ผู้สนับสนุน

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ที่ปรึกษา

THAILAND TAXONOMY

A Deep Dive into the Energy Sector

June 2025

What You Will Learn Today

1. Recap of the Thailand Taxonomy's overall framework and key principles
2. Understand the Basic Principles of Thailand Taxonomy for the Energy Sector
3. Deep dive into the Technical Screening Criteria (TSC) for Energy Activities
4. Explore practical applications and use cases for businesses.

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INTRODUCTION
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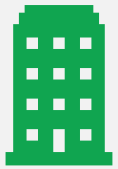
Energy

Transportation

Agriculture



Construction & Real Estate

Manufacturing

Waste Management

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The Importance of Thailand Taxonomy for a Sustainable Economy

มาตรฐานกลางแบบภาคสมัครใจ ที่ใช้อ้างอิงการจำแนกและจัดกลุ่มกิจกรรมทางเศรษฐกิจที่เป็นมิตรต่อสิ่งแวดล้อมของไทย

✓ It provides a common framework to steer the market and guide investors and stakeholders.

✓ It helps mobilize green financing, avoid greenwashing, and increase capital flows to truly green projects..

✓ It serves as a tool for the government to direct capital flows and achieve national climate objectives.

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Thailand Taxonomy identified and prioritizes 6 sectors that are both major contributors to environmental impacts for sustainable transformation, aligning with Thailand's economic structure and commitments.

Phase I

- Energy
- Transportation

Phase II

- Agriculture
- Construction & Real Estate
- Manufacturing
- Waste Management

Thailand Taxonomy is structured and designed to improve the ecological and climate credentials of the economy, and **activities within each sector are selected on the basis of the following**:

1. **Contribution to Environmental Objectives**
2. **Availability of Technologies and Best Practices**
3. **Align with National Policies & Other Green Taxonomies** (inclusion into other taxonomies)
4. **Economic Significance** certain activities is provided for information purposes, but it is not the main reason for activities selection.

*Climate-material activities are selected based on the International Standard Industrial Classification of All Economic Activities (ISIC)(Rev. 4) classification system.

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Advantages of Adopting the Thailand Taxonomy

3.Better Risk Management

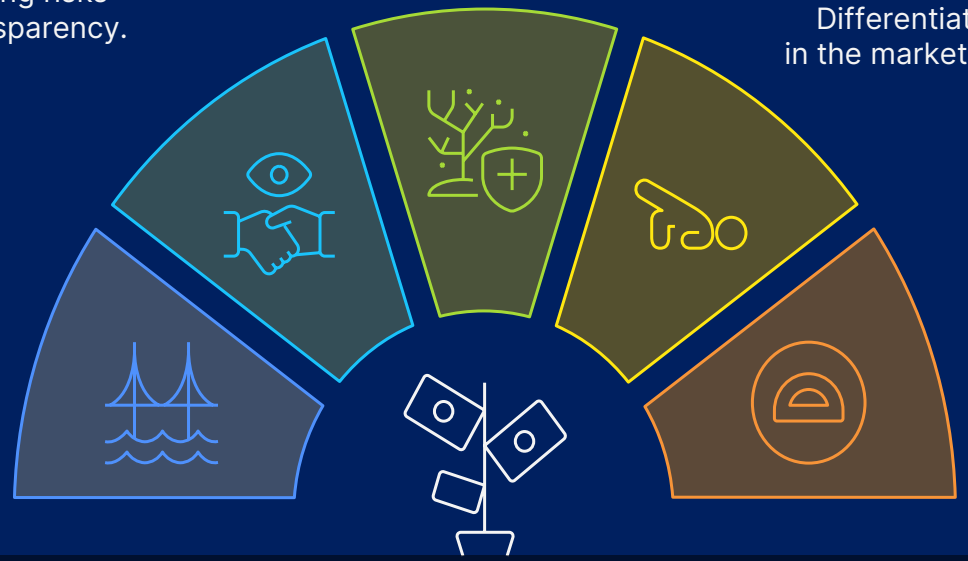
Helps identify and manage environmental risks for resilience.

2.Enhance Credibility

Builds trust and reduces greenwashing risks through transparency.

4.Competitive Advantage

Differentiates organizations in the market with sustainability.



1.Improve Access to Capital

Facilitates funding and favorable terms for green projects.

5.Future-Proofing

Aligns with future policies and avoids regulatory penalties.

- ✓ While Thailand Taxonomy is a powerful tool for promoting sustainability, it cannot be used as a one-size-fits-all solution for all environmental and economic challenges.
- ✓ Thailand Taxonomy is not a mandatory list of economic activities for investors to invest in or not invest in.
- ✓ There are other instruments that can be used to incentivize toward green investment.

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Taxonomy is:

- A system for classifying economic activities to separate sustainable activities from those that are unsustainable and harmful to the environment and climate.
- A convenient tool for use by economic agents, financial market participants and government agencies.
- A tool to categorise financial flows and increase transparency in disclosure, issuance of green financial instruments and financial decision-making.
- A tool to decarbonise those activities that have the potential to affect the climate (climate material) or environment.
- A living document

Taxonomy is NOT:

- A tax collection. The name Taxonomy contains "Tax" but it's not a tax.
- A classifier of activities into 'good' and 'bad'.
- A tool for assessing the financial or economic characteristics of an activity.
- Prohibit lending. Loans can still be issued according to the policies of financial institutions.
- Prohibit investment. Investments can still be made according to the risk appetite of each individual.

Source: Climate Bonds Initiative

Thailand Taxonomy Phase I

Thailand Taxonomy
Phase I

Draft revised 2025

Prepared by:

Climate Bonds Initiative

Supported by:

GB-TAP Green Bond Technical Assistance Program

IFC International Finance Corporation WORLD BANK GROUP
Creating Markets, Creating Opportunities

IN PARTNERSHIP WITH

Thailand Taxonomy Board

BANK OF THAILAND

SEC

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

Energy Policy and Planning Office MINISTRY OF ENERGY

otp

TGO

FTI

FTI Renewable Energy Industry Club

*BOT and SEC are representatives of Working Group on Sustainable Finance (WG-SF)

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Basic Principles of Thailand Taxonomy for the Energy Sector

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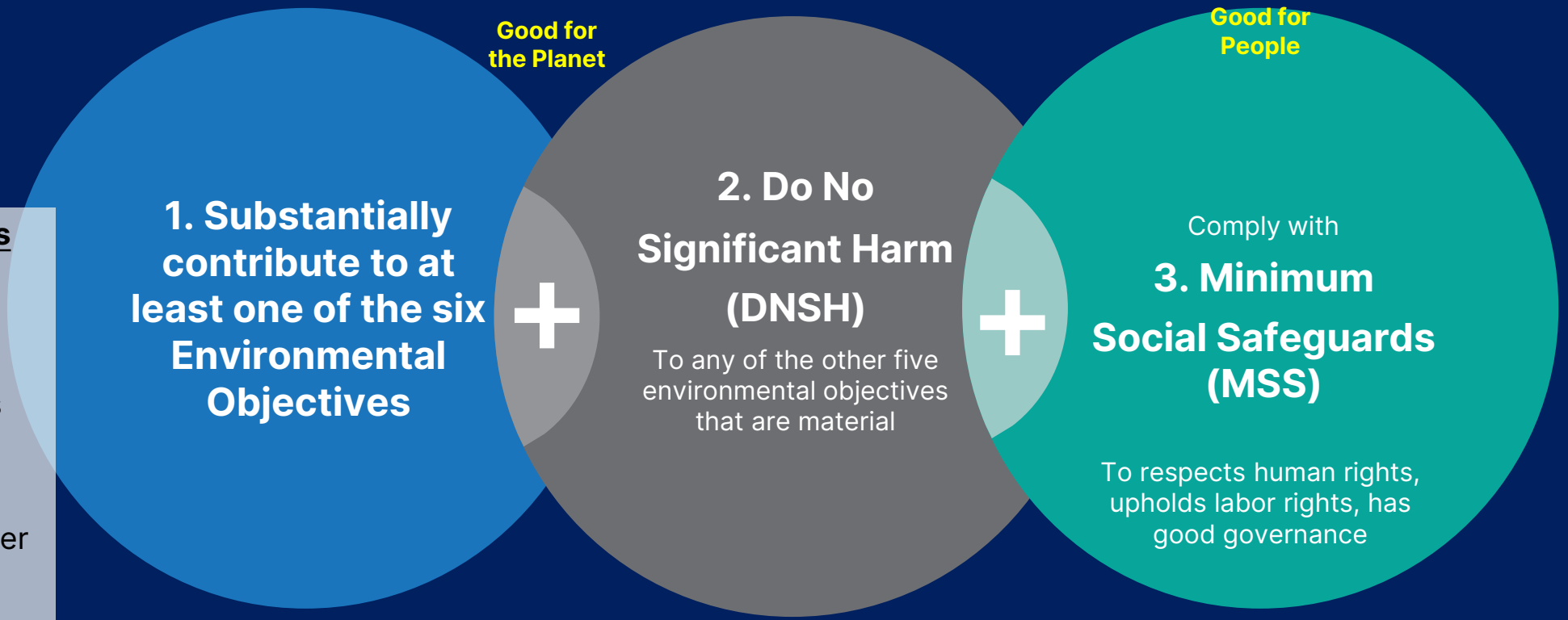
The 3 Core Pillars of Thailand Taxonomy Alignment

Key Development Principles

- ✓ Based on up-to-date climate science
- ✓ Covers a maximum of climate-material activities
- ✓ Interoperable with other green taxonomies
- ✓ Locally applicable, consider Thai Context in amber activities
- ✓ Provides paths to decarbonization for hard-to-abate sectors of the economy
- ✓ Dynamic & Living document



EO1- Climate change mitigation
EO2- Climate change adaptation
EO3- Sustainable use and protection of marine and water resources
EO4- Promotion of resource resilience and transition to a circular economy
EO5- Pollution prevention and control
EO6- Protection and restoration of biodiversity and ecosystems

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Thailand Taxonomy uses a “traffic light system" to assess if an economic activity makes a Substantial Contribution to at least one of the six Environmental Objectives

“Traffic Light System”

Green

Activities that **clearly and significantly contribute** to achieving one of the six Environmental Objectives

Amber

Activities that **can be developed to become more environmentally friendly** and potentially move into the green category in the future. They are crucial for the transition to a low-carbon & sustainable economy.

Red

Activities that **cause significant harm** to one or more Environmental Objectives and must be gradually phased out.

*All activities must comply with important principles such as the **Do No Significant Harm (DNSH)** principle and **Minimum Social Safeguards**.

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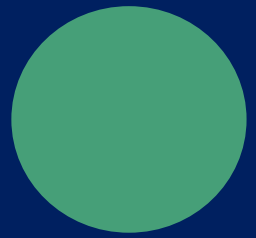
Threshold Modeling for Energy Activities on Climate Change Mitigation

The Goal is to Create Clear Targets

The main purpose of the model is to set clear, science-based targets (thresholds) that define which business activities are truly "green" (aligned with the 1.5°C Paris Agreement goal) and which are "amber" (on a credible path to becoming green).

