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THE EU ENERGY POLICY IMAGE DYNAMICS IN RELATION TO THE EXTERNAL CRISIS: EVIDENCE FROM 5TH AND 6TH EUROPEAN COMMISSION TERMS

MA thesis

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Author's declaration

I have written this Master's thesis independently. All viewpoints of other authors, literary sources and data from elsewhere used for writing this paper have been referenced.

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Abstract

The master thesis explores the EU energy policy agenda change by analyzing legislative preparatory documents prepared by the European Commission in the period between September 2009 and November 2019. This period covers the two legislative cycles of the EU that changed in 2014 and coincided with the major external event – Crimea annexation followed by the warmongering in Eastern Ukraine. Multiple Streams Framework and Punctuated Equilibrium Theory was combined as a theoretical framework, according to which the agenda change is caused by the external event. However, the nature of agenda change depends on the policy problem interpretation by the main policy entrepreneur. Therefore, the paper uses the mixed methodology that combines computational text analysis and qualitative interpretation of the results in order to structurally explore the content of the EU energy policy agenda and its change in relation to the external crisis. So, the thesis concludes that the EU energy policy image has a multifaceted character consisting of five main dimensions: economic, environmental, security, foreign affairs, and procedural ones. The paper also contributes to the understanding of the policy agenda change: the shift happens in parallel with the change of problem definition given by the policy entrepreneur – the European Commission.

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Introduction

Agenda-setting is a necessary precondition for policymaking, as only the issues that are considered by policymakers may have a chance to become a legislative decision (Princen, 2011). Moreover, the agenda-setting is important for a variety of political actors who want to draw attention to the topic of their interest and, consequently, broad their scope of influence (Ibid.). So, the agenda-setting is always about gaining political attention to the issue and studying it may provide insights regarding the policymaking processes of any political entity.

In the case of the EU, the study of agenda-setting may contribute to various areas of research. Firstly, research may provide a deeper understanding of policy-making processes within the EU. Secondly, it can draw insights on the EU structural bias meaning that different EU institutions tend to pay attention to the one range of issues while ignoring others (Princen, 2007). Thirdly, agenda-setting research may reveal the main driving forces behind the European integration, as the level of the Europeanization may be measured by the number of issues discussed on the EU level (Ibid.). Finally, the research on the EU agenda content and its development over time may shed a light on how the issue was addressed by policymakers and how it develops over time (Nowlin, 2016; Princen, 2007).

The EU energy policy was taken in order to research the agenda-setting in the EU. Since the creation of the European Coal and Steel Community following the Treaty of Paris in 1951 until the announcement of the Energy Union establishment in 2014, energy policy has always been central for the European project. Firstly, 2009 Russia-Ukraine gas crisis provoked extensive discussion relating the EU's dependence on Russian gas imports (Pirani et al., 2009). Secondly, after the Crimea crisis happened in 2014 and following it warmongering in Eastern Ukraine, Russia was placed in a position of unreliable supplier, and the discussion related to the EU energy security continued with renewed vigor (Neuman, 2010; Talseth, 2017).

Indeed, the European Commission (hereinafter referred to as "the Commission") stated its awareness of the EU's energy security stance emphasizing the overall dependence of the Union on oil, gas and solid fuel supply. According to the European Commission's opinion, even though the level of energy import dependence is different among Member

States, they are interconnected, and to address the energy security issues it is necessary to take a collective action built on cooperation at regional and supranational levels (European Commission, 2014). It is necessary to enhance the solidarity mechanisms and protect the internal energy infrastructure of the Union along with the strengthening of the energy technologies (Ibid.).

Currently, energy issues remain one of the hottest sets of topics today, especially the security dimension that includes energy efficiency, sustainability, affordability and security of supply. At the same time, 2014 year is a crucial point of time when a major international event coincided with the EU new policy cycle. Therefore, the stated research question is the following: How the policy image changes in response to the external crisis?

So, the policy agenda here is defined as the policy image – the way how the issue is understood as a policy problem and how it is defined (Baumgartner & Jones, 1993; Nowlin, 2016; True et al., 2007). Multiple Streams Framework (MSF) and the Punctuated Equilibrium Theory (PET) are used to explain the EU energy policy characteristics and change. Both theoretical frameworks deal with the question of how and why the policy agenda changes and seeks to describe how the "problem definition", "policy image" or "frame" is understood and defined (Nowlin, 2016, p. 311).

