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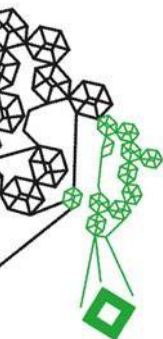


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Public Governance Across Borders
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***The role of scientific evidence in the European Commission's decision
to the inclusion of natural gas and nuclear energy in the Taxonomy
Regulation – a question of bias?***



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Abstract

The European Union itself as a political construct is also an entity that accumulates enormous amounts of interests of a vast variety of stakeholders. Taking the example of the Taxonomy regulation, this thesis aimed to uncover the political dynamics of a selection of stakeholders, namely the Member States and the NGO who aggregate their interest to the European Commission, the decision-maker behind the controversial decision to label nuclear and gas energy as sustainable and green energy sources. The role of evidence in this process is crucially important as the stakeholders and the Commission each use evidence in favor for to justify their stance in their topic. Even though the Commission strives to implement the principle of evidence-based policymaking, it has gotten evident that “evidence” itself is not perfect to use it as a parameter for policy decisions. Evidence can be formed to fit a decision by cherry-picking e.g., to support the narrative of sustainable nuclear and natural gas power. The Commission uses expert group reports to justify this decision. Hereby does it align more with the interests of Germany and France, the most powerful member states, than with NGOs, civil society representatives.

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List of abbreviations

Term or acronym	Meaning of definition
ANDRA	Agence nationale pour la gestion des déchets radioactifs, eng. National Agency for the Management of Nuclear Waste
ASN	Autorité de Sûreté Nucléaire, eng. Authority for Nuclear Security
BMBF	Bundesministerium für Bildung und Forschung, eng. Federal Ministry for Education and Research
BR	Bundesregierung, eng. Federal Government
CAP	Common Agricultural Policy
CCDA	Complementary Climate Delegated Act
CSFN	Comité Stratégique de la Filière Nucléaire, eng. Strategic Committee for the Nuclear Branch
DA	Delegated acts
DNSH	Do no significant harm
EBP	Evidence-based policymaking
EC	European Commission
ECB	European Central Bank
EEA	European Environmental Agency
EEC	European Economic Community
EIB	European Investment Bank
GHG	Greenhouse gas
HLW	High-level (radioactive) waste
JRC	Joint Research Centre
MS	Member State(s)
MTE	Ministère de la Transition Écologique; eng. Ministry of Ecological Transition
MSEG	Member State Expert Group on Sustainable Finance
NG	Natural gas
NGO	Non-governmental organization
Platform	EU Platform on Sustainable Finance
R&D	Research and development
SCHEER	Scientific Committee of Health, Environmental and Emerging Risks
TEG	Technical Expert Group on Sustainable Finance
WBGU	Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen, eng. Scientific Advisory Council of the Federal Government on Global Environmental Change

1. Introduction

The effects of the climate crisis begin to reveal themselves not only primarily in countries of the Global South or in developing countries but also increasingly in Europe. With the flood in several countries in the EU in 2021 (Deutsche Welle 2022), there is now an urgent need to act and to commit to the 1.5°C-goal of the Paris Climate Agreement to secure the livelihood of the Earth (UNFCCC 2015), also visible through the rise of civilian movements like Fridays and Scientists for Future in 2019 (Scientists for Future Deutschland n.d.). This commitment puts the energy sector to the center of political attention since the sector takes up approximately 28% of the greenhouse gas (GHG) emissions in the EU (Eurostat 2018).

Thereupon, the European Commission (EC) published the European Green Deal offering a pathway to climate-neutrality by 2050. In accordance with its provisions, the EU established the Taxonomy Regulation in July 2020 to define which economic activities are categorized as “environmentally sustainable” (European Commission n.d.b). The Taxonomy was amended several times by delegated acts of the Commission with the last amendment in early February as the EC approved the Complementary Climate Delegated Act (CCDA). In this act, the EC regulated specifically which financial products are defined as “green” and “sustainable” to provide planning security for investors and re-direct private capital into sustainable energy (ibid.).

Interestingly, the Commission decided to label nuclear energy and natural gas (NG) based electricity production to be included into earlier mentioned label. This decision attracted much criticism from diverse civil and political stakeholders as well as media (Scientists for Future Deutschland n.d.; BMK Austria 2022; Bloss et al. 2022). Although those labels are hard to define in real-life terms, there is scientific consensus that energy production out of NG and nuclear plants are not sustainable (Lelieveld et al. 2019; Whicker, Schulz 1982). As such, the EU might miss a major chance to re-direct the full political and financial capacity into the expansion of renewable energy and the development of its technology, despite its advantages for the environment and economy. As Russia invaded Ukraine in the end of February 2022, it has also become apparent that investments into renewable energy is matter of energy security.

The inclusion of NG and nuclear energy in the taxonomy is particularly striking given the EC’s commitment to the theory of evidence-based policymaking (EBP) (European Commission n.d.e, n.d.f). It is not clear how the Commission reconciles its commitment to EBP with the labelling of NG and nuclear energy as “green” and “sustainable”. What is clear, however, is that there is a plurality of stakeholders included in the policymaking processes of the EU and that the decision-making is uniquely complex. Issues and concerns of MS, and with that nation states, in combination with corporate interests play a crucial role in the political dynamic of the EU. Navigating through those interests to produce acceptable policy outcomes to all stakeholders and civil society, the EC might only use scientific evidence in favor to justify its decision.

The tension between EBP and those interests will be closer examined during the theory and analysis part. This opens the possibility of bias and cherry-picking around evidence for policymaking. To reach an outlined goal in policymaking, evidence is then thoroughly selected with a certain reasoning to give a justification for that policy. In this case, the Commission might have been biased and aimed at labeling nuclear and NG energy production as “sustainable and green” as policy outcome as the compromise between all those interests and used scientific evidence to justify this stance. More concrete, the EC might have used scientific evidence that argues for nuclear energy as being carbon neutral and environmentally friendly. Furthermore, the EC might have argued that NG serves as low carbon emitting transitional energy source, always referring to the infrastructure to be used by *new* green hydrogen technology.

Due to the far-reaching consequences of the decision on the CCDA regarding the future of energy production in the EU and because there is adequate scientific evidence for the “non-sustainability” of NG and nuclear energy, the question must be why the EC decided the way it did. This thesis therefore singles out the following research question:

What was the role of scientific evidence in the European policy process that led to the inclusion of gas and nuclear as sustainable energy sources in the Taxonomy Regulation against the background of the EU’s commitment to evidence-based policy and current political dynamics?

This research question opens various fields of interests for the analysis. For the reason of organizing and to grasp the content of this thesis, sub questions are developed streamlining the overall themes, and those will be answered during the analysis section.

Thus, to answer the research question, the following sub questions have been developed: For stressing the role of evidence for the Commission: *How is evidence-based policy institutionalized in the EU? And what evidence is there in favor and against considering gas and nuclear as sustainable energy sources?* There will be a focus on Member States and NGOs: *How did the Member States and NGOs use evidence to substantiate their interests? How did the Commission include those interests in the decision-making process leading to the Taxonomy Regulation? And how did the Commission use this evidence, leading to the adoption of the Taxonomy Regulation?* Finally, to include the notions of bias and cherry-picking: *To what extent was the Commission biased to reach this policy goal and how did it cherry-pick scientific evidence to justify it?*

As for the societal relevance, the research question shall provide answers for civil society regarding accountability of stakeholders for the decision, as this decision has direct consequences for renewable energy expansion, global warming, and energy independence, and shall provide more clarity about who takes influence in what manner, and how evidence influences decision-making in the EU.