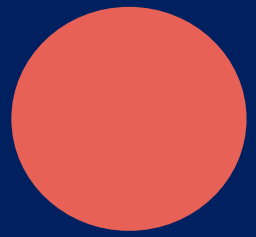


"Green" is the Ultimate, Ambitious Goal

The "green" target is set to the most ambitious international standard (1.5°C pathway) because it is scientifically necessary, attracts climate-aware international investors, and is more cost-effective in the long run than facing severe climate change.

"Amber" is the Practical Starting Point for Transition

For activities that can't become green overnight, there is a transitional "amber" pathway. The starting point for this path is guided by Thailand's own national climate commitments (its NDC), creating a practical "grace period" for businesses to improve.



"Red" activities are those that are incompatible with the long-term net-zero goal, do not have a credible path to becoming green, and are considered harmful to climate change mitigation, meaning they should be phased out (e.g., electricity generation from coal).

Flexible on Technology

The model is "technology-neutral."

It doesn't tell how to reduce its emissions. As long as the target can be met-whether by improving efficiency, using new machinery -it can be considered compliant.

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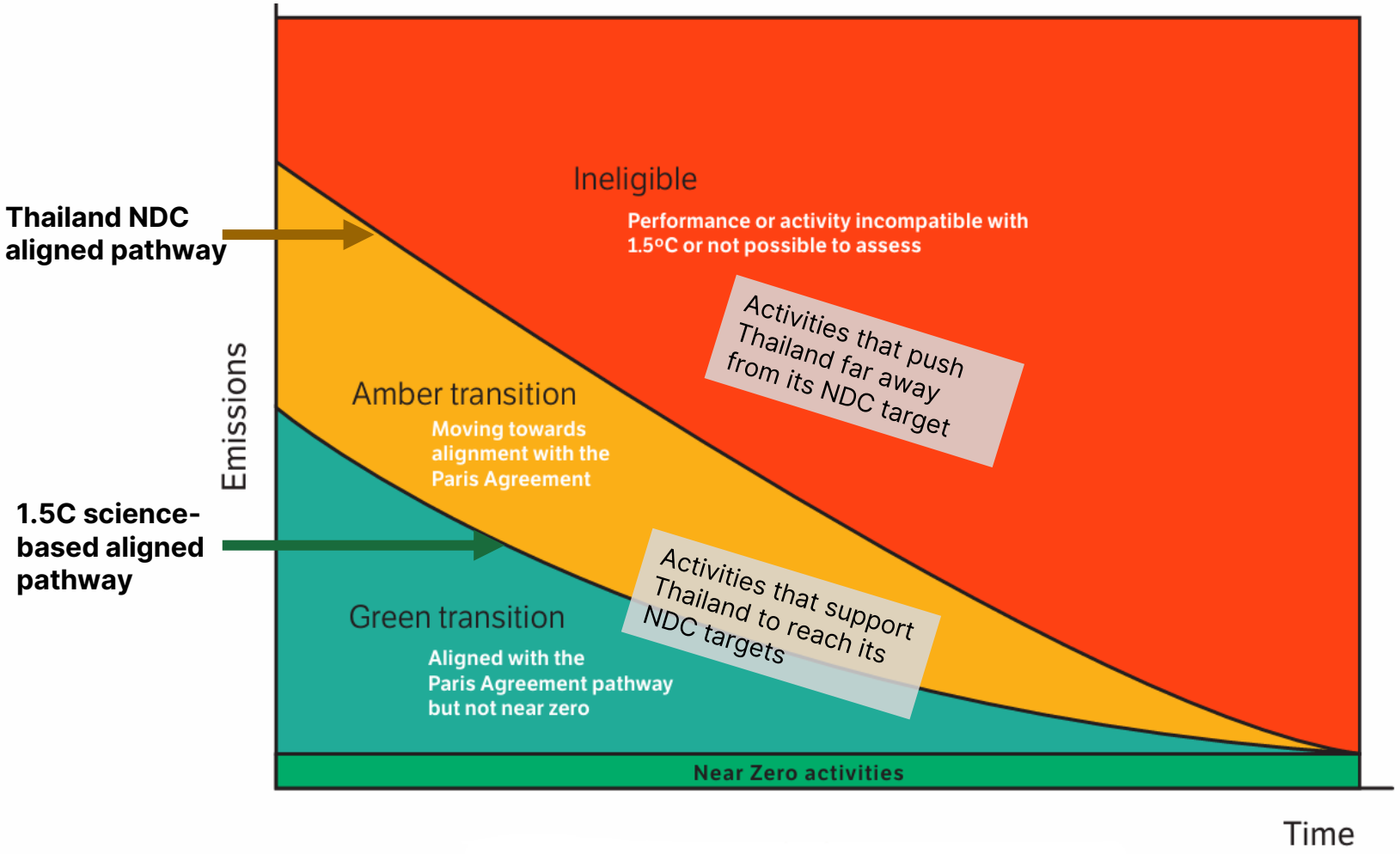
The goal for any business or economy is to move its activities downward on this chart from red to amber, from amber to green, and eventually, towards near-zero emissions.

The GHG emissions must decrease over time to align with global climate goals

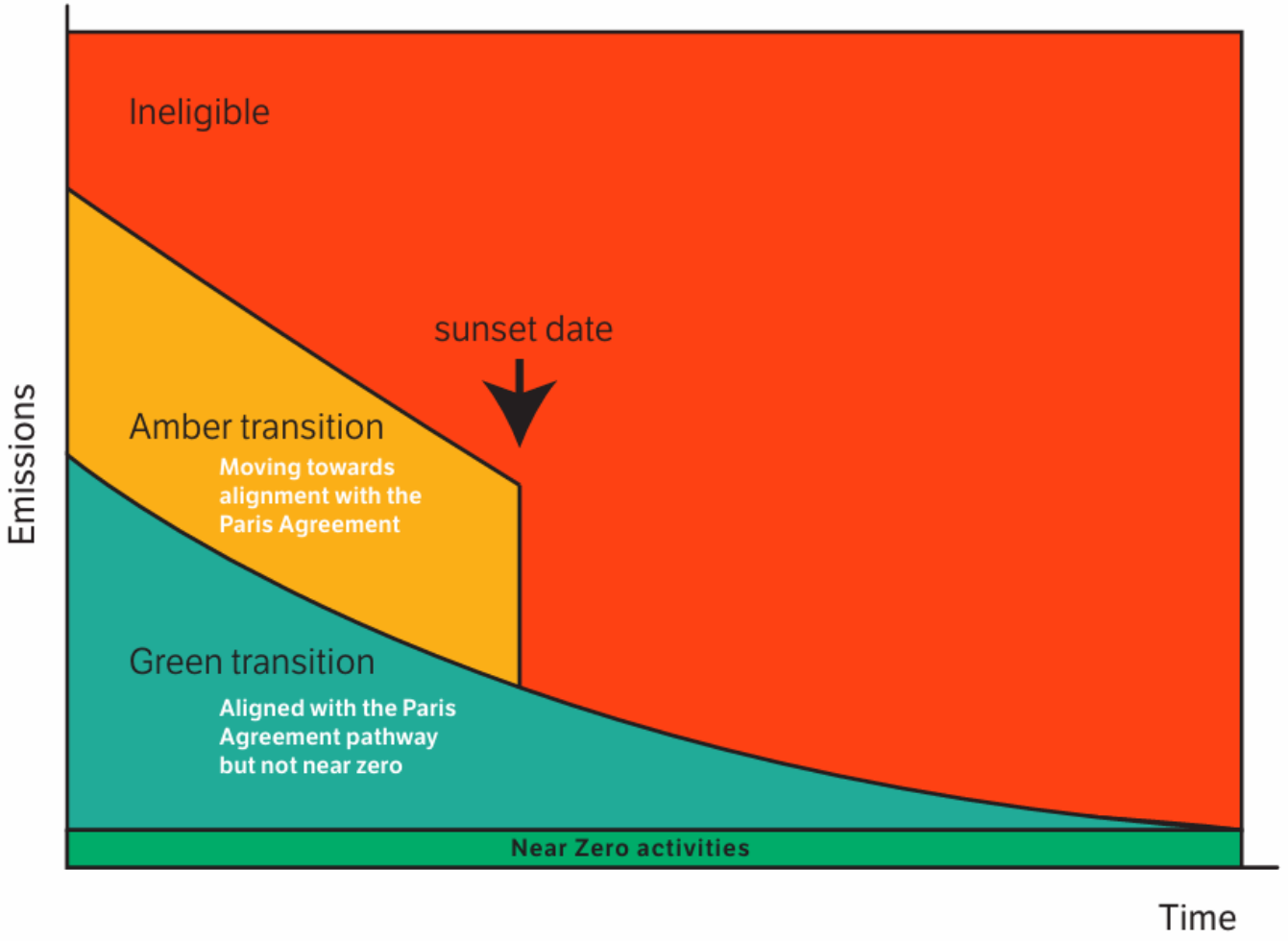


- **New assets/ projects/ activities**: new projects must comply with green criteria.
- **Existing assets/ projects/ activities** could comply with either green or amber criteria.
- Thus, **amber criteria** are available for the transition of **Existing projects** only.
- For some activities, there will be no amber threshold.

Source: Climate Bonds Initiative, explained by Creagy

“Sunset date" acts as a deadline for the "Amber transition"

- A transition cannot last indefinitely – at some point in time, **the amber activity should be following a 1.5°C pathway to net zero.**
- The **Amber criteria have a sunset date (2040) to ensure that transition does not last forever** and that the thresholds facilitate movement towards green.
- **Before the sunset date,** activities that are not fully green but are on an approved improvement path can still be considered compliant and receive transition financing.
- **After the sunset date**, this "amber" category disappears. From that point forward, all activities must meet the much stricter "Green transition" or "Near Zero" criteria to be considered aligned with the taxonomy
- Therefore, transition requires change over time.



