Thailand Taxonomy Board

Climate Bonds INITIATIVE

GB-TAP Green Bond Technical Assistance Program

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

IN PARTNERSHIP WITH

Thailand Taxonomy

Business Guide, Case Studies, and FAQs

June 2023

Table of contents

List of tables

User Guidance and Application Navigation

Effective decarbonisation of Thailand and maximizing the opportunities offered by green technologies are only possible if the government, industry, financial sector, citizens, and non-profit organizations work together and within a common conceptual framework. Therefore, the country's Taxonomy can provide such a framework whilst also making the rules of the game transparent as well as serving as the core of a mechanism that can be applied by all market players.

In order to begin assessing the application process, it is very important to sort out the definitions in the present guidance first.

Table 1. Some definitions used in the guidance[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 understand a company's efficiency and profitability based on data found in financial statements. **Use**: The primary way of aggregating an economic activity to a company level. Some companies may need to aggregate from asset to economic activity level.
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.
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 a 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.

[1] South African Green Finance Taxonomy

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 ISIC4 codes, which cover 21 broad sectors and with four further levels of differentiation. At the fourth level, 615 classes of economic activity are identified.

Use: activity is the basic unit of the taxonomy to which criteria and metrics are applied.

What is a project?

A project refers to a smaller undertaking that is carried out within the context of an activity. Many activities that are limited in time can be structured in real economy as separate time-bound projects. This is especially true for the amber category, where most activities focus on the time-limited movement of an activity toward a trajectory compatible with the green pathway. Thus, in the following guidance the word "activity" will be used, but one must bear in mind, that the activity may exist in the form of a project.

For such 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, it is only the project itself which is considered to be aligned with the Taxonomy and so the turnover associated with the project cannot be classed as aligned until completion.

A step-by-step guide

If there is a need to check whether the entity in question is in line with the present taxonomy, the process of checking it goes as follows:

- **Break down company/project operations into different economic activities according to the ISIC4 classification.**

Entities and projects are main actors of the real economy, but the Thailand Taxonomy's operational unit is the activity, not an entity or a project. In order to assess the eligibility of the activity under the Thailand Taxonomy, one must first dissect an entity or a project into separate activities that generate value or have environmental impact. These activities are attached to the flows of money that may have the form of CapEx, OpEx or revenue/turnover. Ideally, the activities must correspond to the relevant ISIC4 codes, then it will be easier to measure them against the Thailand Taxonomy which also employs the ISIC4 codification. However, it is not always a simple process. Some interpretation may be necessary, but any assessment should be clear about the base assumptions made.

- **Align the resulting activities with the table of economic activities from Section 4 or Taxonomy Excel Table**

The evaluator must compare the resulting list of activities of the enterprise/project with the list of activities included in the taxonomy and select those that are present in the Section 4 of the Taxonomy (or in the Taxonomy Excel Table). The activities that are present in the list may qualify as green, amber or red while others will be included into the Out-Of-The-Scope category (must be separately marked as such). In this case, taxonomy-alignment assessment of these activities is not possible. However, this does not automatically mean that all of the Out-Of-The-Scope activities fall into red activities category. It is simply an indication that they are not currently covered by the taxonomy, but may in the future.

- **Assess activities' performance against the technical screening criteria**

The evaluator should collect and process information that allows them to evaluate the selected activities against the technical screening criteria specified in Section 4 of the Thailand Taxonomy (or the Taxonomy Excel Table). Testing alignment to the technical screening criteria requires robust and granular data. A combination of third-party data providers together with in-house research can ease the process.

The evaluator must then decide whether each individual activity is **green**, **amber**, **red**, or Out-Of-The-Scope of the existing version of the taxonomy. If the economic activity under consideration meets the relevant metrics and thresholds, it is considered either **green** or **amber**. If the economic activity under consideration falls into the red category of the activity article in the Section 4.3 (or in the Taxonomy Excel Table), then it is counted as **red**.