On the scientific side, there are publications arguing either for the Taxonomy Regulation with projections of a decrease of GHG emissions (Luciarelli et al. 2020), or who have a more balanced view based on evaluating different economic sectors (Schütze et al. 2020). Scientific analyses of the most recent decision are scarce due to the short period. Thus, it must be uncovered how evidence is exactly institutionalized in the EU. To address these lacunae, this thesis applies insights from the field of EBP applied to the framework of the European Union. In connection with the concepts of bias and cherry-picking, the threats, and benefits of EBP are discussed and advantages and ameliorations of EBP are laid out in the EU context around environmental and financial policy.

2. Theory

Introducing the topic of the Taxonomy, the public discussion, whilst speaking about the “Taxonomy”, misses the point of what exactly the taxonomy is, what legal status it exactly withholds, and who actually is responsible for it.

As already implied in the introduction, the Taxonomy Regulation (EU 2020/852) is a legal act adopted by the European Parliament and the European Council through the ordinary legislative procedure (Art. 289, 294 TFEU), which sets out conditions for economic activities being environmentally sustainable. In Art. 290 TFEU, the Commission is allowed to adopt DAs which can amend a regulation to the degree which is laid down in the concerning act. The Taxonomy Regulation laid those principles down in Art. 23, giving the EC comprehensive competences to amend it. Finally, the Commission adopted the CCDA (European Commission n.d.b, n.d.d) which allowed labeling of NG and nuclear energy as “green” and “sustainable”. It is demonstrated that the Commission adopted, in accordance with the elaborated legal competences, the controversial CCDA which is responsible for the inflow of monetary resources into nuclear and NG energy under the labeling of sustainability through the Taxonomy Regulation.

In this section, the theoretical framework of this thesis will be worked out. On this basis, hypotheses are developed to each thematic paragraph. Since the objective of this thesis is to uncover the role of evidence within policymaking of the EU, firstly, the concept of EBP will be explored, followed by the role of EBP within the EU policy-making process. Secondly, this part reveals the notion of cherry-picking and bias as concepts as political stakeholders may be biased and cherry-pick scientific evidence. Lastly, potential bias may be explained by other stakeholders which account for the political dynamics of the EU: member states and NGOs.

2.1 Good governance of evidence – the first hypothesis

EBP is a theory which describes how scientific evidence is used in the process of policymaking so that political stakeholders have reliable scientific insights and security that a measure or a policy has the desired outcome. There are multiple political epistemological understandings of the theory e.g., visible in publications of Jasanoff and Parkhurst (Jasanoff 1990, Parkhurst 2017). Overarchingly, they both advocate for the use of scientific evidence in policymaking but underlining the threat of EBP for ignoring social repercussions a policy solely based on scientific evidence would have.

According to Parkhurst, the integrity of the evidence used in policy processes depend, amongst others, on principles like appropriateness, contestability, quality, and rigor (Parkhurst 2017, 160) and conceptualizes “good governance of evidence” (ibid., 8).

Evidence is *appropriate* if it follows an assessment of what the need of a certain policy decision is, it must be selected according to all political considerations of a policy, thus, must mirror advantages, effectiveness, and threats. Evidence is *contestable* if the evidence used is open to appeal and critical questioning, so challenging scientific evidence must be addressed, also when it is conducted for a particular policy decision. This is facilitated also by securing peer review procedures and a focus on replicability. The *quality* of evidence used must be addressed through making judgements on their methodology and data. Lastly, the evidence utilized must be *rigorously* and comprehensively synthesized or addressed to limit the possibility for selective cherry-picking. In addition to these principles, Parkhurst also discusses the concept of stewardship (ibid., 149). Agents, whose task it is to shape governmental evidence advisory systems, such as technical experts, to inform public policy making should have a public mandate. Agents in this case may be expert groups in which the internal debates over topic and its composition are key for the credibility. Credibility is also important for what he calls “Chief Scientific Advisers”, a permanent position within government. This individual may bring certain amounts of bias or is dependent on the superordinated government, a public mandate would decrease dependency here. Also, Parkhurst stresses the role of governmental agencies, as permanent accumulators, and reviewers of policy-relevant evidence. This institutionalization of evidence contributes to the idea of public scrutiny to those stakeholders. EU institutions like the EEA for environmental, and the ECB and the EIB for financial expertise, may be such examples. Another important aspect is transparency (ibid., 139). Information about policy processes and what evidence was used to base a policy decision should be made public, through publishing deliberation records of expert bodies or having public evidence review meetings. This boosts public trust in the process and legitimizes the ultimate decision.

With the implications of EPB and the notion of good governance of evidence in mind, the hypothesis of this section is:

H1: Given its commitment to EBP, the European Commission has explicitly addressed the available scientific evidence on these two energy sources according to the principles of good governance of evidence. In the policymaking process, both the supporters and the opponents of this taxonomy have been included, not least through a proper, independent institutionalization of evidence in the EU framework.

2.2 Evidence in policymaking: bias and cherry-picking – the second hypothesis

Jasanoff, in contrast to Parkhurst, streamlines the notion of evidence being socially constructed (Jasanoff 1990), scientific evidence can be subject of values and moral, as well as certain epistemological assumptions. The critique behind this relies on the assumption that policymakers or institutionalized political entities are not sensitive enough to understand possible values behind evidence, or as Jasanoff writes, there is “bias in scientific assessments” and evidence is “uncritically accepted” (ibid.).

Bias around policymaking can be conceptualized in two types (Parkhurst 2017, 43 et seq.). First, technical bias covers the utilization of evidence that do not correspond to science’s best practice. Technical bias can mean that evidence and data may be cherry-picked and strategically reviewed to find justifications for pre-determined positions as well as faulty interpretations of evidence in policy debates which lead to e.g., false

and early causal claims, or underestimated risks (ibid.). Cherry-picking of evidence in policymaking is fairly common, evidence and science are being politicized or are being filled with politically desirable values to promote political interests (ibid.). Cherry-picking, as part of technical bias, is conceptualized by Parkhurst as the selection and utilization of evidence that stands in accordance with the political goals of a governmental entity. The reason for cherry-picking is oftentimes tensions between the solution that evidence suggests and external influences which may be based on societal or economic pressure, favoring the latter (ibid.).

Second, issue bias intends to shift political debates to specific political concerns in a not-transparent manner (ibid.). Issue bias has a significant influence over the creation of evidence which often explains the choice of subject to conduct research on or the selection of outcomes to include into a study. In addition, stakeholders may present specific policy options as “evidence-based” although the selected evidence only covers parts of the suggested policy option at hand. Lastly, studies with methodological rigor may be interpreted as the only stance to have on a topic (ibid.).

Referring this back to the thesis’ topic, this indicates that the purpose of evidence for policymakers is to justify and found their decision onto them. Depending on the institutionalization of evidence, evidence may function as advisory mechanism, in e.g., evaluating the environmental damage of NG and nuclear energy in trade-off with energy security and capacity. The other way around, policymakers may have a certain stance or opinion on a policy topic, e.g., nuclear and NG energy must be labeled “green and sustainable”, and search for evidence or commission a study. It has become clear that if political stakeholders have, a biased perspective on a topic or on a policy issue, they are in a rather strong position to justify their stance by altering the evidence at hand. Although there is clear evidence for the environmental effects of nuclear and NG energy, one can assume that:

H2: Despite its commitment to EBP, the European Commission has a biased perspective. It explicitly addressed the available scientific evidence on these two energy sources but only selectively cherry-picked the evidence that supported the current political dynamics, thus in favor for nuclear and natural gas energy.

2.3 The influence of dominant member states over environmental NGOs – the third hypothesis

If one assumes that the Commission has a biased perspective through giving reasoning to its decision through cherry-picking evidence, the pressing question is *what explains this bias?*

The Commission itself is influenced by various stakeholders which are located outside its own framework, this can be other EU organs like the Parliament, the Council or external actors outside the EU framework like national governments (even though they are represented in the Council) or others like NGOs. Complex political dynamics shape the EU’s political landscape, and many stakeholders articulate different interests. As the following paragraph shows, the MS’ interests receive special attention through their indirect and direct possibilities to influence the Commission. Also, NGOs seem to have had influence during the decision-making process since the EC stresses their role and those of civil society in the process (Commission n.d.e).