Moreover, the EU energy policy covers a multitude of topics, that is why it is possible to apply the bounded rationality assumption meaning that policymakers can pay attention only to the issues that are within their institutional scope. Moreover, due to the policies' complexity and multidimensionality, it is impossible for policymakers to pay attention to the whole topic, and it is most likely that they will tend to address only certain parts of the issue at a given point of time (Nowlin 2016).

Following the theoretical framework, the policy agenda change is caused by the major external event that provokes issue salience. In this regard, it is necessary to note that the EU energy policy agenda is mostly driven by events, as it is affected by the armed conflicts or intergovernmental conferences on the international level (Kustova, 2017; Szulecki et al., 2016).

In the scholarship, the research on the EU energy policy agenda is conducted in order to reveal the development of the policy agenda over time (Biesenbender, 2015; Bürgin, 2018), to explain the agenda-setting dynamics within the EU institutions and their interaction (Alexandrova & Timmermans, 2015; Thaler, 2016) paying attention to the role of the Commission as policy entrepreneur (Herweg, 2015; Jacobs, 2015; Maltby, 2013; Mayer, 2008)

Most of the scholars examine the EU energy policy by using a qualitative approach. Unlike them, this paper attempts to address the issue of the EU policy image change using the quantitative text analysis tracing the development of the energy policy agenda. In particular, the Structural Topic Modeling will be used to explore the energy policy image of the EU, while the thematic analysis was chosen to interpret the results.

Another feature of this paper is applying the computational text analysis to the set of policy documents – preparatory documents published by the European Commission, which is the main policy entrepreneur of the EU due to its exclusive right for the legislative initiative. Usually, the Structural Topic Modeling is applied to another set of documents – legislative speeches, media, and scholarly articles. However, it is expected, that quantitative research in this paper will help to reveal which particular topics are associated with the EU energy policy image.

Therefore, there are two central objectives of this paper. Firstly, the study will draw insights on how the EU energy policy image is defined by the European Commission. Secondly, the comparison of the Barroso and Juncker Commission terms will be made to reveal if there is a shift in the energy policy definition due to the major external event happened in the 2014 – Crimea crisis – that coincided with the EU new policy cycle. Therefore, the paper will provide some insights on how the EU energy policy image is defined and how the definition is changed.

The structure of the thesis is the following. Firstly, the theoretical framework will be given, where the MSF and PET are discussed and the role of the European Commission as a policy entrepreneur is described. Secondly, the research design and methodology will be given. In this section, the research question will be described in more detail and the research methods will be presented. Finally, the analysis will be given, where the EU energy policy image will be described in terms of the chosen theoretical framework.

1. Theoretical Framework

This chapter gives an overview of the theoretical framework chosen for the research and describes the conceptual context. The chapter is structured in the following way. Firstly, the Multiple Stream Framework and Punctuated Equilibrium Theory will be explained along with their application to the European Union research. Secondly, the literature review on the European Commission's role as the policy entrepreneur will be presented. Finally, the overview of the development of the EU energy policy will be described.

1.1. Multiple Streams Framework

Agenda-setting theory is dedicated to the issue of why certain issues become a subject for political discussion and policy-making while others do not (Baumgartner & Jones, 1993; Kingdon, 2014; Princen, 2011, 2012). Scholarship contains several different theoretical approaches to study agenda-setting and agenda-shaping. One of them is the Multiple Stream Framework (hereinafter MSF), initially introduced by Kingdon and dedicated to describe and explain the processes surrounding the political agenda defining and change (Kingdon, 2014; Zahariadis, 2008).

Kingdon proposes a three-tier explanation of the agenda-setting drawing on the garbage can model of decision-making choice (Cohen et al., 1972). Unlike the latter, MSF introduces a more detailed framework that provides the explanation, how the political processes affect agenda-setting (Béland & Howlett, 2016; Kingdon, 2014).

Describing Kingdon's framework step by step, it is necessary to begin with the main structural elements of the theory. There are five of them: problem stream, policy stream, politics stream, windows of opportunity and policy entrepreneurs (Ackrill et al., 2013; Kingdon, 2014; Zahariadis, 2008).

