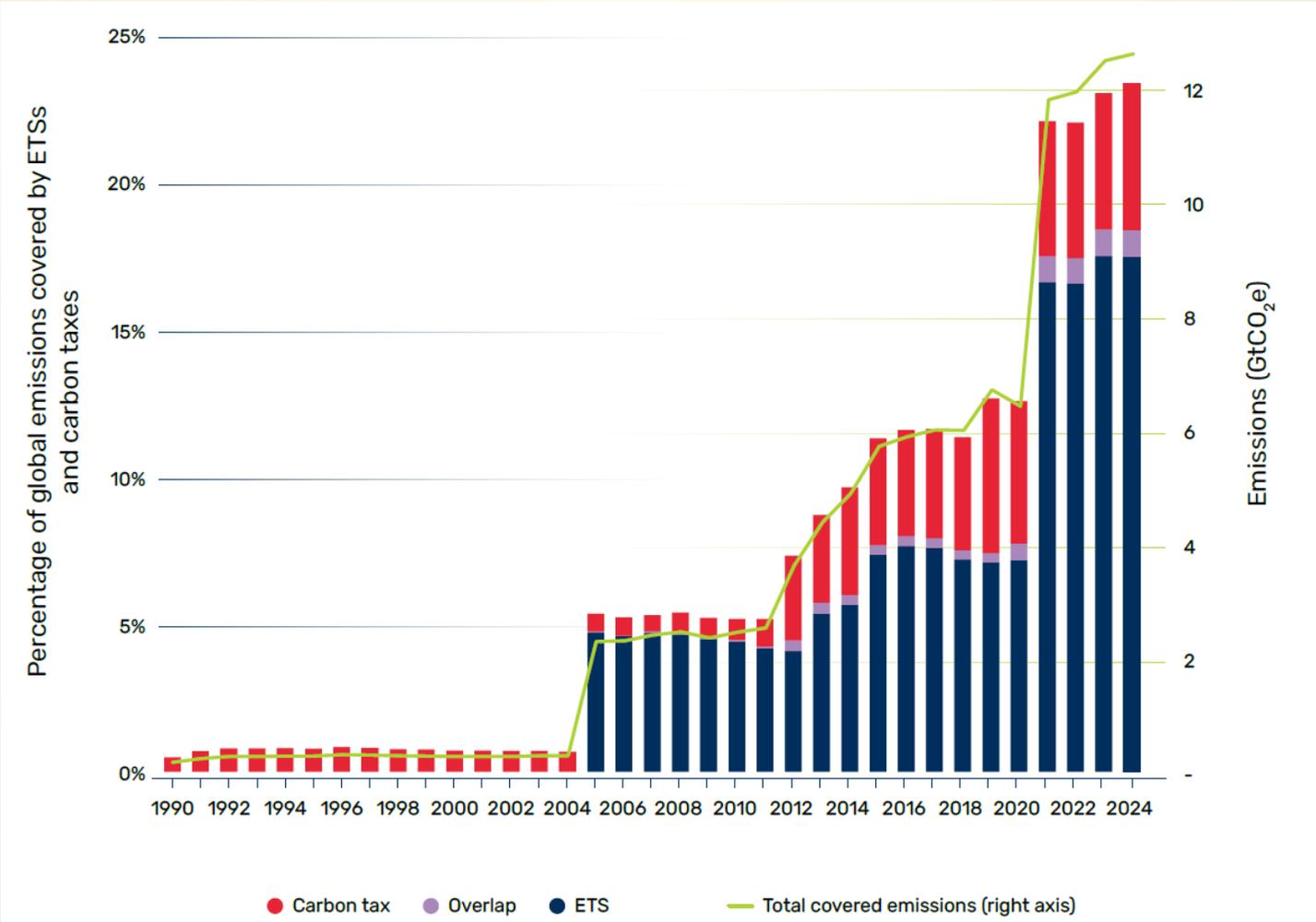
Premium T-VER projects offer higher-quality carbon credits through more detailed baseline emission calculations, using project-specific data and advanced methodologies. This intensive baseline setting results in fewer carbon credits generated, but with greater accuracy and stronger verification, ensuring higher-quality credits compared to Standard T-VER projects.

APPENDIX | THAILAND CLIMATE CHANGE ACT | CARBON PRICING MECHANISM WORLDWIDE

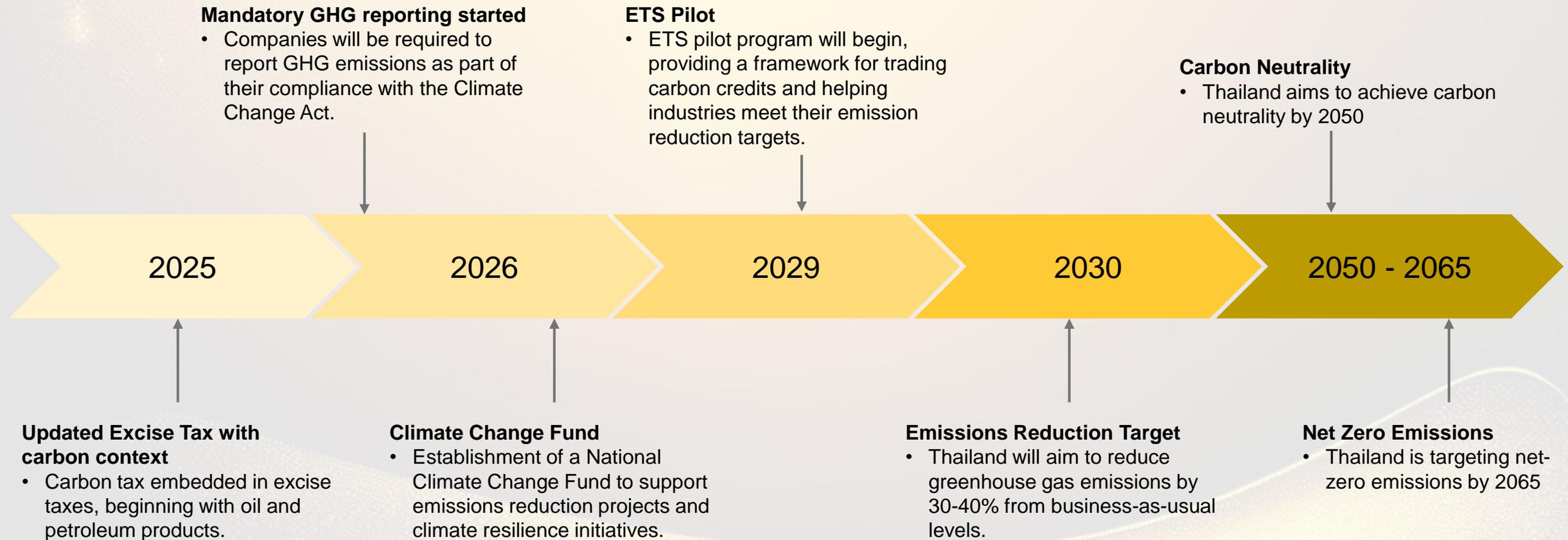
- There are **110 carbon pricing mechanisms worldwide** aimed at reducing GHG emissions (ETS and carbon taxes).
- These mechanisms cover about **24% of global GHG emissions**.



APPENDIX | THAILAND CLIMATE CHANGE ACT | CARBON PRICING MECHANISM



APPENDIX | THAILAND CLIMATE CHANGE ACT | TIMELINE



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