2.3.1 The influence of Member States

Due to the nature of the EU framework the MS play a crucial role in the decision-making processes of the EU. Sticking with the EU framework, the Commission is per se autonomous in adopting DAs within its legal competences. But the MS can exert either legal pressure to the Commission through the revoking of the delegation or expressing objections to the DA (Art. 290 TFEU), or political pressure. The latter can be proclaimed more important, as the governments of the MS themselves are subject to national pressure. For once, the Commission is dependent on the Council of the European Union and the European Council for legislation, agenda setting, and execution of EU law (European Council, Council of the European Union n.d.a, n.d.c). Also, the MS as nation states have their own interests regarding energy since it is connected to domestic industry and employment.

MS have more institutional and individual weight in decision making when they are populous and wealthy but Germany and France stand out due to their special historical role. Their influence on EU integration and in decision making processes of the EU is significant. On the one hand, France was responsible for the notion of “vital interests” and votes of unanimity (CVCE n.d.). France was opposed towards reforms of the then EEC about voting procedures and the CAP. The French government abstained from voting in the Council of Ministers which led to a political standstill in the EEC for over half a year. This concluded with the Luxembourg Compromise in 1966 in which votes of unanimity were made the rule in most policy fields. Also, “vital interests” were introduced so that MS cannot be overruled by a decision if they proclaim reasoning for fearing scrutiny through the decision. This led to a period of incremental integration on European level and influenced strongly future policies.

Regarding Germany, its role during the Euro Crisis was fundamental as has been outlined in detail by Donnelly (2018). Germany, being the largest net contributor towards the EU (Buchholz 2020), had a particular interest for dealing with deficits of other Euro countries. At that time, the German government pushed through with the idea of austerity within the household of countries, being significantly hit by the deficit crises. They were also not fond of the idea of creating a “deficit union”, thus, to share the burden of the deficit since Germany was focused on the “Black Zero”, to not create new debt. Since this idea interfered with the proposal of the EU to lend monetary means to countries in crisis, Germany strongly argued for financial mechanisms under EU law but institutionalized outside of the EU framework. One example here is the creation of the European Stability Mechanism with which members of the Euro zone can borrow financial means from to stabilize their household. The country then must promise cuts in state spending. A group of members providing over 25% of the means can veto a decision in favor for an applicant, only Germany fulfils this criterion alone.

These two countries have significant powers within the EU framework to substantiate their interests. Informally, the heads of states of the two countries consult each other if there is a difficult decision pending in the EU context. Those pre-consultations are at least the basis of discussions in the Councils but often also seen as pre-decisions. Therefore, in EU integration theory, one encounters oftentimes the concept of the “Franco-German axis” (Enderlein, Dittrich & Rinaldi 2017). In addition to their strong voice in EU policymaking, Germany and France have important reasons to be concerned with the Taxonomy decision. Those reasons will be addressed in section 4.3.1.

2.3.2 The influence of NGOs

Teegen, Doh and Vachani (2004, 465-466) define NGOs as institutionalized and organized social movements out of the civil society which range in a “broader institutional environment”. They stress the importance of certain issues for which NGOs are more likely to be institutionalized, foremost environmental and human rights issues, as well as the capability of fundraising and access to decision-making entities (ibid.).

One of the advantages to involve NGOs is a higher amount of credibility and legitimacy in policymaking processes. Put normatively, the policymaking process within the EU benefit from a more direct thread to civil society and trustworthiness, as legitimacy and credibility issues seem to be core deficits of the EU (Longo & Murray 2015). Furthermore, there are academic debates about the function of NGOs within the government process. Lage and Brant (2008) argue that NGOs serve as accumulators of the public opinion and observers and scrutinizers of policy processes. With an augmenting amount of professionalism in NGOs and securing finances and resources (Eberwein & Saurugger 2013) on the other hand, they seek to actively participate in political processes, not least through the concentration of topic-specific research (Green 2017). Strikingly, the information about the inclusion of NGOs within EU policy-processes is limited, there is a document of environmental NGOs which received funding granted by the EC published in 2007 (European Commission n.d.c), and a document evaluating the success of the funding program, which states that the involvement increases with additional funding, from 2005 (Agra CEAS Consulting Ltd. 2005).

Returning to the topic of the thesis, the MS might hold significant legal and political leverage over the Commission to assert their own interests even though they are not directly consulted in the process of DAs.

At the same time, the Commission states that the involvement of civil society actors is also important (European Commission n.d.e). The thesis will analyze in how far the reasoning of the EC reflects the types of evidence brought to fore by powerful member states and NGOs. This leads to the following hypothesis:

H3: The Commission's biased use of evidence in assessing nuclear and natural gas energy aligns more strongly with the use of evidence presented by powerful member states than presented by NGOs.

3. Methods

3.1 Research design

The research questions and the subsequent hypotheses suggest the use of a qualitative content analysis of the textual data. This is grounded by the approach this thesis shall take, to interpret the contents of texts to conceptualize underpinning structures and giving insights into the wider context of the texts. Qualitative textual analysis provides an analyzation of possible interpretations of texts to discover wider narratives (Lockyer 2008). Although there are various forms of textual analysis, content analysis ties in exactly at the narrative point. Content analysis reflects reality as narrative identifying meanings and relationships of certain words, frames, and concepts to reveal priorities of governmental organizations, implicit political perspectives. It is not bound to certain theories which allows the use of theories to create an own framework and to analyze specific points of interests (Julien 2008).

Qualitative content analysis connects to the goal of this thesis to unveil the influence of the different stakeholders on the Commission. It emerges that some stakeholders have informally more power than others, even though the Commission claims that they inform themselves using various channels. The theory part is based on theoretical assumptions which shall be evaluated to examine which stakeholder has which kind of power, whose interests was heard upon the most and, how evidence was used to create a certain narrative of evidence claiming NG and nuclear power are “sustainable and green”.

3.2 Method of data collection

Data will be collected through the systematic review of documents. The dataset contains three distinct sets of documents which will be made available in the Data Appendix. It is necessary to analyze policy documents from the stakeholders, namely the Taxonomy Regulation and the according DA of the EU, and policy papers and official government documents from the MS. As per the institutionalization of evidence in the case of EU decision-making and the NGOs' advisory functions, the significance of other publications with no legal status is not to be underestimated. There is a need to analyze reports of or for the Commission from institutionalized advisory boards such as the TEG and the JRC. Lastly, there will be analyses of reports and opinionated publications of NGOs after analyzing which ones did have influence of the decision-making process.

Schematically, the sense behind this kind of review is that one can examine, in the case of for example official government documents from the Member States, aspects that stand out to secure findings about *who* and *how far* one or more MS influenced the EC in its decision due to expressive power of such amounts of data.

The collection of data and documents was limited to the beginning of June and thus, the analysis will grasp the stances of all stakeholders regarding nuclear and natural gas energy up to this timeframe. Regarding the documents in the German and French language, the author remarks that the author has proficient languages in both languages. The documents are marked in the Data Appendix.

3.3 Method of data analysis

Due to the sheer number of documents, a data management and processing program is important since it severely shortens the process of qualitative data analysis. ATLAS.ti will be used as processing tool for the documents selected.

