SCHOOL OF ECONOMICS AND MANAGEMENT

Bachelor's Programme in Economy and Society (Department of Economic History)

The EU Taxonomy and the Energy Supply Sector

A qualitative case study on the implications of the EU Taxonomy on the regulatory reporting requirements in the energy supply sector

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The EU Taxonomy provides a clear set of criteria for identifying sustainable economic activities and facilitating investment flows in alignment with sustainable practices. Although dynamic, the Taxonomy emphasizes the mitigation of greenhouse gas emissions and biodiversity conservation, making it crucial for companies, policymakers, and capital markets. To meet the EU's environmental goals, a significant transition from fossil fuels to renewable energy sources is required, which highlights the central role of the energy supply sector in the transition to a sustainable economy. This research uses a qualitative case study approach to examine the impact of the Taxonomy on the regulatory reporting requirements for companies in the energy supply sector. The regulatory changes and the experience of a company in the industry, namely the German energy supplier EnBW, are analyzed regarding implementing the requirements of the EU Taxonomy. This research finds a gap between the intended and actual implementation of the Taxonomy. It identifies that the classification of transitional economic activities, interpretation issues, and time constraints contribute to this disparity. The results of this study identify the strengths and potential weaknesses of the Regulation, and suggestions for the future improvement of the Taxonomy are outlined.

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List of Abbreviations

CSRD - Corporate Sustainability Reporting Directive
DNSH - Do No Significant Harm
EU - European Union
GHG - Greenhouse Gas Emissions
KPI - Key Performance Indicator
MS - Minimum (Social) Safeguards
NFRD - Non-Financial Reporting Directive
SDGs - Sustainable Development Goals
SFDR - Sustainable Finance Disclosure Regulation
SR - Sustainability Reporting
TEG - Technical Expert Group on Sustainable Finance
TSC - Technical Screening Criteria

1. Introduction

Sustainability has become increasingly important in the global agenda. Climate change and its consequences, such as extreme weather events, rising sea levels, and more frequent wildfires, have underscored the urgent need for action to reduce greenhouse gas emissions (GHG) and ensure the sustainable use of natural resources. The 2030 Agenda for Sustainable Development, adopted by the United Nations in 2015, outlines 17 Sustainable Development Goals (SDGs) to achieve a more sustainable and equitable world by 2030 (United Nations, 2015). Achieving these goals will require significant changes in how we produce and consume energy and a broader shift toward more sustainable practices across all sectors (Lee, Kjaerulf, Turner, Cohen, Donnelly, Muggah, Davis, Realini, Kieselbach, MacGregor & Waller, 2016).

The European Union (EU) has promoted sustainability through its policy initiative, the European Green Deal, which sets out a comprehensive framework for transforming the EU's economy and achieving climate neutrality by 2050 (Fetting, 2020). The goal is to steer the EU towards a sustainable future pursued through a range of policy initiatives to transform the EU into a modern, prosperous, and equitable society with a competitive and eco-friendly economy. The ambitious commitments of the EU require significant investment, as it is estimated that hundreds of billions of euros are needed in the current decade to reach the carbon reduction targets (European Commission, 2018). The European Commission claims that a shared understanding of what constitutes environmentally sustainable investment can facilitate the funding of the transition to a more sustainable economy by bringing clarity to investors, avoiding market fragmentation, and reducing the risk of greenwashing (European Commission, 2018).

The EU Taxonomy is a regulatory framework intended to facilitate the transformation of the EU economy toward meeting the European Green Deal targets, including the 2050 climate-neutrality goal (Fetting, 2020). It is a classification system that aims to channel public and private investment into environmentally sustainable economic activities to achieve environmental objectives (Stefano, 2022). Adopted in July 2020, the Taxonomy establishes a dynamic list of environmentally sustainable economic activities, provided they contribute substantially to at least one of six environmental objectives and do not significantly harm any other (European Commission, 2020). While the basic legal act for the Taxonomy is already in force, establishing detailed criteria for classifying activities as green is ongoing (Stefano, 2022). The First Delegated Act on reporting obligations of companies was adopted in July 2021 and came into force on 1 January 2022, establishing criteria for activities helping to mitigate or adapt to climate change (European Commission, 2021a). Activities in the nuclear and gas sectors are the subject of a complementary delegated act proposed by the European Commission on 2 February 2022 (Stefano, 2022). This briefing focuses on the two delegated acts determining which activities should be considered sustainable and contributing to the fight against climate change and be reported as such.

The energy supply sector is one of the essential areas for achieving sustainability and mitigating climate change. Energy production and consumption are responsible for significant global GHG emissions, with fossil fuel combustion for electricity and heating accounting for the largest share (European Environment Agency, 2023). According to the European Commission (2022), the total energy use in the EU accounts for around 75% of direct GHG emissions. Moreover, the energy supply sector currently accounts for over 20% of GHG emissions in the EU. Therefore, the energy sector plays a crucial role in continuing to reduce emissions and, consequently, in achieving sustainable economic development and addressing the pressing challenge of climate change (European Commission, 2022a; de Oliveira Neves, 2022). It is also an essential driver of economic growth and a critical enabler of many other economic activities. Therefore, it is imperative to find and incorporate more sustainable solutions, especially regarding achieving the SDGs and targets of the European Green Deal.

Given the central role of the energy sector in the transition to a sustainable economy, it is essential to understand the impact of the Taxonomy on this industry. The Taxonomy is expected to have far-reaching implications, affecting investment decisions, business strategies, and policy development. Understanding how the Taxonomy will likely impact the energy sector is crucial for ensuring a smooth and effective transition to a more sustainable energy system. This sector is also particularly interesting because of the recent discussions about the Taxonomy and its classification of nuclear and gas activities. As mentioned above, the First Climate Delegated Act defines Technical Screening Criteria (TSC) for specific gas and nuclear activities as transitional activities to facilitate the transition away from more harmful energy sources (European Commission, 2021a). The Act declared that nuclear and gas-powered plants built until 2030 would be recognized as transitional energy sources as long as they are used to replace other fossil fuels such as coal and oil (Conea, 2022). This decision caused much public attention in the media and among politicians in multiple EU countries. While the European Commission (2021a) has reassured that gas and nuclear-related activities may be labeled as ‘green’ only if they meet specific criteria, oliticians, activists, and environmental organizations have criticized the EU's labeling of gas as a ‘green’ investment. They have opposed it, stating that it discredits EU efforts to establish itself as a global leader in climate policy and risks delaying the transition to a net-zero economy and some countries, such as Austria, even filed a lawsuit against the decision (Igini, 2022).

1.1 Research Question

The EU Taxonomy is a framework that sets out the criteria for environmentally sustainable economic activities and is expected to shape the regulatory landscape for energy supply companies in the EU. The new regulatory changes have been mandated per the Taxonomy since January 1, 2022, and have been in effect for just over a year.

This thesis investigates how the Taxonomy influences the energy supply sector. Specifically, the research seeks to examine the impact of the Taxonomy on the regulatory environment for energy supply companies operating within the EU. The study analyzes the new regulations put in place due to the implementation of the Taxonomy and aims to investigate the experiences of an energy company, namely the German energy supplier EnBW, with the latest regulatory reporting requirements. The research outlines the challenges and opportunities the Taxonomy presents for the energy sector, along with its implications for policy and regulation. In essence, this study explores the influence of the Taxonomy on the regulatory landscape governing the energy supply sector and the adaptation strategies employed by a company in response to these changes.

The research question to be answered in this study is the following:

Main Research Question:
How does the EU Taxonomy influence the regulatory environment for energy supply companies in the EU?

To effectively investigate the question, a thorough review of the Taxonomy and its different components will be conducted. Sustainability Reporting (SR) will be introduced to understand the background of the new regulatory changes for companies, specifically for companies within the energy sector. To understand what the experience of companies has been like with the Taxonomy and how it has been implemented, this thesis will analyze the case study of EnBW. EnBW is a significant German energy supply company in Germany and voluntarily adopted the Taxonomy in its business portfolio a year ahead of the legal requirement. Despite the obligation being mandated from the 2022 financial year, EnBW already implemented the Taxonomy in 2021 and has since published two reports about their experience with the Regulation. Besides this, the company can be reasonably regarded as a representative player within the industry because it is both the third largest German energy supplier and because it has a similar composition of the total energy mix compared to the other two largest suppliers, yet the largest share of renewables, as revealed in Table 1 in section 5.1.2 (EnBW, 2023a; E.ON, 2022; RWE Group, 2021; Statista, 2023).

Therefore, the study's sub-research question is:

Sub-Research Question:
How has the German energy supplier EnBW experienced the regulatory changes brought about by the EU Taxonomy, and what factors have been most challenging for implementing the Regulation?

To understand the experience during the first mandatory reporting cycle, this study analyzes the two reports about implementing the Taxonomy published by EnBW in 2021 and 2022. As these reporting requirements have been in effect for just over a year, it examines how the company has responded to the regulatory changes and adapted to the new reporting requirements. To show the scope and characteristics of a potential gap of what is to be implemented according to the Taxonomy legislation and what is implemented in practice on the company level, EnBW's experience with the Regulation will be examined through the lens of policy implementation theory.

