

**A Work Project, presented as part of the requirements for the Award of a Master's
degree in Finance from the Nova School of Business and Economics.**

**"A Comparative Analysis of the EU and Singapore Green Taxonomies:
The Role of Mitigation, Transition Risk, and The Challenges of Operating
under Multiple Taxonomies"**

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Abstract

This study examines the EU and Singapore green taxonomies, focusing on their similarities, differences, and implications for firms. It explores how these frameworks guide sustainable investments, enhance climate-risk management, and improve sustainability reporting. By comparing these taxonomies, the study highlights their role in positioning firms as leaders in the transition to a sustainable future. Additionally, it investigates taxonomy developments across Asia, the Singapore taxonomy's potential applications within the region, and the challenges firms face when navigating multiple taxonomies. This analysis provides insights into managing sustainable investments in diverse regulatory environments while fostering cross-border alignment in sustainability practices.

Key words: Climate finance, Green taxonomies, Mitigation risk, Transition risk, Southeast Asia, Europe, China, Interoperability

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Introduction

Over the past decade, extreme weather events and climate-related natural hazards have become more frequent and intense, causing negative impacts on communities, businesses, financial resources, and natural assets (Standard Chartered Bank, 2024). Compared to pre-industrial time (1850-1900), average temperatures worldwide have increased by $1.45 \pm 0.12^{\circ}\text{C}$ (World Meteorological Organization, 2023). Concentration of carbon dioxide, methane and nitrous oxide reached record high levels in 2022, and are still increasing (World Meteorological Organization, 2023). Ocean heat reached its highest level from the time observation started. Moreover, the global mean sea level rise has also reached its highest level: the rate of sea level rise in the period 2014-2023 has more than doubled compared to the 1993-2002 observation period (World Meteorological Organization, 2023). On top of that, antarctic sea-ice and glaciers have reached a record low in 2023. Natural disasters have become more common: in 2023 alone they resulted in losses of USD 250 billion (MunichRE, 2024). Furthermore, while natural disasters resulted in 74,000 deaths in 2023, 83% of which were due to devastating earthquakes, economic losses were mainly due to weather-related disasters (76% of the total), rather than to geophysical causes (MunichRE, 2024). As the global climate crisis worsens and the demand for sustainable investing grows, a set of frameworks known as taxonomies has been developed to guide investors. Even though extreme weather events and temperatures are on the rise, adaptation finance has barriers. There is still uncertainty regarding definitions of what is adaptation and a lack of understanding thereof, hence countries and international institutions have started to develop adaptation “taxonomies” (Martín, R.S., Ranger, N., & England, K., 2024). Taxonomies are “a classification system identifying activities, assets, and/or project categories that deliver on key climate, green, social or sustainable objectives with reference to identified thresholds and/or targets” (ICMA, 2021). While taxonomies

address various environmental issues such as biodiversity, water management, and pollution prevention, this paper focuses on their role in addressing climate change, particularly through mitigation and adaptation. These components are critical for directing investments toward activities that help reduce greenhouse gas emissions or build resilience against climate impacts. In order to maintain high standards for green investments and directing capital towards sustainable economic activities, green taxonomies such as the European Union and United Kingdom ones are essential (Della Croce, R., Whittaker S., & Hlavackova C., 2024). Firms and investors use taxonomies to determine which activities align with adaptation goals for reporting, corporate strategy, and investment decisions. Governments and regulators utilize them for sovereign bond issuance, tracking adaptation finance, and enhancing disclosure and reporting requirements (Natixis, 2023). The European Union Taxonomy became the first framework for sustainable activities in 2020, which aimed at directing capital flows toward sustainable activities. Afterwards, other countries started to create a Taxonomy for sustainable activities including the UK, as well as Singapore and Malaysia in Asia. Since firms operate in different parts of the world and in different capital markets, it's important to have taxonomies that allow interoperability among markets. Understanding the effect of the Singapore Taxonomy on firms is critical to help the Southeast Asian region shift towards an ever increasing sustainability, and to support economic and social development. Since Singapore is viewed as Southeast Asia's climate leader, adopting the Taxonomy helps firms to combat climate change and advance sustainability while establishing themselves as leaders in the dynamic realm of green finance, creating long-term value creation and sustainable growth. The aim of this paper is to make a comparison between the EU and Singapore's green taxonomies, focusing on mitigation and transition risk. This paper is going to answer the following question: what are the differences between the EU and Singapore green taxonomies, and what are the main effects of firms operating under multiple taxonomies?

First, this paper is going to explain basic information about climate finance, sustainability risks, and the two main Taxonomies analysed: the EU and the Singapore ones. Second, the methodology of the study is presented. Third, the EU and Singapore Taxonomies are analysed more in detail, focusing on mitigation, transition, the financial metrics used, and the advantages of each Taxonomy. Fourth, Taxonomy developments in other Asian countries and the subsequent effects of operating under multiple Taxonomies are presented. Lastly, the main conclusions, limitations, and recommendations of further research are presented.

Literature review

Climate finance

Climate finance aims to help mitigation and adaptation in order to address climate change (UNFCCC, 2024). It is important for mitigation, because investments are needed to considerably reduce emissions, and for adaptation, since financial resources are required to adapt to the harmful effects and reduce the impacts of climate change. Countries in every region of the world, due to their high vulnerability and limited adaptive capacity, are exposed to natural hazard impacts and risks. The effects of climate change are more acute in emerging markets and developing nations. Even with global warming below 1.5°C, the health-related risks of climate change are escalating quickly, already leading to loss of lives and livelihoods. Health systems are under pressure, and the lack of support for equitable adaptation has left populations vulnerable to rising climate hazards. The economic consequences of climate change will be massive, even if the Paris Agreement goals will be achieved: damages and lost economic growth will account for billions by 2030, and trillions by 2050 (Climate Policy Initiative, 2023).

In the past few years, climate finance has been increasing from USD 653 billion in 2019/2020 to USD 1.3 trillion on annual average in 2021/2022, mitigation finance accounting for the most growth (Climate Policy Initiative, 2023). The growth is primarily concentrated in China, the US, Europe, Brazil, Japan, and India, which account for 90% of the received funds. Despite the growth, flows consistently failed to meet the necessary needs, especially in developing and low-income countries. Flows to or within the least developed countries were less than 3% (USD 30 billion) of the global trade and flows to or within emerging and developing countries were 15%. However, adaptation finance continues to lag: it reached an all time high in 2019/2020 at USD 63 billion, which is still far behind the needed USD 212 billion per year by 2030 for developing countries alone (Climate Policy Initiative, 2023).