Kleinheksel et al. (2020) introduces the notion trustworthiness as the qualitative counterpart of reliability in quantitative analyses. Although “[r]eproducibility [as another word for trustworthiness] is not typically a goal of qualitative research” (ibid.), it is desirable since it secures consistency in coding with the aim to streamline processes of interpretations based on retrospective thoughts of other researchers, to create transparency during the coding process, and to give insights on the trail of thoughts in the research. A first exploration of other scientific publications led to the conclusion that there are no previously made coding schemes for the topic of this thesis. The core of this section is providing the coding scheme of this thesis after which the documents are analyzed. Codes can be single words or short phrases under which a document is examined. They are derived from the theory and hypotheses and help with the categorization of data (Benaquisto 2008). Those categories allow the data to be analyzed later as they are the outcome of applying the codes to the documents. The coding schemes is as follows:

Table 1: Developed coding scheme pre-analysis.

Hypo-thesis	Category	Codes	Explanation
H1	Good governance	PRO cost of energy transition; gas and nuclear as transition energy; relation nuclear and carbon neutrality, existing infrastructure, CON environmental damage, economic benefits, slowing transition, nuclear waste; POLIT discussion of interests / trade-offs	Usage of scientific evidence that balances advantages and disadvantages of gas and nuclear energy on environmental and social scales/ externalities.
H2	Commission’s biased perspective	PRO Evidence, economic benefits, climate change mitigation, climate goals, re-evaluation, extensive assessment, research and development	The EC cherry-picks evidence to justify its biased opinion.
H3	Political dynamics: member states	PRO evidence, nuclear waste, waste treatment, existing infrastructure, transition period, GHG emissions, climate goals, energy security	Member States insist on natural gas and nuclear and give (scientific) reasoning to protect national interests.
H3	Political dynamics: NGOs	CON evidence, environmental damage, GHG emissions, nuclear waste, non-availability of evidence, lack of civil representation, energy dependency	NGOs representing civil society in the process and their participation is stressed several times by the EC.

As the coding concerns documents in different languages, the relevant terms are handled as literal translations. Exemplary, the code for nuclear waste (see Table 1 in H2) is here discussed to show how the author treated the codes. To start, the code “nuclear waste” has been found most, which marks its stark importance. Seemingly, the French documents focus on the research and evidence around the topic of nuclear energy and waste, as well as the documents on the expert groups consulted by the EC, whereas the German documents rather focus on the research and evidence on gas energy, mentioning “nuclear waste” once.

According to the ASN, French authorities and industry categorize nuclear waste in four categories regarding their radioactivity: very weak, weak, moderate, and high activity (ASN 2021, 355). The JRC uses a similar declaration of the radiation of waste. Those terminology is treated as the code “nuclear waste”.

For gas, there has been assessment on how this energy form provides for “energy security”, as Germany is highly dependent on NG energy (Appunn et al. 2021). For example, Zukunft Gas (eng. Future Gas), the inter-trade organization of private companies within the gas economy states that “[a] natural gas exit would endanger the industrial basis of our national economy and the security of supplying more than 20 million households sustainably” (Zukunft Gas 2022, 2). This provides an example on how the coding of “energy security” is treated.

4. Analysis

Due to the sheer accumulation of interests and stakeholders in the EU, decision-making processes are quite complex, an example of that is the CCDA at hand. The analysis suggests that the EC always had extensive evidence resources in reach. There is a plurality of counseling entities with MS, NGO, industry, technical expert participation which have been involved in the process. They mainly gave feedback and assess the criteria made by the Commission on their effectiveness on channeling investment, climate change mitigation and the protection of the environment. In this section, the results out of the analysis of the aforementioned documents via Atlas.ti is presented. The structure of the analysis is aligned with the structure of the sub question so that a basis is created to either accept or reject the hypotheses.

In the following section, the institutionalization of EBP according to the Better Regulation Guideline and Toolbox documents is outlined.

4.1 The institutionalization of EBP in the EU – Good Governance and Better Regulation

The Commission set up comprehensive measures to ensure what it calls “Better Regulation”, in which it lays down principles like stakeholder consultation, impact assessments, and evaluation and fitness checks, implying that the EC dealt with principles of good governance itself. In the following, some of the provisions of Better Regulation are examined, especially the aspects standing out in terms of “evidence” as per its use of coding.

According to the understanding of the EC, better regulation “[...] is about creating legislation that achieves its objectives while being targeted, effective, easy to comply with and with the least burden possible” (European Commission 2021a, 3) and goes back to the Commissions better regulation policy of 2019 (COM (2019)178). Four regulatory mechanisms seem of importance as they have been stressed in the Guidelines document, namely evaluation and fitness checks, impact assessments, input from stakeholders, and compliance promotion tools (ibid). Those mechanisms are, furthermore, subject to principles inter alia participation, transparency, and evidence-basis (ibid, 6). A participative approach considers and invites all stakeholders affected by EU law to contribute to the legislative process, a transparent approach guarantees an open preparation of laws and regulations by making the evidence that led to a decision openly available, and an evidence-based approach needs to address the “[...] best available evidence (including scientific evidence, where available).” (ibid.)

The EC, hereby, refers to the terminology “evidence” and differentiates between evidence and “scientific evidence”. Additionally, the EC defines evidence as to “[referring] to multiple sources of data, information, and knowledge, including quantitative data such as statistics and measurements, qualitative data such as opinions, stakeholder input, conclusions of evaluations, as well as scientific and expert advice” (ibid., 5).

The definition further goes into detail about the Better Regulation Toolbox and introduces the concept of evidence-*informed* policymaking (ibid.).

Here, the Commission describes how evidence should be dealt with, the concepts are understanding, mapping, collection, analysis, interpretation, and presentation of evidence. Exemplary, mapping evidence means that the root of the evidence used in a policy must be clear within the impact assessment of a policy (European Commission 2021b, 23). The impact assessment of the CCDA discusses evidence in one point (European Commission 2021c, 59) stating that evidence arises mostly from the work of the TEG and its accumulation of evidence and stakeholder consultation.

To summarize, several aspects stand out in the institutionalization of evidence by the EC. First, according to the EC, there must be some kind of “non-scientific evidence” which is worthy of naming it evidence in the framework of EBP, as seen through the use of terminology of evidence and “scientific evidence”. Its definition of “evidence” indicates again that the term evidence can be understood in a non-scientific way such as advice from “experts” (not further defined) or opinions.

Second, the alteration from evidence-based to evidence-informed is a noticeable change in wording from evidence being the basis of policy to policy being informed by evidence. This change is also observable throughout the coding process, as evidence-informed policy is then used throughout the document. These two things considered, the word evidence loses gradually its meaning as evidence-based turns to evidence-informed and evidence can be non-scientific.

Third, the EC conceptualizes evidence-informed policymaking quite extensively (European Commission 2021b, 20-30), but in the example of the CCDA there are several instances where the Commission does not fulfill its own criteria. In the case of mapping data, it misses to outline what evidence exactly is used but also relies almost exclusively on the TEG, an expert group which is also compounded of non-EU stakeholders. It can be argued that EU organs which are already in place to gather environmental data, like the EEA are at least negligently ignored, even though there are members of the TEG from said agency. Principles laid out to themselves are not fully followed. The latter may be explained by the fact that the EC’s view of good governance is not legally bound to those principles and EC staff should rather be “guided” by them (European Commission 2021b, 3).

4.2 Short screening of available evidence on nuclear and natural gas energy

To be able to assess what evidence has been utilized in the process of the CCDA, this part provides a short screening on the available scientific evidence on the two energy forms. It is acknowledged that there is a variety of factors to assess different energy sources after e.g., deaths, air pollution, GHG and other emissions, as well as social and economic factors.

For instance, combining the data from Sovacool et al. (2016) and Markandya & Wilkinson (2007), nuclear and NG energy production face significantly lower death rates than electricity from coal and oil regarding air pollution and accidents per terawatt-hour (TWh). For comparison, the death rate per TWh for oil is 18.43 whereas for gas it lies around 2.82 and for nuclear 0.07. Thus, gas energy is 6.5 times safer and nuclear is 263.3 times safer than energy from oil. The death rate per TWh for renewable energy sources (solar, hydropower, and wind) ranges from 0.02 to 0.04 which is significantly lower than oil (460.8 – 921.5 times) and gas (70.5 – 141 times).