Please, bear in mind, that amber activities are subject to a "sunset date" of 2040. This is the date after which amber activities are no longer available. This happens because the scientifically calculated decarbonisation pathway moving towards 1.5 – 2 degrees by 2050 does not allow even slight emission increase after this date, only green activities will be appropriate there.

- **Assess activities' compliance with the DNSH and minimum social safeguards**

The evaluator needs to assess whether the activity is consistent with DNSH principles (Section 5.1) and whether minimum social safeguards (5.2) are met. The evaluator should accompany the final report with a separate section on DNSH/Social Safeguards compliance. If the activity, project, or company in question do not comply with DNSH or MSS criteria but otherwise pass relevant technical screening criteria and metrics, it may be considered eligible for the corresponding green or amber category if the operating company submits an additional plan indicating how it will correct the deficiencies.

At present, the Thailand Taxonomy only covers climate change mitigation as an environmental objective, with the remaining five expected to be added in future iterations of the Thailand Taxonomy. As such, activities, projects, and a company/issuer can only currently be classified as being aligned with climate change mitigation, although DNSH requirements should be considered for all the remaining five environmental objectives.

While DNSH requirements have not been detailed in the present draft of the Taxonomy, they will be developed further in future iterations.

- **Prepare the assessment report for the relevant task/audience on the assessment of the entity/activity**

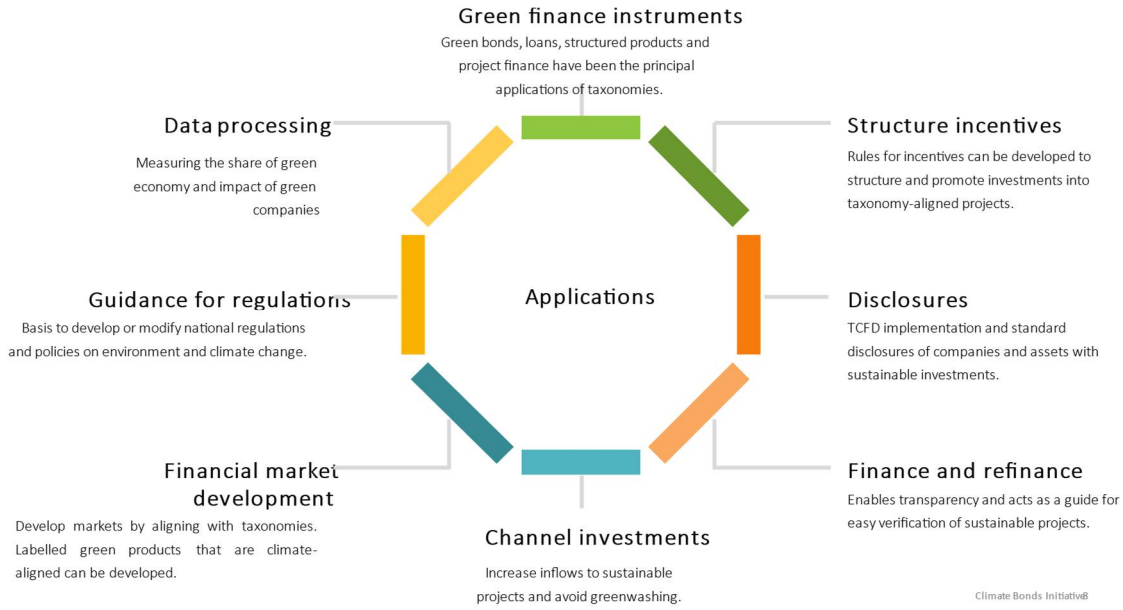
The assessment report is a document that contains all the information necessary to make the conclusion about activity alignment with the Taxonomy. It may accompany a bond framework, prospect of emission, disclosure report (if the company may report its overall alignment to the taxonomy) or just be published on a website for public view. It may differ in name and structure depending on the nature of the application, but in general can cover the following information:

- A decision on whether the activity/activities or project/projects in question are recognized as green or amber under the criteria of the Thailand Taxonomy
- In case the company decides to engage the verifier, all relevant collected information, assumptions, and data for the audience (whether it is an external reviewer, a bank, a government, or general public) of the report to be able to verify information through an independent third party.
- If all or some part of the activities in question are designated as amber, the report must be accompanied by a plan describing how the activity will transition towards net-zero pathway in the timeframe designated by no later than 2040.
- An additional assessment against the DNSH and MSS requirements must be conducted and included in the assessment report. If the activity does not comply with DNSH or MSS criteria, in order for the opinion on the overall compliance to be finalised, a plan of remedial measures must be included into the assessment report. Without this plan the final report cannot be considered complete.