Source: Climate Bonds Initiative, explained by Creagy

Energy Sector Activities

Sector	Subsector by ISIC 4 Code (UNSD)	Subsector by ISIC 4 Code (TSIC)
Energy	D351 - Electric power generation, transmission and distribution	
	D352 - Manufacture of gas; distribution of gaseous fuels through mains	
	D353 - Steam and air conditioning supply	

ISIC Sector (TSIC)	ANDBI Sector23F	Activity in the Section 4 of Thailand Taxonomy
D351 - Electric power generation, transmission, and distribution	D35104 Solar power gen generation	Solar energy
	D35105 Wind power generation	Wind energy
	D35106 Hydro power generation (incl. pump storage)	Hydropower
	D35107 Geothermal power generation	Geothermal power
	D35108 Bio power generation	Bioenergy generation and production (incl. SAF)
	D35101 Gas power generation	Natural gas
	D35109 Marine power generation	Ocean energy
	N/A	Electricity generation from renewable non-fossil gaseous and liquid fuels
	D35111 Energy storage (not incl. pump storage)	Storage of electricity and thermal energy
	D35110 Transmission and distribution of electricity (incl. ICT and smart technology)	Transmission and distribution of energy
	N/A	Cogeneration of heating/cooling and power using renewable sources of energy
D352 - Manufacture of gas; distribution of gaseous fuels through mains	D35110 Transmission and distribution (incl. ICT and smart technology) D35203 Gas distribution	Transmission and distribution networks for renewable and low-carbon gases
D353 - Steam and air conditioning supply	D35302 Provision of steam / air conditioning (renewable production)	Production of heating and cooling using waste heat
		Installation and operation of electric heat pumps
		Heating and cooling distribution

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Energy Sector Technical Screening Criteria

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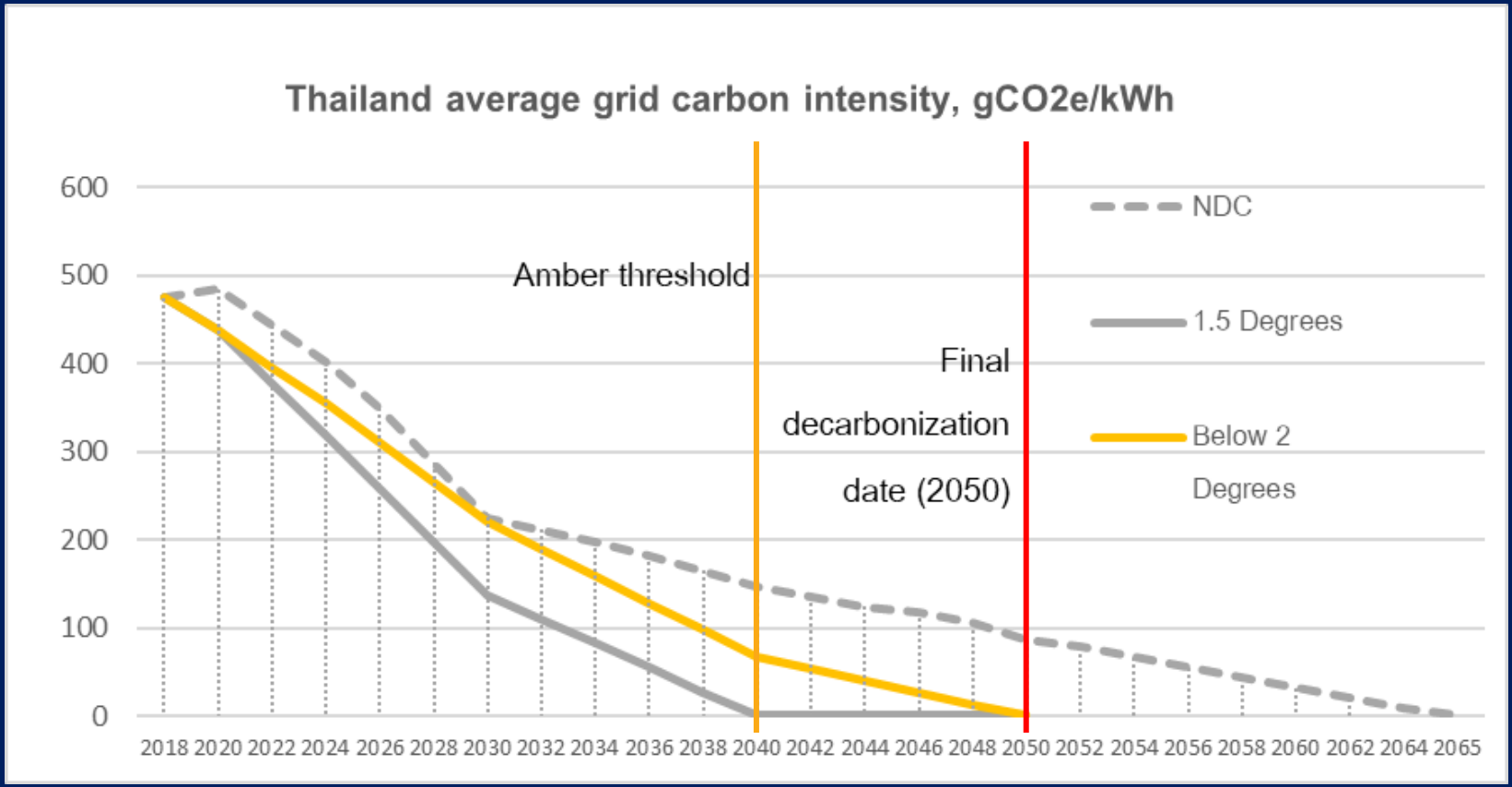
Thailand grid carbon intensity modelling 2018-2050



- For Thailand to be able to go along the 1.5-degree pathway green carbon intensity must reach on average 138 grams CO2 per kilowatt-hour by 2030 and net-zero by 2040.
- For a Well below 2-degree scenario the corresponding figures are 220 gCO_2e/kWh by 2030 and net-zero by 2050.
- Achieving this will require major changes to electricity production, including the use of renewable technologies, and the reconfiguring of existing fossil fuel facilities to increase renewable uptake.

Source: TPI, Calculated from Thailand's Long-term Low Greenhouse Gas Emission Development Strategy (Revised Version – November 2022)

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Thresholds for Electricity Generation (gCO2e/kWh) under Thailand Taxonomy

	2022-2025	2026-2030	2031-2035	2036-2040	2041-2045*	2046-2050*
Green Activities	100	100	100	100	50	
Amber Activities	381	225	191	148	N/A	N/A
Red Activities	>381g	>225g	>191g	>148g	>50g	>50g

Note: All thresholds are subject to review every three to five years in accordance with new data and technological development.
* Post-sunset dates, amber certification is no longer available
** Energy efficiency measures are covered under these energy sector criteria by the very means of establishing thresholds using emission intensity (gCO2 per unit of production). In order to achieve a certain threshold, the activity must reduce its emission intensity, including by implementing measures to improve efficiency as an option.

- **The green threshold** in the Thailand Taxonomy will be established as 100 gCO2e/kWh until 2040 with the emission of 50 gCO2e/kWh afterwards. This threshold is justifiable from the point of view of international compatibility as both EU and Climate Bonds taxonomies consider it appropriate. It is an ambitious threshold that allows the state and the market to bring emissions down rapidly.
- **For amber threshold** is defined following the NDC-based pathway. This is applicable for existing activities only – which means that the activity/asset is in existing before 1 January 2024. 2040 is established as a sunset date for the amber threshold. After this date only green thresholds and criteria are applicable for all activities. It is noted that the sunset date may be subject to change based on new technologies or evolving scientific views.
- **Red activities** can under no circumstances be considered contributing to climate change mitigation.

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Activities in the Energy Sector of Thailand Taxonomy

1.	Solar energy generation
2.	Wind energy generation
3.	Hydropower generation
4.	Geothermal power generation
5.	Bioenergy generation and production (including SAF)
6.	Energy production from natural gas
7.	Marine energy generation
8.	Electricity generation from renewable non-fossil gaseous and liquid fuels, including low-carbon hydrogen and its derivatives
9.	Cogeneration of heating/cooling and power using renewable sources of energy
10.	Production of heating and cooling using waste heat
11.	Installation and operation of electric heat pumps
12.	Heating and cooling distribution
13.	Transmission and distribution networks for renewable and low-carbon gases, including low-carbon hydrogen and its derivatives
14.	Storage of electricity, thermal energy and low-carbon hydrogen and its derivatives
15.	Transmission and distribution of electricity

A note on scoping

A user of the Taxonomy can use the scoping to establish compliance with it.

The user can read a detailed description of all eligible operations in the “Description” section of each activity card. Additionally, for orientation purposes, a “Scope” line has been added to the activity cards, which contains fundamentally important information about what is allowed within a given activity:

- **Construction:** this activity involves the construction of new facilities (power plants, factories and other facilities) that will host Taxonomy-compatible activities (e.g. solar power plants or low-carbon transport infrastructure). **All cash flows directed towards the construction of these facilities (including loans taken out, bonds issued, etc.) are considered compatible with the Taxonomy.**

- **Operations:** only operations on existing objects (e.g. managing a fleet of vehicles or repairing them) are aligned with the Taxonomy. **All cash flows associated with these operations (including profits, costs and credits) are also Taxonomy compliant and can be recognised as such in the documents. The specific list of Taxonomy-compliant operations can be seen in the “Description” line of the activity card.**

- **Retrofitting:** this activity is limited to the modernisation of existing facilities to a level approaching the requirements of the Taxonomy. **The funds spent on such an activity are also Taxonomy compliant.**

1. Solar energy generation

Sector classification and activity		
Sector and activity	Energy generation with solar technologies	
ISIC CODE	3510	
Description	Construction and operation of electricity generation facilities that produce electricity, heating, and cooling from Solar Photovoltaic, Concentrated Solar Power (CSP) or any other types of solar energy-based technologies	
Scope	Construction and operation	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	All energy generation is eligible
	Amber	N/A
	Red	Power plants dedicated to support fossil fuel infrastructure are harmful to the objective of climate change mitigation
Criteria reference	Climate Bonds Initiative Solar Energy Background paper	

2. Wind energy generation

Sector classification and activity		
Sector and activity	Wind energy generation	
ISIC CODE	3510	
Description	Construction and operation of electricity generation facilities that produce electricity, heating and cooling using wind power	
Scope	Construction and operation	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	All electricity generation activities from onshore and offshore wind power plants are eligible
	Amber	N/A
	Red	Power plants dedicated to support fossil fuel infrastructure are harmful to the objective of climate change mitigation
Criteria reference	Climate Bonds Initiative Wind Energy Background Paper	

3. Hydropower generation

Sector classification and activity		
Sector and activity	Hydropower	
ISIC CODE	3510	
Description	Construction and operation of electricity generation facilities that produce electricity, heating, and cooling from Hydropower	
Scope	Construction and operation	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	A hydropower facility in operation before 1 January 2024 is eligible if it has either: • A power density > 5W/m2 OR • GHG emissions intensity < 100g CO2e/kWh during the life cycle of the powerplant. A hydropower facility commencing operation on 1 January 2024 or after this date is eligible if it has either: • A power density > 10W/m2 OR • GHG emissions intensity < 50g CO2e/kWh during the life cycle of the powerplant. In addition, pumped storage facilities must also meet one of the following criteria: • The facility is demonstrably purposefully built in conjunction with intermittent renewables AND / OR • The facility is contributing to a grid which already has a share of intermittent renewables deployment of at least 20% or has credible evidence of programmes in place that increase the share of intermittent renewables to this level within the next 10 years. Evidence of such programmes might be the current development of renewable energy facilities that are due to come online in the near term, or the auction of PPAs for renewables. AND / OR • The facility can credibly demonstrate that the pumped storage will not be charged with an off-peak grid intensity that is higher than the intensity of the electricity that it will displace when it is discharged. For example, demonstrating that there is no combination of the following in the merit order: (1) mid-merit coal and (2) gas used at times of peak demand. For any new project the executor must also follow additional criteria outlined in Criteria for Hydropower Section
	Amber	Retrofitting that improves either power density or decreases emission intensity of the existing hydropower plant by at least 15% is eligible
	Red	• The activities that are not compliant with green or amber criteria are harmful to the objective of climate change mitigation • Power plants dedicated to support fossil fuel infrastructure are harmful to the objective of climate change mitigation
Criteria reference	Climate Bonds Initiative Hydropower Criteria Document and Background Paper In this current version, the existing facility refers to the facility that is operating or receives the construction permit from the relevant authorities before 1 January 2024. The new facility refers to the facility that receives the construction permit after 31 December 2023.	