Although this evidence marks that NG energy more pollutant and causes more deaths than nuclear and renewable energy sources, there are oftentimes arguments made in favor for NG energy, this may be NG as transitional energy source or the utilization of the NG infrastructure for green hydrogen, as present in the hydrogen strategy of the EU (European Commission n.d.a). For the latter point, there is evidence that, firstly, green hydrogen in the medium-term future will be limited due to the lack of its domestic production capabilities (Bard et al. 2022, 44), secondly, there are uncertainties on what effect hydrogen gas has on the materials of the NG infrastructure (ibid., 33), and, thirdly, hydrogen may cause corrosion within underground storage facilities (ibid., 31).

Nuclear energy has low levels of GHG emissions in comparison to fossil energy sources and a comparably low death rate. This is the reason why nuclear energy has been suggested recently in various occasions to be a viable option for substituting GHG intensive energy sources. Public stakeholders, though, have addressed the issue of the storage of (high-level) nuclear waste. The current handling formed public distress and mistrust by evaluating geological repository possibility on evidence alone and by not consulting the public (Rosa et al. 2010). Without informing the public properly, nuclear waste has been stored in proximity to the place of residence of people without addressing issues of health and environment. As well, a final and permanent solution for the depository of nuclear waste, especially high-level waste (HLW), has not been found yet, which is reasoned by the changes within materials for containment of the waste caused by radiation (Ewing, Weber & Clinard 2019). Often, medium-term interim solutions of depository devolve into long-term solutions without the necessary safety requirements. In relation, half-life of most radioactive materials are at least or profoundly over 10000 years (Sanders & Sanders 2020). Further, Whicker & Schultz

(1982) outlined damaging effects of nuclear material on the environment and El-Hinnawi (1977) stresses the carcinogenetic and toxic nature.

To conclude, nuclear and NG energy in terms of death rate per TWh are significantly safer than their (other) fossil counterparts, but renewable energy sources remain to be safer. Notably, the difference between NG and renewable energy sources is far greater than between nuclear and NG energy. Even between nuclear and NG energy, nuclear energy appears to be safer (40.3 times) in terms of deaths per TWh than NG. This can be explained by the emission of GHG gases and other air pollutants during the lifetime cycle of the power plants respectively. Here, nuclear energy plants emit less than 1/9th of the CO₂-e /kWh in comparison to NG energy plants. In terms of those aspects, nuclear energy can be seen as a clean and safe energy source in comparison to fossil energy sources, including NG, which is used as a pro-argument for nuclear energy.

The use of existing NG infrastructure remains to be questionable as there remain unanswered questions about corrosion in used materials. At least, the use of the infrastructure is combined with economic burden. Nuclear power plants have the advantage of low death rates but the storage of HLW is still connected to technical uncertainties, plus considering the devastating effects of nuclear waste (especially HLW) on the environment and public health into account. Lastly, the latter is observable through the accidents of Chernobyl and Fukushima, as wide areas of land are uninhabitable due to radioactive poisoning and many people suffer from it still.

This screening of evidence is also important to the coding that has been done in this thesis. Scientific evidence forms the basis of the coding, arguments for the inclusion of nuclear and NG energy (in Table 1, “PRO”) are for example the lifecycle emissions which are lower than (other) fossil fuels or the deadliness of those to energy sources in comparison to others. On the contrary side (Table 1, “CON”), the issue of storing nuclear waste has been made clear and is re-found with the code “nuclear waste”. The issue of knowledge not being present for using NG infrastructure for renewable gases and the uncertainty of geological depository of HLW are significant arguments for “non-availability of evidence”.

4.3 The use of evidence of Member States and NGOs

This section analyzes how the stakeholders reconcile scientific evidence with their interests. As demonstrated, France and Germany have significant formal and informal powers within the EU context to substantiate their interest. Through the document review, it has gotten evident that the French government advises for the continuation of funding for nuclear energy using its established governmental and non-governmental framework. For Germany, the governmental advocacy for NG is limited, but there are industrial stakeholders who advocate for continuing the financing of NG for energy production.

Information from the NGOs, who were actively part in the policymaking process through consultation or expert group participation, was also limited. The documentation suggests that NGOs provided their expertise especially through expert groups, consultations outside of the expert group framework have not been documented.

4.3.1 France and Germany – Decision-making powerhouses

4.3.1.1 Nuclear power: The case of France

The French government built a construct of powerful public authorities and expert groups to institutionalize nuclear energy within the governmental framework. Most prominently, these are the ASN, MTE, CSFN, and ANDRA.

Firstly, the MTE published a paper in which the ministry stresses that French nuclear power plants are safe, not least through fierce controlling of the ministry itself (MTE n.d., 4). It proceeds to explain how safe nuclear energy is and that there is a need for climate change mitigation to hold on onto nuclear energy, as it has been and still is a secure energy form with low carbon emissions. Also, it outlines the supervision procedure for all nuclear reactors in France and plans to tighten controls until 2025. Other than “energy security”, “economic benefits”, or “transition”, no coding has been found in this document, including “evidence”.

The ASN published its annual report of 2021 to the government discussing the state of nuclear security in France (ASN 2022). In unison with the section 5.2 of this thesis, core aspects are made visible. The ASN reports that very low to medium-level waste is handled in a way, through industrial processes and geological depository, that it cannot be harmful to the environment and to public health (ibid., 354 et seq.). On the other hand, the ASN acknowledges that the storage and the depository HLW remains an unanswered question (ibid., 359-360). There is a project put in place to develop a strategy for a permanent depository solution called “Cigéo”. This project is still under development and is in need for further R&D so that technical safety requirements can be reached (ibid., 362 et seq.). In terms of risk assessment for public health, the ASN states that the strictness of controlling measures is effective for assessing the safety of power plants, causing no extraordinary escape of radioactive material into the environment. The radiation in the air remains under the threshold of what the WHO proposes (ibid., 102 et seq.). It compares that in metropolitan France (12 million inhabitants), there are approximately 4000 inhabitants per year who develop lung cancer due to radiation poisoning, in contrary to 46363 inhabitants who got it from tobacco (ibid., 103). ANDRA, composed of industry representatives and academia, has gotten a mandate to push the development of project “Cigéo”. They present the status quo of research providing deep technical insights on innovation and research, with a special focus on the underground laboratory on developing methods for permanent depository. They also stress the importance of further R&D of the final depository for HLW and demonstrate that they are well connected to the French academia, ranging from engineers to chemists (ANDRA 2019, 43). Here, under the code “evidence” falls the “Conseil Scientifique” (eng. Scientific Council) and the “Comité Technique Souterrain” (eng. Underground Technical Committee), evidence is not mentioned further (ibid., 54-55). Lastly, they outline a strategy to inform the public about the topic of nuclear waste, by providing comics, inviting YouTube influencers, and pedagogical programs for schools (ibid., 57-58).

The CFSN shows the importance of the general nuclear industry in France, stressing foremost the economic significance. The industry and the government hold 220000 employees, has had a revenue of 50 billion € and spent 1.3 billion € in R&D CFSN (CFSN 2016).

4.3.1.2 Natural gas: The case of Germany

In comparison, for Germany, the establishment or the institutionalization of the NG industry and the government is less apparent than in France with nuclear energy. Further, extensive government reports and documents are also less frequent. There is limited information of the industry as well, not least through the bankruptcy of the NordStream II AG, the operator company of the pipeline and the concentration of industrial and governmental resources on that lately. The bankruptcy led to the deletion of documents of said company and limited amounts of information on this topic of the German government. In addition, there has been a change of involved parties in the German government, social democrats, greens, and liberals are part of it so that long time energy strategies are under a paradigm shift.

