THAILAND TAXONOMY

# Annex

May 2025

THAILAND TAXONOMY BOARD

# Contents

# Annex I: General guidance on taxonomy application

This section contains general descriptions of Taxonomy's operating principles and key concepts found throughout the text that are relevant to financial flows. This section does not in any way constitute an instruction for the use of the Taxonomy in Thailand as the actual procedure of its implementation should be determined by relevant regulators.

Please remember that taxonomies of this type as a tool were created for use in the financial market, so many verification processes are tied to financial instruments and their operating principles. For the application of the Taxonomy in other areas, additional clarifications are required and should be provided by the relevant regulator.

## Key taxonomy definitions

### 1. What is revenue?

Revenue or net turnover means the amounts derived from the sale of products and the provision of services after deducting sales rebates and value added tax and other taxes directly linked to turnover. Overall turnover is equivalent to a firm's total revenues over a defined period. Turnover ratios are used by financial analysts to assess a company's efficiency and profitability based on data found in financial statements.

### 2. What is CapEx?

Capital expenditure (CapEx) is a payment for goods or services recorded or capitalised on the balance sheet instead of expensed on the income statement. Use: Aside from helping investors analyse a company's investment in its existing and new fixed assets, capital expenditures can give an indication of a company's strategy for improving environmental performance and resilience.

### 3. What is OpEx?

Operating expenses (OpEx) are shorter-term expenses required to meet the ongoing operational costs of running a business. While revenue is an indicator of ongoing operations and activities and is the primary indicator for alignment, where new investment is being made in technology to better align an issuer, then CapEx would be a more appropriate indicator. The use of revenue, CapEx, or OpEx is dependent on the vehicle being financed. In particular,

where capital is being extended to fund a particular activity or project, then CapEx would be more appropriate.

4. **What is an activity?**

When a company offers goods or services, it is performing an economic activity. The universe of economic activities is described using ISIC codes, which cover 21 broad sectors and with four further levels of differentiation. At the fourth level, 615 classes of economic activity are identified. The ISIC codes map directly to the EU's NACE classification system.

5. **What is a project?**

A project is an individual or collaborative enterprise that is planned to achieve a particular aim. For the purpose of Thailand Taxonomy, a project is a timebound activity or a set of activities that is intended to achieve a desired outcome, usually transforming the activity from not aligned with the Taxonomy into aligned with the Taxonomy.

## How is activities' alignment aggregated to the company/issuer level?

At the issuer level, net turnover from aligned activities needs to be aggregated to determine an entity's degree of alignment with the Taxonomy. For example, one activity representing 45% and another representing 15% of issuer/company revenue may be aligned, but an activity representing 40% of revenue may not. In this case, an issuer/company would be determined as having 60% revenue alignment. For projects following completion, the company can claim 100% of the turnover associated with the project as being aligned with the Taxonomy if it meets the technical screening criteria for Green or Amber. During the project timeframe, it is only the project itself that is considered to be aligned with the Taxonomy, so the turnover associated with the project cannot be classed as aligned until completion.

## How to define if different entities and forms of action are aligned with the Taxonomy

- An **activity** (e.g., production of steel or zero-emission vehicles) may be considered aligned with the Taxonomy if
    - If it meets the Technical Screening Criteria and related thresholds defined by the Taxonomy (green or amber category. Renewable Energy Certificates may be employed when operators are unable to supply renewable energy, provided that

these align with the green categories defined by the Thailand Taxonomy. Exceptions apply to certain activities where specific using of such certificates is prohibited.

- None of the **company** operations violate DNSH and MSS requirements, or the company has stated that, at present, some of the DNSH or MSS requirements are not fulfilled, but it has published a plan to remediate these deficiencies within three years.

- A **project** (e.g., retrofitting of the steel factory or construction of the solar power plant) may be considered aligned with the Taxonomy if
  - **All** major measures of the **project** (not counting supporting activities like accounting) are aligned with either green or amber criteria of one of the activity cards. For example, a power plant that is retrofitting scrubbers or installing carbon capture and storage technology.
  - **The project** meets the DNSH and MSS requirements.
- **Non-financial companies** may disclose the proportion of their economic activities that align with the Taxonomy criteria. The translation of environmental performance into financial indicators (revenue/turnover, CapEx and OpEx) allows investors and financial institutions to have clear and comparable data to help them with their investment and financing decisions. The main reporting options for non-financial companies would be:
  - Taxonomy-aligned **revenues** represent the proportion of the net turnover derived from products or services that are from activities that are aligned with the Green or Amber technical screening criteria for at least one of the six environmental objectives of the Taxonomy.
  - Taxonomy-aligned **CapEx** represents the proportion of the capital expenditure of an activity that is Taxonomy-aligned or is part of a credible plan to extend or reach Taxonomy alignment.
  - Taxonomy-aligned **OpEx** represents the proportion of the operating expenditure associated with taxonomy-aligned activities or the CapEx plan. The operating expenditure covers direct non-capitalised costs relating to research and development, renovation measures, short-term lease, maintenance, and other direct expenditures relating to the day-to-day servicing of assets of property, plant and