1.2 Research Aim

This study provides a comprehensive analysis of the EU Taxonomy as a whole and its regulatory implications on the energy supply industry in the EU. By examining the experiences of a company within this industry with the new regulatory changes, it seeks to offer insight into the challenges and opportunities presented by the Taxonomy. In general, the findings of this research will have significant implications for policymakers and energy supply companies as they seek to navigate the complexities of this regulatory framework.

Ultimately, this study aims to contribute to a better understanding of the impact of the Taxonomy on the energy supply industry and will inform efforts to promote sustainable economic development in the EU. It will examine the regulations implemented and the experiences of the energy supply company EnBW adapting to these changes. From this, conclusions will be drawn about the effectiveness of the Taxonomy, aiming to show a potential gap between the intended implementation according to the European Commission and what is practically understood and implemented by the companies subject to the new regulatory framework. From this, suggestions for the future improvement of the Regulation will be made, which can have practical implications for energy supply companies, regulators, and policymakers to identify areas for improvement and refine their approach. Additionally, it could provide insights into the factors that influence the effectiveness of regulatory policy in achieving its objectives, contributing to theoretical knowledge.

However, it is essential to remember the potential limitations, namely that the Taxonomy is not yet finished and that this research focuses on one specific company. This study was conducted in the spring of 2023 and used the available legislative publications. However, new publications might come out later, which might impact some of the findings of the analysis. Additionally, even though the company of choice, the energy supplier EnBW, is considered representative of this industry given its energy size, composition of the total energy mix relative to other suppliers, use of renewables, sustainability agenda, and compliance with the Taxonomy regulations, their experiences with the Regulation and its implementation might be limited. Companies in both the same and different economic sectors might have other specific requirements regarding their economic activities and may have divergent implementation experiences.

1.3 Thesis Structure

This thesis consists of these main sections: introduction, literature review, theoretical framework, methodology, analysis, and discussion/conclusions.

The introduction motivates the research topic by highlighting sustainability in the EU and the introduction of the EU Taxonomy as a framework for promoting sustainable development. The choice of the energy sector is justified, and the research aim is outlined, setting the foundation for the main research question. The literature review provides an overview of the Taxonomy, its background, goals, and components. It introduces sustainability reporting, discusses the implications of the Taxonomy for reporting, and explains its various users, focusing on company-level reporting requirements. Additionally, it outlines the significance of the energy sector in the EU. The theoretical framework section introduces policy implementation theory and its relevance to understanding the practical implementation of the Regulation. The methodology section outlines the qualitative case study approach employed in the thesis and identifies the sources used. The analysis section explores the implications of the Taxonomy Regulation within this sector and delves into reporting experiences. It specifically analyzes reports from the German energy supplier EnBW, identifying and analyzing the critical barriers to implementing the Taxonomy, namely the classification of transitional economic activities, interpretation issues, and time constraints. The analysis findings are then examined through the lens of policy implementation theory. Finally, the analysis results are used to derive recommendations for future improvements to the Taxonomy. Additionally, the implications of this research for companies, policymakers, and stakeholders are discussed. The study's limitations are acknowledged, and suggestions for future research directions are provided.

2. Literature Review

2.1 The EU Taxonomy

2.1.1 Background of EU Decarbonization

The global community committed to limiting global warming in the 21st century to well below two degrees, preferably to no more than 1.5 degrees, through the 2015 Paris Climate Agreement (United Nations, 2015). To achieve this, global CO2 emissions must be reduced by 80 to 95% by 2050, resulting in a comprehensive decarbonization of the global economy. At the EU level, these climate goals are vigorously pursued through the European Green Deal and the EU Action Plan on Financing Sustainable Growth. (European Commission, 2018; Fetting, 2020). The aim is for Europe to become climate-neutral by 2050, with a minimum of a 55% reduction in GHG emissions by 2030 compared to 1990 levels (Fetting, 2020). To achieve the initiative of the European Green Deal, redirecting investments towards sustainable projects and activities is crucial to meet the EU's climate and energy targets for 2030 (Deloitte, 2023; European Commission, 2018).

However, what exactly does the term 'sustainable' mean? Before adopting the Taxonomy, a definitive and measurable set of standards supported no widely accepted definition. Therefore, the necessity for a shared vocabulary and a clear definition of what 'sustainable' means has become apparent. For this purpose, the Taxonomy was developed as a classification system to define so-called 'environmentally sustainable business activities' (Deloitte, 2023). The Taxonomy Regulation has formalized the Taxonomy on sustainable economic activities and is a significant move towards addressing this issue. It offers explicit guidance on what it means for economic activities across various industries to be sustainable, taking into account scientific evidence, quantitative and qualitative criteria, and compliance with the goal of carbon neutrality (Dorendorf, 2020).

The Taxonomy Regulation was first published in the Official Journal of the EU on 22 June 2020 and entered into force on 12 July 2020 (European Commission, 2020). It establishes the basis for the Taxonomy by setting out overarching conditions for economic activity to qualify as environmentally sustainable. It defines environmental sustainability concerning economic activities, but the term 'economic activity' is not defined in the Taxonomy Regulation (Canfora, Dri, Polidori, Solzbacher & Arranz Padilla, 2021). According to the European Commission (2008, p. 15), "[a]n economic activity occurs when capital goods, labor, manufacturing techniques or intermediary products are combined to produce specific goods or services." Thus, economic activity is characterized by the input of resources, a production process, and an output

of goods or services. To simplify the language of this paper, the term ‘economic activity’ will be used for both the category and the actual activity.

The Taxonomy Regulation outlines the comprehensive framework of the Taxonomy, including the four fundamental conditions that must be met for an activity to be Taxonomy-aligned, the six environmental objectives that an activity can significantly contribute to, and how an activity can make a substantial contribution to each of the six environmental objectives (European Commission, 2020). In addition, these new obligations include reporting requirements to regulators and stakeholders that apply to financial market participants who sell a financial product as a sustainable investment and large companies with more than 500 employees (Dorendorf, 2020; European Commission, 2020).

2.1.2 The EU Sustainable Finance Framework

To better understand the context of the Taxonomy, it is essential to know how it fits within the broader sustainable finance framework in the EU. Three disclosure tools create one coherent framework, namely the Non-Financial Reporting Directive (NFRD), the EU Taxonomy, and Sustainable Finance Disclosure Regulation (SFDR) (European Commission, 2021b). These three work together to form a comprehensive framework for sustainable corporate reporting.

The Taxonomy provides objective criteria for identifying green economic activities contributing to EU environmental goals. The NFRD, now known as the Corporate Sustainability Reporting Directive (CSRD), is currently undergoing revision to include qualitative and quantitative information about a company's sustainability impacts and risks (European Commission, 2021b). The CSRD and the Taxonomy together require companies under the CSRD to disclose their environmental performance and their Taxonomy-aligned economic activities (European Commission, 2021b). The SFDR complements these corporate disclosures by creating a comprehensive reporting framework for financial products and entities. The SFDR applies from March 10, 2021, and is expected to have significant behavioral effects on financial firms and indirectly on the business models of invested companies (European Commission, 2021b).

2.1.3 Goals of the EU Taxonomy

The primary goal of the EU Taxonomy is to direct financial resources toward environmentally sustainable investments. It establishes a standardized language and framework, which enables market participants to understand the meaning of the term ‘sustainable’ (Deloitte, 2023). The Taxonomy implements a structure that allows for the evaluation of an investment’s level of sustainability. Specifically, it establishes the first categorization system that determines the

quantitative and qualitative requirements for economic activities to be considered sustainable or 'green' in financing and investment (Deloitte, 2023; Dorendorf, 2020). The Taxonomy is also a tool for transparency that requires companies and investors to disclose their share of Taxonomy-aligned activities (European Commission, 2020). This disclosure will facilitate comparisons of companies and investment portfolios and help guide investment decisions. Companies can use the Taxonomy to plan their climate and environmental transition and raise finance for this transition, while financial companies can use it to design credible green financial products (European Commission, 2020).

It is important to note that the Taxonomy is not a mandatory list of economic activities for investors to invest in. Companies are also not required to meet mandatory environmental performance requirements (European Commission, 2020). Instead, investors can choose where to invest, but the Taxonomy is expected to encourage a transition toward sustainability over time. Furthermore, it is essential to understand that economic activities not recognized by the Taxonomy as significantly contributing to the EU's climate and environmental objectives are only sometimes environmentally harmful or unsustainable (Dorendorf, 2020). Only some activities that contribute substantially to environmental objectives are yet to be part of the Taxonomy Delegated Acts.

2.1.4 Environmental Objectives

According to the European Commission (2020), the EU Taxonomy Regulation sets out six environmental objectives:

1) climate change mitigation;
2) climate change adaptation;
3) sustainable use and protection of water and marine resources;
4) transition to a circular economy;
5) pollution prevention and control; and
6) protection and restoration of biodiversity and ecosystems.