The BMBF published a strategic paper on how to enhance research in sustainability (BMBF 2020). For this goal, it relies on external expertise of non-university research facilities (ibid., 56 et seq.). The BMBF sets out climate mitigation goals and wants to support the industrial sector to decrease its CO₂-emissions, to produce green hydrogen and transition industrial processes towards it, and to develop methods for the removal of CO₂ out of the air (ibid., 11 et seq.). Even though, they provide climate mitigation goals, and they outline the R&D activities which have to be done to reach this goal, NG and nuclear energy are not mentioned, although coding for “transition period” has been found.

A scientific counsel, the WBGU, has been put in place to gain technical and scientific insights on how the climate goals Germany adopted can be put in place. Their focus is similar to the one of the BMBF. They mention the need for international partnership in R&D but stress the importance to stop the use of fossil fuels as this is the most effective way to stop CO₂-emissions (WBGU 2021, 10). By doing this, the government must reduce subsidizing fossil fuels and enhance the quality of ecosystems so that CO₂ are stored in a natural way (ibid., 11). Since this procedure is being evaluated as not sufficient as plans to reduce CO₂-emission miss the 2050 goals of being climate neutral so far, processes must be developed to industrially store CO₂ from the air (ibid.).

Zukunft Gas is an industrial sector union of all companies dealing with natural gas for energy production purposes to chemical industries. The union demands switching to natural gas for energy production and industrial processes (where possible) for climate change mitigation purposes (Zukunft Gas 2022, 2). Though Zukunft Gas acknowledges that there is a need to enlarge renewable energy production, it suggests the use of NG so that fluctuation from renewable energy plants can be absorbed. NG is, according to the union, best to guarantee and provide energy security (ibid., 4). Furthermore, it stresses that the existing gas infrastructure can be used for other gas forms produced renewably, like green hydrogen and biogas, so that investments now in gas infrastructure secures the supply of renewably produced gases in the future to industry and households (ibid., 4).

The new BR of Germany published statement concerning the CCDA and its opinion on the inclusion of NG and nuclear energy. In this statement, the BR strongly advocates for the exclusion of nuclear energy in the Taxonomy since extensive regulation on security, final disposal of nuclear waste, and R&D goals are not further defined by the EC (BR 2022). Towards gas, which is less prevalent in this document, the BR welcomes the guidelines by the EU but sees need for adjustments of the phasing-out period of NG energy (ibid.). Moreover, the BR stresses the need for NG as transitional energy source and proclaims that R&D for the utilization of the infrastructure for NG has found progress, with modern infrastructure already being “hydrogen ready” (ibid.).

It has gotten evident, that France reasons the continuation of nuclear energy by its importance for the national energy mix and for the industrial sector. Both, the governmental and industrial institutions, are aware of the issue of HLW which shall be tackled in the future with future R&D developments in permanent geological depository. Environmental and public hazards remain barely assessed. Combined with the issue that HLW cannot be contained in a safe manner, even though projects for the development of final depository like “Cigéo” and in general R&D projects are still ongoing, this infers those French stakeholders hope for future research and innovation to deal with the issue.

The topic of NG as energy form in Germany is addressed in a rather covered manner. The information of the government addressing NG is limited, changes through the new government are to be expected. Core aspect remains to be that NG can be used as transitional energy source to substitute more CO₂-intensive ones and to use gas infrastructure for renewably produced gases. But there is evidence that suggests that this is not one to one possible. Additionally, the WBGU suggests the elimination of using fossil fuels to get on track to the commitments, that Germany promised in the Paris Agreement by extending renewable energy production.

4.3.2 The case of NGOs

NGOs play, as introduced in the theory part, a crucial role within policy processes as civil stakeholders and providing evidence to the process. In this case, the review of documents, foremost those of the expert groups, suggest that there was little *documented* consultation of NGOs. The only direct consultation of NGOs in the process of the CCDA was within the TEG put in effect by the Commission specifically for creating technical screening criteria and observing the compliance of the Taxonomy with the objectives set in the Green Deal. The TEG was also consulted prior to the establishment of the CCDA. The focus of the TEG in the process of the CCDA has therefore been to control whether the environmental objectives of the Green Deal are hurt by the proposal of the EC to include nuclear and NG energy to the Taxonomy. Looking on the members of the TEG, it is evident that only four of the 35 permanent members were from WWF, the plurality of technical experts came from the financial sector (TEG 2020, 64). In the following, the coding that has been used for the political dynamics of NGOs will be used to analyze documents from the WWF regarding their stance. Codes, to review whether the WWF has a negative stance on the inclusion of nuclear and NG energy, have been amongst others “environmental damage”, “GHG emissions”, “non-availability of evidence”, and “energy dependency”. Plus, to examine how much weight the WWF has brought in expertise-wise, the final TEG report will be examined.

Firstly, WWF discusses in its annual report of 2021 of the European Policy Office inter alia the role it played in the development of the report on the Taxonomy and CCDA and how it positions itself on the issue of

including nuclear and NG energy production (WWF 2022b). Their main claim has been to implement a “science-based taxonomy” (ibid., 28), thus, to follow *current* scientific evidence on the energy forms. In their opinion fossil fuels including NG are harmful to the environment since it increases dependency on directly CO₂-emitting energy sources. Together with other NGOs and scientists, the WWF outlines that those emissions from NG not only stem from energy production but also from gas leakage. If 3% of the NG emits into the atmosphere, the effect of NG in terms of CO₂-e would be similar to coal (WWF n.d.). Further, the WWF stresses that neither is the goal to storage HLW not in reach, nor would new nuclear power plants be ready in time for reaching the climate goals of 2030 (WWF 2022a). Also, new investments into NG energy would hinder reaching the 2030 goals, even if new NG facilities must be constructed to be able to handle renewably produced gases (ibid.).

To introduce the findings of the TEG, it concluded to recommend the inclusion of NG energy into the Taxonomy, after various rounds of stakeholder and expert consultation. They acknowledge the importance of it for energy production of various MS, its importance for climate change mitigation as it is a lower carbon emitting energy source in comparison coal, and its role as transition energy also acknowledging the potential for gas infrastructure to be used for green hydrogen (TEG 2020, 19-20). On the other hand, nuclear energy stands in breach of the environmental objective of the “[...] protection and restoration of biodiversity and ecosystems [...]” (Art. 17 Taxonomy Regulation). There is no evidence yet to safely ensure the final disposal of radioactive waste in unison with technical screening procedures of the Taxonomy (TEG 2020., 54-55). Moreover, it states that its understanding whether nuclear energy hurts the DNSH criterion is limited since the members of the TEG are almost fully experts from the financial sector. Consultants and observers to the TEG seem to have more expertise in this regard but were not mandated to actively contribute to the TEG’s final report (ibid., 64-66).

The DNSH criterion appears to be of higher importance as its connection to nuclear energy is reviewed upon further in the process. Do no harm in general is a policy principle that has its foundation in medical practices and was extended to e.g., security and foreign policies, regimenting humanitarian aid to prevent negative effects of interventions (Charancle & Lucchi 2018). Then, the Commission decided to implement the DNHS, that no sustainable investment of financial product under the Taxonomy shall violate the environmental objectives laid down in Art. 17 of the Taxonomy Regulation *significantly* (see e.g., Art. 1 of the CCDA). The distinction “significantly” hereby allows for room of interpretation on what hurts the environment significantly or insignificantly, if there is “evidence” (see section 4.1) which supports an “insignificant” damage.