Usability examples and case studies

The Thailand Taxonomy may be used for a variety of different purposes associated with confronting climate change and moving the economy towards a more sustainable model. However, it is important to notice that a separate legal instrument is needed to make the taxonomy usable in each sphere of application. The taxonomy is an "engine" or a "soul" of the green finance system, but it needs supplementary documents, instructions, or pieces of national/international legislation to be connected to the real economy and financial market (For further details look at the Appendix 3 Question 4).

Possible taxonomy applications:



***Source**: Climate Bonds Initiative (CBI)*

Here are some of the examples how the taxonomy can be used with case studies:

- The Taxonomy can be used for **labelling green finance instruments**, such as bonds[2], loans[3], structured products etc. This is its main sphere of application. For making this possible a separate bond or loan standard is needed.

Case study: Rapid transit lines for a city, Financed through a bond issuance	**Case study: Expansion of the company's solar infrastructure, Financed through a loan**
Environmental objective: climate change mitigation. The company will allocate the green bond proceeds with the aim to support the construction of new metro lines in a	**Environmental objective**: climate change mitigation. The company will utilize the loan proceeds with the aim to increase its solar power generation segment and

[2] Climate Bonds Standard V3.0, Climate Bonds Initiaive

[3] Green Loan Principles, LSTA

Case study: Rapid transit lines for a city, Financed through a bond issuance	Case study: Expansion of the company's solar infrastructure, Financed through a loan
densely populated area and thus help contribute to lower the carbon footprint of the region.	supply more renewable electricity into the grid
The company X is intending to issue green bonds in order to finance or refinance, in whole or in part, existing and future projects that improve mobility services and related infrastructure, namely the: • Construction of new lines and line extensions: almost 200 km of new automatic metro lines supplementing the 400 km of existing lines. In case the company X decides to engage verifier, the Company X confirmed to the verifier that all its eligible assets (metros, metro lines and the supporting infrastructure such as the stations and technical centres) are fully electrified and support electric assets uniquely. Article 4.2.5 Enabling infrastructure for low emitting transport supports the construction of the zero-emitting electrical railway transportation as well as supporting infrastructure. The bond is thus eligible under Article 4.2.5 criteria if the DNSH and MSS criteria are observed. The management systems for internal processes and controls for the Eligible Assets was established, including: • tracking of proceeds, managing unallocated proceeds, and earmarking funds to eligible assets.	The proposed investment consists of a corporate facility of up to US$400 million to Company X, which specialises in providing power. Proceeds will be used to fund the Company's expansion into the solar power generation segment, including the financing of four solar power plants with a total installed capacity of 350 MW. Solar generation is directly eligible under the Energy criteria, so the loan may be qualified as green if the DNSH and MSS Criteria are observed. In accordance with the loan facility agreement, the funds will be disbursed in tranches on an ongoing basis whenever the borrower will incur expenses directly related to the expansion into the solar power generation segment **Alignment reporting:** For Bank A the loan comprises 10% of its portfolio. In this case, 10% of its portfolio can be marked as green.