Strict Criteria for Hydropower

Taxonomy Criteria for New Hydropower Projects

Environmental Safeguards:

- Must comply with Activity's criteria **and** additional safeguards.
- Implement **all technically feasible and ecologically relevant mitigation measures**, including:
  - **Fish migration support** (e.g. fish-friendly turbines, fish passes, adjusted operation during spawning).
  - **Ecological flow maintenance** (mitigating flow variation, ensuring sediment flow).
  - **Habitat protection or enhancement**.
- Monitor effectiveness under permit or authorisation conditions aimed at achieving **good water status**.

Impact Assessment Requirements:

- Design and site must ensure:
  - **No deterioration** or compromise of water body's good status/potential; **or**
  - If deterioration occurs, it must be:
    - **Not significant**, and
    - Justified by a **cost-benefit assessment**, proving:
      - **Overriding public interest** or **greater benefits to society**.
      - **No better alternative** with lower environmental impact (e.g. refurbishing existing plants).

Basin-Wide Protections:

- Must **not permanently compromise** the status of other water bodies in the **same river basin**.
- **Compensatory measures** required to restore continuity and offset fragmentation—initiated **before** project execution.

4. Geothermal power generation

Sector classification and activity		
Sector and activity	Geothermal power	
ISIC CODE	3510	
Description	Construction and operation of electricity generation facilities that produce electricity, heating, and cooling from geothermal power	
Scope	Construction and operation	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	New facilities meeting declining green threshold for the Energy Sector
	Amber	Existing facilities meeting declining amber threshold for Energy Sector with a prescribed sunset date
	Red	• The activities that are not compliant with green or amber criteria are harmful to the objective of climate change mitigation • Power plants dedicated to support fossil fuel infrastructure are harmful to the objective of climate change mitigation
Criteria reference	Climate Bonds Initiative Geothermal Energy Background Paper In this current version, the existing facility refers to the facility that is operating or receives the construction permit from the relevant authorities before 1 January 2024. The new facility refers to the facility that receives the construction permit after 31 December 2023.	

Bioenergy Criteria

Taxonomy Criteria for Bioenergy Projects

Overview:

- Bioenergy has **separate screening thresholds**, not based on the Thresholds for Electricity Generation Table.
- Criteria aligned with **CBI Biomass** standards, using the latest scientific/technical data.
- Applies to:
  - Biomass/biofuel production facilities
  - Heating/cooling and CHP using biofuel/biomass
  - Bio-refineries
  - Related infrastructure

Key Requirements:

1.Biomass/Biofuel Production Facilities:

1. Must meet **GHG emissions thresholds** (in gCO_2e/kWh).
2. Covers liquid, solid, and gaseous forms used in heating, co-generation, and transport.

2.Heating/Cooling & CHP Facilities:

1. Biomass/biofuel used must meet **GHG emissions thresholds** (gCO_2e/kWh).
2. Facilities must achieve **≥80% energy conversion efficiency**.
3. **CHP mode** must comply with additional requirements in **Section: Bioenergy Criteria**

Bioenergy Criteria for facilities producing biomass/biofuel

Table provides the summary of these thresholds. The rationale of determining these specific thresholds can be found in the Climate Bonds Bioenergy Criteria Background Paper.

Asset type	Thresholds for biofuel/biomass produced/used (primary energy)	Energy efficiency thresholds
Facilities producing liquid biofuel, solid and gaseous biomass for heating and co-generation	57.6g CO2e/ kWh	N/A
Facilities producing biofuel for transport	67.7g CO2e/ kWh	N/A
Heating/cooling, and co-generation facilities using biofuel/biomass	57.6g CO2e/kWh	80%

To demonstrate they meet this threshold, issuers are required to conduct a life cycle assessment (LCA) of GHG emissions from their bioenergy.

The scope of the LCA should include:

- Feedstock production
- Feedstock processing
- Biofuel/bioenergy production
- Biofuel storage and blending
- Intermediate and final transport steps: transportation of feedstock to processing facilities to fuel production facilities, and transportation of fuel to the point of consumption

Source: CBI

Bioenergy Criteria for facilities producing biomass/biofuel

Compliant feedstock

Under the present Criteria, all types of feedstocks are eligible with these exceptions:

- Wood (and all woody biomass)
- Third generation biofuels (algae)
- Biodegradable Municipal Solid Waste (MSW), including sewage sludge and food waste

Feedstock used for production of bioenergy should comply with one of the following:

- Forest Stewardship Council (FSC);
- Biomass Biofuels voluntary scheme (2BSvs);
- Bonsucro; International Sustainability and Carbon Certification (ISCC Plus);
- Roundtable of Sustainable Biomaterials (RSB)
- Round Table on Responsible Soy (RTRS)

Bioenergy facilities must also either:

- Be certified under the RSB low indirect land use change (iLUC) optional module to demonstrate that they have low indirect land use impact; or
- Provide evidence and documentation to demonstrate that they meet low iLUC risk biomass criteria and compliance indicators under the RSB optional module, i.e.:
  - Yield increase: issuers demonstrate that source feedstock for the facility is produced through an increase in yield compared to a reference date, without any additional land conversion. The biomass that is produced above the baseline scenario is eligible.
  - Unused/degraded land: issuers demonstrate that source feedstock for the facility is produced from land that was not previously cultivated or was not considered arable land.
  - Use of waste / residues: issuers demonstrate that the raw material used is derived from existing supply chains and does not require dedicated production out of arable land.

Remark:

For facilities producing both biomass-based products for energy purpose (power and heat), and for non-energy use (such as food and feed ingredients, pharmaceuticals, chemicals, materials and minerals), issuers are required to allocate GHG emissions to the biomass for energy purpose based on energy content of the biomass-based products.

For such facilities, only the biomass for energy purposes need to meet the GHG emissions thresholds. That is, currently no additional GHG emissions thresholds for biomass products for non-energy use. However, users of these Criteria are reminded that if biomass products for energy use accounts for less than 50% of feedstock inputs then the facility is not aligned with this Taxonomy.

To check the compliance with the threshold it is required to use RSB GHG Calculator Tool for GHG emissions calculation.

5. Bioenergy generation and production (including SAF) (1/3)

Sector classification and activity	
Sector and activity	Bioenergy
ISIC CODE	3510, 2011
Description	Construction and operation of electricity generation facilities that produce electricity, heating and cooling from bioenergy (biomass, biogas and biofuels); Construction and operation of facilities producing bioenergy, including sustainable aviation fuels (SAF)
Scope	Construction and operation. These Criteria apply to assets and projects relating to: • Facilities producing biogas/biomass/biofuel/SAF • Heating/cooling, and co-generation facilities using biofuel/biomass • Bio-refinery facilities • Supporting infrastructure associated with the above

5. Bioenergy generation and production (including SAF) (2/3)

The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	• For all types except SAF: New and existing facilities meeting the criteria for Bioenergy (Bioenergy Criteria Section) • For all types except SAF: All types of feedstocks are eligible, including residues, energy crops and lignocellulosic biomass such as straw, with three exceptions: - Wood (and all woody biomass) except for those produced in line with Forestry Criteria of the Taxonomy; - Algae - Biodegradable Municipal Solid Waste (MSW), including sewage sludge and food waste • For all types except SAF: Feedstocks used for production of bioenergy should comply with the guidelines from one of the following bodies: ○ Program for the Endorsement of Forest Certification Scheme (PEFC) ○ Forest Stewardship Council (FSC); ○ Biomass Biofuels voluntary scheme (2BSvs); ○ Bonsucro; ○ International Sustainability and Carbon Certification (ISCC Plus); ○ Roundtable of Sustainable Biomaterials (RSB) ○ Round Table on Responsible Soy (RTRS) ○ Roundtable on Sustainable Biomaterials (RTSB) ○ International Sustainability and Carbon Certification (ISCC) • For SAF only: resulting product should comply with CORSIA Sustainability Certification schemes or • For all types of bioenergy: the resulting product should comply with the relevant national standards that align with the CORSIA Sustainability Certification Schemes.

5. Bioenergy generation and production (including SAF) (3/3)

The activity makes significant contribution to climate change mitigation		

Metrics and thresholds	**Amber**	• Only existing facilities are eligible
		• For all types except SAF: Lifecycle emission intensity meets amber thresholds for Electricity Generation under Thailand Taxonomy. For all types except SAF: All types of feedstocks used for production of bioenergy are eligible, including residues, energy crops and lignocellulosic biomass such as straw, with three exceptions:
		  - Wood (and all woody biomass)
		  - Algae
		  - Biodegradable Municipal Solid Waste (MSW), including sewage sludge and food waste
		• For all types except SAF: Feedstock used for production of bioenergy should comply with one of the following:
		  ○ Forest Stewardship Council (FSC);
		  ○ Biomass Biofuels voluntary scheme (2BSvs);
		  ○ Bonsucro;
		  ○ International Sustainability and Carbon Certification (ISCC Plus);
		  ○ Roundtable of Sustainable Biomaterials (RSB)
		  ○ Round Table on Responsible Soy (RTRS)
		• For SAF only: retrofitting of SAF production facilities or other production facilities enabling them to produce CORSIA Certification Schemes-compliant biofuels.

	Red	The activities that are not compliant with green or amber criteria are harmful to the objective of climate change mitigation
Criteria reference	Climate Bonds Initiative Bioenergy Background Paper In this current version, the existing facility refers to the facility that is operating or receives the construction permit from the relevant authorities before 1 January 2024. The new facility refers to the facility that receives the construction permit after 31 December 2023.	

6. Energy production from natural gas

Sector classification and activity		
Sector and activity	Energy production from natural gas	
ISIC CODE	3510	
Description	Retrofitting of facilities that produce energy from natural gas	
Scope	Conversion and retrofitting projects only	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	Conversion of existing natural gas power plants to use low-carbon hydrogen leading to an emission intensity of the plant of less than indicated in the Table 11
	Amber	• Retrofit of existing natural gas plants that leads to life cycle emission intensity meets declining amber thresholds for the Energy Sector with a prescribed sunset date in Thresholds for Electricity Generation Table. • Life-cycle GHG emissions are calculated based on project-specific data using ISO 14067:2018 or:2018 or ISO 14064-2:2019 or equivalent • At retrofitting, measurement equipment for monitoring of physical emissions, such as those from methane leakage, is installed or a leak detection and repair program is introduced • At operation, physical measurement of emissions are reported and leak is eliminated. • Compliance with the current Amber criteria is verified by an independent third party and must be published for public assessment
	Red	New natural gas-based power plants (where the project got construction permit after 31 December 2023) are harmful to the objective of climate change mitigation
Criteria reference	European Commission Delegated Regulation (EU) 2022/1214 of 9 March 2022 In this current version, the existing facility refers to the facility that is operating or receives the construction permit from the relevant authorities before 1 January 2024. The new facility refers to the facility that receives the construction permit after 31 December 2023.	