EU Taxonomy

There are several green taxonomies being developed around the world, the EU and UK's being the most advanced and complete ones. In order to direct the creation of its sustainable finance roadmap, the European Commission, in 2016, established the High-Level Expert Group on Sustainable Finance (HLEG). They served as the foundation for the Commission's 2018 Action Plan on Financing Sustainable Growth and priority was given to the creation of a classification system of green activities (European Commission, 2024a). In 2018, the European Commission established a Technical Expert Group on Sustainable Finance (TEG), which developed a Final Report in 2020 focused on the recommendations for a Taxonomy, implementation guidelines, and a technical annex featuring screening criteria. The EU green Taxonomy is based on Substantial Contribution to climate change mitigation and adaptation, and "do no significant harm" principles. According to Article 9 of the Regulation (EU) 2020/852 (European Union Law, 2020), an economic activity to be considered EU Taxonomy compliant, it should make substantial contribution to one of the following environmental objectives: (i) climate change mitigation (CCM), (ii) climate change adaptation (CCA), (iii) the sustainable use and

protection of water and marine resources, (iv) the transition to a circular economy, (v) pollution prevention and control, and (iv) the protection and restoration of biodiversity and ecosystems. Moreover, when making a Substantial Contribution to climate change mitigation and adaptation, investments must not do any significant harm to other sustainability objectives and must not contribute towards maladaptation (UNDRR, 2023). To add, the EU Taxonomy established three classification categories for the activities that significantly support one or more environmental objectives: low carbon, transitional, and enabling. Low carbon activities are those that do not result in greenhouse gas (GHG) emissions or that increase GHG removals, transitional are the ones for which there is not a low carbon alternative, but that support the transition to a low carbon economy, and enabling are those that directly enable other activities to significantly contribute to achieving the environmental objectives (ICMA, 2021). Examples of low-carbon activities are renewable energy generation, electric vehicle manufacturing, and energy-efficient building construction. Transition activities are, for example, natural gas as a replacement of coal, carbon capture and storage in industrial processes, and improved livestock management in agriculture. And lastly, enabling activities are, for example, grid modernization for renewable integration, R&D in clean technologies, and green finance and insurance (Manifest Climate, 2020).

Singapore Taxonomy

In December 2023, the Monetary Authority of Singapore (MAS) and the Green Finance Industry Taskforce (GFIT) published the Singapore-Asia Taxonomy for Sustainable Finance, with the technical support and advice from the Climate Bonds Initiative (CBI) (Singapore-Asia Taxonomy for Sustainable Finance, 2023). The Taxonomy aims to promote the growth of an environmentally sustainable economy in Singapore and ASEAN by establishing science-based, robust technical screening criteria for economic activities and projects that align with Singapore's and the region's broader environmental goals. It is designed to define the green

and transition economy, along with identifying related opportunities. Moreover, it is used as a guide for market participants (such as asset owners, policymakers, regulators, financial institutions and investment managers) as a means to prevent greenwashing. The five environmental objectives align with the ones in the EU Taxonomy: climate change mitigation, climate change adaptation, protect healthy ecosystems and biodiversity, promote resource resilience and circular economy, and pollution prevention and control. However, the main focus of the Taxonomy is climate change mitigation. The Singapore Taxonomy distinguishes between three types of activities: green, amber,

and ineligible. Green activities are the ones which contribute substantially towards climate change mitigation by operating with near-zero emissions, or are following a pathway aligned with the 1.5°C target. Amber activities are the ones that are not on the 1.5°C pathway, but are either

progressing along a green transition pathway within a specified timeframe, or facilitating substantial short-term emissions reductions with a designated end date. And lastly, ineligible activities are the ones that do not comply with either green or amber activities and thus are unsustainable activities since they are not compatible with a 1.5°C pathway.

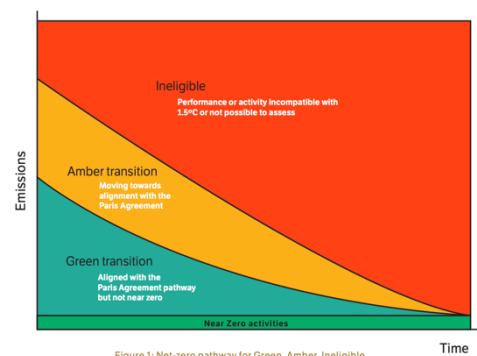


Figure 1 Net-zero pathway for Green, Amber, and Ineligible. Source: Singapore-Asia Taxonomy for sustainable finance (2023)

Methodology

The methodological approach used in this study is based on a systematic literature review (SLR) which is used in academia to offer both qualitative and quantitative insights into the structure and development of research in a given field. Moreover, SLR shows the evolution of scientific literature within a specific domain, highlighting its key challenges and potential avenues for future research (Colicchia, C., & Strozzi, F., 2012). According to Massaro, M., Dumay, J., &

Guthrie, J. (2016), SLR can provide a better and more impactful research compared to the traditional methods used in literature review. Having a set of rules, SLR has also fewer biases and is more transparent in the execution, along with improved measures and techniques for validation and reliability. A thorough research of academic articles and online data has been done: various sources have been used, such as Google Scholar, news websites, institutional websites and academic journals. More in detail, academic articles, reports from international organizations, and industry publications have been used to answer the research question.

To start the identification of studies that will be used in the paper, several keywords that synthesize the main area of interest had to be selected. This part of the research is one of the most important ones since, if they keywords are not effectively identified, the results may change. Since the main aim of this paper is to make a comparison between the EU and Singapore's green taxonomies and understand their impact on firms, focusing on mitigation and transition risk, the following keywords have been searched: "EU green Taxonomy", "Singapore green Taxonomy", "mitigation", "transition risk", "green finance EU Singapore", "sustainable finance Taxonomy", "impact of green taxonomies", "financial institutions green regulations", "taxonomy developments in Asia", and "interoperability of taxonomies". To make sure that all the sources used are relevant for answering the research question, I made sure that they address: 1) an analysis between the EU and Singapore's green taxonomies, 2) how these taxonomies affect firms, and 3) taxonomy developments in Asia and their interoperability.

The search of the literature has been carried out between July 2024 until November 2024 and it produced 67 academic articles. In order to progressively reduce the number of articles, the time period has been reduced to the past 5 years, keywords have been made more specific, and articles in other languages other than English have been discarded. This paper focuses on current and relevant information to highlight recent developments and discussions in the field,

therefore it focuses on academic articles that were mainly published in the past 5 years (2019 – 2024). However, it also uses older sources providing essential context and definitions of the topic. Moreover, only sources in English have been used. Lastly, this paper focuses on the EU, Singapore and other Asia countries, therefore the sources used are about these geographical areas. In the end, a total number of 49 sources have been used in order to write this study.