Each objective is defined in the Taxonomy Regulation (European Commission, 2020). At the core of the Taxonomy is the definition of a sustainable economic activity based on two criteria. Firstly, economic activity should contribute to at least one of the six environmental objectives listed above. Secondly, it should not significantly harm the other objectives while respecting fundamental human rights and labor standards (European Commission, 2020).

The Taxonomy Regulation outlines fundamental requirements that must be met by a specific economic activity to be considered environmentally sustainable under the Regulation. The

economic activity must meet the following conditions to formally be considered sustainable (or 'Taxonomy aligned') (Canfora et al., 2021; Dai, 2021; European Commission, 2020):

1) Make a substantial contribution to at least one of the six environmental objectives and meet relevant Technical Screening Criteria (TSC)
2) Do no significant harm (DNSH) to the other five environmental objectives and meet relevant TSC
3) Comply with minimum safeguards (MS).

As taken from Dorendorf (2020), the figure below demonstrates the conditions that must be met for an economic activity to be sustainable. To put it shortly, for an economic activity to be qualified as environmentally sustainable and aligned with the Taxonomy, it must make a substantial contribution to one or more of the six environmental objectives, do no significant harm to the other environmental objectives, and comply with MS, all while meeting the TSC (Canfora et al., 2021; Dai, 2021; European Commission, 2020).

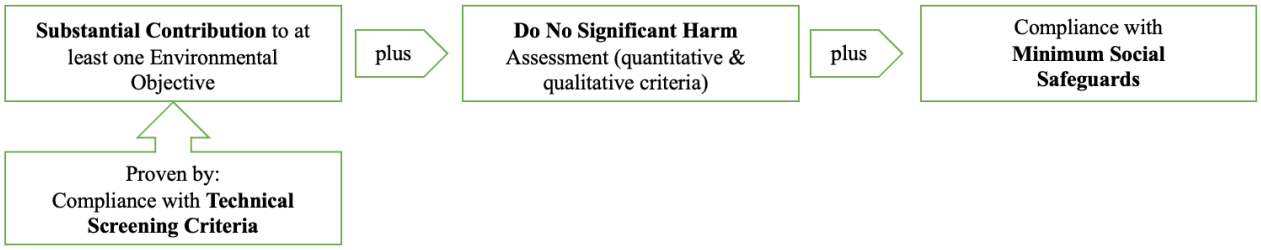


Figure 1. The Conditions for Environmentally Sustainable Economic Activities (Dorendorf, 2020)

2.1.5 Technical Screening Criteria

The EU has thus far created criteria for economic activities that can significantly contribute to climate change mitigation and adaptation, as outlined in the Climate Delegated Act and Complementary Climate Delegated Act (European Commission, 2020; European Commission, 2021c; European Commission, 2022b). To guarantee that an economic activity contributes to one of the environmental objectives without causing considerable harm to the other five objectives, the EU establishes performance criteria, known as Technical Screening Criteria (TSC), in delegated acts. According to the European Commission (2020), the TSC specify the environmental performance requirements for each economic activity that ensure a substantial

contribution to the specific environmental objective without causing significant harm to other environmental goals.

The TSC are divided into ‘Substantial Contribution’ and ‘Do No Significant Harm’. The former ensures that economic activities either positively impact the environment or significantly reduce negative environmental impacts, while the latter ensures that economic activities do not disrupt other environmental objectives (European Commission, 2020). Together, these criteria provide that Taxonomy objectives are coherent and that progress toward one objective does not come at the expense of another (European Commission, 2020).

2.1.6 Substantial Contribution

The term ‘Substantial Contribution’ varies depending on the environmental objective and is defined in the TSC. However, there are three main ways an activity can significantly contribute to an environmental objective, as Canfora et al. (2021) identified: by improving the environment, reducing pressure on the environment, or enabling either of the first two. According to the authors, the first two ways relate to the activity's performance, while the third is about allowing other activities. In other words, if an activity has a positive environmental impact, it leads to an improvement in the environment.

A substantial contribution to climate change mitigation would involve achieving performance levels that align with climate neutrality and limiting the global temperature increase to 1.5 degrees Celsius, as demanded in the Paris Climate Agreement (European Commission, 2020; United Nations, 2015). According to the European Commission (2020), this would include implementing solutions to significantly reduce the most significant climate-related risks related to a specific activity. However, it is essential to remember that while the Taxonomy labels particular activities to be environmentally sustainable, it does not automatically mean that activities are inherently unsustainable should they not do so (European Commission, 2020). The Commission's methodology for the substantial contribution is based on the work of the Technical Expert Group (TEG), whose task is to develop metrics in the context of its works on the Taxonomy which can allow for the improvement of the disclosure of climate-related information (EU Technical Expert Group on Sustainable Finance, 2020).

2.1.7 Do No Significant Harm Criteria

The ‘Do No Significant Harm’ (DNSH) principle is designed to prevent investments and economic activities that would be considered sustainable from harming the environment or society (European Commission, 2020; Sundqvist, 2022). EU regulators were the first to adopt

this principle to avert short-sighted investment strategies and promote investment procedures prioritizing various environmental and social objectives rather than a singular goal (Clifford Chance, 2021). In essence, the DNSH principle's fundamental objective is to guarantee that actions promoting one environmental objective do not harm other objectives (Clifford Chance, 2021). Even if an economic activity constitutes a substantial contribution to an environmental objective, no economic activity will be considered sustainable under the EU Taxonomy if it causes significant harm to any of the other five ecological goals (Clifford Chance, 2021).

Article 3 (b) and (d) of the Taxonomy Regulation set out scientific and target-based DNSH criteria for each economic activity of an entity (European Commission, 2020). To be eligible under DNSH, an economic activity must satisfy the appropriate TSC and significantly contribute to Objective 1, namely the climate change mitigation objective (Dai, 2021; EU Technical Expert Group on Sustainable Finance, 2020). Additionally, the activity must comply with additional DNSH TSC linked to the other five environmental objectives but not Objective 1 (Dai, 2021). The TSC differ based on the kind of economic activity and the environmental objectives it contributes to. Still, to qualify under the Taxonomy, an economic activity must meet all relevant DNSH TSC (Dai, 2021). Complementing the Taxonomy Regulation, the Climate Delegated Act that specifies DNSH TSC for each economic activity, categorized by environmental objectives (Dai, 2021; European Commission, 2022b). According to Dai (2021), an economic activity may not require DNSH TSC for the objective it supports or for all other objectives, which may be due to minimal impact on one or more objectives or because those objectives are irrelevant to the activity.

2.1.8 Minimum Social Safeguards

The ‘Minimum Social Safeguards’ (MS) are part of the EU Taxonomy and are based on recommendations made by the TEG (Platform on Sustainable Finance, 2022a). According to the Final Report on Minimum Safeguards by the Platform on Sustainable Finance (2022a), whose purpose is to facilitate discussions among policymakers with the ultimate goal of increasing the level of private capital in environmentally sustainable investments, MS aim to ensure that companies with environmentally sustainable economic activities aligned with the Taxonomy meet specific minimum governance standards and do not harm any social norms, such as for examples human rights. In practice, this means that Taxonomy-aligned activities are required to align with the official standards for responsible business conduct, as mentioned in (Platform on Sustainable Finance, 2022a):

1) OECD Guidelines for Multinational Enterprises (OECD MNE Guidelines)
2) UN Guiding Principles on Business and Human Rights (UNGPs)
3) International Bill of Human Rights

According to Sunqvist (2022), complying with the MS requirements aligns with the social dimension of the Taxonomy. The conditions apply to all eligible economic pursuits and remain consistent regardless of environmental objectives or economic activities (Dai, 2021; Platform on Sustainable Finance, 2022a).

2.2 EU Taxonomy Reporting

2.2.1 Sustainability Reporting

No business can succeed without its stakeholders' approval as a socially and environmentally responsible entity (da Conceição da Costa Tavares & Portugal Dias, 2018). Due to the growing awareness and concern about the impact of companies and entire industries on the environment and society, reporting information related to an entity's sustainability has become increasingly important. Different stakeholders, such as customers, investors, and employees, have increasingly become interested in the environmental performance of companies and have demanded greater transparency regarding the sustainability of entities' economic and social activities (da Conceição da Costa Tavares & Portugal Dias, 2018).

Sustainability reporting (SR) goes beyond the more traditional financial profit-determining measures such as profits or return on investment and provides additional information on an organization's environmental, social, and economic performance and therefore allows stakeholders to make more informed decisions about their engagement with a specific company (da Conceição da Costa Tavares & Portugal Dias, 2018; Slaper & Hall, 2011). Moreover, from the company perspective, SR can help identify current challenges and opportunities for improvement, enhancement of the company's reputation, and attractiveness for investors. Overall, SR has become a tool for transparency about a business's environmental and social performance (Lakhani & Herbert, 2022; Slaper & Hall, 2011).

2.2.2 Obligations of EU Taxonomy Reporting

The Taxonomy serves as a classification framework for companies to determine the eco-friendly nature of their economic activities or investments. It outlines the criteria that qualify an activity as environmentally sustainable, requiring a noteworthy contribution towards at least one of the EU's environmental objectives without causing significant harm to any of these objectives and with adherence to MS (European Commission, 2020).