Case study: Rapid transit lines for a city, Financed through a bond issuance	Case study: Expansion of the company's solar infrastructure, Financed through a loan
• the details of commitments for reporting prior to issuance, including investment areas, management of unallocated proceeds and frequency of periodic assurance engagements. (user can refer from guidelines on bond issuance and offer for sell of green bond regulated by related agency.) **Alignment reporting**: • From company X, which makes 100% from rapid transit lines will be classified as green. • For portfolio reporting, if this company accounts for 5% of the financial institution's debt portfolio, then the financial institution will report 5% as green (weight in portfolio x% of green revenues)	

- The taxonomy can be used for **financing and refinancing** green projects and **properly reporting their share.**

Case study: Off-shore wind farm, equity investment from a financial institution	Case study: Freight transportation, equity investment from a financial institution
Environmental objective: substantial contribution to climate mitigation	**Environmental objective:** substantial contribution to climate mitigation
Off-shore wind energy is considered to make a substantial contribution to climate change mitigation by providing zero emission energy and are classified as green under the Thailand Taxonomy. Company A makes 20% of its revenue from off-shore wind farms and 80% of	Freight transportation currently accounts for a significant proportion of carbon emissions from transportation in Thailand and ASEAN region so reducing tailpipe emissions from this source would make a substantial contribution to climate change mitigation.

Case study: Off-shore wind farm, equity investment from a financial institution	Case study: Freight transportation, equity investment from a financial institution
its revenue from thermal coal-fired power stations. As the offshore wind farm activity automatically falls under the green classification, the financial institution then needs to satisfy itself that the company does not breach the DNSH/MSS requirements to classify this company's offshore wind farm activity as green under the Taxonomy.	Company B makes 100% of its revenues from freight transportation, with 10% from its local, electric-powered delivery fleet and 90% from its revenues from energy-efficient long distance delivery trucks. The Taxonomy classifies freight transportation with zero direct tailpipe emissions as green, as long as the vehicles are not used to transport fossil fuels. Heavy-duty vehicles that have specific CO2 emissions of less than half of the reference CO2 emissions of all vehicles in the vehicle sub-group to which the heavy-duty vehicle belongs are classified as amber, as long as they are also not used to transport fossil fuels.
Alignment reporting: For company A, which makes 20% of its revenue from its offshore wind farm activity and 80% from its thermal coal-fired power station activity, 20% of its revenue will be classified as green and the remainder as red. For portfolio reporting, if this company accounts for 5% of the financial institution's equity portfolio, then the financial institution will report 1% of its portfolio as green and 4% as red (weight in portfolio x % of green revenues).	**Alignment reporting:** Because wholly electric transport automatically falls under the green classification, the Financial Institution then needs to satisfy itself that the company does not breach the DNSH requirements to classify this company's activity as green under the Taxonomy. For the truck delivery activity, the company needs to provide both current CO2 emissions as well as a credible transition pathway for its delivery fleet to reach zero tailpipe emissions by the sunset date in order to be classified as amber under the Taxonomy (See Section 2.3). The financial institution also needs to satisfy itself that the company does not breach the DNSH/MSS requirements on pollution and the circular economy for this activity. In total, for company B, 10%

Case study: Off-shore wind farm, equity investment from a financial institution	Case study: Freight transportation, equity investment from a financial institution
	of its revenue will be classified as green and the remainder as amber.

- The taxonomy can be used to facilitate **reporting and disclosures**[4] by financial market participants. In this case, it increases transparency of the market and helps the regulator to assess the situation with green finance in the country.
- Companies can use the criteria contained in the Taxonomy **as a reference**. The Taxonomy can be used for checking the eligibility of underlying projects and asserts to be included in green or sustainable finance instruments or benchmark for their environmental and sustainability transition strategies and plans.
- The Taxonomy can also be used by the government and the regulator to **tie incentives and support measures**[5] for market participants. It helps to shape the policy of the country in a desired manner.

Among the government incentives to support the development of the green finance market and transition of the economy the following may be considered:

- The provision of government guarantees green bond issuance to de-risk green bond issuance, allowing institutional investor participation. This encourages green bond issuance over traditional issuance.
- Encouraging the use of green financial instruments through subsidies and incentives which reduce cost of green capital and ensure attractive returns.
- The provision of targeted subsidies that are crucial to enable the cost competitiveness of specific green technologies and to enable industrial transitions, for example, the subsidies provided by the US Government for low-carbon hydrogen production.
- The provision of risk weightings adjustments by central banks for capital and reserve requirements and collateral frameworks to incorporate climate risks.