It must be acknowledged that another expert group EU Platform for Sustainable Finance has been put in place which is from the number of members more numerous and the share of members of NGOs is more extensive like Birdlife, or the European Water Association. This expert group was mandated to review the Taxonomy and published a report focusing recommendations which shall be implemented by the EC to not undermine the sustainability of financial activities. Most prevalently, the Platform agrees with the argument of WWF and sees a violation of NG energy production and nuclear energy with DNHS (Platform 2022, 6-10). But EC sees a future role for the Platform in mandating it to monitor the technicalities of the Taxonomy and development of further technical screening criteria, within the Taxonomy framework as has been proposed by the EC for “[...] future reviews of this policy” (European Commission 2021c, 48).

It is evident that the access towards information how NGOs have been consulted in the process has been limited. All codes in the NGOs coding section have been found, except coding for “lack of civil representation”. Also, the non-availability of documents from NGOs or the WWF with extensive elaborations on the issues at hand led to a significantly lower number of found codes, in comparison to the ones of Germany and France.

The WWF, as only civil society member, was outnumbered in the TEG by financial experts. This domination shows as although the WWF advocates for the exclusion of NG energy, as there is evidence that NG can lead to similar CO₂ emissions as coal. In contrary, the TEG follows the view of the WWF and sees the issue of the DNSH criterion to be hurt by nuclear energy, specifically in the final depository of high-level nuclear waste. Even though the Platform, which consisted of more NGO members, was mandated to

comprehensively review technical screening criteria, of which DNSH is an example of, and urges to tighten regulation on what is sustainable and green so that nuclear and NG energy fall out of this labelling, the EC rather sees a “future role” for the Platform.

4.4 The Commission – Interests, evidence, and bias

Now that the first three sub questions have been addressed in the three latter subsections, the next three will be answered here as they each deal with the Commission. As has been developed, the interests of Germany, France and the WWF have been made clear. Whereas Germany has interest to establish extended financing for NG energy, France advocates for the continuation of nuclear energy financing. The WWF, on the other hand, strongly advocates for the exclusion of both energy forms. In the following, it is examined how the EC followed those interests and substantiated them with the evidence at hand by tracing further the process of the CCDA. Secondly, there will be an assessment whether the EC has been biased or not. Here, the coding comes again into effect: If the EC addressed the evidence accordance with “Better Regulation”, the review of evidence and information at hand would be balanced with argument in favor or against the inclusion of both energy forms into the Taxonomy. If the Commission was biased and had a pre-set stance on both issues, the EC would have cherry-picked evidence and information to either support the “pro inclusion” or “contra inclusion” side.

4.4.1 Reconciling interests and evidence

The EC relied heavily on expert groups when it comes to evidence. As already established, the TEG was the main expert group consulting the EC towards the Taxonomy and its CCDA, thus, to include nuclear and NG energy into the Taxonomy as “sustainable and green” financial activities. The short summaries of the following insights complete the picture of what evidence the EC has at hand.

After the TEG asked for further reviewing the assessment of DNSH and nuclear energy, the JRC was consulted which is a permanent technical expert group under the Commission to provide evidence for the Commission for policy decisions. The JRC was mandated to check the main issue raised by the TEG, whether nuclear energy hurts the DNSH principle regarding the environmental objectives. The published report gives in short green light for including nuclear energy production in the Taxonomy and based on this report and the Commission plans to implement it. In summary, the JRC examined the issue and evidence around emissions of nuclear power plants, which are very low in emitting greenhouse gases, nitrous oxides and sulfur dioxides which complies with the known environmental objectives (JRC 2021, 9). There is no evidence that radioactive waste can be securely treated in a way that is does not propose a harm to the environment, especially regarding HLW with stark radiation levels. Though, the JRC weighs this aspect with the low emissions of nuclear plans proclaims that nuclear energy may be included into the Taxonomy, if sufficient monetary means are directed into R&D projects for deep geological repositories (JRC 2021, 273, 278).

Those reports were addressed in the impact assessment of the CCDA and are seen as evidence equivalence since the EC heavily relies on those reports in its decision. Firstly, the EC reviewed the report of the TEG and adopted the decision of the TEG to include NG into the Taxonomy, as the TEG report evaluates NG to not violate the DNSH criterion (European Commission 2021c). When the TEG stated that its technical expertise is not comprehensive enough to evaluate the equivalent aspect for nuclear energy, the EC legitimizes the decision to also implement nuclear energy within the Taxonomy through the JRC report (ibid.).

Furthermore, the EC stresses that there is no need to further assess the evidence used by these expert groups as the reports deal with evidence on those energy forms extensively and only refers to those reports if necessary. Exemplarily, when the EC addresses the issues raised by the EU Platform regarding the incompatibility of NG and nuclear energy with the DNSH criterion, the EC points to the review of evidence by the TEG and the JRC. Their advice is that those energy form are compatible with DNSH, if certain criteria are met, like the increase of monetary means and support of R&D activities (ibid.).

Thus, the Commission follows the interests of Germany and France to implement nuclear and NG energy in the Taxonomy. Even though the WWF uses evidence to underline that NG also violates against the DNSH

criterion, its stance is already overridden in the TEG report. The EC uses the report to justify its implementation of NG into the Taxonomy as just the burning of NG in terms of CO₂-e does not violate DNSH. The JRC states that nuclear energy meets DNSH as the emissions of nuclear plants over the life-time cycle is comparable the ones of renewable energy sources which is sufficient evidence for the EC to also implement nuclear energy in the Taxonomy. Since the Platform, where more NGOs participate as they have more permanent members in this expert group, criticizes both decisions the EC shortly addresses these issues but points to the reports of JRC and TEG and sees sufficient evidence that those energy forms do not violate DNSH (ibid.).

4.4.2 Was the EC biased?

The latter section already outlines a few aspects that play into the topic of bias. The EC acknowledges the evidence presented by stakeholders which oppose the Taxonomy decision and addresses the opposing evidence, foremost those of the Platform. The EC deals with the issues by stating that the other reports suggest that nuclear and NG energy is indeed “green and sustainable” by the Taxonomy’s standards. Further, the EC does not share the view with the stakeholders that oppose the inclusion, as it states that evidence in favor for this have been sufficiently reviewed by technical expert groups who are in favor of the inclusion (European Commission 2021c, 21, 23).

As has been conceptualized in the theory part, cherry-picking is oftentimes used if policymakers have been biased to justify a pre-set policy choice. As it seems, the EC follows Germany’s and France’s interest to implement nuclear and NG energy into the Taxonomy. It has become clear that, in terms of evidence the EC relied on the reports of the expert groups, mostly on the TEG and the JRC to justify its decision. The coding for bias suggests that if the EC wants to exert this policy goal, it will have cherry-picked evidence and arguments in favor for the policy decision. In consequence, it violates against its principles of good governance or “Better Regulation” in only or mainly selecting evidence that show “economic benefits” or “climate change mitigation” of the energy forms.

To conclude, even though the EC has contradicting evidence at hand, it abstains from addressing this evidence further. It states that it acknowledges that some amendments must be made for the Taxonomy in terms of technical screening criteria but overall, it sees that those energy forms are necessary to reach the goal of climate change mitigation (ibid., 15). Thus, it can be said that although there is contradicting evidence over the effectiveness of NG saving GHG emissions in comparison to other fossil energy sources, and even though there is no solution in sight for the final depository of HLW, the EC cherry-picks the provisions made by the JRC and the TEG to justify its stance. Further, the critique from the Platform is not addressed in depth, as the EC outlines that the role of the Platform is rather to be found in the future. This has been also made apparent through the coding as the EC over-proportionally addresses aspects which are in favor of both energy forms, giving not enough insight on e.g., “environmental damage”.

4.5 Coming back to the hypotheses

Since the sub question have now been all addressed, there is now sufficient ground to either accept or reject the hypotheses for this thesis.