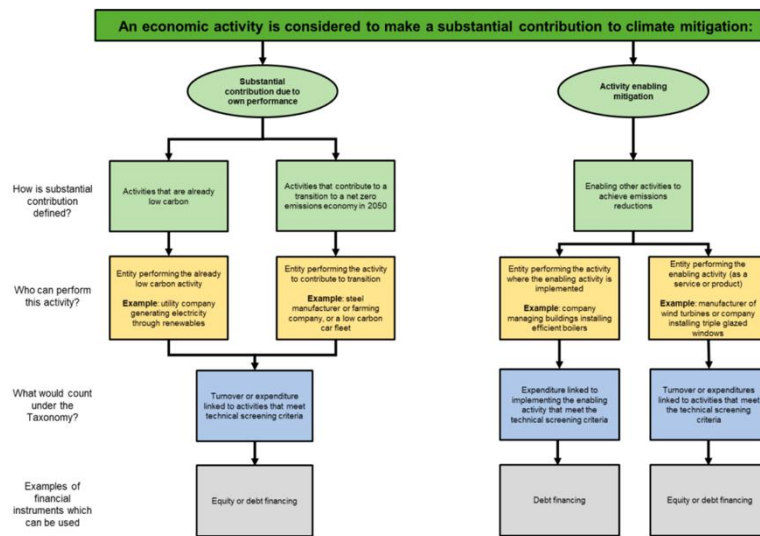
Analysis & discussion

Mitigation in the EU Taxonomy

An economic activity is considered to contribute significantly to climate change mitigation under the EU Green Taxonomy if it helps balance greenhouse gas (GHG) concentrations in the atmosphere, thereby preventing harmful human impact on the climate system. This can be achieved by reducing or avoiding GHG emissions or enhancing GHG removals through any of the following approaches: generate and use renewable energy, improve energy efficiency, improve climate-neutral mobility, transition to sustainably sourced renewable materials, enhance carbon sinks in the land, build the energy infrastructure needed to facilitate the decarbonization of energy systems, and produce clean fuels by renewable or carbon-neutral sources (European Commission, 2020b).

The EU Taxonomy defines two kinds of activities: one that substantially contributes to mitigation due to its own performance, and one enabling mitigation in another economic activity. Moreover, in the EU Taxonomy the risks associated with activities that might undermine climate change mitigation are also considered (European Commission, 2020a). For example, the use of passenger cars and commercial vehicles can undermine climate change mitigation, due to their contribution to GHG emissions from fossil fuels, their energy-intensive production, and their lifecycle emissions. Thus a DNSH threshold has been decided, which consists in additional technical screening criteria that are either process-based or quantitative

performance criteria (European Commission, 2020a). Of the 66 activities in the Taxonomy, 51 have been identified and have a DNSH threshold for mitigation criteria (European Commission, 2020a). Furthermore, the methodology for calculating Taxonomy-aligned turnover, CapEx, and OpEx, where applicable, varies based on the type of financial instrument (equity or debt) and the specific environmental objective the investment aims to achieve. A company may issue a green bond or seek a green loan to adapt one or more of its activities to physical climate risks. The related expenditures (from the bond or loan) will be considered Taxonomy-aligned if the



company adheres to the Taxonomy's processes and criteria for climate change adaptation. However, the turnover generated from those activities made resilient will not be Taxonomy-aligned because only

enabling activities can consider their turnover as Taxonomy-aligned from an adaptation perspective. Moreover, it has not yet been fully determined whether an economic activity can ever be considered completely "resilient" to climate change and included in the Taxonomy, because adapting to climate change is an ongoing process that may never achieve a final state (European Commission, 2020a). The Platform on Sustainable Finance will continue developing criteria to determine resilience benefits, potentially allowing turnover from adapted activities to be accounted for in the future (European Commission, 2020a).

Transition in the EU Taxonomy

Transition is also a main component: the EU Taxonomy must be used in a way that financing is directed towards the transition to a more sustainable economy in the continent. There are some heavy emitting sectors for which low-carbon solutions do not exist, therefore the EU Taxonomy proposed transition pathways based on two principles: avoiding the lock-in of assets that are incompatible with these objectives, and achieving environmental performance significantly exceeding the sector average (European Commission, 2020a). Activities in sectors that do not have an economically and technologically feasible low carbon alternative, they should be considered to contribute substantially to climate change mitigation as they support the transition towards a net-zero economy only if those activities: 1) achieve GHG emission levels that represent the top performance in the sector or industry, 2) do not impede the development and implementation of low-carbon alternatives, and 3) avoid the lock-in of carbon-intensive assets, taking into account their economic lifespan (European Commission, 2020a).

In the EU Taxonomy, two main financial metrics are required to be disclosed: turnover, which allows investors to report what percentage of their fund is invested in Taxonomy-aligned activities, and CapEx/OpEx, which show whether the company is moving in the right direction in terms of climate change mitigation and transition (European Commission, 2020a). Non-financial metrics are also used to determine whether an activity is Taxonomy-aligned, however, they are specific for each economic activity and are explained in detail in the EU Taxonomy Technical Annex (European Commission, 2020b). For example, in the water collection, treatment and supply sector, the metrics used are: average system energy consumption (encompassing abstraction, treatment, and distribution) per cubic meter of authorized water supply (European Commission, 2020b).

Current trends of the EU Taxonomy

In 2023, companies governed by the EU's Non-Financial Reporting Directive (NFRD) were required to fully disclose EU Taxonomy metrics in their annual reports (CDP, 2023). According to CDP (2023) 2,000 large companies in the EU are obliged to make Taxonomy disclosures, which represent EUR 10 trillion in market capitalization and 2 gigatons of direct GHG emissions. Companies are asked to disclose KPIs linked to the two environmental objectives currently in effect: climate change mitigation and climate change adaptation. However, according to a study by CDP (2023) companies tend to disclose more about climate change mitigation. Moreover, the study found that 500 out of the 2,200 listed NFRD companies do not have a EU Taxonomy disclosure, showing that companies still need time to fully comply with and implement the Taxonomy's disclosure requirements. Companies reporting on the EU Taxonomy mainly come from the industrial sector, with the financial and discretionary sectors following behind. Firms in the EU have to report their Taxonomy eligibility, thus whether their activities fall under the sectors defined by the Taxonomy, and alignment, so whether those eligible activities meet the Taxonomy's sustainability standards. In the year of the study, 2023, financial companies were only required to report the eligibility figures. Based on the CDP (2023) study, on average, firms report that only 25% of their revenues and 30% of their CapEx are eligible under the EU Taxonomy. This means that just a portion of their activities fall under the economic sectors defined by the Taxonomy. This low eligibility is partly due to the limited scope of the EU Taxonomy, since it currently focuses on activities that can make a substantial contribution to climate objectives. Moreover, large economic sectors, such as healthcare, consumer staples, telecommunications, and much of the technology sector, are currently not covered by the EU Taxonomy. This means companies in these industries cannot classify their revenues or CapEx as eligible for the Taxonomy, contributing to lower overall eligibility figures. Some companies may have some eligible activities under the EU Taxonomy, however, even fewer activities are actually aligned: in the study only 11% of revenues and 12%

of CapEx are aligned. The CDP (2023) study also found that there is no strong correlation between firms' GHG emissions and how much of its economic activity falls under the scope of the EU Taxonomy (revenue alignment).