Other policies and measures can be found in the Climate Bonds Initiative report "101 sustainable finance policies for 1.5°C" [6]

[4] Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector

[5] 101 Sustainable Finance Policies for 1.5°C Report, CBI

[6] 101 Sustainable Finance Policies for 1.5°C Report, CBI

Frequently Asked Questions

1. What is Thailand Taxonomy?

In general, a Green Taxonomy is a classification system for economic activities according to environmental objectives. There are many possible objectives for a green taxonomy such as climate change mitigation, climate change adaptation, protection and restoration of biodiversity and ecosystems etc. The taxonomy development usually begins with addressing the climate change mitigation objective. Such a taxonomy is a guide to climate aligned projects and assets. It is a tool for bond issuers, financial institutions, statistical agencies, investors, governments and municipalities and others to help them understand the type of investments that will deliver a low carbon economy. In addition, A robust taxonomy is transparent, grounded in the latest climate science aligned with the goal of reaching net-zero emissions by 2050 as prescribed by the relevant UN bodies to create a common reference for comparing the social and environmental impacts of different investments and protect investors from greenwashing, put pressure on companies to become climate aligned and steer investment towards more sustainable initiatives.

It must be noted that the economic activities that are not included in the Taxonomy as substantially contributing to climate objectives are not necessarily environmentally harmful or unsustainable. They may be just irrelevant to the field or not researched well enough to be considered beneficial or harmful. For example, many activities in the services sector fall into this category.

The Thailand Taxonomy considers both environmental objectives and economics activities that are appropriate and suitable to Thailand's context. Additionally, the Thailand Taxonomy is also aligned with the ASEAN Taxonomy and other internationally recognized taxonomies such as the EU Taxonomy and the Climate Bonds Taxonomy. In the initial phase, Thailand Taxonomy has been developed based on climate change mitigation in energy sector and transportation sector. The next phase is expected to cover significant sectors such as manufacturing, agriculture, construction and waste management. The Thailand Taxonomy is launched for use as a common reference on a voluntary basis.

2. Does my company's good sustainability or green rating received from a third-party provider such as MSCI or Vigeo Eiris make its activities automatically green?

No. The Taxonomy focuses on the environmental aspect and evaluates green and non-green activities within an entity on that basis. A sustainable rating incorporates social and governance aspects of a business model and as such a company with activities that are not compliant with the present Taxonomy can technically still have a good sustainability rating due to the S and G element of ESG. The Thailand Taxonomy, in this current version, deals only with the climate change mitigation aspects of the company's activities.

3. **What kind of activities and sectors are included in the present version of Thailand Taxonomy?**

Based on the ISIC-4 Code System, the scope of the energy sector covered in this taxonomy refers primarily to the production of electricity from various sources, including related activities on heat and cooling, transmission, distribution, and storage. The scope of the transport sector reflects to different modes of transport of passengers and freight from one point to another without covering the manufacturing of vehicles (according to ISIC this is a part of the manufacturing sector).

4. **How activities thresholds, decarbonisation pathways and criteria calculated?**

All criteria and thresholds in this Taxonomy have based CBI and its partners' Standards and Sector criteria that have been developed independently with input from global stakeholders and rigorously adhere to science-based evidence. However, recognizing that credible incorporation of climate change needs to be adapted to meet national circumstances, Thailand Taxonomy Board and CBI have taken into consideration of Thailand's individual circumstances and decarbonisation policies in the development of this taxonomy. In addition, the CBI's primary mission is to create scientifically valid decarbonization criteria for various sectors of the economy independent of the political and financial ramifications. The documents and criteria developed by the CBI are used in varying degrees by all existing green finance systems today, including the European Union, China, Russia, South Africa, Colombia, etc.