Parkhurst outlined his principles of good governance of evidence for the implementation of EBP and a lot of those principles can be re-found in the Better Regulation documents. He stresses the importance of the integrity of the evidence used and discusses further that the transparency of the process for the reason of public scrutiny is important. The Better Regulation documents deviate from the principles of good governance in three ways: Firstly, the word evidence loses its meaning since the EC distinguished between “non-scientific evidence” and scientific evidence, and, secondly, deviates from evidence-based to evidence-informed policymaking. Thirdly, the EC does not fulfill its own criteria set out in Better Regulation and declares them to be not required. So, the first hypothesis, *given its commitment to EBP, the European Commission has explicitly addressed the available scientific evidence on these two energy sources according to the principles of good governance of evidence. In the policymaking process, both the supporters and the opponents of this taxonomy have been included, not least through a proper, independent institutionalization of evidence in the EU framework,* can be rejected.

The second hypothesis states that *despite its commitment to EBP, the European Commission has a biased perspective. It explicitly addressed the available scientific evidence on these two energy sources but only selectively cherry-picked the evidence that supported the current political dynamics, thus in favor for nuclear and natural gas energy.* The review of evidence in section 5.2 gave insight on what scientific evidence exists contemporarily and the Impact Assessment how the EC followed this evidence. Although there is evidence that shows that nuclear power is low on CO₂-emissions and is not as deadly as fossil energy production, the issue of HLW is not solved. It still proposes a significant threat to public health and the environment. NG, on the other hand, is lower on GHG-emission than other fossil fuels but its climate potential, if around 3% of the gas used in the EU manages to leak out, is comparable to that of coal. But the EC relies heavily on the decision of the TEG and the JRC, both declaring that after the review of evidence nuclear and NG can indeed be labeled “sustainable and green”. Even though the EC is aware that there is evidence against this, the EC points to said reviews and dashes forward with the implementation of nuclear and NG in the Taxonomy, which is like what has been outlined in section 3.2 as technical bias and cherry-picking, as well as issue bias, in the case of the JRC and its mandate. Coding suggests that the EC uses arguments to justify the decision by stressing it benefits “climate change mitigation” and the EU’s “climate goals” and promises “research and development” in areas such as geological depository and green hydrogen. The acceptance of H₂ is relatively well supported.

Lastly, this decision profits member states like Germany and France. Historically, they have institutionalized and unofficial power over decision-making processes in the EU. In terms of nuclear energy, France is highly dependent on this energy source for its energy production, but also for economic reasons. There are strong ties between the French government, the nuclear industry, and academia for safety concerns and research. Coding suggests here that they strongly advocate for nuclear energy in terms of reaching “climate goals”, the issue of “nuclear waste” is currently being tackled by R&D projects like “Cigéo”.

For Germany, current political dynamics are difficult to investigate since in the recent time, the change in government and the sanctions on NordStream II will affect the standing of NG in this country. Nonetheless, frequent codes such as “transition period” and “existing infrastructure” suggests that Germany has interests in continuing with NG as energy source. Through Zukunft Gas it is visible that there is a strong industry union arguing for the implementation of NG in the Taxonomy. Especially new NG power plants can be changed over for the use of renewably produces gases. Even though it is possible to use some of the existing infrastructure for the latter, it is yet bound to technical uncertainties

With all that in mind, NGO implementation in the process has been scarce and the strong argument against the implementation of both energy forms in the Taxonomy, the advocacy of the WWF is overlooked. Therefore, H₃ that *the Commission’s biased use of evidence in assessing nuclear and natural gas energy aligns more strongly with the use of evidence presented by powerful member states than presented by NGOs,* can be accepted.

5. Conclusion

To conclude, it can be said that this thesis outlined the process of the Taxonomy and the CCDA, including the role of the EC, powerful member states, NGOs, and evidence. The research question is as follows:

What was the role of scientific evidence in the European policy process that led to the inclusion of gas and nuclear as sustainable energy sources in the Taxonomy Regulation against the background of the EU’s commitment to evidence-based policy and current political dynamics?

To begin with, scientific evidence plays a crucial role in this policy process. Policy decisions based on scientific evidence are complex and to not let evidence derive policymakers to solely make “technical” decisions, it is important to acknowledge that policy decisions are a compromise between political and societal interests. Societal interests imply that sometimes it is important to also address values and to reconcile them with scientific evidence. Scientific evidence can also be loaded with value, or, in the wording

of Jasanoff, evidence is socially constructed. Policymakers need to address the issue of evidence being socially constructed so that they can eliminate bias in terms of policymaking. Uncritically accepting evidence without addressing its potential bias can likewise lead to overall disadvantageous policy outcomes, similar to making sheer “technical” decisions.

As has been established, the EC took the recommendations of the expert groups as evidence and uses them as legitimization of including nuclear and NG energy into the Taxonomy. The issue of evidence being potentially valued is not addressed by the EC, nor are the arguments made by the expert groups further assessed. Also, the EC softens up the meaning of evidence as shown above. In terms of good governance, the EC violates against the measures of integrity made by Parkhurst, in changing to evidence-informed policy making, and creating the notion of “non-scientific evidence”. Although there is scientific evidence, that NG can be as damaging for the environment as coal and HLW cannot be stored in a safe manner, the EC points to, and cherry-picks consequently, the TEG and the JRC reports that state that those energy forms do meet the DNSH criterion. Latter report has been criticized by another expert group, called SCHEER. It criticizes the evidence used by JRC as it is heavily based on modelling, calculations, and on technology that does not yet exist, exemplary the proper treatment of HLW, its complete geological enclosure, and new reactors whose production of HLW is driven to a minimum (SCHEER 2021, 16). In direct wording, SCHEER explains that “[...] there is no *empirical* [emphasis by author] evidence generated by a radioactive waste disposal facility that has gone through all the three stages (pre-operational, operational, and post-closure) for the entire timeframe foreseen; none of the existing facilities has completed its entire lifecycle.” (SCHEER 2021, 16) This report was not yet ready during the Impact Assessment of the CCDA, but it shows that the evidence of the reports used by the EC for its justification, may be in parts flawed.

Through the pressure of Germany, France, and the according industries behind these countries, EU wide decisions are being affected. Environmental NGOs have been involved in the process but are clearly overridden in the process like the case of the WWF demonstrates. The critique of the Platform was also not further addressed but they will be responsible to supervise the future implementation of technical screening criteria of the Taxonomy.

The EU might miss a major chance to redirect public and private investments into truly “green and sustainable” energy forms, like solar, wind, and hydropower, and to actively contribute to its climate neutrality goal until 2050 without facing the issue of geological storage of nuclear waste. To facilitate the energy transition on an EU-wide level, there must be significant investments into the building of renewable energy sources, on energy saving facilities, and on an EU energy network.

The author acknowledges that the scope of the analyzed documents was vast, and the review could have been more detailed, even if this analysis already gave deepened insights into the role of evidence on the example of the CCDA. It can be argued that a selection of aspects is necessary to answer the research question on target, as the incorporation of all significant aspects is hardly ever possible.

Future research can further conceptualize the idea of good governance of evidence in the EU. The following aspects are proposals for improving the status quo. Using the case of the CCDA, the EC could e.g., make the principles in Better Regulation legally binding, after reviewing those according to EBP principles, especially regarding the integrity of evidence. Additionally, the EC needs to address the evidence laid down in the expert groups’ reports for decreasing influences of evidence underlying technical or issue bias. Also, the EC needs to further implement NGOs as civil society stakeholders, as NGOs are well-connected to evidence-producing entities, so that they have well-established expertise in their field. Lastly, more focus should be given to e.g., EU agencies and their expertise. In this case, the EEA might have been able to contribute more regarding environmental evidence, since it functions as networking agency or the intersection of all environmental agencies of the MS.

6. Literature

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