The Regulation imposes nonfinancial reporting obligations on certain entities, which will be outlined below (European Commission, 2020). The reporting requirements for the two climate change objectives, namely climate change mitigation and adaptation, have been in effect since January 1, 2022. The requirements for the other four environmental objectives have only come into play from January 1, 2023, and the reporting will cover the financial year preceding it. Implementing the Taxonomy significantly improves mandatory sustainability reporting within the European Union, as it directs funding toward undoubtedly eco-friendly activities (Pettingale, de Maupeou & Reilly, 2022).

The Taxonomy mandates entities to disclose information about the level of alignment of their activities with the Taxonomy (European Commission, 2021b). More precisely, it requires companies to disclose the proportion of their eligible activities or align with the Taxonomy's six environmental objectives (European Commission, 2020). So-called ‘eligible activities’ may not be sustainable but contribute to an objective, while ‘aligned activities’ must be both eligible and sustainable (EY, 2023). The regulation requires reporting the share of Taxonomy-aligned activities contributing to turnover, capital expenditures, and operating expenditures for nonfinancial operations and the disclosure of how and to what extent an operation's activity is Taxonomy-aligned for financial operations (EY, 2023). In addition to fulfilling the reporting obligation, these disclosures generate strategic inquiries regarding the long-term viability of a company's business model as they increase pressure to improve sustainability performance (EY, 2023).

2.2.3 Users of EU Taxonomy Reporting

Article 8 of the EU Taxonomy imposes additional nonfinancial reporting obligations on certain entities (European Commission, 2020). Financial market participants and large and listed SME businesses must comply with Taxonomy reporting requirements, contingent on the results of EU political negotiations regarding the CSRD (European Commission, 2020; Pettingale, de Maupeou, Reilly, 2022). Companies subject to the CSRD must include information in their annual reports regarding the degree to which their activities align with the Taxonomy (Taxonomy-eligibility) and adhere to the criteria established in the Taxonomy delegated acts (Taxonomy-alignment). Meanwhile, other companies outside the purview of the CSRD can opt to disclose such information to access sustainable financing voluntarily or for other business-related reasons (European Commission, 2020).

According to the EU Technical Expert Group on Sustainable Finance (2020), the Taxonomy sets out three significant groups of Taxonomy users:

1) Participants of financial markets that offer financial products in the EU (including occupational pension providers)
2) Large companies required to publish a nonfinancial statement under the NFRD/CSRD
3) The European Union and member states, when setting public measures, standards, or labels for green financial products or green (corporate) bonds.

This report will focus on the second group, namely large companies in the energy supply sector. However, it is essential to note that the Taxonomy has many applications beyond these.

According to the TEG's final report on the Taxonomy (2020), the Taxonomy introduces a new disclosure requirement for companies already obligated to provide a nonfinancial statement under the NFRD. While the implementation might vary at the national level, the NFRD covers large public companies with an average of more than 500 employees, which includes both publicly listed companies and banks as well as insurance companies (Dorendorf, 2020; EU Technical Expert Group on Sustainable Finance, 2020; Simmons & Simmons, 2022). Furthermore, a large public interest entity subject to the NFRD should have a balance sheet of more than 20 million euros or a net turnover of more than 40 million euros yearly (EU Technical Expert Group on Sustainable Finance, 2020). All companies under this requirement must describe their activities associated with Taxonomy-aligned activities. This includes disclosing the proportion of turnover, CapEx, and OpEx aligned with the Taxonomy for nonfinancial companies. The information should be included as part of the nonfinancial statement, which may be located in annual reporting or a separate sustainability report (EU Technical Expert Group on Sustainable Finance, 2020).

2.2.4 EU Taxonomy Reporting Requirements for Companies

The Taxonomy Regulation requires companies to provide disclosures at the company level (EU Technical Expert Group on Sustainable Finance, 2020). Because companies can be involved in various economic activities, they must disclose in their nonfinancial statements how they are associated with environmentally sustainable economic activities (EU Technical Expert Group on Sustainable Finance, 2020). The Taxonomy outlines specific climate-related key performance indicators (KPIs) that large nonfinancial companies should report on. These KPIs include the percentage of a company's turnover, capital expenditure, and operating expenditure related to environmentally sustainable economic activities (EU Technical Expert Group on Sustainable Finance, 2020). When used with the Taxonomy's TSC, the term 'Taxonomy-aligned' refers to economic activities that meet the necessary standards (EU Technical Expert Group on Sustainable Finance, 2020; Simmons & Simmons, 2022). The term 'Taxonomy-non-eligible' classifies economic activities not covered by the Taxonomy. Disclosure of non-eligible activities is required when there are no Taxonomy-aligned activities. By using Taxonomy-aligned

turnover, companies can determine their compliance with the Taxonomy's standards, while CapEx provides insight into future adherence (Sundqvist, 2022).

As Dorendorf (2020) puts it, the companies mandated to report on aligning their business activities according to the Taxonomy must produce a high level of transparency. Additionally, a disclosure statement that a financial product or economic activity is not fully sustainable or does not have sustainable objectives must be included, even if it does not claim to have such characteristics.

2.3 The EU Energy Supply Sector

To understand the significance of the energy supply sector in the EU, it is helpful to look at the historical importance of this sector for Europe's economic growth. Kander, Malanima, and Warde (2014) analyze the relationship between energy and economic growth in Europe. According to the authors, energy as a factor in economic growth is more important than commonly believed among economists. They argue that the transition towards fossil fuels during the period of Industrialization was a necessary condition that enabled modern economic growth in Europe (pp. 366-368). The authors highlight global citizens' challenges regarding energy today and argue that using technologies like renewable energy sources, nuclear power, and gas has raised concerns due to their cost, associated risks, and negative environmental impact. The combustion of fossil fuels, particularly coal, drives global warming and poses a significant risk to climate stability, especially in poorer regions. As demonstrated by the Paris Climate Agreement, the transition to cleaner energy sources requires urgent action, but the nature and scale of this transition are contentious issues that raise ethical questions about responsibility and cost distribution (Kander, Malanima & Warde, 2014; United Nations, 2015).

By adopting the European Green Deal and the Taxonomy, the EU is dedicated to transforming its economy to be more sustainable, efficient, and competitive (European Commission, 2018). Achieving this involves implementing various economic reforms such as decarbonizing the energy system, transitioning to a circular economy, and reversing the decline in ecosystems and biodiversity. According to the International Renewable Energy Agency and the European Commission (2018), the EU has been a global leader in deploying renewable energy for over 20 years by setting long- and short-term targets and implementing supportive policies. Even though this resulted in considerable growth in the consumption of renewable energy across the region, from a share of 9% in 2005 to over 21% in 2021, most of the energy consumed still comes from fossil fuels, whose combustion releases air pollutants and contributes to climate change through GHG emissions (European Commission, 2018; European Environment Agency, 2023).

When ranking the major economic sectors of the EU by GHG emissions, the sectors responsible for the highest emissions were the manufacturing sector with 23%, followed by electricity and gas supply with 21% (Eurostat, 2022). This demonstrates the significant threat that the energy sector can pose to the climate, but, at the same time, it shows the immense impact that positive changes toward more sustainable practices can have on the EU. Achieving the ambitious climate and energy targets of the EU to increase the proportion of renewable energy sources in the overall energy mix and conserve energy through efficiency improvements could, therefore, significantly reduce GHG emissions and their impacts. Similarly, the EU has been heavily reliant on imported energy. Russia's invasion of Ukraine highlighted the dependence on fossil fuel imports and price fluctuations, which resulted in sharply increasing energy prices and energy insecurity in the EU (European Environment Agency, 2023). The vast amount of GHG emissions and the ongoing energy crisis have amplified the call for an accelerated energy transition. To address these concerns, conserving energy and transitioning rapidly toward more reliable and affordable renewable energy sources is crucial. In short, as Careri, Efthimiadis, and Masera (2022, p. 6) put it, "[e]nergy infrastructure development is a key element for the fulfillment of EU energy policy objectives in a multifaceted perspective."

3. Theoretical Framework

3.1 Policy Implementation Theory

Despite its intended outcome, a new law, policy, or regulation, such as the EU Taxonomy, will only be effective if implemented correctly. It is, therefore, imperative to ensure effective policy implementation and comprehend its nature, given that policies may not be executed precisely as intended (Mthethwa, 2012; Seraw & Lu, 2020).

Policies outline a series of objectives and actions. As policies confront the practical challenges of implementation, they are frequently redefined and interpreted during implementation (OECD, 2000). Still, their implementation is often non-linear and subject to change over time due to various factors, some of which are beyond the control of the policymakers (Mthethwa, 2012; OECD, 2000). According to Seraw and Lu (2020), policy implementation is viewed as one of the most challenging stages of public policy, with a gap between what is to be implemented and what is implemented. Because the implementation of policies is characterized by complexity, political sensitivity, and various barriers obstructing the process, it is often neglected by scholars and policymakers (Seraw & Lu, 2020).