Problem stream consists of perception and realization of the existing problems that requires a governmental action to be solved (Béland & Howlett, 2016; Kingdon, 2014). Usually, people in or around government recognizes problems perceived to be important and generate public policy change proposals. Along with this, in the context of the problem stream people are engaged in political activities (e.g. lobbying or election

campaigns) (Kingdon, 2014). So, in the first stream is dedicated to the problem recognition.

The *policy stream* compromises of qualified policy community specialists whose objective is to analyze existing problems and provide appropriate solutions. Policy stream helps to estimate the existing alternatives and narrow down the choice between them (Béland & Howlett, 2016; Kingdon, 2014). Kingdon compares the floating of the policy ideas in this stream with primeval soup, as all the possible policy solutions are presented by specialists in various forms, examined and re-examined in a multitude of ways before being chosen for serious governmental evaluation (Kingdon, 2014). In the policy stream, consensus is built based on processes of persuasion and diffusion (Ibid., p. 159). Thus, the policy stream's objective is to define and assess possible policy solutions.

Political stream is characterized by features of organized political forces (e.g. interest groups or political parties), administrative or institutional change, ideological change in the state's legislative branch and national mood (Ibid., p. 145); here the consensus-building processes are conducted through bargaining around the policy solution choice (Ibid., p. 159).

The above-described streams are mostly independent from each other and each of them has separate dynamics with several exceptions. For example, experts' expectations regarding budgetary advantages may affect the character of problems to be chosen for consideration from the problem stream (Ibid., p. 88). Another case can be described in this regard: existing problems' public perception in the problem stream may affect the election results occurred in the political stream (Ibid., p. 88). Consequently, Kingdom argues, that it is necessary to understand the conditions under which all of the streams are coupling – *policy window*, that describes such short-term advantageous circumstances when there is an opportunity for a given issue to be pushed on the policy agenda (Ibid.).

Kingdon defines the agenda as certain issues to be taken for serious consideration by decision-makers (Kingdon, 2014; Tosun et al., 2015a). Open policy window also has an impact on the *decision agenda*, that is a list of topics that was prepared for a policy decision (Bache, 2013; Kingdon, 2014; Princen, 2007). Decision agenda can be found in the *governmental agenda*, which is a set of issues that are considered to constitute a problem in the problem stream of Kingdon's explanatory framework (Kingdon, 2014, p.

4). So, only when governmental officials start to widely address the issue, it becomes a problem on the official agenda (Béland & Howlett, 2016).

Policy window opens either because of the change in the political stream (e.g. administrative or ideological change or change in the national attitudes) or because the new problem occurred in the problem stream and attracted officials' attention (Kingdon, 2014). Despite these factors, the policy window may open because a focusing event occurred, e.g. a disaster, crisis or a certain personal experience (Ibid.).

Another reason for window opening is the activity of *policy entrepreneurs* – such persistent and qualified actors who has sufficient political connections and who are ready to invest their energy, time, reputation and other personal resources to promote a certain issue (Ibid., p. 20). So, entrepreneurs pursue their personal goals along with facilitating the streams' coupling (Ibid.).

Indeed, ambiguity is the fundamental part of the policy-making and agenda-setting processes in MSF, as the final agenda and policy choice are not purely rational and not fully a result of given institutional design (Zahariadis, 2008). In the light of the theory, it is possible to argue, that final policy and agenda output rely on the interaction between three abovementioned streams in the moment of coupling (Ibid., p. 517).

Even though Kingdon's framework was designed to explain only agenda-setting processes, currently it is often used to describe and explain the policy formation and legitimation (Herweg, 2015, p. 90)

As MSF was designed to explain the US case, it is necessary to explain how this framework may be applied to the EU agenda-setting. Unlike the US polity structure, the EU does not have a strict institutional hierarchy, and that is why the political power in the EU policy-making plays an important role; in other words, the decision-making power is derived more from the policymaking process, not from the institutional design (Ackrill et al., 2013; Moschella, 2011; Zahariadis, 2008). In particular, a limited number of highly qualified policy entrepreneurs are able to push forward the desirable issue in the circumstances of time constraints and ambiguity (Zahariadis, 2008).