Singapore Taxonomy

The main users of the Singapore Taxonomy are financial institutions that provide debt and/or equity capital, however also firms, regulators, policymakers and other financial market participants can use it (Singapore-Asia Taxonomy for sustainable finance, 2023). The financial institutions intended to use the Taxonomy are equity fund management, debt fund management, alternative investment management, private equity, venture capital, infrastructure financing, among others. And even though the main focus of the Taxonomy is Singapore, it is designed to be adaptable across Southeast Asia, with potential for broader applications as well. However, despite this flexibility and potential for broader applications, there is currently no official indication that it will be formally adopted outside Singapore. The Singapore Taxonomy is not mandatory, however firms can use it to understand to what degree their investments are aligned with the Taxonomy. It provides firms a framework for understanding what constitutes a sustainable economic activity. More specifically, it removes uncertainties about what is considered to be a sustainable activity, and improves transparency and robustness in 1) portfolio alignment with net-zero, 2) risk managing investment and lending processes, 3) product innovation, and 4) sustainability disclosures (EY, 2024). Firms should use activity classifications to determine eligibility and, where possible, incorporate additional data to assess alignment. If investors lack source information from the investee company, they can use terms like "potentially aligned" or "estimated aligned" (Singapore-Asia Taxonomy for sustainable finance, 2023). There are several steps needed for Taxonomy assessment. First, financial institutions should identify the extent to which the firm's/issuer's activities fall within the relevant target sectors. Then, they should evaluate the proportion of

revenue (or CapEx/OpEx) that aligns with one or more Environmental Objectives. Lastly, as a best practice, they should disclose the alignment of the company's/issuer's activities with the Taxonomy's Do No Significant Harm (DNSH) criteria or minimum social safeguards (Singapore-Asia Taxonomy for sustainable finance, 2023). Appendix 4 shows graphically the required steps needed in doing a Taxonomy assessment.

Mitigation in the Singapore Taxonomy

The Singaporean green Taxonomy main objective is climate change mitigation. An activity can be considered to make substantial contribution to climate change mitigation if: it avoids GHG emissions, reduces GHG emissions, promotes activities that enhance low-carbon performance or lead to significant emissions reductions, and facilitates activities that support the transition to a cleaner energy, either through renewable power generation or decarbonization technologies, as well as developing and implementing carbon capture and sequestration in specific industrial processes (Singapore-Asia Taxonomy for sustainable finance, 2023). In the Singaporean green Taxonomy, the transmission and distribution of fossil gas is considered an ineligible activity. However, electricity generated from fossil gaseous fuels can also be considered a green activity. In this case, GHG emissions of electricity generated from fossil gaseous fuels should be 100gCO₂e/kWh or lower, similar to the EU one. The Singapore Taxonomy uses two metrics: revenue or net turnover and CapEx/OpEx. In addition to assisting investors in evaluating a company's investment in both existing and new fixed assets, capital expenditures can provide insight into the company's strategy to enhance environmental performance and resilience. Revenue reflects ongoing operations and activities and serves as the main indicator for alignment. However, when new investments are made in technology to improve an issuer's alignment, CapEx becomes a more suitable indicator (Singapore-Asia Taxonomy for sustainable finance, 2023). Similar to the EU Taxonomy, the Singapore one uses

different non-financial metrics used for each of the economic activities presented in the document (Singapore-Asia Taxonomy for sustainable finance, 2023).

Similarities and differences between the taxonomies

A first main difference between the two is that the Singapore Taxonomy is not legally binding, meaning that it is not mandatory for financial institutions. However, it is used by firms as a guiding role for sustainable finance, to allocate capital towards carbon-neutral activities, and to help firms align with global standards. On the other hand, the EU one is legally binding for financial institutions and large companies under the Corporate Sustainability Reporting Directive (CSRD) with over 250 employees and/or over €40 million in turnover and/or more than €20 million in total assets (European Parliament, 2022). From 2026, the EU Taxonomy will also be compulsory for small and medium enterprises. This ensures that companies are held accountable to global climate goals and transparency in their environmental impact. It is important to note that the EU Taxonomy was not legally binding when it was introduced, but the CSRD made it so. Therefore, a similar situation may happen in the Singapore Taxonomy in the coming years. Moreover, since the Singapore Taxonomy is new compared to the EU one (it was published less than one year ago), there is fewer literature available on the topic. Both the EU and Singaporean Taxonomy focus on the same eight sectors: industrial, carbon capture and sequestration, waste and water, energy, construction/real estate, agriculture and forestry/land use, transportation and fuel, information and communications technology. In the South-East Asian region, these eight sectors account for 90% of GHG emissions (EY, 2024), while in the EU they account for 93.5% of direct GHG emissions (European Commission, 2020a). While both taxonomies focus on high-emission sectors like energy, transportation, and agriculture, they adapt their criteria based on national priorities and economic structures. For example, the Singapore Taxonomy includes unique activities tailored to its climate and economic context, such as carbon capture and sequestration, which might not be as pronounced

in the EU Taxonomy. Investors and firms operating across borders must be aware of these differences to navigate regulatory landscapes and make informed decisions. This is particularly relevant for financial institutions with international exposure, as they need to align their investments with the taxonomies of the jurisdictions where they operate (Clarity AI, 2023). Moreover, both the EU and Singapore Taxonomies use different non-financial metrics for each economic activity.

The main difference between the two green taxonomies is the use of the “traffic light” system in the Singaporean one. On the other hand, the EU one focuses on determining which activities are already environmentally sustainable. While both the EU and Singapore taxonomies use similar metrics (e.g., revenue, CapEx/OpEx), the difference in their approach, especially with respect to transition and enabling activities, can shape the financial instruments available in the market. The EU Taxonomy, for instance, emphasizes the importance of “transition” investments in sectors without low-carbon alternatives, while the Singapore Taxonomy focuses more on the broader mitigation of GHG emissions across various sectors (European

Commission, 2020b; Singapore-Asia Taxonomy for Sustainable Finance, 2023). For firms and financial institutions operating across Southeast Asia and Europe, understanding these differences is critical for

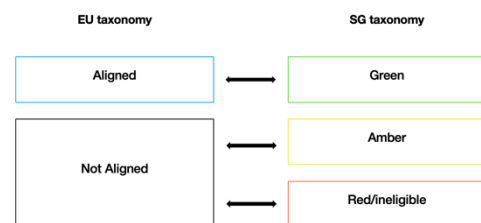


Figure 3 Mapping of EU and Singapore green taxonomies. Source: own work

aligning their operations with multiple regulatory frameworks. The varying criteria may lead to different reporting and disclosure requirements, influencing cross-border investments. As the Singapore Taxonomy continues to evolve, its alignment with international standards like the EU Taxonomy could foster smoother cross-border financial flows, but significant differences, such as the use of a “traffic light” system in Singapore, may still create complexities for multinational companies (Singapore-Asia Taxonomy for Sustainable Finance, 2023).