Ultimately, the success or failure of a policy depends on various factors, including political support, sufficient resources, stakeholder analysis, strategic implementation planning, effective

organizational and accountability systems, and critical capacity (Cerna, 2013; Seraw & Lu, 2020). For example, political factors include slow approval processes and insufficient political backing. In contrast, analytical competence and operational capacity have characteristics such as poor policy feasibility and weak management structure, respectively (Seraw & Lu, 2020). In short, as Seraw and Lu (2020, p. 113) put it, "[t]he secret of policy success or its opposite side lies in all of these factors: their presence or absence determines policy success or failure." They further explain that while attempts have been made to develop theories to understand policy implementation better, it has generally been agreed that the process needs to be more complex to be accounted for by a single approach. Regarding this, Cerna (2013) explains how policy change and implementation can be described and reviews various methods in the growing literature on policy implementation. According to Cerna (2013, p. 23), the following variables are critical for the effective implementation of a policy: policy standards and objectives; policy resources; characteristics of the implementing agency; economic, social as well as political factors and, finally, the disposition of the implementer.

In this thesis, the idea of policy implementation will be applied to understand the experiences of the energy sector with implementing the Taxonomy. To investigate a potential gap between what is to be implemented according to the Regulation and what is implemented in practice, this study will examine the experiences of a particular company within the energy supply sector, namely EnBW. As argued above, the company represents the industry due to its size and a significant share of renewables. It also has a similar composition of the total energy mix compared to the other two largest suppliers, as shown in Table 1 in section 5.1.2.

4. Methodology

4.1 Research Design

The EU Taxonomy is designed to help businesses identify and measure their environmental sustainability and covers various industries, including the energy supply sector. This project aims to contribute to understanding how the Taxonomy influences the regulatory environment for energy supply companies in the EU and how energy supply companies have responded to the regulatory changes brought about by the Regulation. To answer the research question, this thesis uses an exploratory method to conduct a qualitative case study of the German energy supplier EnBW.

A qualitative case study approach offers a promising in-depth method to investigate this topic as it can facilitate the exploration of more complex and nuanced phenomena that can not be easily quantified, namely the experience and challenges of an energy supply company regarding

adapting to regulatory changes brought about by the Taxonomy (Creswell, 2013). According to Rashid, Rashid, Warraich, Sabir, and Waseem (2019), a case study research approach investigates a phenomenon within a specific context using diverse sources of data and different perspectives to explore its multiple aspects. As they put it, such an approach examines a real-life phenomenon, providing a detailed understanding of a specific case by exploring the complexity within its context. According to Crowe, Cresswell, Robertson, Huby, Avery, and Sheikh (2011), case studies can be beneficial for understanding the causal connections and pathways arising from new policy initiatives, which is why this method has been selected for this thesis. It can provide insights into the implications of the Taxonomy for this specific sector and allows for a deeper understanding of the delivery gaps for implementing the new regulations (Crowe et al., 2011). Hence, this thesis investigates the specific case of the energy supplier EnBW and its response to the regulatory changes brought about by the Taxonomy. As mentioned in Chapter 1, this company is considered representative of the energy supply industry due to its significant size, energy mix composition, a large share of renewables, and compliance with the Taxonomy. By conducting an in-depth analysis of the information published by EnBW, the case study aims to gain insights into the company's experience and implementation strategies. Through this, this research will identify categories where the implementation of the Taxonomy has been complicated or unclear from which recommendations for policymakers can be derived.

The case study uses information from company reports to examine how the Taxonomy impacts the energy supply industry's regulatory environment, the energy supplier EnBW's measures to adapt to these alterations, and what issues they encountered implementing the new requirements. In short, this research approach contributes to a comprehensive understanding of the implications of the Taxonomy within the energy supply sector. The sources used for this thesis and how they will be used and analyzed to understand the implications of the Taxonomy on the energy sector are outlined in the section below.

4.2 Primary and Secondary Sources

In the literature review, the context of the EU Taxonomy and what specific new regulatory changes it entails regarding company reporting requirements have been described in detail. The most critical aspects of the Taxonomy Regulation were taken from its two main primary legislative sources, namely the ‘Regulation EU 2020/852’ on the establishment of a framework to facilitate sustainable investment as well as the ‘Taxonomy Regulation Delegated Act 2021’ (European Commission, 2020; European Commission, 2021a). In the final part of the literature review, the energy sector's significance for improving sustainability efforts in the EU was outlined using information from the European Commission and European Environment Agency. Given the vast amount of legislative publications on the Taxonomy, the implications of the

Taxonomy on the energy supply sector will be analyzed using primary legislative publications by the European Commission and the TEG.

The main objective of this paper is to analyze and understand the experience that a company in the energy supply industry has had with implementing the Taxonomy. More specifically, this study examines the case of EnBW using the two publications on the Taxonomy published by EnBW in 2021 and 2022. To understand the significance of the Taxonomy on this specific sector, the EnBW case study will explain the effects of the regulatory changes on energy companies and how they have incorporated the classification system into their business practices and annual reporting. Ultimately, using information from the Taxonomy publications will allow a deeper understanding of the implementation challenges. Despite the legal requirements of the Taxonomy that started in 2022, EnBW implemented it into its business portfolio a year earlier in 2021, ahead of the obligation (EnBW, 2021). Therefore, the company's publications on the Taxonomy can, first and foremost, be seen as a way to show that EnBW has been a frontrunner in implementing the Regulation. However, while these publications communicate to customers, stakeholders, and peers, EnBW also intends to inform the general public and policymakers about their difficulties with the Taxonomy. Overall, EnBW's communications reveal their experiences with the Regulation, both positive and negative.

Finally, the policy implementation theory will be applied to analyze the energy supply company's encounters with implementing the Taxonomy. Ultimately, this study will focus on the experiences of EnBW to demonstrate the disconnect between the Regulation's intended implementation and the actual implementation in practice. These experiences will be put in context with the official legislative information published by the European Commission and the TEG, as described in the literature review of this study. Consequently, the results will be used to argue for a mismatch between the intended and actual implementation of the Taxonomy.

5. Analysis

The analysis section of this thesis consists of two parts. Firstly, it explores the significance of the energy supply sector in Europe and introduces the company profile of EnBW. The second part deals with the experiences that companies have had with reporting according to the EU Taxonomy. Here, the focus is on the energy supplier EnBW and its problems with implementing the new regulatory requirements.

5.1 The Energy Supply Sector

The energy supply sector is an essential industry within the EU due to its substantial size and significant GHG emissions. Given its pivotal role and environmental impact, the sector becomes critical in pursuing sustainability objectives.

5.1.1 Implications of the EU Taxonomy on the Energy Supply Sector

The new regulations and reporting requirements of the EU Taxonomy also apply to the energy supply sector. According to Dorendorf (2020), the initial TSC were developed for seven industries, including the energy sector.

To comply with the Taxonomy, energy suppliers must thoroughly assess their business activities and sustainability goals as part of their strategy, with financial institutions reporting their eligibility and alignment information (Syrjälä, 2022). The Regulation includes economic activities that are already low carbon and those that contribute to a transition to zero net emissions by 2050. High-emitting activities commonly occurring in the energy sector can also be considered, but only if they contribute to achieving net carbon neutrality by 2050 or are top performers under the EU Emissions Trading System benchmark (de Oliveira Neves, 2022). According to de Oliveira Neves (2022), this will be particularly demanding for the energy industry since traditional economic activities per se will not be eligible, and initiatives aligned with climate change mitigation, such as carbon capture, must be implemented to achieve eligibility. Furthermore, to avoid higher capital costs for those unable to align with the Taxonomy, energy companies are expected to create roadmaps toward sustainability and analyze their environmental impacts (Syrjälä, 2022).

Kubín, Králík, and Vašíček (2022) analyze the implications of the Taxonomy for the energy sector in the context of the adequacy of resources and find that, according to the current set of

conditions for new resources resulting from the new regulations, there is a risk that in the medium term, there will be no new resources, technologies, and fuels available in European countries on the threshold of the energy transition, which may compromise energy security. This shows that the Taxonomy can significantly impact the future development of the European energy sector in the context of the energy mix. Overall, there is a consensus that powerful dedication to improving the sustainability of economic activities is required from companies operating in the energy industry (Kubín et al., 2022; Syrjälä, 2022).