In the case of the EU, ambiguity consists of several features. Firstly, actors do not have clear objectives because of existing time constraints (Ibid., p. 517). Secondly,

participation is not permanent, as it is easy for actors to move from one decision area to another (Zahariadis, 2008). Finally, non-transparent organizational technology meaning that the policy process in the EU becomes unstable as a result of diverse responsibilities of the actors (Ibid.).

Transferring MSF to the European policy-making process, it is also necessary to identify the content of each stream. Problem stream also aims to identify conditions that are addressed by citizens and policy-makers (Zahariadis, 2008). Conditions are identified by indicators like trade deficit or dangerous level of air pollution that attracts the attention of policymakers and internal and external focusing events (Ibid.). In the context of EU policy-making, policy stream can be seen as *primeval soup* of ideas and suggestions made by experts in the EU policy networks, including also ones arisen from member states (Kriesi et al., 2006; Zahariadis, 2008). The politics stream here is characterized by European mood, the ideological balance in the European Parliament and balance of the national and partisan affiliation in the Council (Zahariadis, 2008).

Following the Kingdon's logic, Zahariadis (2008) argues, that even though events in the streams occur independently from each other, the reasons and dynamics of coupling should be traced as well. Open policy window defines limitations applying to rationality of the EU policy process. Window opens and provides political actors to attract the attention to their special problems (Kingdon, 2014; Zahariadis, 2008). So, the coupling process is referred to setting an institutional agenda, that provides a well-defined proposal increasing the amount of available alternatives to make a decision (Herweg, 2015). Another coupling process tackles the issue of policy formulation and focuses on the political negotiations regarding the form of a policy proposal (Ibid., p. 91).

All in all, coupling is a major aspect of MSF. In this regard, it is necessary to consider the role of policy entrepreneurs in the EU policymaking and agenda-setting. In the context of the EU, entrepreneurs have a more significant role than it was proposed by Kingdon, so the line needs to be drawn between the broad policy entrepreneurship and specific policy entrepreneurs (Ackrill et al., 2013, p. 873).

1.2. Punctuated Equilibrium Theory

Unlike the Kingdon's MSF, which provides a detailed, close-up perspective on policy change, Punctuated Equilibrium Theory (PET) is a theory of high level of abstraction (Baumgartner & Jones, 1993, p. 5). Kingdon's framework explains the fusion of new ideas into governmental agenda, however, from a system-level point of view, agenda-setting is not always a driver of change but also a driver of stability (Ibid., p. 5).

Moreover, MSF is criticized for being conceptually fuzzy, especially when it comes to the definition of main political actors contributing to the policy agenda change – policymakers and policy entrepreneurs (Kuhlmann, 2016, p. 42). Here the conceptualization of these two actors is only partially built of the concept of bounded rationality, but their rationale for action is not explained in detail, therefore the institutional analysis may be vague (Ibid., p. 47). Therefore, it is suggested to combine the MSF with PET approach aiming to describe the agenda-setting dynamics to provide more accurate institutional analysis and explain the entrepreneurs' strategies in more detail (Ibid.).

PET builds its argument on the agenda-setting literature (Princen, 2013). Explaining the logic of policy-making PET outlines a pattern consists of long periods of stability alternating with brief moments of drastic change (Baumgartner & Jones, 1993). In other words, according to the PET framework, the policymaking process is seen as equilibrium. After the short change period, the policy-making will inevitably return to the equilibrium again, even if the new equilibrium differs from the previous status quo stance (Princen, 2013). So, PET extends the Kingdon's framework in a way that it deals with not only policy change but also with policy incrementalism (or *"near stasis"*) (True et al., 2007, p. 160).

Taking into account the institutional setting constraints, the policy-makers have limited scope of attention, therefore they cannot avoid paying attention to one set of issues ignoring others that are out of their scope – *bounded rationality* (Jones, 2003, pp. 406–407; Simon, 1972; True et al., 2007, p. 156). Each institution has a specific task to fulfill, so they are rigid in their way to respond to the problems and events that lays outside of their specific task (Princen, 2013, p. 864).