Taxonomy developments across South East Asia and China

Most Southeast Asian countries have set emission reduction targets under the Paris Agreement (UNFCCC, 2024). These targets are driving a regulatory focus on taxonomies as tools for attracting green capital. Developing taxonomies in Southeast Asia is very important, due to the region's highly vulnerability to climate impacts with increasing droughts, cyclones, floods, landslides, and sea level rise (ADB, 2021). Singapore is the pioneer in Asia regarding the development of a green taxonomy, and following its path many other countries have started to develop their own distinct ones: Malaysia, Indonesia, Vietnam, and China, for example. However, these are designed with regional alignment in mind, and there's a push for interoperability, which could foster closer integration between these taxonomies and Singapore's. As Southeast Asia's financial systems grow, the Singapore taxonomy's framework may provide a model for cross-border green bond issuance, particularly as regional cooperation is emphasized, especially with China's Belt and Road Initiative (BRI) linking these economies in green finance efforts (Green Central Bank, 2022). China's Green Bond Endorsed Project Catalogue, one of Asia's most established taxonomies, addresses pollution reduction, resource conservation, and adaptation (People's Bank of China, 2021). The People's Bank of China (PBOC) has been at the forefront of promoting green finance, which is particularly relevant for Southeast Asia. China's green finance strategy provides frameworks that align with the country's broader carbon-neutral goals. This is influencing financial markets not only within China but also in neighboring regions as part of the BRI's green finance aspects (Green Central Bank, 2022).

Malaysia's Climate Change and Principle-Based Taxonomy has been published in 2021 and it helps assess climate change's impact on businesses, households, and the broader economy (Bank Negara Malaysia, 2022). Moreover it introduces a principle-based taxonomy for financial institutions to categorize economic activities based on environmental impact and their

transition to a low-carbon economy, and it helps standardized classification and reporting of climate-related exposures to facilitate risk assessment. This taxonomy's assessment structure reflects both transition and adaptation risks, making it compatible with Singapore's approach but with a specific focus on financing for economic resilience.

Vietnam and Indonesia's Just Energy Transition Partnerships (JETPs) commit these countries to phase out coal and increase renewable energy investments. While Indonesia already has a green taxonomy, Vietnam is still exploring one and its frameworks are still under development. Vietnam's JETP aims at reaching its GHG emissions peak in 2030, reaching peak annual power sector emissions of 170 MtCO₂e by 2030, limiting peak coal-fired generation capacity to 30.2 gigawatts, and reaching 47% of country's electricity generation from renewable energy by 2030 (Climate Policy Initiative, 2024). Moreover, it also focuses on improving the energy transition's regulatory framework and ensuring a just transition. Vietnam's JETP aligns with taxonomy frameworks that categorize sustainable energy activities, highlighting the need for a taxonomy to attract and monitor green funding. Structuring taxonomies to prioritize transition activities could help Vietnam meet its commitments, easing the access to international green finance.

As mentioned above, a Vietnam's Taxonomy does not currently exist, but the Vietnamese ministry of planning and investment proposed a draft in September 2024: the new Vietnam Standard Industrial Classification System (VSIC) (Vietnam Briefing, 2024). This framework divides sectors into three categories: green, transitioning, and supporting ones. Green sectors are the ones that align with green growth objectives while avoiding significant harm to other environmental goals. Transitioning sectors may pose risks to certain environmental targets, though they are vital to Vietnam's economy and will be encouraged to adopt more sustainable practices. Supporting sectors include activities that support or enhance green industries, thereby indirectly contributing to green growth (Vietnam Briefing, 2024). Moreover, according to the

new Vietnam Standard Industrial Classification System, an economic sector is defined to be green when it fulfills at least one of the following environmental objectives: climate change mitigation, climate change adaptation, ecosystem and biodiversity protection, or resource resilience and the transition to a circular economy (Vietnam Briefing, 2024). Indonesia's JETP is the world's largest energy transition package to date, with a USD 20 billion commitment (JETP, 2023). Its primary objective is to develop a Comprehensive Investment and Policy Plan (CIPP), which is a living document to be regularly updated and evaluated.

Indonesia's JETP aims to cap total power sector emissions at 290-million-ton CO₂eq by 2030, reach a 34% of energy generation from renewables, and reach net zero in the power sector by 2050 (JETP, 2023). Moreover, it also aims to accelerate the retirement of coal plants. Indonesia's green taxonomy has been published in 2024 and it categorize activities according to four environmental objectives: climate change mitigation, adaptation, ecosystem and biodiversity protection, and transition to a circular economy (IEEFA, 2024). Compared to a previous version of the taxonomy, it divides activities into three categories: green, transitional, and does not meet criteria. However several criticisms arose: while it provides financing for the closure of coal-fired power plants, it classifies the financing of new coal-fired plants as transitional (IEEFA, 2024). Moreover, the criteria used are too lax.

Both Indonesia and Vietnam's JETP are more flexible, focusing mostly on transition and financing adaptation, while the EU taxonomy has stricter environmental and social criteria. Singapore's green taxonomy can be seen as a regional reference, since it is designed with flexibility to align with other SEA countries' sustainability priorities. Moreover, it clearly shows that it is designed to promote sustainable development not only in Singapore, but in the whole SEA. By defining science-based and rigorous technical screening criteria for economic activities and projects, it ensures alignment with Singapore's and the broader region's environmental objectives (Singapore-Asia Taxonomy for sustainable finance, 2023). China's

taxonomy is also influential in the region, mainly due to its BRI project: standardizing SEA taxonomies with China's standards could facilitate sustainable financing for infrastructure projects aligned with BRI's green goals. The CCFI paper, *ESG Regulatory Framework for Asset Managers in the EU, UK, US, and Singapore* by Imperial College Business School (Savi, A. & Ostrovnaya, A., 2024), provides a good comparative basis for understanding how various regions approach ESG regulations. Among the ESG regulations in the world, the EU is notably one of the most open regions for portfolio managers, allowing them considerable freedom to implement their own methodologies in defining what qualifies as an ESG or sustainable fund. The EU SFDR provides more flexibility in fund classification, with the Article 8 category supporting a broad spectrum of ESG strategies (Eurosif, 2022). This approach allows firms to introduce innovative strategies within their sustainable financial product offerings. Therefore, since there is a great degree of freedom in the regulatory text, standardisation has been prevented, which has led to different outcomes (Savi, A. & Ostrovnaya, A., 2024). The absence of clear boundaries defining sustainable investments, combined with new disclosure requirements, presents a problem for asset managers. In Singapore, the ESG regulations also have a good level of flexibility for asset managers: by conducting their own sensitivity analyses on potential outcomes, they can compete by transparently sharing with investors how they interpret uncertain variables based on the portfolio manager's value judgments, rather than viewing it as a challenge (Savi, A. & Ostrovnaya, A., 2024).