equipment that are necessary to ensure the continued and effective use of such assets.

- The process below can be followed by financial institutions that wish to calculate the alignment of their **portfolio against the Taxonomy:** ,:
  - After constructing a portfolio of investments, financial institutions should check the alignment of individual companies with different categories of Taxonomy and then construct a weighted average for each category (green, amber, and red). Portfolios with a green or amber alignment greater than 75%[1] would be permitted to identify as a "green" or "transitional" product.
  - For **equity** investments, company revenue is used as the main proxy for equity exposure to Taxonomy-aligned economic activities. In order to calculate total portfolio alignment, the calculation is the weight of the asset within the portfolio multiplied by the proportion of the company revenue, which is eligible and aligned with each Taxonomy alignment classification (Green, Amber, and Red) for inclusion under the Taxonomy.
- For **corporate debt and/or bonds** which are being used to fund Taxonomy-aligned projects, then 100% of the investment can be classed as Taxonomy-aligned where it commits to meeting the technical screening criteria for the environmental objective at the maturity of the project.
- In order to check the alignment of **debt** or **equity**:
  - **Equity investments**. For equity investments, company revenue is used as the main proxy for equity exposure to Taxonomy-aligned economic activities.
  - **Debt capital**. The approach for general debt capital is broadly the same as for equity investments, with revenue being used as a proxy for portfolio exposure to Taxonomy-aligned economic activities, where appropriate. For corporate debt and/or bonds which are being used to fund Taxonomy-aligned projects, then 100% of the investment can be classed as Taxonomy-aligned, where it commits to meeting the technical screening criteria for the environmental objective at the maturity of the project.

## Annex II: Activities contribution to the objectives of the Taxonomy

The main environmental objective of the Taxonomy is climate change mitigation (reducing emissions leading to global warming). This is the only task that is well developed in global climate science in terms of technologies to achieve it. However, many of the activities included in the Taxonomy also contribute to other objectives. This table will help users to better navigate this area. It is based on the work[1] of the European Union on defining the contribution of different economic activities to different environmental objectives. In case if there was no guidance on this (for example, in case of agricultural section) – the final decision was made based on the own analysis of the consultants' team.

**Important note**: this table is only indicative and cannot be used as a basis for financial decisions.

[1] The European Commission [EU], "Commission Delegated Regulation (EU) 2023/2486," Official Journal of the European Union, September 21, 2023, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302486.

| | Climate change mitigation | Climate change adaptation | Sustainable use and protection of marine and water resources | Resource resilience and transition to a circular economy | Pollution prevention and control | Protection and restoration of biodiversity and ecosystems |
|---|---|---|---|---|---|---|
| Energy sector | | | | | | |
| Solar energy generation | | | | | | |
| Wind energy generation | | | | | | |
| Hydropower generation | | | | | | |
| Geothermal power generation | | | | | | |
| Bioenergy generation and production | | | | | | |
| Energy production from natural gas | | | | | | |
| Marine energy generation | | | | | | |
| Electricity generation from renewable non-fossil gaseous and liquid fuels, including green hydrogen | | | | | | |
| Cogeneration of heating/cooling and power using renewable sources of energy | | | | | | |
| Production of heating and cooling using waste heat | | | | | | |

| | Climate change mitigation | Climate change adaptation | Sustainable use and protection of marine and water resources | Resource resilience and transition to a circular economy | Pollution prevention and control | Protection and restoration of biodiversity and ecosystems |
|---|---|---|---|---|---|---|
| Installation and operation of electric heat pumps | | | | | | |
| Heating and cooling distribution | | | | | | |
| Transmission and distribution networks for renewable and low-carbon gases, including green hydrogen | | | | | | |
| Storage of electricity, thermal energy and green hydrogen | | | | | | |
| Transmission and distribution of electricity | | | | | | |
| Transportation sector | | | | | | |
| Transport via railways | | | | | | |
| Other passenger land transport | | | | | | |
| Urban and suburban passenger land transport | | | | | | |
| Freight transport by road | | | | | | |
| Enabling infrastructure for low-emission transport | | | | | | |