Moreover, another assumption can be made from the bounded rationality statement. The success of the issue to be placed in the political agenda depends on the issue interpretation meaning that every issue is multidimensional and consists of a variety of the topics (Nowlin, 2016). Taking into account the policy-makers' bounded rationality it is possible to assume that they cannot pay attention to the whole topic, and it is most likely that policy-makers will address only certain parts of the issue in a given point of time (Ibid., p. 312).

Consequently, according to the PET, this pattern can be broken in two ways. Firstly, following the MSF, the external focusing event can facilitate the shift of attention to preciously ignored problem (Kingdon, 2014; Princen, 2013). Secondly, this focusing event may cause such large amount of pressure on policy that the emerged problem cannot be ignored anymore (Princen, 2013). So, the character of drastic policy change depends on a degree of problem ignorance: the longer the issue does not receive appropriate attention, the more radical the change will be (Ibid.). However, on each change stage, institutions produce *frictions* – obstacles for policy change that are made by emphasizing the signals that undermine existing policies or imposing the restrictive decision-making requirements (Ibid., p. 858).

The main features of PET are *policy images* and *policy venues.* Policy images are framed as *"public understandings of policy problems"* (Baumgartner & Jones, 1993, p. 25) that are a *"mixture of empirical information and emotive appeals"* (True et al., 2007, p. 161). When the image is supported by the policy, it is attributed to the *policy monopoly* – monopoly on *"political understandings concerning the policy of interest and an institutional arrangement that reinforces this understanding"* (Baumgartner & Jones, 1993, p. 6). So, when political opponents begin to raise different set of policy images that contradict with the existing ones, policy monopoly began to deteriorate (True et al., 2007, p. 159).

Policy venues are institutional areas where the decision is made by a closed cycle of experts – *policy subsystem* (Princen, 2013, p. 856). Here the decision-making institutions focus on their objective, so they tend to ignore other issues that are outside their scope of competences, as it is derived from the bounded rationality assumption (Ibid.). So, it the circumstances of changing policy image the *venue shopping* emerges: the attempts of

opposition actor to involve more favorable venues to the existing policy subsystem (Princen, 2013, p. 857).

Studying agenda change in the PET framework allows to implement two general approaches: cross-sectional and longitudinal analysis. The former approach refers to the study on how different types of issues generate policy changes in different subsystems (Baumgartner & Jones, 1993). The latter is dedicated to the research on how the issue in question is emerged and faded in the agenda over time (Ibid.).

As mentioned above, PET is a general theory of a high level of abstraction that aims to explain the agenda and policy change from a system level point of view. However, like Kingdon's approach, the theory was designed to explain the change in the US policy system. Therefore, it is necessary to explain how the theory can be applied to the EU policy-making studies.

All in all, the EU can be described as a venue or a multitude of venues that makes it a suitable case to study venue-shopping and creation of policy images (Princen, 2013). The study can follow either vertical or horizontal venue-shopping (Ibid., pp. 859–860). Vertical venue-shopping refers to the issue how member states deliver their venues from national to the EU-level, while horizontal venue-shopping deals with well-established EU policies and why do they change over time (Ibid., pp. 859–860). Another issue to be studied within the EU according to the PET approach is the framing and reframing policy images (Princen, 2013; Princen & Rhinard, 2006). Here the issue framing is crucial point that affect the nature of policy change (Moschella, 2011; Princen, 2013).

Analyzing agenda-setting strategies of the EU, a conclusion can be drawn. So, the EU agenda-setting and policy-making patterns seem to follow the PET logic and can also be attributable to horizontal and vertical venue-shopping logics.

Horizontal venue-shopping approach provides several insights. Studying the EU energy policy in longitudinal perspective, Benson and Russel (2015) showed that the historical pattern confirms the shifts from the markets harmonization to the multitude of issues, including security, renewable energy promotion and environmental regulations. The change become possible due to the growing public concern regarding the security of

energy supply, energy efficiency and environmental issues (Benson & Russel, 2015, pp. 188–189).

The same applies to the EU fisheries policymaking. The study emphasizes the there is a mutual connection between policy image and the institutional venues and the way political actors operate in the circumstances of open policy opportunity (Princen, 2010). Therefore, different venues struggling for their policy interpretation to be a major one, contribute to the development of fisheries policy (Princen, 2010, p. 40).