7. Marine energy generation

Sector classification and activity		
Sector and activity	Marine energy	
ISIC CODE	3510	
Description	Construction and operation of electricity generation facilities that produce electricity, heating, and cooling from marine energy	
Scope	Construction and operation	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	Green	All energy generation activities from marine energy are eligible
	Amber	N/A
	Red	N/A
Criteria reference	Climate Bonds Initiative Marine Renewable Energy Background Paper	

8. Electricity generation from renewable non-fossil gaseous and liquid fuels, including low-carbon hydrogen and its derivatives

Sector classification and activity		
Sector and activity	Electricity generation from renewable non-fossil gaseous and liquid fuels, including low-carbon hydrogen and its derivatives	
ISIC CODE	3510	
Description	Construction and operation of electricity generation facilities that produce electricity using gaseous and liquid fuels of renewable origin, including low-carbon hydrogen and its derivatives. This activity does not include electricity generation from the exclusive use of biogas and bioliquid fuels.	
Scope	Construction and operation	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	• Life-cycle GHG emissions from the generation of electricity using renewable gaseous and liquid fuels must be lower than Green Activities threshold from the Thresholds for Electricity Generation Table. • Life-cycle GHG emissions are calculated based on project-specific data, where available, using ISO 14067:2018 or ISO 14064-1:2018 or ISO 14064-2:2019 or equivalents • Quantified life-cycle GHG emissions are verified by an independent third party.
	Amber	Lifecycle emission intensity meets declining amber thresholds for the Energy Sector with a prescribed sunset date in Thresholds for Electricity Generation Table.
	Red	The activities that are not compliant with green or amber criteria are harmful to the objective of climate change mitigation
Criteria reference	Climate Bonds Initiative Hydrogen Background Paper and Bioenergy Paper	

9. Cogeneration of heating/cooling and power using renewable sources of energy

Sector classification and activity		
Sector and activity	Cogeneration of heating/cooling and power using renewable sources of energy	
ISIC CODE	3510, 3530	
Description	Construction and operation of installations used for cogeneration of heat/cool and power exclusively from renewable sources of energy, indicated in the present taxonomy (solar, wind, geothermal, bioenergy, ocean energy, renewable liquid and gaseous fuels, including low-carbon hydrogen)	
Scope	Construction and operation	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	• The life-cycle GHG emissions from the co-generation of heat/cool and power from renewable energy sources meets declining green threshold (Thresholds for Electricity Generation Table) • The underlying renewable source of cool/heat and energy (solar, wind, bioenergy etc.) must comply with the green criteria for the respective source of energy from the present Taxonomy • Life-cycle GHG emissions are calculated based on project-specific data, where available, using ISO 14064-1:2018 or ISO 14064-2:2019 or equivalent • Where facilities incorporate any form of abatement (including carbon capture and storage or use of decarbonised fuels) that abatement activity complies with the relevant section under Thailand Taxonomy (e.g. CCS/CCUS related activities under manufacturing sector)
	Amber	• Retrofit of existing cogeneration power plants that leads to life cycle emission intensity meeting declining amber thresholds for the Energy Sector with a prescribed sunset date (Thresholds for Electricity Generation Table) is eligible. • Where facilities incorporate any form of abatement (including carbon capture and storage or use of decarbonised fuels) that abatement activity complies with the relevant section under Thailand Taxonomy (e.g. CCS/CCUS related activities under manufacturing sector)
	Red	Cogeneration of heating/cooling and energy from non-renewable sources, such as fossil fuels and fossil fuels derivatives (like fossil fuels-based hydrogen) is harmful to the objective of climate change mitigation
Criteria reference	European Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021	

10. Production of heating and cooling using waste heat

Sector classification and activity		
Sector and activity	Production of heating or cooling using waste heat	
ISIC CODE	3530	
Description	Production of heating and cooling using waste heat	
Scope	Operations only	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	The activity produces heating/cooling from waste heat
	Amber	N/A
	Red	N/A
Criteria reference	European Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021	

11. Installation and operation of electric heat pumps

Sector classification and activity		
Sector and activity	Installation and operation of electric heat pumps	
ISIC CODE	3530	
Description	Installation and operation of electric heat pumps	
Scope	Installation and operations	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	• Refrigerant GWP ≤ 675; AND • A minimum requirement is the implementation and adherence to a recognised environmental management system (ISO 14001 or equivalent)
	Amber	N/A
	Red	N/A
Criteria reference	European Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021	

12. Heating and cooling distribution

Sector classification and activity		
Sector and activity	Heating/Cooling Distribution	
ISIC CODE	3530	
Description	Operation of pipelines and associated infrastructure for distribution of heating and cooling, ending at the sub-station or heat exchanger.	
Scope	Construction and operations	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	The system uses at least 50% renewable energy or 50% waste heat or 75% cogenerated heat or 50% of a combination of such energy and heat.
	Amber	N/A
	Red	N/A
Criteria reference	European Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021	

13. Transmission and distribution networks for renewable and low-carbon gases, including low-carbon hydrogen and its derivatives

Sector classification and activity		
Sector and activity	Transmission and distribution networks for renewable and low-carbon gases, including low-carbon hydrogen and its derivatives	
ISIC CODE	3520, 4940	
Description	•Repurposing of gas networks for the distribution of gaseous fuels through a system of mains •Repurposing of gas networks for long-distance transport of renewable and low-carbon gases by pipelines •Construction or operation of transmission and distribution pipelines dedicated to the transport of hydrogen or other low-carbon gases •Operation of such networks, including delivery to the final consumer	
Scope	Construction, operations, and retrofitting	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	• Transmission and distribution networks for low-carbon gases and low-carbon hydrogen and its derivatives are eligible. • Retrofit of natural gas distribution lines to allow 100% low-carbon hydrogen and its derivatives or other low carbon gases. Low-emission gases are gases whose emissions when used to generate electricity do not exceed the limits specified for the green category in the Thresholds for Electricity Generation Table. • The activity includes leak detection and repair of existing gas pipelines and other network elements to reduce methane leakage. Noted: Low carbon gases are the gases whose life-cycle GHG emissions from the generation of electricity is lower than Green Activities threshold from the Thresholds for Electricity Generation Table.
	Amber	N/A
	Red	• Transmission and distribution of gases whose emission exceeds green category threshold in the Thresholds for Electricity Generation Table is harmful to the objective of climate change mitigation • Retrofitting of gas networks for the transmission of gases whose emission exceeds the green category threshold from the Thresholds for Electricity Generation Table is harmful to the objective of climate change mitigation
Criteria reference	Synthetic criteria, more than three sources	

14. Storage of electricity, thermal energy and low-carbon hydrogen and its derivatives

Sector classification and activity		
Sector and activity	Storage of electricity and thermal energy	
ISIC CODE	No specific ISIC Code	
Description	Construction and operation of facilities that store electricity, thermal energy, low-carbon hydrogen and its derivatives and return it later	
Scope	Construction and operations	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	**Green**	• All electricity and low-carbon hydrogen and its derivatives storage systems are eligible. This includes battery energy storage systems (BESS), among others. • All thermal energy storage systems where the generated energy falls below 100 gCO_2e/kWh measured on life cycle emission basis are eligible (including geothermal energy storage)
	Amber	N/A
	Red	N/A
Criteria reference	Climate Bonds Electrical Grids and Storage Background Paper, European Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021	

15. Transmission and distribution of electricity

Sector classification and activity		
Sector and activity	Transmission and distribution of electricity	
ISIC CODE	3510	
Description	• Construction and operation of transmission systems that transport the electricity on the extra high-voltage and high-voltage interconnected System. • Construction and operation of distribution Systems that transport electricity on high-voltage, medium-voltage and low-voltage distribution Systems. • Construction and operation of interconnections that transport electricity between separate systems.	
Scope	Construction and operations	
The activity makes significant contribution to climate change mitigation		
Metrics and thresholds	Green	• Transmission and distribution infrastructure dedicated to a direct connection or an expansion of connection between power plants with energy intensities less than 100 gCO_2e/kWh (life cycle emissions) is eligible • Transmission and distribution infrastructure that is on a decarbonisation trajectory where at least 67% of the newly connected generation capacity in the system is below the generation threshold value of 100 gCO_2e/kWh measured on a Product Carbon Footprint (PCF) basis, over a rolling five-year period OR • the average System grid emissions factor is below the threshold value of 100 gCO_2e/kWh measured on a PCF basis, over a rolling five-year average period • Includes all enabling ICT systems and smart management systems for the eligible infrastructure
	Amber	N/A
	Red	Construction and operation of transmission and distribution infrastructure where the share of non-compliant electricity is higher than 33% is harmful to the objective of climate change mitigation. Non-compliant electricity is electricity produced with emission intensity above defined in the green category of the Thresholds for Electricity Generation Table
Criteria reference	Climate Bonds Electrical Grids and Storage Background Paper	

Red list of activities

Activities that are clearly inconsistent with goals of the present taxonomy are outlined in the table below with their corresponding ISIC codes. Only activities that are outlined in the table are considered non-compliant, not the whole code (if it's not stated explicitly). The activities that are neither green, nor amber, no red **are not considered non-compliant**. They are considered **out of the scope** of the present taxonomy. The taxonomy does not define of cover them.

This table outlines, clarifies and complements, not replaces red categories in all activity cards in the Section 4.

Table 16. List of activities not in compliance with the present taxonomy

ISIC Code	Activity
All codes	Activities that fall into a red category in each specific activity card are considered non-compliant
3510 - Electric power generation, transmission and distribution	• Production of electricity or thermal energy using any fossil fuels (coal, oil, gas, and their derivatives, including fossil-based hydrogen, but excluding byproducts like waste heat) is considered non-compliant (except the activities that comply with thresholds and conditions in the amber category) • Construction of any new facilities (including fossil gas powered) than produce electricity and thermal energy using fossil fuels is considered non-compliant • Construction and operation of any renewable power plants that are fully or partially intended to support any operations related to fossil fuels and their derivatives, including, but not limited to their extraction, processing, transportation, or storage is considered non-compliant • Generation of electricity from renewable gaseous and liquid fuels where GHG emissions from the generation of electricity are higher than 100 g CO2e/kWh is considered non-compliant (except the activities that comply with thresholds and conditions in amber category in 4.1.8)
3520 - Manufacture of gas; distribution of gaseous fuels through mains	• Production of fossil fuel gas and its derivatives is considered non-compliant • Production of gas from biofuel where feedstock is not compliant with requirements from activity 5 is considered non-compliant

Do No Significant Harm (DNSH)

Generic DNSH Requirements	
Objective	**Description**
Climate change mitigation	For an activity to demonstrate that it will do no significant harm with respect to factors related to climate change mitigation, the following must be implemented: • The manager should calculate Scope 1 and Scope 2 emissions related to the activity as well as Scope 3 emissions if material to the sector in question. Estimation of emissions referring to credible international or national proxies such as Intergovernmental Panel on Climate Change (IPCC) and Thailand Greenhouse Gas Management Organization (TGO) may be used.; • The manager should identify potential risk to other people or assets to directly increase their GHG emissions as the result of the activity's implementation.; • The manager should take actions to minimise GHG emissions associated with the implementation of the activity, including, but not limited to installation of monitoring and leak prevention measures (if applicable).
Climate change adaptation	• Any activity seeking to demonstrate its compliance with DNSH related to climate change adaptation must conduct a Climate Risk and Vulnerability Assessment (CRVA) in accordance with the guidance provided in Annex III: Climate Risk and Vulnerability Assessment (CRVA). • The manager of the activity should strive to minimise adaptation risks revealed throughout the CRVA. Adaptation solutions should support system adaptation that takes into consideration regional and national adaptation strategies and plans.
Sustainable use and protection of marine and water resources	• Risks associated with water consumption and water quality must be identified, assessed and mitigated to the biggest possible extent. Water risk analysis tools must be used for this purpose (e.g. risk assessments by national environmental authorities, water footprint, WWF Water Risk Filter, WRI Aqueduct or comparable). • If assets or activities are located in water-stressed areas, may be affected by floods or water quality issues, ensure that water use and conservation management plans, developed in consultation with relevant stakeholders, have been implemented. • Ensure that water use/conservation management plans (including monitoring, reporting and verification methodology), developed in consultation with relevant stakeholders, have been developed and implemented as per international standards and guidelines. (e.g., UNEP Framework for Freshwater Ecosystem Management; ISO 13.060: Water Quality or comparable).