Effects of operating under multiple taxonomies

Consider a scenario made by the Asian Development Bank (2023) where a German bank's Singapore subsidiary extends a loan for a project in Indonesia, with equity contributions from an Indonesian investor and a Japanese private equity firm. In this situation, multiple taxonomies could become relevant: (1) The EU Taxonomy, since the bank is based in Germany; (2) the Singapore Taxonomy, as the loan is processed through the bank's Singapore subsidiary; (3) the

Indonesia Taxonomy, due to the involvement of an Indonesian investor; (4) the ASEAN Taxonomy, because the project is located in an ASEAN country and the Japanese private equity firm has adopted it as the standard for its ASEAN portfolio, preferring a regional benchmark over individual country taxonomies; and (5) the internal taxonomy of the German bank. The German Bank would comply with the EU Taxonomy, while the Singapore subsidiary would report according to the Singapore Taxonomy, and the Indonesian investor would adhere to the Indonesia Taxonomy. Meanwhile, the Japanese private equity firm would evaluate its investments using the ASEAN Taxonomy. This allows each party to apply a different taxonomy according to their specific obligations or preferences, using the taxonomy they are either required to follow or choose to adopt independently.

A problem may arise when an activity aligns with some taxonomies but not with others. It also generates extra work for all parties involved, as each one would have to assess every transaction separately and independently, without the benefit of a standardized classification system. In many cases, the project financing structure might be simpler, but cross-border financial flows still introduce the challenge of navigating multiple taxonomies. While manageable, this adds to costs, increases time requirements, and reduces the ease of securing financing. This complexity can create disincentives for financing and lead to confusion (Asian Development Bank, 2023). Even if taxonomies are designed to be interoperable, an activity eligible under one taxonomy would need to be reassessed under another, and activities designed to meet the criteria of one taxonomy may not qualify under a different one. This leads to inefficiencies in global capital flows and complicates cross-border assessments. Furthermore, disruptions in capital intermediation may occur, as financial institutions raising capital in a jurisdiction with a different taxonomy from the one they provide financing in might struggle to bridge the gap, especially if the jurisdictions they raise capital from have more ambitious standards than those they finance.

Therefore, the Asian Development Bank (2023) suggests to move beyond interoperability, toward equivalence, meaning that an activity eligible under one taxonomy could also be recognized under another one. Ideally, taxonomies should incorporate common design elements, such as environmental objectives, activity classifications, key criteria like DNSH, social considerations, and assessment frameworks that rely on the same metrics. It is also crucial for taxonomy developers to adopt shared guiding principles, such as a science-based approach. Only through common principles and design features can taxonomies be made comparable, interoperable, and ultimately equivalent (Asian Development Bank, 2023). In November 2024, the Multi-Jurisdiction Common Ground Taxonomy (M-CGT) has been presented to improve interoperability between EU, China, and Singapore (MAS, 2024). The M-CGT has been developed collaboratively by the People's Bank of China (PBOC), the European Union Directorate-General for Financial Stability, Financial Services and Capital Markets Union (FISMA), and the Monetary Authority of Singapore (MAS), builds upon the EU-China Common Ground Taxonomy (CGT). On top of serving as a technical reference document for many market participants, the M-CGT will also become the reference for jurisdictions developing their domestic green taxonomies. It is designed to support the comparison of an increasing number of taxonomies, fostering greater interoperability and facilitating cross-border green capital flows. The M-GCT analysed and mapped 110 activities across 8 sectors, which identified that approximately 60% of the common activities identified across the three taxonomies were clearly defined using the most stringent criteria, primarily in the manufacturing, transportation, water, and waste sectors (MAS, 2024). For about 5% of the common activities, mainly in electricity generation and construction, the criteria were fully aligned across the taxonomies. For example, the activity "Electricity generation from wind power" uses the same criteria across the three taxonomies (European Commission, 2024). However, for roughly 33% of the common activities, the criteria were not directly comparable.

In these cases, alignment with the M-CGT requires an activity to meet at least one of the taxonomies' criteria. This discrepancy was more prevalent in sectors like construction, agriculture, and forestry, where local regulations, standards, or certifications are frequently used as references.

Conclusion & limitations

This paper has examined the critical role of green taxonomies in directing investments toward sustainable activities, with a focus on the European Union and Singapore frameworks. As the climate crisis escalates, taxonomies are emerging as essential tools for aligning financial flows with climate adaptation and mitigation goals. Firms in the EU are obliged to disclose the alignment of their activities with taxonomy criteria, impacting their operations, reporting practices, and investment strategies. In contrast, firms in Singapore are only encouraged to use the taxonomy as a guide, focusing on voluntary green alignment and providing flexibility. However, the Singapore Taxonomy may become compulsory gradually, as it happened in the EU. Moreover, both the EU and Singapore Taxonomies place great emphasis on climate change mitigation, though in different ways. The EU Taxonomy, as the pioneer framework, has thus established rigorous technical screening criteria for green investments in a highly regulated market. In contrast, the Singapore Taxonomy demonstrates adaptability to regional priorities and the flexibility needed to address diverse economic and environmental contexts in Southeast Asia, including rising energy demands and economic growth.

A key finding of this research is the importance of interoperability among taxonomies to address the challenges faced by firms operating across jurisdictions. Southeast Asia's taxonomies, driven by unique regional needs and climate vulnerabilities, emphasize flexibility and alignment, with Singapore and China leading integration efforts to attract green capital and foster sustainable growth. Differences in taxonomy structures, financial metrics, and reporting

standards create complexity but also present opportunities for innovation and leadership in sustainable finance. By promoting alignment among frameworks, governments and institutions can enhance cross-border collaboration, reduce barriers to sustainable investment, and promote a harmonized global approach to climate action. To solve the problem of working under multiple taxonomies, the Asian Development Bank suggests to move towards equivalence, and not focusing on interoperability only. On the other hand, the M-GCT can help countries in Asia to improve interoperability and facilitate cross-border green capital flows. Moreover, the M-GCT will also help jurisdictions that are still developing their green taxonomies.

Despite these insights, this research has limitations. First, the paper relies on existing literature and secondary data, which may not fully capture the latest developments or nuanced practical challenges faced by firms. Second, the analysis focuses primarily on mitigation and transition risks, leaving adaptation efforts and other environmental objectives less explored. Third, given the evolving nature of taxonomies, the findings may be subject to change as frameworks are updated or new ones emerge. Lastly, while this paper highlights the importance of interoperability, further research is needed to assess how firms and investors navigate overlapping taxonomies in practice, particularly in regions with diverse regulatory landscapes. Future research should explore the long-term impacts of these frameworks on environmental performance, corporate resilience, and economic development. Additionally, as other Asian countries develop their own taxonomies, examining their convergence or divergence with existing frameworks will be crucial.