5. **Can the Taxonomy damage the economy? What will happen to the activities that are not aligned with the Taxonomy?**

No, the taxonomy itself is not meant to jeopardise economic sectors. It is not a mandatory list of economic activities for investors to invest in nor does it set mandatory requirements on environmental performance for companies or for financial products. The Taxonomy is merely a labelling system to provide guidance to economic and financial stakeholders on which activities are green, and which are not. The taxonomy could lead to governments and policymakers implementing certain additional measures to support green activities and hinder the development of non-aligned activities, but this is not an automatic implication just with the Taxonomy came into being. Given there are no global mandatory investment standards in place, investors have autonomy on determining investment methodologies and priorities.

6. **What are the differences between Red and Out of Scope?**

Red: Activities that are currently not compatible with net-zero trajectory and are not going to become compatible anytime soon and do not meet the criteria and indicators for green or amber activity.

Out of Scope: Activities, such as aviation, that are not classified in the current taxonomy scope but could be changed in the future, and these activities are not classified as red activity.

7. Does the energy sector in this Taxonomy include only supply-side activities or demand-side activities as well?

The standard classification unit for this Taxonomy (as for almost all other existing taxonomies) is an activity that corresponds to the relevant ISIC code. In this framework, emissions associated with, for example, electricity generation (supply-side) are covered under the energy sector, while emissions associated with the consumption of electricity (demand-side) are attached to the activities that consume electricity, for example, manufacturing of cement or electric cars. In this case they are recognised as Scope 2 emissions[7] of manufacturing activities and are dealt with as such in different sectoral taxonomies that cover activities that consume electricity. These sectoral taxonomies will be developed under future phases of the Thailand Taxonomy.

8. Are energy efficiency measures eligible under the Taxonomy?

Yes, energies efficiencies are among eligible technologies to use to achieve the energy intensity thresholds established in this taxonomy. Sometimes energy efficiency metrics are considered as an alternative to GHG emissions per tonne of unit of production. However, the IPCC clearly refers to global greenhouse gas **emission reduction pathways** as the appropriate science-based tool to respond to the threat of climate change and to boost sustainable development and poverty eradication efforts. Therefore, whilst we are supportive of businesses that use energy efficiency technologies to improve the emission profile of their activities (as indicated in Section 3.2), we consider lowering GHG emissions per unit of production to be the sole most important indicator that must be targeted in the present Taxonomy.

9. How should I calculate my emissions for the purpose of using the present taxonomy? What scope should I consider for this?

Unless stated otherwise, the emission thresholds in the taxonomy relate to Scope 1 and Scope 2 emissions. In this case, the owner of the activity should calculate the emissions of the activity as well as the emissions of associated electricity, heating, cooling, and water supply. All GHG gases emissions should be translated into CO2 equivalent. If the requirements state that the emissions must be calculated according to the LCA (Lifecycle Assessment Approach), the owner must go beyond Scopes 1[8] and 2 and calculate emissions with a prescribed methodology. For more on Scopes and LCA please refer to Annex 2 of the Taxonomy.

---

[7] Scope 2 refers to an organization's energy indirect GHG emissions e.g. from the purchase of electricity to be used by the organization

[8] Scope 1 refers to the direct GHG emissions from an organization's activities e.g. fuel combustion in machineries, vehicles, or chemicals from wastewater treatment or leaks from the organization's activities etc.

10. Is the Taxonomy alone enough to use in the real economy?

In most cases, no. The Taxonomy is an "engine" or a "soul" of the green finance system, but it needs supplementary documents, instructions or pieces of national/international legislation to be connected to the real economy and financial market:

- To **label green bonds,** a green bond standard and framework must be applied. This defines the proper process for the use and management of proceeds, process for evaluation and selection of projects, disclosure rules and regulations etc. Among the prominent examples of standards and framework are the Climate Bonds Standard[9], China Green Bond Principles[10], ICMA Green Bond Principles[11], Asian Development Bank Green Bond Framework[12] etc.

- To **label green loans,** a green loan standard and framework is needed. In essence, it is similar to a green bond standard and some countries combine green load and bond standard into one document[13], but it contains a few distinct features mostly attributed to the fact that loans issuances do not usually require the same level of transparency such as the Loan Markets Association Green Loan Principle and Green Finance Guidelines for the Banking and Insurance Industry of China[14].