Do No Significant Harm (DNSH)

Generic DNSH Requirements	
Objective	**Description**
Promotion of resource resilience and transition to a circular economy	• In order to assess whether the activity in question is doing significant harm to this objective, a lifecycle assessment inline with ISO 14040 and ISO 14044 (or any comparable international methodology) should be conducted on the products, material, process, or other measurable activities. • The activity manager should implement concrete demonstrable measures to maximise the efficient use, reduction, repair, recycling and reuse of materials during the activity operational life cycle (e.g. through contractual agreements with recycling companies and integration of the cost of recycling), proper treatment and waste disposal (e.g. proper end-of-life management of batteries) and compliance, as a producer, with Extended Producer Responsibility standards must be demonstrated. • New installations must be designed and manufactured for high durability, easy to dismantle, refurbishment and recycling to the extent possible. Potential of repair of facilities and equipment, and the accessibility and interchangeability of the activity's equipment components must be ensured. • The activity shall apply relevant national regulations and international guidelines associated with retirement and dismantlement plans for plants and infrastructure related to the activity.

Specific DNSH Requirements	
Objective	**Description**
Promotion of resource resilience and transition to a circular economy	• Ensure renewable energy installations and associated components have been designed and manufactured for high durability, easy dismantling, refurbishment, and recycling, aligned to international standards and guidelines (e.g., KAPSARC Guide to Circular Economy, French standard, XP X30-901, Circular economy—Circular economy project management system or comparable). • Ensure reparability of renewable energy installations, accessibility and exchangeability of the components.

Do No Significant Harm (DNSH)

Generic DNSH Requirements	
Objective	**Description**
Pollution prevention and control	• A recognised environmental management system (ISO 14001, EMAS, or comparable) should be adopted for the enterprise where the activity takes place. • Ensure the activity undergoes screening to assess whether it leads to the manufacture, placing on the market, or use of dangerous substances (as defined by relevant Thailand laws and regulations), whether on their own, in mixtures, or in articles, and causes significant harm to the environment. • Integrated Environmental Assessment in line with the UN Environment Programme's Guidelines for Conducting Integrated Environmental Assessments5 must be conducted for the activity to specifically identify and manage environmental detrimental risks related to the emission of pollutants, heat, light or noise to the environment. • It must be demonstrated that neither the construction nor operation of the activity is emitting dangerous substances, noise, light or heat in excess of those allowed by relevant national or international regulations. Furthermore, the achievement of applicable air, water and soil quality targets should not be hampered due to the activity. • In the case that the construction and/or operation of the activity is known to cause significant harm to the environment, the activity must identify risk-based measures to prevent the pollution, and safely remediate any contamination caused by the activity. • Based on the EIA, ensure that management plans are developed for every pollutant causing significant harm. Management plans are to be drafted in consultation with relevant stakeholders. Furthermore, Monitoring, Reporting and Verification strategies are to be implemented to monitor the compliance and effectiveness of the mitigation measures.

Specific DNSH Requirements	
Objective	**Description**
Pollution prevention and control	Wind Energy: Ensure any required mitigation measures for avoiding underwater noise created by the installation of offshore wind turbines

Do No Significant Harm (DNSH)

Generic DNSH Requirements	
Objective	**Description**
Protection and restoration of biodiversity and ecosystems	• The determination of whether a biodiversity related environmental impact assessment (EIA) is required for a particular activity or not is made through a case-by-case examination of the activity6. If applicable, an Integrated Environmental Assessment (EIA) in line with the UN Environment Programme's Guidelines for Conducting Integrated Environmental Assessments must be conducted for the activity. • The activity manager must mitigate all potential risks for biodiversity and ecosystems associated with activity implementation that were identified throughout the EIA. • Ensure the Biodiversity and Ecosystem Management Plans are developed in consultation with relevant stakeholders. Furthermore, ensure that the Monitoring, Reporting and Verification strategies are implemented to monitor the compliance and effectiveness of the mitigation measures. • New financed facilities and infrastructure should not be located in ecosystems that are strategic for food security, rich in biodiversity, or that serve as habitat for endangered species (flora and fauna) that are in the Thailand lists of nationally protected areas or on the IUCN Red List. Museums or technical facilities (specifically electronic communications network equipment and facilities used to originate, process, transfer, transmit or receive electronic communications calls and information signals) necessary for their functioning are exempt from this requirement. • For sites and operations located in or near biodiversity sensitive areas (defined as areas included into, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment must be carried out in line with the criteria set by IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources9. For these sites, a long-term biodiversity monitoring and assessment programme must be adopted.

Application of DNSH criteria to Thailand taxonomy activities

No.	Activity	Climate change mitigation	Climate change adaptation	Sustainable use and protection of marine and water resources	Promotion of resource resilience and transition to a circular economy	Pollution prevention and control	Protection and restoration of biodiversity and ecosystems
1.	Solar energy generation	Generic	Generic	Generic	Generic + Specific	Generic	Generic
2.	Wind energy generation	Generic	Generic	Generic	Generic + Specific	Generic + Specific	Generic
3.	Hydropower generation	Generic	Generic	Generic	Generic + Specific	Generic	Generic
4.	Geothermal power generation	Generic	Generic	Generic	Generic + Specific	Generic	Generic
5.	Bioenergy generation and production (including SAF)	Generic	Generic	Generic	Generic + Specific	Generic	Generic
6.	Energy production from natural gas	Generic	Generic	Generic	Generic + Specific	Generic	Generic
7.	Marine energy generation	Generic	Generic	Generic	Generic + Specific	Generic	Generic
8.	Electricity generation from renewable non-fossil gaseous and liquid fuels, including low-carbon hydrogen and its derivatives	Generic	Generic	Generic	Generic + Specific	Generic	Generic
9.	Cogeneration of heating/cooling and power using renewable sources of energy	Generic	Generic	Generic	Generic + Specific	Generic	Generic
10.	Production of heating and cooling using waste heat	Generic	Generic	Generic	Generic + Specific	Generic + Specific	Generic
11.	Installation and operation of electric heat pumps	Generic	Generic	Generic	Generic + Specific	Generic	Generic
12.	Heating and cooling distribution	Generic	Generic	Generic	Generic + Specific	Generic + Specific	Generic
13.	Transmission and distribution networks for renewable and low-carbon gases, including low-carbon hydrogen and its derivatives	Generic	Generic	Generic	Generic + Specific	Generic + Specific	Generic
14.	Storage of electricity, thermal energy and low-carbon hydrogen and its derivatives	Generic	Generic	Generic	Generic + Specific	Generic	Generic
15.	Transmission and distribution of electricity	Generic	Generic	N/A	Generic + Specific	Generic	Generic

Minimum Social Safeguards (MSS)

The eligible asset or activity must ensure that it does not generate a negative social impact and observe minimum social safeguards (MSS). For this, the owner of the activity must adhere to the relevant local regulatory framework and policies, relevant internationally recognised principles and conventions, and have a social management system in place. The minimum number of laws, standards and regulations that should be observed by the owner includes (including, but not limited to):

- United Nations Guiding Principles on Business and Human Rights (2011)

International Labour Organisation core conventions:

- Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87)
- Right to Organise and Collective Bargaining Convention, 1949 (No. 98)
- Forced Labour Convention, 1930 (No. 29) (and its 2014 Protocol)
- Abolition of Forced Labour Convention, 1957 (No. 105)
- Minimum Age Convention, 1973 (No. 138)
- Worst Forms of Child Labour Convention, 1999 (No. 182)
- Equal Remuneration Convention, 1951 (No. 100)
- Discrimination (Employment and Occupation) Convention, 1958 (No. 111)

International Bill of Human Rights conventions:

- Universal Declaration of Human Rights (1948)
- International Covenant on Civil and Political Rights (1966)
- International Covenant on Economic, Social and Cultural Rights (1966)

The practices of activity owner must also be in line with the following IFC Performance Standards, where applicable:

1. Performance Standard 1: Assessment and management of environmental and social risks and impacts.
2. Performance Standard 2: Labour and working conditions
3. Performance Standard 3: Resource efficiency and pollution prevention
   (in parts where it does not contradict to the DNSH requirements of the present Taxonomy)
4. Performance Standard 4: Community Health and Safety
5. Performance Standard 5: Land Acquisition and Involuntary Resettlement
6. Performance Standard 6: Biodiversity Conservation
7. Performance Standard 7: Indigenous Peoples
8. Performance Standard 8: Cultural Heritage

Example of User Application

THAILAND TAXONOMY

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Examples of a wide range of Thailand Taxonomy applications

Corporate Reporting & Strategy

- **Sustainability Reporting:** Companies can report the percentage of their economic activities (e.g. CapEx, revenue) that meet the taxonomy criteria.
- **Strategic Planning:** Identifying areas for green investment and transition within the company to improve taxonomy alignment over time.
- **Supply Chain Management:** Encouraging suppliers to adopt more sustainable practices that align with taxonomy criteria.

Financial Products

- **Structuring Green Bonds/Loans:** Defining eligible projects and activities for which proceeds can be used.
- **Creating Sustainable Investment Funds:** Setting criteria for portfolio selection.
- **Benchmarking:** Comparing the sustainability level of different financial products.