| | Climate change mitigation | Climate change adaptation | Sustainable use and protection of marine and water resources | Resource resilience and transition to a circular economy | Pollution prevention and control | Protection and restoration of biodiversity and ecosystems |
|---|---|---|---|---|---|---|
| Sea and coastal water transport | | | | | | |
| Inland water transport | | | | | | |
| Passenger and freight transport by air | | | | | | |
| Agriculture sector | | | | | | |
| Growing of perennial and non-perennial crops, incl. cassava, corn, mango, pineapples, banana etc.[2] | | | | | | |
| Cultivation of sugarcane | | | | | | |
| Cultivation of rice | | | | | | |
| Cultivation of rubber trees | | | | | | |
| Cultivation of palm oil trees | | | | | | |
| Livestock production | | | | | | |
| Aquaculture production | | | | | | |
| Sustainable forest management | | | | | | |

[2] For agricultural activities contribution means that at least one practice suggested for implementation under the agricultural criteria can contribute to each of the objectives in the taxonomy.

| | Climate change mitigation | Climate change adaptation | Sustainable use and protection of marine and water resources | Resource resilience and transition to a circular economy | Pollution prevention and control | Protection and restoration of biodiversity and ecosystems |
|---|---|---|---|---|---|---|
| Forestry plantation | | | | | | |
| Conservation, restoration, and maintenance of natural forests | | | | | | |
| Construction and real estate sector | | | | | | |
| Construction of new buildings | | | | | | |
| Renovation of the existing buildings | | | | | | |
| Acquisition or ownership of buildings | | | | | | |
| Installation, maintenance, and repair of special-purpose building equipment | | | | | | |
| Building demolition and site preparation | | | | | | |
| Early Warning Systems | | | | | | |
| Manufacturing sector | | | | | | |
| Manufacturing of cement | | | | | | |
| Manufacturing of aluminium | | | | | | |
| Manufacturing of iron and steel | | | | | | |

| | Climate change mitigation | Climate change adaptation | Sustainable use and protection of marine and water resources | Resource resilience and transition to a circular economy | Pollution prevention and control | Protection and restoration of biodiversity and ecosystems |
|---|---|---|---|---|---|---|
| Manufacturing of hydrogen | | | | | | |
| Manufacturing of basic chemicals | | | | | | |
| Manufacturing of plastics in primary form | | | | | | |
| Manufacturing of batteries | | | | | | |
| Manufacturing of renewable energy technologies and products | | | | | | |
| Manufacture of low-carbon technologies for transport | | | | | | |
| Manufacturing of energy efficiency equipment for buildings | | | | | | |
| Manufacturing of other low-carbon technologies | | | | | | |
| Capture of CO2 | | | | | | |
| Transportation of CO2 | | | | | | |
| Storage of CO2 | | | | | | |

| | Climate change mitigation | Climate change adaptation | Sustainable use and protection of marine and water resources | Resource resilience and transition to a circular economy | Pollution prevention and control | Protection and restoration of biodiversity and ecosystems |
|---|---|---|---|---|---|---|
| Utilisation of captures CO2 | | | | | | |
| Introduction of energy efficiency and decarbonisation measures in manufacturing activities not specified in the Thailand Taxonomy | | | | | | |
| Waste management sector | | | | | | |
| Anaerobic digestion of sewage sludge | | | | | | |
| Anaerobic digestion or composting of bio-waste | | | | | | |
| Collection and transport of waste | | | | | | |
| Depollution and dismantling of end-of-life products | | | | | | |
| Waste to Energy | | | | | | |

| | Climate change mitigation | Climate change adaptation | Sustainable use and protection of marine and water resources | Resource resilience and transition to a circular economy | Pollution prevention and control | Protection and restoration of biodiversity and ecosystems |
|---|---|---|---|---|---|---|
| Landfill gas capture and utilisation | | | | | | |
| Remediation of contaminated sites and areas | | | | | | |
| Remediation of legally n-conforming landfills and abandoned or illegal waste dumps | | | | | | |
| Sorting and material recovery from n-hazardous waste | | | | | | |
| Treatment of hazardous waste | | | | | | |
| Construction, extension, upgrade, operation and renewal of urban wastewater collection and treatment | | | | | | |
| Construction, extension, upgrade and operation of centralised wastewater collection and treatment | | | | | | |

| | Climate change mitigation | Climate change adaptation | Sustainable use and protection of marine and water resources | Resource resilience and transition to a circular economy | Pollution prevention and control | Protection and restoration of biodiversity and ecosystems |
|---|---|---|---|---|---|---|
| Renewal of centralised wastewater collection and treatment | | | | | | |
| Phosphorus recovery from wastewater | | | | | | |

# Annex III: Guidance on performing a Climate Risk and Vulnerability Assessment (CRVA)

This annex encompasses CRVA to be considered under the climate change adaptation, as and when activities undergo an assessment for substantial contribution to the objective or do-no-significant-harm to the objective.