- To facilitate **disclosure** by national companies, certain reporting guidelines interms of climate should be established in Thailand.. In the future, Taxonomy-linked disclosure standards may help the country to measure the climate-aligned economy. The examples include the "Sustainable Finance Disclosure Regulation[15] and the " Corporate Sustainability Reporting Directive"[16] issued by the European Union.

- To make the Taxonomy a successful instrument of Thailand's government climate policy, a set of **support measures** must also be adopted to nudge investors in the right direction. The main goal of these measures is to direct domestic and foreign capital towards green projects. Examples of these measures can be found in Climate Bonds Initiative report "101 sustainable finance policies for 1.5°C"[17].

---

[9] Climate Bonds Standard V3.0, CBI

[10] China Green Bond Principles, National Association of Financial Market Institutional Investors

[11] Green Bond Principles, ICMA

[12] Green and Blue Bonds, Asian Development Bank

[13] Such as Russia Resolution No. 1587, 21 September 2021, On The Approval of The Criteria for Sustainable (Including Green) Development Projects in The Russian Federation and the Verification System Requirements for Sustainable (Including Green) Development Projects In The Russian Federation

[14] Green Finance Guidelines for the Banking and Insurance Industry of China, China Banking and Insurance Regulatory Commission

[15] Sustainability-related disclosure in the financial services sector, European Commission

[16] Corporate sustainability reporting, European Commission

[17] 101 Sustainable Finance Policies for 1.5°C, CBI

11. Why does the Taxonomy consider activities such as coal/oil extraction or coal/oil-powered plants as non-compliant? They are still important for the economy.

The international climate science, which serves as the basis of the present Taxonomy, is very clear: in order to achieve the goals of the Paris Agreement and, therefore, to avoid the catastrophic consequences of climate change, all fossil fuels must be phased out as soon as possible. The Taxonomy includes only those activities that are relevant for stated climate goals (for instance, climate change mitigation), but not for pure economic development or a specific political agenda.

12. Why do both green and amber sectoral decarbonisation pathways end at 2050 while Thailand's NDC establishes 2065 as a Net-Zero Year?

Thailand's NDC is a complex and comprehensive political pledge that covers many aspects of the economic and climate policy of the country. It is based on many important concepts, including the concept of common, but differentiated responsibility for tackling climate change. The Taxonomy, however, is based on scientific climate data that is always the same regardless of the territory where it is applied. Having said that the Taxonomy incorporates certain aspects of Thailand's NDC and Thailand's Long-Term Low Greenhouse Gas Emission Development Strategy: LT-LEDS Revised Version[18]: for example, the amber threshold is calculated based on NDC-aligned data. However, to ensure that we remain true to a 1.5-degree pathway, the decarbonisation pathways described in this Taxonomy do not end in 2065 but rather in 2050, and sunset dates for the NDC-aligned amber thresholds have been established for 2040. If NDC-based thresholds were to be extended until 2065 so that companies were allowed to transition up to that date then, according to the Climate Action Tracker, it would mean that Thailand would essentially move along the 4-degree pathway[19] and not the 1.5-degree pathway prescribed by the Paris agreement.

13. Why are Waste-to-Energy activities not included into the taxonomy?

We have not included Waste-to-Energy at this point in the development process because the activity falls under the waste treatment sector. Therefore, it will be added in the future phase of the development of the Taxonomy. In general, waste is not a valid source of energy and recycling must always be considered first in order to return resources to the economy. Only after waste is thoroughly recycled, may the remaining unrecyclable fractions be burned with the necessary precautions.

The Bio-energy criteria under the current Thailand is not the same as waste-to-energy. The criteria only allow to turn part of municipal biowaste (such as grass and leaves) into biofuel (not burning them). Almost no solid communal waste is suitable for the

[18] Thailand Long-Term Low Greenhouse Gas Emission Development Strategy (Revised Version: Nov.2022)

[19] Country Summary: Thailand, Climate Action Tracker

production of biofuel, so this list does not include communal waste, and the list will always be limited for a very small number of non-recyclable types of waste.