In conclusion, green taxonomies represent a step toward addressing climate risks and unlocking capital for sustainable growth. The EU and Singapore Taxonomies, while distinct, share a common vision of advancing climate resilience and promoting sustainable development. By leveraging their strengths and enhancing interoperability, they can play a pivotal role in guiding the global transition to a low-carbon economy.

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Appendix

Paris agreement

The 2015 United Nations Climate Change Conference (COP 21) was a major turning point for climate change. The Paris Agreement was the most important outcome: 196 countries agreed to keep the increase of global temperatures to less than 2°C above pre-industrial levels and curb the temperature increase to 1.5°C above pre industrial levels (UNFCCC, 2015). Moreover, it aimed at enhancing the ability to adapt to the adverse climate effects, and encourage climate resilience and low greenhouse gas emissions. Lastly, it aimed at aligning financial flows with a pathway toward low greenhouse gas emissions and climate-resilient development. Globally, it is estimated that EUR 6.35 trillion a year will be needed to meet the Paris agreement goals by 2030 (European Commission, 2020a).

Sustainability risks

According to the EU's Sustainable Finance Disclosure Regulation (SFDR, 2019), Article 3, sustainable risk is defined as an environmental, social, or governance event or condition that could potentially or actually cause a substantial negative impact on the value of an investment due to adverse sustainability effects. There are three risks coming from climate change: physical, transition, and litigation risks. Physical risk refers to the effects of climate change, including rising sea levels, shifts in temperature and precipitation patterns, and the heightened frequency and intensity of natural disasters. Climate change could harm physical assets and firms' production capacity, increasing credit risk for banks and asset managers, leading to financial losses in the insurance sector, and weakening governments' financial standing (Battiston et. al, 2021). Transition risk, on the other hand, refers to the challenges linked to shifting toward a low-carbon economy, including changes in government policies, limitations

on production processes, technological advancements, and shifts in consumer preferences. Positive and negative adjustments of asset prices and shifts in defaults across entire asset classes due to the transition to a low-carbon economy could lead to financial shocks for asset managers, institutional investors and banks' portfolios (Battiston, 2021). Lastly, liability risk refers to the legal risks and claims on losses and damages caused by climate change that result from the effects of physical and transition risks.

Adaptation and resilience

Physical risk is being underestimated by investors (Della Croce, R., Whittaker S., & Hlavackova C., 2024). When focusing only on asset risk assessment and reporting under the Task Force on Climate-related Financial Disclosures (TCFD) framework, investors underestimate physical climate risk. This approach often overlooks the potential impact of multiple, compounding climate hazards (e.g., heatwaves and overheating, in addition to flooding) as well as secondary and indirect effects (Della Croce, R., Whittaker S., & Hlavackova C., 2024).

To be considered green, investments must also make significant contributions toward achieving climate resilience in response to relevant climate change impacts (UNDRR, 2023). Climate resilience can be achieved by directly addressing climate change impacts, alleviating pressures that worsen and/or are worsened by climate change impacts, and facilitating either of the two aforementioned types. Investors must be able to assess resilience, too. Especially after the Covid-19 pandemic and catastrophic weather events of the past years, there is the need to add a new variable, resilience (ESG + R), in the ESG measurement to successfully recover, adapt, and grow against shocks and stress (World Economic Forum, 2021).

Resilience is the ability of interconnected social, economic, and ecological systems to withstand a hazardous event, trend, or disturbance, adapting or restructuring in ways that preserve their core function, identity, and structure (Climate Bonds, 2024). In order to reduce

vulnerability and enhance resilience, three things are required (World Bank Blogs, 2024). First, more rapid development: since poorer people are more vulnerable to climate change effects, alleviating poverty is among the most effective strategies to decrease climate vulnerability. Second, more resilient development: a good level of resilience is still not delivered by all development patterns (e.g. cities are still growing in flood-prone areas, infrastructure is not built and kept using the correct standards, and fast development usually leads to degradation of ecosystems and more water scarcity). Third, targeted adaptation intervention.

There are already initiatives to build upon: Climate Bond Initiative's progress in the development of adaptation and resilience typologies, the International Sustainability Standards Board's work on disclosure and standardization, the World Bank's Resilience Rating System that helps create more resilient projects and operations, and the Gold Standard Adaptation Framework used for instructions to analyze climate-related risks.

However, better development and resilience are not enough to preserve the earth's inhabitants, especially those living in more vulnerable communities. More resources will be needed to face the challenges of climate change, thus increasing the need for adaptation finance.

According to the Intergovernmental Panel on Climate Change (2022), adaptation is the process of adjusting to actual or expected climate conditions and their effects to reduce harm or capitalize on beneficial opportunities. In natural systems, adaptation involves adjusting to the current climate and its effects, while human intervention may help the process.

According to a research by the Standard Chartered Bank (2022), for every 1 USD spent on adaptation, 12 USD would be generated. On the other hand, the cost of inaction over the period 2025 - 2100 is estimated to be USD 1,266 trillion, which is the variation in losses between a business-as-usual scenario and those occurring within a 1.5°C pathway. The economic opportunity should act as an incentive to the market, however there are some barriers which

have historically limited private finance flows, such as limited revenue streams for many adaptation and resilience investments and long investment horizon.

Adaptation finance reached 63 billion USD in 2023, according to the Climate Policy Initiative (2023). Although adaptation finance is lagging worldwide, capital for climate action is still available. It is essential to develop policy frameworks that support efforts to 1) evaluate, tackle, and reduce physical climate risks while measuring resilience benefits, and 2) integrate metrics for adaptation and resilience (Della Croce, R., Whittaker S., & Hlavackova C., 2024).

Maladaptation is defined by the IPCC (2022) as “... actions that may lead to increased risk of adverse climate-related outcomes, including via increased greenhouse gas (GHG) emissions, increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future”.

For any activity for which there is no carbon-neutral alternative, it should be considered to be making a substantial contribution to climate mitigation if that activity: has GHG emission levels that align with the best performance in the sector or industry, does not obstruct the development and implementation of low-carbon alternatives, and does not result in a lock-in in carbon-intensive assets, considering how long these assets will last economically (European Commission, 2020b).

The EU Taxonomy does not take into consideration fossil fuels, including liquid and gaseous fuels, since they are not considered to make a substantial contribution to climate change mitigation. If they were included in the Taxonomy, the risk of lock-in would arise, undermining the EU Taxonomy’s definition mentioned above about what activities are considered to contribute to climate change mitigation and transition (European Commission, 2020a). However, the Taxonomy implies that electricity produced from gas can be included as long as the life cycle impact of producing 1kWh of electricity is below the declining threshold. The

declining threshold is set at life cycle emissions of 100gCO₂e/kWh, which will be reduced every five years to 0gCO₂e/kWh by 2050 (European Commission, 2020b).