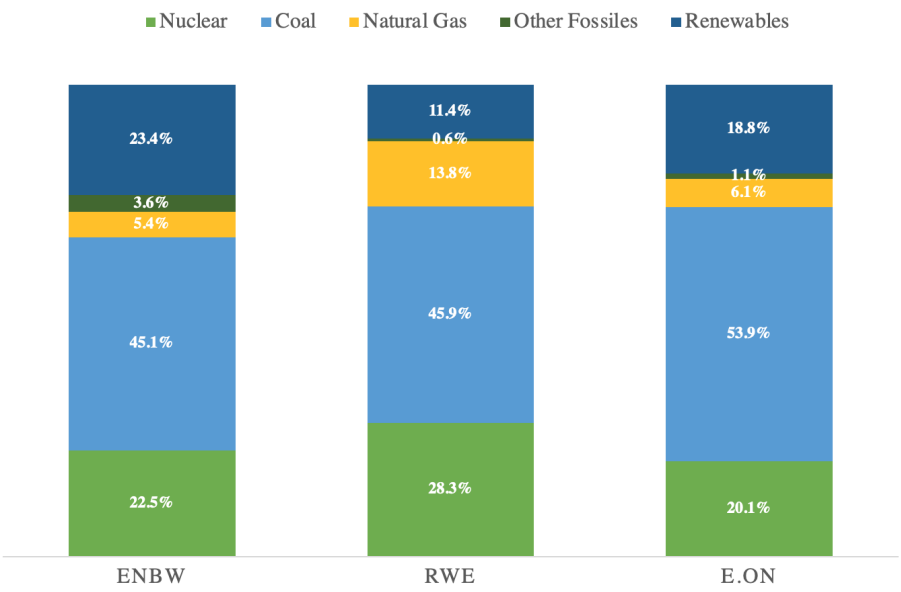
5.1.2 EnBW Company Profile

Energie Baden-Württemberg AG, or EnBW, is a publicly-traded energy company headquartered in Karlsruhe in southwestern Germany. Together with the energy suppliers RWE and E.ON, it belongs to the most significant primary energy suppliers in Germany, with over 21,000 employees and about 5.5 million customers, to whom it provides electricity, gas, water, energy solutions, and industry services (EnBW, 2019; Statista, 2023).

The table below compares the total energy source mix of the three energy suppliers in 2021, the year that the Taxonomy regulations were first issued by the European Commission (EnBW, 2023a; E.ON, 2022; RWE Group, 2021). The energy landscape of all three companies is predominantly dominated by traditional sources, namely coal and nuclear, accounting for the most significant portion of the energy mix, while renewable energy sources follow suit. Comparatively, natural gas and other fossil fuels hold a considerably smaller amount across the three companies. The table also reveals a similar composition of EnBW's overall energy mix compared to the other two suppliers, implying that EnBW can be reasonably regarded as a representative player within the industry. Consequently, EnBW is a suitable candidate for a case study examining the application of the Taxonomy in the energy sector.

The EnBW business portfolio is split into three segments: intelligent customer infrastructure, critical infrastructure for the transmission and distribution of electricity and gas, and sustainable generation infrastructure (EnBW, 2023b). According to the 2022 Annual Report, EnBW (2023b) aims to transform from an energy supply company to a sustainable and innovative infrastructure partner, with sustainability as a guiding principle for its business model. Also, the table demonstrates that, although coal and nuclear energy remain predominant across all three companies, EnBW exhibits the highest proportion of renewable energy at 23.4%, aligning with its commitment to sustainability and making it the most renewable compared to the other two suppliers. Furthermore, EnBW (2019) plans to invest over five billion euros by 2025 in expanding renewable energies and exploring selective internationalization to complement its primary market in Germany.

Table 1. Comparison of the Total Energy Source Mix of 2021 (EnBW, 2023a; E.ON, 2022; RWE Group, 2021)



5.2 EU Taxonomy Reporting Experiences

The subsequent section delves into the experiences of companies in adhering to the reporting obligations set by the EU Taxonomy. Specifically, it focuses on the case of EnBW and examines the challenges encountered while implementing the regulatory requirements. The company Taxonomy reports are introduced, followed by an analysis of implementing the Taxonomy. The analysis focuses on three major categories: the classification of transitional economic activities, interpretation issues, and time constraints.

5.2.1 General Experiences

To support companies in the transition to sustainable reporting, the EU Commission adopted a phased-in approach to enable nonfinancial undertakings to prepare for the fiscal year 2022 reporting cycle (European Commission, 2021b). The Taxonomy was officially adopted in July 2020 and mandated companies to disclose the percentage of their aligned or eligible operations with the Taxonomy. Companies are therefore required to report a portion of qualitative and quantitative information and only the eligible, rather than aligned, amount of economic activities (EY, 2023).

In 2022, the first year of reporting, the Taxonomy had established TSC for 70 activities related to the first climate objective, namely climate change mitigation, and 68 activities associated with the second objective, namely climate change adaptation (European Commission, 2020; Pettingale, de Maupeou & Reilly, 2022). That year, the reporting requirements only applied to the first two environmental objectives. The remaining four objectives, as have been outlined above, had their TSC developed at the end of 2022, with official reporting starting in 2023. As of 2022, the Taxonomy covered only 13 sectors and was missing some industries with significant impact on the European economy, such as, for example, the agricultural sector (Pettingale, de Maupeou & Reilly, 2022).

The initial implementation of the Taxonomy presented enormous hurdles for many businesses that must submit reports (Deloitte, 2023; EY, 2023). Considering the limited coverage of the Taxonomy until that point in time, some companies and organizations found that few to none of their economic activities qualified under the Taxonomy, even if these have demonstrated their sustainability or might only have a minor impact on the environment (Pettingale, de Maupeou & Reilly, 2022). The problem with this is, according to Pettingale, de Maupeou, and Reilly (2022) and Deloitte (2023), that organizations have a limited incentive to shift towards more sustainable business activities if the Taxonomy does not yet cover their activities. Moreover, if the Taxonomy does not have a broad reach throughout the EU economy, it is unlikely that investors will take an extensive interest beyond the obligatory reporting obligations (Pettingale, de Maupeou & Reilly, 2022).

Additionally, the short period provided for the first-time application of the extended regulations left companies with little time to develop a solid understanding of the concepts of the Taxonomy. In practical application, numerous questions of application and interpretation of undefined terms and circumstances have arisen, including applying the DNSH criteria and TSC (EY, 2023). In cases where no TSC were established, companies were advised by the European Commission to use their metrics and measurements and clarify their relation to the Taxonomy (Platform on Sustainable Finance, 2022b). Nevertheless, such economic activities would not be regarded as aligned with the Taxonomy, which is paradoxical considering the goals of the regulation (Pettingale, de Maupeou & Reilly, 2022).

According to EY (2023), companies faced challenges complying with the regulation after the first reporting year, including a short time frame and lack of suitable processes, difficulty in sourcing information, and room for interpretation. Even though they consider the initial year a good step toward transitioning to cleaner energy, EY highlights the complexity of reporting and achieving sustainable impact.

5.2.2 EnBW EU Taxonomy Reports

With the adoption of the European Green Deal and the EU Taxonomy, sustainable finance, sustainable economic activities, and the work of the TEG have been becoming more important (Deloitte, 2023). EnBW's 2025 strategy and commitment to climate neutrality align with the EU's goal to achieve net-zero GHG emissions by 2050 (Deloitte, 2023). According to Deloitte (2023), it aligns with EnBW's self-image to advocate transparent, integrated, and efficient reporting. It is important to note that, even though the application of the Taxonomy has only been legally required since 2022, EnBW decided to already implement it into its business portfolio for the 2021 fiscal year and, therefore, well before the legal obligation commenced (EnBW, 2021). Following the initial implementation, EnBW published two reports revealing their experience with the Taxonomy (EnBW, 2021; EnBW, 2022). EnBW's full compliance with the enacted Taxonomy regulations has been verified by a legal audit of their annual report. Given this, it is reasonable to consider EnBW's reports as reliable sources of information for this thesis.

The first report on the EU Sustainable Finance Taxonomy aimed to classify the requirements of the Taxonomy in the context of the further development of financial and sustainability reporting from the perspective of a reporting company (Deloitte, 2023; EnBW, 2021). Here, the focus is on the early application of the requirements of the Taxonomy and their interpretation for the preparation of disclosures of environmentally sustainable revenues, CapEx, and OpEx (Deloitte, 2023). EnBW (2021) explains how they have dealt with the practical implementation of the Taxonomy, outlines significant findings from the first-time Taxonomy reporting, and draws on a series of recommendations for finalizing it.

In 2022, EnBW published another Taxonomy report, showcasing how the EnBW business portfolio conforms to the Taxonomy and how this information was included in the Integrated Annual Report for 2021 (Deloitte, 2023; EnBW, 2022). The company reports on the EnBW approach to the Taxonomy, their interpretation issues since the initial implementation, and their general, mainly internal, experiences implementing the Taxonomy requirements (EnBW, 2022).

5.2.3 Implementation Problems

The new reporting requirements, according to the Taxonomy, are linking nonfinancial and financial information for the first time, which is a significant development for companies regardless of the industry they are in, as it makes it essential to showcase the commitment to a sustainable business agenda to both the users of the annual report and their stakeholders and peers. In other words, reports compliant with the Taxonomy reporting requirements allow for comparing sustainable activities between companies.

In the reports on the Taxonomy, EnBW shares essential insights into the experience of implementing the regulatory framework (ENBW, 2021; EnBW, 2022). As mentioned in the broader context of experiences with the Taxonomy, companies encountered various challenges with the Regulation, especially during the initial implementation phase. The overall experience and problems faced during this period can be subdivided into three main categories: the classification of transitional economic activities, interpretation issues, and time constraints, which will be discussed below.