14. Why is aviation not covered under the present Taxonomy?

Aviation is an important sector of the economy, but also one of the hardest to abate due to technological and physical issues. International climate science is still unclear about the best way to provide decarbonisation pathways for aviation, and almost no other taxonomy contains this sector. In addition, the current data of Thailand's CO2 emissions from domestic and international flights, including the size of the aircraft is not sufficient for analysis and setting appropriate criteria and thresholds. This sub-sector will be reexamined once there is sufficient data or clear evidence of international climate science or technological advancement.

15. Why are hybrid cars not covered under the present Taxonomy?

Hybrid cars are an interim measure that is locking in suboptimal technologies when better zero-emission technologies are available. In 2022, Tests were run on some of Europe's best-selling hybrid cars - including the BMW X5 and Volvo XC60 - and show that hybrids can actually emit up to 89 per cent more CO2 than initial reports show[20]. Currently hybrids are cheaper than electric cars, but the cost of the latter is decreasing rapidly, and we see no reason to lock in suboptimal technology for the next decade.

16. The transport sector's criteria and thresholds under this Taxonomy only cover low-carbon transport and related infrastructure, such as EV charging stations, rail transport systems etc., while roads and expressways are not covered. Can roads and expressways be invested in despite not being included in the Taxonomy as green investment?

Yes, the Taxonomy does not prevent any entity in the country from doing any type of economic activity. The Taxonomy merely indicates which of these activities are green and which are not without hindering the development of any activity. Currently, Thailand does not isolate its roads and expressways for only EV charging stations or gas stations.

17. Do we have to consider the source of electricity when we consider EVs or other forms of low-carbon transport green?

No. The taxonomy does not take into account the source of electricity used to power the EVs. Only direct (tailpipe) emission of the car is important, and it must be zero gCO2e.

[20] Hybrid v electric cars: What's the cheapest and most sustainable choice?, Euronews

Alignment with other taxonomies

Compatibility of criteria in the Thailand Taxonomy and other major taxonomies is very important for various reasons outlined in Section 1. However, it must always be kept in mind that full literal compatibility between any two taxonomies is unachievable due to the following factors:

- **Widely used references to national regulations**. Every national taxonomy is built for its domestic market and often refers to national laws and regulations unapplicable in other countries.
- **Difference in DNSH criteria**. DNSH is an important part in many taxonomies, but unlike the eligibility criteria that are in most cases scientifically calculated, DNSH criteria are broader as well as country and sector specific.
- **Absence of amber category**. Most of the taxonomies have no amber category and this it is impossible to compare the Thailand Taxonomy to them.

Thus, the following compatibility table must be assessed bearing these factors in mind. In most cases compatibility will mean "general compatibility in terms of **green threshold**". Green means "mostly compatible", orange – "mostly incompatible", N/A – activity is not present in the assessed taxonomy.

Table 2. Taxonomy criteria alignment table

Thailand Taxonomy	EU Taxonomy	China Taxonomy	CBI Taxonomy	South Africa
Solar				
Wind				
Hydro				
Geothermal				
Bioenergy				
Natural Gas		N/A	N/A	N/A
Ocean Energy				
Renew. Non-Fossil			N/A	
Heat/Cool Waste Heat				
Cogeneration of power and heating/cooling				
Electric Heat Pumps			N/A	

Thailand Taxonomy	EU Taxonomy	China Taxonomy	CBI Taxonomy	South Africa
Heat/Cool Distribution			N/A	
Gas Transmission Networks			N/A	
Storage Electr./Thermal				
Transmission Of Electr.				
Transport via Railways				
Other Passenger Land Transport				
Urban/Suburban Pass. Transport				
Road Freight				
Enabling Infrastructure				
Sea/Coastal Water Transport		N/A		N/A
Inland Water Transport		N/A		
Retrofitting Water Transport	N/A		N/A	N/A