Transition risk in the EU Taxonomy

Alessi, L. and Battiston, S. (2021) developed a method to measure financial portfolio's transition risk based on the EU green Taxonomy. They found that the highest transition risk is found in high-carbon activities: the transport sector has a transition risk exposure share of 81.2% and the real estate sector a share of 70%. Moreover, the mining and quarrying sector has transition risk exposure of 59.8%, the electricity one at 31.2%, and the manufacturing one at 14.3%. Overall, the transition risk is estimated to be 5.5%. They have also found that financial institutions' exposure to transition risk is lower than non-financial sectors, ranging from 1.7% for banks to 9.9% for other financial institutions. Additionally, financial institutions with significant exposure to transition risk have not shown alignment with Taxonomy standards, highlighting their strong exposure to the fossil fuel sector. This outcome is primarily driven by their equity holdings, as less regulated financial institutions increased their investments in high-carbon companies following the Paris Agreement.

Tettamanzi, P., Gotti Tedeschi, R. & Murgolo, M. (2023) stated that the European Commission, due to the Russo-Ukrainian war and the disputes over the supply of gas, allowed under certain conditions the use of gas and nuclear energy to facilitate the ecological transition, thus identifying them as targets for sustainable investment. Critics say that, even if not ideal, maintaining gas in the Taxonomy can help the energy transition since it is less polluting than coal.

Methodology process

To improve the relevance and precision of the search results, the initial broad keywords were refined through an iterative process. This process was necessary to ensure that the search captured literature directly addressing the intersection of green taxonomies, climate-related risks, and their impact on firms. The steps undertaken for keyword refinement were as follows:

1. Identifying core themes

Based on the research objectives, the focus was narrowed to four main themes: Green taxonomies in the EU and Singapore, their implications for firms, climate change-related risks, including mitigation and transition risk, and implications of working with different taxonomies.

2. Adding specificity:

Broad terms such as "green finance" and "sustainable finance" were replaced with more specific phrases that included actionable terms and contextual relevance. For example: "Green finance EU Singapore" became "green finance taxonomy comparison EU Singapore" and "Transition risk " was refined to "transition risk management in firms".

3. Combining keywords:

Keywords were combined to capture intersectional topics. For example: "Sustainable finance taxonomy" was combined with "implications for firms" or "climate risk", "Impact of green taxonomies" was paired with "regulatory compliance" or "firm-level adaptation".

4. Testing search outcomes:

Keywords were tested across databases to assess their effectiveness in narrowing down results. The number of articles retrieved and their relevance to the research question were reviewed, and adjustments were made to ensure higher-quality outcomes.

5. Excluding irrelevant contexts:

To avoid articles that were not aligned with the study's focus, terms such as "corporate social responsibility" or "general environmental policies" were avoided unless explicitly tied to green taxonomies and their implementation.

6. Incorporating regional focus:

Keywords were tailored to highlight regional contexts, particularly Singapore and Southeast Asia. For instance: "Taxonomy developments in Asia" was refined to include "green finance regulations in ASEAN countries" and "adoption of Singapore green taxonomy in Southeast Asia".

7. Dynamic adjustments:

As key papers were identified during the initial search, their terminology and keywords were analyzed and incorporated into subsequent searches to ensure comprehensive coverage of the topic.

How will companies use the EU Taxonomy?

According to the European Commission (2021), large financial and non-financial companies subject to the Non-Financial Reporting Directive are required to disclose the extent to which their activities align with the criteria outlined in the EU Taxonomy. Similarly, financial market participants, such as asset managers, must disclose how aligned the activities funded by their financial products are with the EU Taxonomy. Companies have to report on the extent of their investments—for example through capital expenditures—in expanding or enhancing their Taxonomy-aligned activities or upgrading other activities to achieve alignment. Disclosures regarding green revenue and green expenditure provides the market with valuable insights into: (1) companies whose activities already meet EU Taxonomy criteria, indicated by the share of revenue from Taxonomy-aligned activities, and (2) companies working towards alignment, shown through their green expenditure. Market participants have numerous potential voluntary

applications of the EU Taxonomy that are not explicitly outlined in policy instruments. For instance, companies may incorporate the EU Taxonomy criteria into their environmental and sustainability transition strategies and plans. Businesses and project promoters can align with these criteria to appeal to investors seeking green investment opportunities. Similarly, investors can apply the EU Taxonomy criteria during due diligence processes to screen and identify sustainable investment opportunities aimed at delivering positive environmental impacts.

Advantages of the EU Taxonomy

There are several advantages in using the EU Taxonomy (PwC, 2024). First, it reduces reputational risks and environmental risks through standardized reporting. This approach enhances transparency, positively influencing stakeholders' perceptions of firms and supporting asset managers in demonstrating their commitment to sustainable practices. Second, it provides firms with the opportunity to generate added value and stand out from competitors, ultimately fostering greater client confidence and creating additional business opportunities through partnerships with larger institutions. Third, it requires client businesses to report on sustainability indicators, resulting in a significant enhancement in the availability and quality of corporate data. Lastly, it involves developing a standardized segmentation process for clients, improving risk management practices, enhancing due diligence, and increasing resilience to environmental and social risks.

Financial metrics used in the EU taxonomy should be provided also if the activities are in transition or enabling, and should be included in either the annual report or sustainability report. Moreover, investors have to disclose the environmental objectives to which the investments contribute, and the percentage of underlying investments that are aligned with the Taxonomy. This should include a detailed breakdown between activities classified as “enabling” and those considered “transition” (European Commission, 2020a).

The Singapore Taxonomy has several advantages. First, it helps firms to understand what is the environmental impact of their activities and better manage climate risk, setting the course for net-zero. Second, it allows for better assessment of risk and opportunities, and deals with regulatory compliance. Third, it facilitates the creation of green and sustainable loans, bonds, and other financial instruments that align with the Taxonomy. Fourth, it improves disclosure quality and auditability. In the coming years, investors are advised to report both the eligibility and the alignment of their investments with the Taxonomy.

Effects of operating under multiple taxonomies

For European banks or investors operating across multiple taxonomies, like those of the EU and Singapore, there are significant implications. European financial institutions operating in SEA must balance compliance with both the EU taxonomy and SEA-specific taxonomies, which vary in definitions and thresholds for sustainable activities. This dual compliance effort may require aligning portfolio management practices with less stringent transition categories in SEA while adhering to stricter European environmental and social standards. This complexity can lead to an increased administrative burden and may require dual reporting practices to comply with both regional and EU taxonomy requirements.

Figures



Figure 4 Step by Step Guide to Taxonomy Assessment. Source: Singapore-Asia Taxonomy for sustainable finance (2023)