5.2.3.1 Classification of Transitional Activities

EnBW (2021) faced a significant challenge during the first reporting year in 2020: certain business activities were not yet fully covered in detail by the Delegated Act, making it difficult to classify them for Taxonomy alignment. Similarly, in the consequent year, the company continued to criticize that numerous economic activities were still not covered by the most current version of the Regulation (EnBW, 2022).

EnBW (2022) explains that the methods for classifying so-called 'transitional activities' in the energy sector are not sufficiently detailed. They explain that there was an ongoing discussion and uncertainty about the classification of specific business activities, such as activities related to gas and nuclear energy (EnBW, 2022). According to the Complementary Climate Delegated Act published by the European Commission (2022), transitional activities are the activities of a business for which there are no either technologically or economically feasible alternatives that are low in carbon, but that still support the transition toward a climate-neutral economy according to the goals set by the Paris Climate Agreement and the European Green Deal. The European Commission (2022, p. 2) explains that "[r]enewables will play a fundamental role in meeting the climate and environmental goals of the Union" and that "[i]n that light, investments in renewables need to scale up to meet the needs of the energy market of the Union for more renewable and clean energy." To help facilitate the transition to renewable energy sources, the European Commission (2022b) has classified natural gas and nuclear energy as transitional activities. However, for these activities to be classified as sustainable, the Complementary Delegated Act lists specific criteria that must be fulfilled (European Commission, 2022b).

For natural gas, these criteria include the replacement of existing coal plants, a national coal phaseout plan, using low-carbon gasses, reducing emissions, and complying with direct emissions thresholds, which, ultimately, can make it more difficult for the majority of the natural gas activities to be qualified to be a green source of energy (European Commission, 2022b). Regarding nuclear, business activities related to nuclear energy are considered low-carbon. The Commission (2022) has therefore declared that these activities should be qualified under Article 10 (2) of Regulation (EU) 2020/852 of the Taxonomy, which states that these economic activities can be considered to be substantially contributing to climate change mitigation, the first

environmental objective outlined in the initial version of the Taxonomy in 2020. Additionally, the Final Report on the Taxonomy from the TEG (2020) also stated that nuclear energy, if complying with the corresponding TSC, should be considered sustainable business activities according to the Taxonomy. Besides the low-carbon argument, the European Commission (2022b) explained their decision to be valid as numerous EU member states are including nuclear energy in their plans to meet sustainability targets. Moreover, nuclear power can also be considered to support the employment and phasing of renewable energy sources (European Commission, 2022).

Despite agreeing with the general concerns that this decision may lead to increased use of and investment in fossil fuels and nuclear energy, two energy sources previously condemned to be unsustainable, EnBW (2021) outlines another issue they faced implementing the new requirements. According to them, there was a lack of clarity in calculating transitional activities in the energy sector. As mentioned above, a transitional activity is an economic activity lacking a viable low-carbon alternative, both economically and technologically, while contributing to the transition toward a climate-neutral economy. While the Climate Delegated Act outlines detailed descriptions of the respective business activity as well as clearly defined TSC and DNSH criteria, it remains unclear how exactly the step from the initial identification of Taxonomy-eligible activities and assessment of their alignment with the Regulation using the criteria (i.e., Substantial Contribution, TSC, DNSH, and MS) to the final share of Taxonomy-relevant economic activities into financial KPIs is supposed to work in practice.

5.2.3.2 Interpretation Issues

EnBW's Taxonomy reporting for the 2020 financial year was based on the Taxonomy Regulation and TSC in the draft delegated act for the first environmental objective (i.e., climate change mitigation) (EnBW, 2021). With the publication of the Final Delegated Act and associated TSC for the first two environmental objectives in 2021, the application of the new regulations was expanded in the reporting period of the 2021 financial year (EnBW, 2022).

Generally, it is argued that the meaning and language used in these delegated acts are not entirely clear and may require additional interpretation aids, which have only been partially published by the EU Commission, leaving some uncertainty regarding their interpretation (EnBW, 2022, p. 9). According to EnBW (2022), they faced interpretation issues, making it difficult to understand the requirements and implement them to comply with the Regulation fully. They argue that, in some instances, there are discrepancies in interpreting the guidelines for calculating KPIs, as provided by the European Commission and the TEG. In their opinion, some KPIs do not effectively achieve the Taxonomy's goal of directing capital toward more sustainable investments. An example of concern is the CapEx KPI, which involves non-monetary components, such as

provisions for decommissioning liabilities and the integration of right-of-use assets from leases, following the International Financial Reporting Standards (EnBW, 2022, p. 4).

Closely related to what has been discussed in the section on transitional activities above, the information on natural gas and nuclear energy has been challenging to understand and interpret for each specific economic activity, making it difficult to implement the required changes fully (EnBW, 2022). As mentioned above, the European Commission's most recent TSC for natural gas and nuclear energy in the complementary Delegated Act has generally accepted these forms of energy generation as potential transition technologies. However, the criteria for compliance are stringent and can be interpreted differently (EnBW, 2022). As a result, it is currently unclear whether the large number of power plants required for the transition to more renewable energy sources in Germany will meet the criteria in the future, especially for natural gas (EnBW, 2022).

5.2.3.3 Timeline Issues

The limited time allocated for the initial implementation of the Taxonomy resulted in companies having insufficient time to comprehend the new regulatory requirements. According to EnBW (2021), properly implementing the Taxonomy required sufficient time and the involvement of experts beyond the Sustainability department, particularly the department responsible for internal financial recording. The company writes that the initial implementation of the Taxonomy required significant effort to raise awareness among business areas, collect data, verify, and compile financial KPIs. Furthermore, they consider the commitment from the Board of Management and operational integration into functional and business units necessary for successful implementation (EnBW, 2021; EnBW, 2022).

Considerable effort was required to ensure that each business area fully understood the new reporting requirements, collecting relevant data for calculating KPIs and providing verifications and meaningful documentation as evidence of economic sustainability (EnBW, 2022). After the second year of reporting according to the Taxonomy, EnBW (2022) explains that, besides already having some experience with the requirement, it was still necessary to provide a thorough explanation of the precise purpose of the Taxonomy and its implications for the energy sector at the company level to numerous individuals involved in the discussions and decision-making process. According to the company, this included internal colleagues in the specialized departments of the EnBW Group and external stakeholders (EnBW, 2021; EnBW, 2022).

As this thesis has shown, there is a vast amount of legislative publications, additional information, and particular industry-specific publications on the Taxonomy. Besides attaining a basic understanding of the meaning behind the Taxonomy, the enormous amount of information can make it very difficult to understand what is required of companies which will, ultimately, affect the ability of a company to comply with the Taxonomy. As EnBW (2022) points out, it has

been an ongoing and significant challenge for companies operating in the real economy to stay updated and implement the extensive array of relevant legislation and initiatives related to sustainable finance, including those published by the EU Commission in the past three years.

5.2.4 Key Findings

Despite the phased-in approach of the Taxonomy, which aimed to allow companies more time to prepare for the full implementation, this analysis has shown numerous hurdles to its implementation. The broad experiences outlined above show that companies had problems identifying the Taxonomy-qualified economic activities and had little time to understand the requirements well. Furthermore, questions have arisen about applying the different criteria and how the level of alignment can be derived and calculated.

The case of EnBW shows that they faced similar challenges, and the main problems during the initial implementation can be categorized into three groups: transitional activities, interpretation, and time constraints. EnBW faced difficulties aligning certain business activities with the Taxonomy due to unclear criteria, especially in the case of natural gas and nuclear energy. The company also encountered issues understanding and implementing the requirements, such as KPI calculations. Furthermore, limited time for implementation, as well as the need for expert knowledge, were identified as crucial factors. Staying updated with the extensive legislative and industry-specific information further posed challenges in complying with the Taxonomy, which ties in with a previous argument, namely that the vast amount of available information can be challenging to process and understand.

5.3 Policy Implementation Theory and the EU Taxonomy

Successfully implementing a regulation like the EU Taxonomy is crucial for its intended outcome. The goal of the Regulation is the creation of a classification system helping both companies and investors to understand the sustainability of economic activities of corporations and firms to make more sustainable investments and business decisions (European Commission, 2020). However, as discussed by various authors, policy implementation is complex and often faces challenges, resulting in a gap between the intended and actual execution (Mthethwa, 2012; Seraw, Lu, 2020; Cerna, 2013). The analysis of the Taxonomy's background, how companies have responded to it, and the implementation experience of a specific firm in the energy sector shows that such a gap exists.

Implementing a policy or regulation, such as the Taxonomy, is determined by political support, resources, stakeholder analysis, planning, accountability, and capacity. Mthethwa (2012) outlines different dimensions of policy implementation, of which a few are relevant to understand the identified and analyzed issues faced by the energy supplier EnBW concerning the intended implementation of the Taxonomy.