Investment Decisions

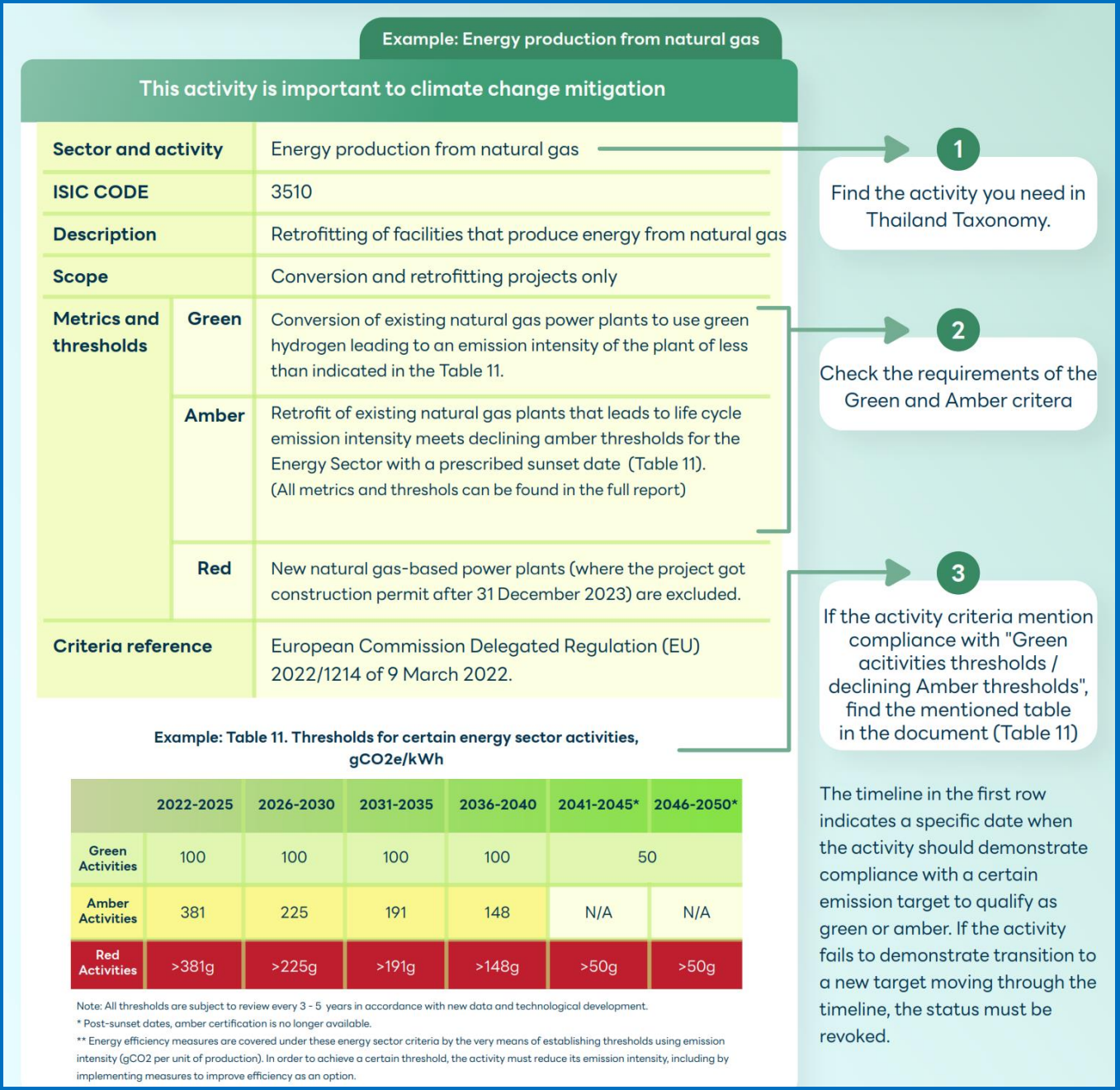
- **Screening:** Identifying investments that meet specific environmental criteria.
- **Due Diligence:** Assessing the environmental performance and risks of potential investments or loans.
- **Portfolio Allocation:** Shifting capital towards taxonomy-aligned assets.

Policymaking

- **Developing Green Standards and Incentives:** Using the taxonomy as a basis for official green labels for financial products or services.
- **Informing Public Spending:** Guiding government investments and public procurement towards sustainable options.
- **Monitoring National Progress:** Tracking the growth of the green economy.

THAILAND TAXONOMY

How to read and use traffic lights criteria and thresholds



Example: Energy production from natural gas

This activity is important to climate change mitigation

Sector and activity		Energy production from natural gas
ISIC CODE		3510
Description		Retrofitting of facilities that produce energy from natural gas
Scope		Conversion and retrofitting projects only
Metrics and thresholds	**Green**	Conversion of existing natural gas power plants to use green hydrogen leading to an emission intensity of the plant of less than indicated in the Table 11.
	Amber	Retrofit of existing natural gas plants that leads to life cycle emission intensity meets declining amber thresholds for the Energy Sector with a prescribed sunset date (Table 11). (All metrics and threshols can be found in the full report)
	Red	New natural gas-based power plants (where the project got construction permit after 31 December 2023) are excluded.
Criteria reference		European Commission Delegated Regulation (EU) 2022/1214 of 9 March 2022.

1 Find the activity you need in Thailand Taxonomy.

2 Check the requirements of the Green and Amber critera

3 If the activity criteria mention compliance with "Green acitivities thresholds / declining Amber thresholds", find the mentioned table in the document (Table 11)

Example: Table 11. Thresholds for certain energy sector activities, gCO2e/kWh

	2022-2025	2026-2030	2031-2035	2036-2040	2041-2045*	2046-2050*
Green Activities	100	100	100	100	50	
Amber Activities	381	225	191	148	N/A	N/A
Red Activities	>381g	>225g	>191g	>148g	>50g	>50g

Note: All thresholds are subject to review every 3 - 5 years in accordance with new data and technological development.
* Post-sunset dates, amber certification is no longer available.
** Energy efficiency measures are covered under these energy sector criteria by the very means of establishing thresholds using emission intensity (gCO2 per unit of production). In order to achieve a certain threshold, the activity must reduce its emission intensity, including by implementing measures to improve efficiency as an option.

The timeline in the first row indicates a specific date when the activity should demonstrate compliance with a certain emission target to qualify as green or amber. If the activity fails to demonstrate transition to a new target moving through the timeline, the status must be revoked.

Action Steps:

1. Find the activity you need in Thailand Taxonomy. If there is no such activity, that activity is out of scope of the Thailand Taxonomy.

2. Check the requirements of the activity to be aligned with green or amber thresholds and criteria.

3. If the activity criteria mention compliance with "sectoral criteria and thresholds", find the mentioned table to reference for the activities in energy sector.

THAILAND TAXONOMY

5 Steps to Use Thailand Taxonomy

Example: A power plant that generates electicity using different sources.

	Solar generation	Coal generation	Bioenergy generation	Consulting services
1. List your activities Break the entity/project into activities.				
2. Check the coverage Define activities from the breakdown, use the Section 4 of the Thailand Taxonomy.	**Covered** under section 4.1.1	**Covered** in Red List (section 4.3)	**Covered** under section 4.1.5	**Not Covered**
3. Color your activities Categorize the activities, see if they are in line with green / amber criteria defined in the Taxonomy.		 Fossil fuel-based activities		
4. 'Do no harm' to others? Define whether activities that meet green or amber criteria also meet DNSH and MSS requirements.	**Meet both DNSH and MSS requirements**		**Does not meet DNSH/MSS requirements.** *Adopt a plan to remediate in 3 years*	
5. Conclude the evaluation Prepare a final conclusion and Supplementary reports.	 **Eligible as Green**	 **Eligible as Red**	 **Eligible as Amber** Harm should be remediated within the timeframe in the plan. If not, the status will be revoked.	 Out of scope Thailand Taxonomy
Example of adopting in the financial tool	can apply for Green loan or bond according to the criteria set by financial regulators	cannot apply for sustainable finance instrument	can apply for transition loan or bond according to the criteria set by financial regulators	

THAILAND TAXONOMY

Case Study: Diversification of a Thai Oil & Gas Company

Thailand Taxonomy: Context & Implications for Fossil Fuel Companies

Purpose of the Taxonomy:

- Classifies economic activities as **environmentally sustainable**.
- Evaluates at the **activity/project level**, not whole companies

Position on Fossil Fuels:

- **All fossil fuels must be phased out** to meet Paris Agreement goals.
- Activities like **extraction, transport, storage**, or use of hydrocarbons are:
  - **Not eligible** under transition activities.
  - Often classified as **non-compliant (Red List)**.
  - Includes internal combustion vehicles, coal power, and fossil fuel infrastructure.

Business profile	The company's core business is in fossil fuels, primarily oil and gas extraction, transport, and processing. These activities are likely classified as Red or Out of Scope under the Thailand Taxonomy. However, the company can still engage in the sustainable finance market by diversifying into Taxonomy-aligned economic activities, contributing to Thailand's climate goals.
GHG emissions hotspots	Scope 1: Fugitive emissions from oil and natural gas extraction, processing, and transport and Direct combustion of fuels. Scope 2: Purchased electricity and potentially heat used in the company's various operations, from extraction sites and processing plants to administrative offices. Scope 3: Downstream emissions from the combustion of the oil and gas products that the company sells.
Taxonomy-Aligned Activities for Diversification	**1. Renewable Energy Generation** Solar, wind, marine, or bioenergy. **2. Low-Carbon Transport Infrastructure** EV charging stations, SAF infrastructure. **3. Manufacturing of Green Technologies** EV components, renewable energy tech, energy-efficient equipment. **4. Building Retrofitting** Upgrading company buildings for energy efficiency and climate resilience.

THAILAND TAXONOMY

Case Study: Diversification of a Thai Oil & Gas Company

Defining taxonomy alignment

1. Renewable Energy Generation

Relevant Sector under Thailand Taxonomy: Energy Sector

Relevant Activity under Thailand Taxonomy: Solar energy generation (Activity card 4.1.1) and Wind energy generation (Activity card 4.1.2)

Environmental Objective under Thailand Taxonomy: EO1: Climate Change Mitigation

Taxonomy-aligned assessment:

- **Solar and wind power** are listed under the **Energy sector** as **Green-aligned** activities.
  - **Solar:** Green if not linked to fossil fuel infrastructure; Red if supporting it.
  - **Wind:** Onshore/offshore generation is Green; Red if tied to fossil fuel operations.
- To be **Taxonomy-compliant**, projects must:
  - Meet **substantial contribution criteria** (Green or Amber),
  - Fulfil **DNSH** (Do No Significant Harm) across other environmental goals,
  - Comply with **Minimum Safeguards (MSS)**.
- **DNSH for solar/wind** includes:
  - Promoting **resource efficiency**, **durability**, and **recyclability**.
  - Aligning with Thai laws and international standards (as part of MSS).

Reporting:

- Criteria apply to both **construction and operation** phases.
- Used to assess **financial alignment** (CapEx, OpEx, revenue) or **entire projects**.
- Example: A solar power plant project is aligned if it meets the criteria.
- Alignment can also be reported at the **company level** based on the share of revenue or CapEx from aligned activities.

Case Study: Diversification of a Thai Oil & Gas Company

Defining taxonomy alignment

2. Low-Carbon Transportation Infrastructure

Relevant Sector under Thailand Taxonomy: Transport Sector

Relevant Activity under Thailand Taxonomy: Enabling infrastructure for low-emission transport (activity card 4.2.5)

Environmental Objective under Thailand Taxonomy: EO1: Climate Change Mitigation

Taxonomy-aligned assessment:

Enabling Infrastructure for Low-Emission Transport (Thailand Taxonomy)

- **Covers infrastructure that supports low-carbon transport.**
  - **Road transport: EV charging points, grid upgrades.**
  - **Airports: EV charging, SAF-supporting infrastructure.**
- Classified as Green if it supports low-emission transport.
- Classified as Red if dedicated to fossil fuels (e.g. ICE vehicle support, fuel stations, parking).
- To be **Taxonomy-compliant**, projects must also meet:
  - DNSH (Do No Significant Harm) criteria, and
  - Minimum Safeguards (MSS).

Reporting:

- Once aligned (Green + DNSH + MSS), companies can report related financial flows as Taxonomy-aligned.
- **CapEx:**
  - Includes spending on EV charging or SAF infrastructure (construction, equipment, grid upgrades).
  - 100% eligible if funding a project that commits to meeting Taxonomy criteria upon completion.
- **OpEx:**
  - Covers operational costs (e.g. servicing, maintenance, R&D) of aligned infrastructure.
- **Revenue:**
  - Revenue from operating EV chargers or SAF facilities can be reported as aligned, based on share of total revenue.
  - For new projects, revenue is aligned after completion if all criteria are met.