The guidance is based on guidance prepared by the German Environment Agency [3]for performing a taxonomy compliant CRVA[4], based on the principles and framework of ISO 14091.

**Table 1 Terminology to be used under CRVA[5]**

| Terminology | Context |
|---|---|
| **Climate-related hazard** | The potential occurrence of natural or human-induced physical events and changes which stem from changes to the climate caused by anthropogenic GHG emissions. Potential climate-related hazards are listed under Table below. |
| **Vulnerability** | Encompasses or susceptibility to harm and lack of capacity to cope and adapt. |
| **Risk** | Under this context, the potential impacts as a result of exposure to hazards and level of vulnerability to specific climate-related hazards. |
| **Physical Climate Risk** | A physical climate risk can occur to any Activity (or system), where the Activity is exposed to and sensitive to a climate-related hazard. For example, "potential flooding damage to buildings or infrastructure." |

## Application of a CRVA

For an activity to demonstrate that it meets the criteria for contribution to the objective or do-no-significant-harm to the objective the following must be considered:

[3] German Environment Agency. How to perform a robust CRVA for EU Taxonomy reporting? Recommendations for Companies. November 2022

[4] The EU Taxonomy refers to a CRVA as a method for identifying material impacts to the Activity, in line with both chronic and acute climate-related disasters

[5] The definitions are adapted and derived from the relevant climate adaptation sections of the IPCC AR6 and ISO 14090.

1. Physical climate risks that are material to the activity must be identified from those listed in Table 2. This includes the following steps:
    I. Screening of the Activity to identify which physical climate risks from the list in Table 1 may affect the performance of the activity during its expected lifetime;
    II. Where the activity screened is likely to be at risk from one or more of the physical climate risks in Table 2, conduct a risk assessment in line with CRVA check list (see the template after Table 2 to assess the significance of the physical climate risks on the activity; and
    III. Assess and prioritise adaptation solutions that can reduce the identified physical climate risk.
2. Risk assessment must be proportionate to the scale of the activity and its expected lifespan, such that:
    I. For activities with a lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale, which may include extrapolated past trends data;
    II. For all other activities, the assessment is performed using the highest available resolution, state-of-the art climate projections across the existing range of future scenarios[6] consistent with the expected lifetime of the activity, including at least, 10-to-30-year climate projections scenarios for major investments.

The climate projections and assessment of impacts are based on best practice and available guidance, issued by international bodies, national or regional authorities, standardisation bodies and other sources of equivalent trustworthiness and consider the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most

[6] Future scenarios include Intergovernmental Panel on Climate Change (IPCC) representative concentration pathways RCP2.6, RCP4.5, RCP6.0, and RCP8.5.

recent Intergovernmental Panel on Climate Change reports[7], scientific peer-reviewed publications, and open source[8] or paying models.

For existing and new activities using existing physical assets, physical and non-physical solutions ('adaptation solutions') must be identified, assessed, prioritised. An adaptation plan for the implementation of those solutions is to be drawn up accordingly. This implementation plan must cover a timeframe of up to five years and reduce the most important identified physical climate risks that are material to that activity.

For new and existing activities using newly built physical assets, the Activity must integrate adaptation solutions that reduce the most important identified physical climate risks that are material to that activity at the time of design and construction and implement them before the start of operations.

## Guidance on conducting a CRVA

In general, there are four main steps that should be included as part of a CRVA:

**Step 1:** Identify the lifespan of the activity under assessment, and identify the specific components (i.e., factors, processes, materials, etc., of the activity) that would require an investigation under a risk assessment.

**Step 2:** Screening of climate-related hazards from Table 2 and identify those with most potential risks to the activity and/or objects under assessment.

**Step 3:** Conduct the risk assessment. For current potential risks, it is recommended to use past climate trends and climate projections based on these trends. For future potential risks, it is recommended to use a range of climate projections based on future scenarios.