Firstly, policy formulation is a potential reason for unsuccessful implementation and non-compliance. According to the OECD (2000), a reason for non-compliance with a policy is related to the degree to which the target group, namely the users of the Taxonomy as outlined above, knows of and comprehends the rules. This relates to Mthethwa's (2012) argument that, for a policy to support its intended outcome, its content, objectives, goals, and strategies should be clearly and appropriately formulated. Similarly, Seraw and Lu (2020) consider analytical competence, namely unclear objectives, structure, and inconsistent feasibility, as barriers to policy implementation. In the case of the Taxonomy, it has been analyzed that EnBW faced challenges in classifying certain business activities for Taxonomy alignment due to limited detail in the Delegated Act. While the European Commission classified natural gas and nuclear energy as transitional activities which can be categorized to be environmentally sustainable according to the Taxonomy and, therefore, Taxonomy aligned if they comply with certain conditions, EnBW reported that there was a lack of clarity in calculating transitional activities in the energy sector, particularly in translating them into financial KPIs. More precisely, economic activities related to gas and nuclear energy caused ongoing uncertainty.

Even if certain activities are currently not covered by the Taxonomy due to the entire sector lacking coverage or the absence of formulated TSC by the European Commission and the TEG, they might still substantially contribute to one or more of the six environmental objectives. Paradoxically, despite their substantial contributions, these economic activities would not be considered aligned with the Taxonomy, contradicting the objectives of the Regulation. Furthermore, in cases where specific TSCs have not yet been established, companies were advised by the European Commission to utilize their metrics and measurements to determine their relationship with the Taxonomy, leading to confusion.

The presence of a solid strategic timeline, work plans, and operational directives is often the missing link between policy formulation and actual implementation (Mthethwa, 2012; Seraw, Lu, 2020). Therefore, according to the policy implementation theory, the second relevant dimension to explain the gap between the intended and actual implementation of the Taxonomy can be the planning and mobilizing of resources (Mthethwa, 2012). According to Mthethwa (2012), the factors to consider for facilitating policy implementation include, for example, the presence of an implementation plan, the requirement for organizations to acquire new skills and training, the assurance of funding for new initiatives, and the reliability of resource flow. As described in the previous analysis, the abundance of legislative publications and industry-specific information related to the Taxonomy posed difficulties, impacting companies' compliance.

Staying updated and implementing sustainable finance initiatives remained a significant challenge for companies in the real economy. Additionally, the limited implementation time frame for implementing the Taxonomy led to challenges in understanding regulatory requirements. The experience of EnBW showed that comprehending the purpose and implications of the Taxonomy among stakeholders is an ongoing effort. The company emphasized the need for sufficient time, the involvement of experts, and raising awareness among business areas.

6. Discussion and Conclusions

This thesis investigated the EU Taxonomy and its impact on the EU's regulatory environment for energy supply companies. It explored the regulations implemented, how the energy supply company EnBW responded, and their strategies to adapt to these changes. The research results are used to derive potential suggestions for both policy recommendations on how the Taxonomy can be improved to ensure its successful implementation on the company level and directions for future research.

6.1 Policy Recommendations

The EU Taxonomy aims to provide investors with guidance and direction, offering an objective benchmark for comparing the actual sustainability level of investment products labeled as such (Dorendorf, 2020). Based on the review of the legislative publications by the European Commission and TEG and the analysis of the implementation experiences of EnBW, the mismatch between the intended and practical implementation of the Taxonomy has been demonstrated. While keeping in mind that the Taxonomy is not yet finished and, therefore, an ongoing process with new pieces of information and publications coming out frequently, the identified implementation issues can be used to derive recommendations for the future improvement of the Taxonomy. Both the experiences outlined in section 5.2.1 and the case of EnBW explained and analyzed in sections 5.2.3 and 5.2.4 demonstrate that companies have been facing various difficulties during the first year of compulsory Taxonomy reporting, the most significant issues stemming from the amount and unclarity of the legislation. In general, to successfully implement the reporting requirements mandated by the Regulation, these problems need to be addressed, and an overall better understanding of the Taxonomy needs to be advanced.

Firstly, there is a vast amount of information in the form of legislative publications, FAQs, reports, and papers that deal with the Taxonomy. Therefore, information about the implications and mandatory requirements for a specific company within a particular sector can be

challenging. Similarly, given the complexity of the draft reports from the European Commission and expert groups such as the TEG, it can be challenging to comprehend the given information, ultimately affecting the successful implementation level. For example, given the extensive amount of information in the Delegated Act, it can be complicated for companies to understand specific TSC. According to Dai (2021), complying with these requirements may not be clear, and the sheer quantity of DNSH criteria, the details involved in each requirement, and the differences in the application to economic activities can result in considerable difficulties in evaluating the level of alignment according to the Taxonomy. Therefore, to increase the acceptance of the Regulation and to facilitate the transition and implementation of the requirements, it is essential to make the regulations as practical and accessible as possible and establish reasonable timelines for their implementation.

Regarding including economic activities related to natural gas and nuclear energy in the list of transitional activities, the 2022 Complementary Climate Delegated Act published by the European Commission (2022b) sparked controversy. It caused much discussion in various EU countries such as, for example, Austria and Germany. While the Commission (2022) justifies this inclusion by stating that gas and nuclear activities can be considered 'green' only if they meet specific criteria and that they play an essential role in facilitating the transition to a renewable-based future, as agreed on in the European Green Deal, the controversy arises from the differing perceptions and opinions surrounding these energy sources. As Igini (2022) pointed out, not all countries agreed on labeling nuclear and gas as green energies, and Austria even filed a lawsuit against the decision. The author further describes that, although Germany has not joined the legal action, it supports the decision to file a lawsuit, as it believes that the objections to the Taxonomy will now be reviewed by the courts (Igini, 2022). Here, it would be advisable for the European Commission to engage in further dialogue and discussions with member states, industry representatives, and stakeholders. This could help address the concerns from the opposers of this decision surrounding these energy sources and ensure that the classification as 'green' or 'transitional' is based on a better understanding and consensus. Also, the environmental impact and criteria for labeling both gas and nuclear as potentially 'green' should be thoroughly assessed frequently so that firms can make more informed decisions and that potential controversy can be mitigated in the future.

Finally, to ensure the coherence of the Taxonomy with the EU's broader goal of achieving a sustainable economy, it needs to be viewed as a complementary component that works in conjunction with other policies like the European Green Deal. It is, therefore, important that the Taxonomy is continuously expanded and revised to cover all economic sectors and related economic activities ultimately. Furthermore, guidance on the classification of aligned activities, the calculation of KPIs, and a realistic implementation timeline should be provided to allow companies to understand the requirements. Even though this would potentially add even more information that needs to be processed, a more detailed guide on implementing the reporting requirements would make it easier for companies to comply with the Regulation successfully.

6.2 Research Implications

This research aims to provide a more comprehensive understanding of the impact of the Taxonomy on energy supply companies in the EU which can have important implications for different stakeholders. The findings of this research will be valuable to energy supply companies, regulators, and policymakers, as they seek to navigate the changing regulatory landscape of the energy sector in the EU. By examining the implementation experiences in the energy supply sector, this research can be helpful for policymakers and regulators to identify areas for improvement and refine their approach to achieve their objectives better. Overall, this research has the potential to generate valuable insights and knowledge in a range of areas, including policy, regulation, industry behavior, and sustainability. It could inform policy decisions, contribute to the growing body of research on sustainable energy practices, and help companies navigate regulatory challenges, offering essential benefits to multiple stakeholders.

6.3 Research Limitations and Suggestions

It is essential to note the potential limitations of this study. Firstly, limited research has been conducted on the Taxonomy, its implications, and its effects on the energy sector. The Taxonomy is still evolving, and while this study was conducted in the spring of 2023, new publications might come out later, which might impact some of the findings of the analysis. This study draws on a comprehensive set of literature to analyze the impacts of the EU Taxonomy. Given the limited academic literature on this subject, it draws on legislative publications and company reports to construct a clear and cohesive understanding of the Taxonomy and its effects on the energy sector.

It is further necessary to note that, due to its novelty, energy companies have had limited experience with this regulatory framework. This study focuses on the case of EnBW. While this company is arguably representative of the sector, the experiences of other companies within or outside this industry might differ. Additionally, the literature published by the company EnBW may be subject to potential bias, limiting the findings' generalizability. Finally, it is also essential to acknowledge that the Regulation and the classification of certain business activities related to the energy supply industry, such as nuclear energy and gas, may undergo significant changes during and after the study period.

Because of the novelty of the Taxonomy, more profound research and study about its impacts and final implementation is not yet possible. However, there are many options for future research about the Regulation. Future research could deal with the long-term effects of the Taxonomy on the energy sector, namely how it affects the sustainability of economic activities besides the

reporting requirements and whether it proves to support the EU's sustainability agenda significantly. Furthermore, the ongoing implementation process and how effectively the Regulation is implemented at the company level could be researched in more detail and over a more extended period than the initial two years of reporting. Here, it can also be interesting to look at the implementation problems from a comparative perspective, namely comparing the Taxonomy to other regulations to investigate how effectively the Regulation has been implemented compared to similar policies. Finally, given the political disagreements regarding the classification of gas and nuclear energy as transitional activities, further research could be done on how effective this decision has proven to be for the transition to a more sustainable EU economy with a more renewable energy mix.

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