Case Study: Diversification of a Thai Oil & Gas Company

Defining taxonomy alignment

3. Manufacturing of Green Technologies

Relevant Sector under Thailand Taxonomy: Manufacturing Sector

Relevant Activity under Thailand Taxonomy: Enabling activities

Environmental Objective under Thailand Taxonomy: EO1: Climate Change Mitigation

Taxonomy-aligned assessment:

Taxonomy-Aligned Manufacturing Activities

- Falls under the **Manufacturing sector** in the Thailand Taxonomy.
- To be **Green-aligned**, activities must meet **technical screening criteria**, **DNSH**, and **MSS** requirements.

Eligible Manufacturing Includes:

- **Renewable energy technologies** that meet Green energy criteria.
- **Low-carbon transport tech** (e.g. EVs, fleets, key components) aligned with Transport sector standards.
- **Energy efficiency equipment** (e.g. HVAC, lighting) meeting top national/international labels (e.g. Label No.5).
- **Batteries**: production, repurposing, or recycling.
- **Other low-carbon tech**: goods with high energy efficiency or significant GHG reductions.

Reporting:

- **CapEx:**
  - Includes construction, equipment, and infrastructure for facilities manufacturing Taxonomy-aligned technologies.
  - 100% of investment via corporate debt/bonds can be reported if committed to meet Green + DNSH + MSS upon completion.
- **OpEx:**
  - Covers servicing, maintenance, R&D, and other costs for operating Green-aligned facilities.
- **Revenue:**
  - Revenue from sales of aligned products (e.g. renewables, EV components, efficiency tech, batteries) is reportable based on its share of total revenue.
  - Revenue from new projects is counted after completion, if criteria are met.

Case Study: Diversification of a Thai Oil & Gas Company

Defining taxonomy alignment

4. Retrofitting existing building

Relevant Sector under Thailand Taxonomy: Construction and Real Estate

Relevant Activity under Thailand Taxonomy: Renovation of the existing buildings**Environmental Objective under Thailand Taxonomy:** EO1: Climate Change Mitigation and EO2: Climate Change Adapation

Taxonomy-aligned assessment:

Green Category

Mitigation:

- Meets Green criteria for new buildings via: Emission intensity thresholds (net-zero by 2050), or recognised green building certifications (e.g. TREES, LEED, EDGE) + 30% efficiency improvement.
- Whole Life Carbon Assessment (WLCA) required (for reporting).

Adaptation:

Requires Climate Risk & Vulnerability Assessment (CRVA).

Must address key climate risks using nature-based or best-practice solutions.

Amber Category

Mitigation: GHG or energy use reduction by:≥30% for buildings <10,000 m^2≥20% for buildings ≥10,000 m^2

Red Category

Renovations for fossil fuel infrastructure = Red. (Exception: Office/trading buildings for fossil fuel firms not considered Red.)

Note: All projects must also meet DNSH and MSS criteria.

Reporting:

- **CapEx:**
  - Includes costs for upgrades (e.g. insulation, energy-efficient systems, renewables, EV chargers, adaptation).
  - 100% of project CapEx can be reported as aligned if committed to meeting criteria upon completion.
- **OpEx:**
  - Covers ongoing maintenance and management of aligned buildings post-renovation.
- **Revenue:**
  - Usually not applicable for own office buildings; CapEx and OpEx are key metrics for alignment reporting.

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Q&A

Please submit your question using the Q&A feature.

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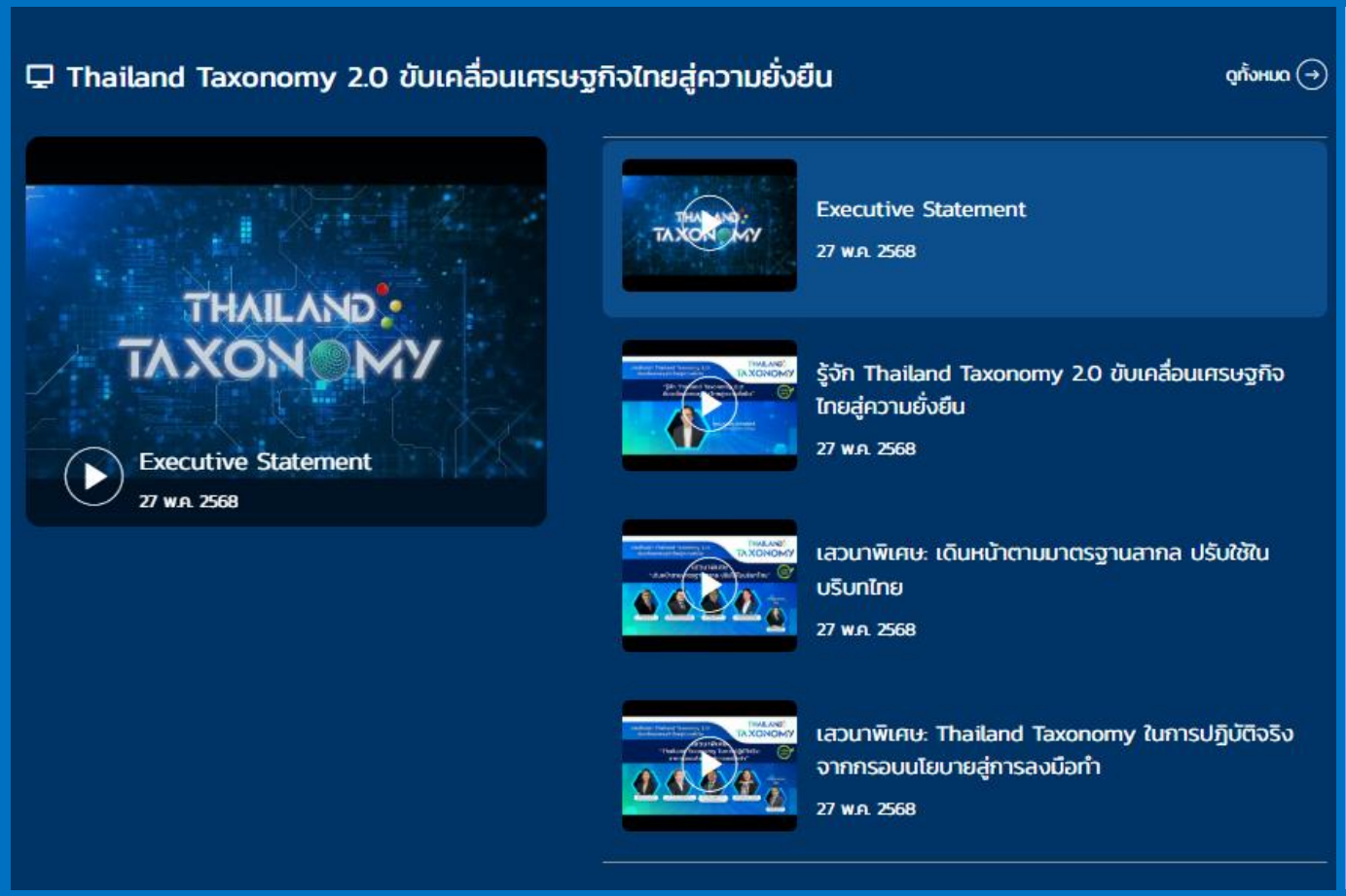
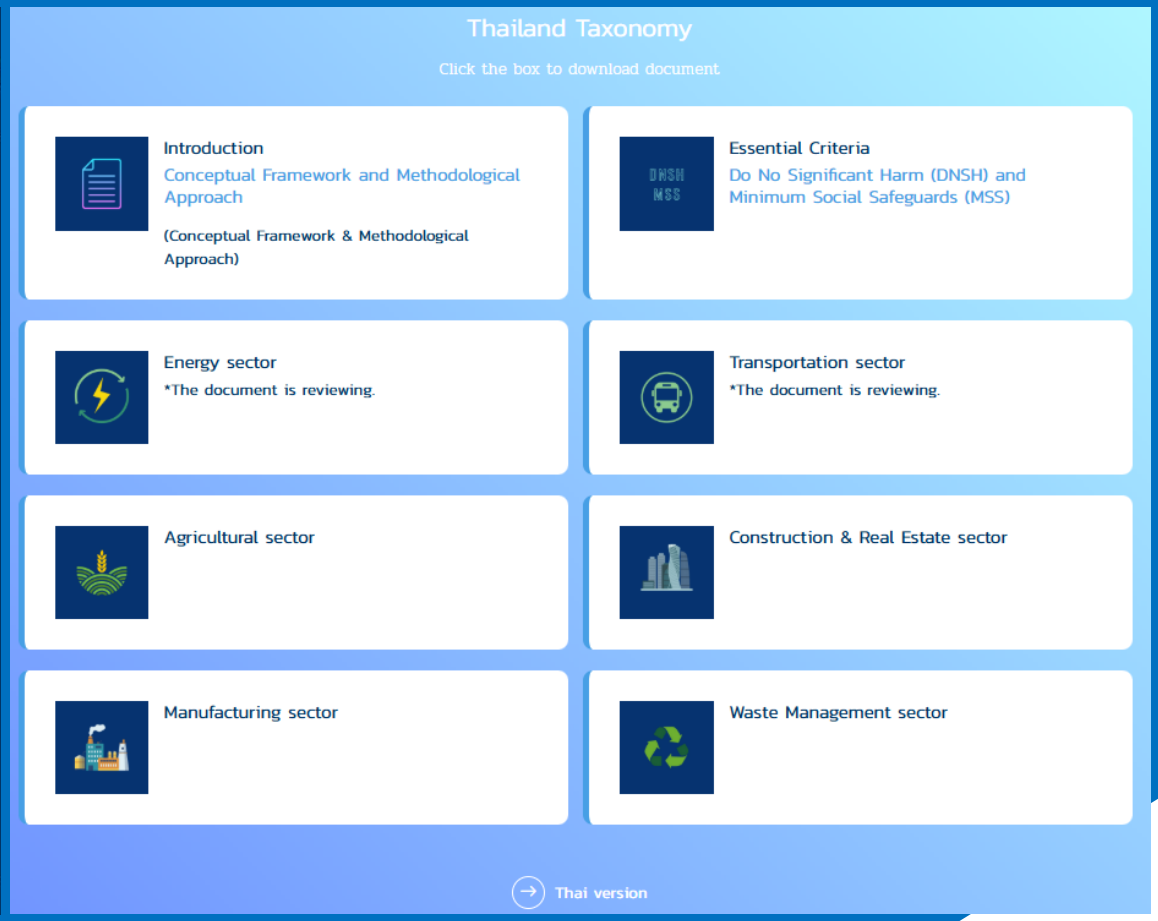
For more resources, please visit the official websites of the organisations under the Thailand Taxonomy Working Group.





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Coming up...

Online Webinar		
24 June 2025	10:30-12:00 ICT	Transportation
26 June 2025	13:30-15:00 ICT	Manufacturing
27 June 2025	10:30-12:00 ICT	Agriculture
	13:30-15:00 ICT	Waste management
30 June 2025	13:30-16:00 ICT	Construction and Real Estate

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