- For an activity with a lifespan of less than 10 years may use extrapolated past trends data assessment;

[7] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[8] 5 Including, but not necessarily limited to the Copernicus Services managed by the European Commission.

- For an activity with a lifespan of more than 10 years, an assessment of both current and future risks based on modelled data is required.

**Step 4:** Identify adequate and effective adaptation solutions to reduce the risks that are material to the activity, including: o Identifying a range of possible solutions/measures; and o assessing the different solutions for their costs, benefits, effectiveness for reducing or eliminating the risk, the adaptation efforts, or the level of resilience.

Adaptation solutions must:

- Not adversely affect physical climate risks of other people, of nature, of cultural heritage, of assets and of other activities;
- Not result in any form of maladaptation, including solutions which will not achieve the intended objective or may result in unintended side effects;
- Be consistent with Thailand National Adaptation Plan;
- Must consider the use of nature-based solutions to the extent possible.

Proactive consultations on the proposed activity must be conducted. This ensures that adaptation solutions do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other stakeholders (directly impacted or interested persons). The consultation process should at least:

- Identify potentially impacted and/or interested persons, assets, heritage, etc.; and
- Communicate, consult, and/or provide for the participation of these persons/institutions ensuring that their concerns, desires, expectations, needs, rights, and opportunities are considered.

In this way, the adaptation solutions will ensure that there are no negative impacts as a result of implementing the activity.

**Table 2 Classification of climate-related hazards**

| | Temperature related | Wind related | Water related | Solid mass related |
|---|---|---|---|---|
| Chronic | - Changing temperature (air, freshwater, marine water)<br>- Heat stress<br>- Temperature variability | Changing wind patterns | - Changing precipitation patterns and type<br>- Precipitation or hydrological variability<br>- Ocean acidification<br>- Saline intrusion<br>- Sea level rise<br>- Water stress | - Coastal erosion<br>- Soil degradation<br>- Soil erosion<br>- Solifluction |
| Acute | - Heat wave<br>- Wildfire | - Cyclone, hurricane, typhoons<br>- Storms (including dust and sandstorms)<br>- Tornadoes | - Drought<br>- Heavy precipitation<br>- Flood (coastal, fluvial, pluvial, ground water) | - Landslide<br>- Subsidence |

## Template of CRVA checklist

An example of a climate risk and vulnerability checklist is shown in **Table 3**. This checklist can be used as a template for evidence to be provided to assessors that climate risk and vulnerability of an Activity has been considered.

**Table 3 Template for CRVA checklist**

| Step | Item | Description | Explanation | Status |
|---|---|---|---|---|
| 1A | Lifespan of the activity equipment and materials | Activity description | What is the proposed Activity? | |
| 1B | | Equipment and materials description | What equipment and materials will be used to perform this Activity | |
| 1C | | Activity start | When will the Activity start operations? | |
| 1D | | Activity end | When will the Activity cease operations (either through deterioration of components or reduced demand for Activity)? | |
| 1E | | Operational life >10 years? | Will the operational life of the Activity be more than 10 years?:<br>• If no, conduct assessment using current IPCC climate scenarios and trends based on extrapolated current climate data.<br>• If yes, conduct current and future assessment using both IPCC climate scenarios and trends. | |
| 2A | Climate related hazards | Potential climate risks to the Activity | Identify and list potential risks to the Activity from Table 2, considering location of the Activity and applicable scenarios and trends as described in 1E | |
| 2B | | Evaluate most common potential risks | Consider the likelihood of the risk based on the location of the Activity. | |

| Step | Item | Description | Explanation | Status |
|---|---|---|---|---|
| 3A | Risk assessment | Projection of climate hazards | If activity has operational life >10 years, what potential hazards may occur based on using both IPCC climate scenarios and trends? | |
| 3B | | Potential impact of climate related hazards | How could climate-related hazards could affect elements of the Activity? Direct impacts may not always occur; some may also be indirect (or impacts in succession). Where appropriate, use flowchart to map the anticipated risks and impacts from each identified climate-risk hazard. | |
| 3C | | Potential impact of climate related hazards | How could climate-related hazards could affect elements of the Activity? Direct impacts may not always occur; some may also be indirect (or impacts in succession). Where appropriate, use flowchart to map the anticipated risks and impacts from each identified climate-risk hazard. | |
| 4A | Identify adequate and effective adaptation solutions | Adaptive solutions | List adequate and effective adaptation solutions under identified climate-related hazards | |