Another evidence can be found in the Burns, Clifton, and Quaglia (2018) paper, where the dynamics of the EU financial reform is investigated. Due to external shocks the salience of financial issues increased, and the harsher the perception of crisis, the policy change becomes more likely (Burns et al., 2018, p. 738). In the case of financial reform, it was expected that the major external crisis causes a policy image change in a way, that the policy perception will turn from a subsystem level to the macro-level solution search (Ibid.). However, the study concludes, that the actual circumstances within the polity and the will of policy entrepreneurs provoked only limited number of new venues to be discussed at the EU-level (Ibid., p. 741).

Comparing the agricultural policy dynamics in the European and US polities, Sheingate (2000) argues that the liberalization of agricultural policies in both the EU and US cases is followed by the policy image redefinition in terms of negative externalities: threats of trade retaliation, environmental damages, budget deficit and other (p.357). Therefore, the ground for venue change becomes possible (Princen, 2011; Sheingate, 2000).

Vertical venue-shopping approach also shed a light on the EU policymaking and agenda-framing issues. Princen (2011) developed a typology of the EU agenda-setting strategies based on processes of venues-shopping and framing. According to the argument, agenda-setters in the EU polity face two main challenges: gaining attention to the issue and building credibility (Princen, 2011, p. 931). Therefore, to increase the value of attention to the issue in question entrepreneur may increase the participation through venue-shopping and venue-modifying meaning finding appropriate venue to mobilize other participants in the policy process to challenge the existing policy image (Ibid.). In addition to supporters' mobilization, agenda-setters need to frame the issue in question in a way that it may gain additional interest (Ibid., p. 933).

Building credibility task takes form of either capacity-building or authority claiming. In the EU context, capacity-building refers to the acquiring and maintaining the organizational capacity enough to push the national issue to the EU-level both within and outside the EU institutions (Princen, 2011, p. 935). At the same time, claiming authority strategy refers to the creating a rationale to prove that the issue in question indeed constitutes a problem that is European in scope (Ibid., p. 938).

Also, the study of Guiraudon (2000) provides an insight on the EU immigration policy. Author describes the development of the EU immigration policy in 1980-1990s as a strategic venue-shopping, that was initiated by the local migration control agencies (p. 252). So, in the bottom-top manner, migration agencies of the member states promoted policy-making venues at the EU level that challenged the opposition group of immigrant rights promoters (Guiraudon, 2000, p. 260; Princen, 2013, p. 860).

Finally, Wendon (1998) argues that the Commission plays a role of the *image-venue entrepreneur* as it shows the similar behavior: the Commission does not only define the content of the issue through shaping the policy image but also contributed to the institutional venue change and building that are quite semi-autonomous in nature (Wendon, 1998, p. 350). This study shows that by framing the policy image of the EU social policy, the Commission makes it more attractive for the member state governments and other important policy actors and may provoke a change (Ibid., p. 344). Therefore, it is an evidence that PET can be applied not only at the macro-level, but also at the institutional level (Princen, 2013; Wendon, 1998).

1.3. Entrepreneurial Role of the European Commission

The European Commission seems to play a role of a main policy entrepreneur due to its exclusive right of legislative initiative (Biesenbender, 2015; Goetz & Meyer-Sahling, 2009; Princen, 2007). Moreover, the Commission's role as policy entrepreneur heavily depends on the uncertainty of member states regarding confronting issues, as Commission has an ability to identify and prioritize these problems and achieve a necessary consensus between member states on the way of finding appropriate solution (Ackrill et al., 2013, p. 875). Nevertheless, the Commission does not act in a vacuum, and this formal right to

initiate legislation does not mean the inevitable success of the policy proposal in question (Biesenbender, 2015; Tosun et al., 2015b).

Indeed, the Commission as policy entrepreneur contradicts with MSF, as it challenges the assumption that policy entrepreneurs should not be located within agenda-setting process (Ackrill et al., 2013, p. 876). However, due to the ability of the Commission to strategically define the policy agenda on the European level, that includes *agenda-setting* – placing new issues in the agenda, *agenda structuring* – defining subsets of important issues, and *agenda exclusion* – remove several issues from the scope of discussing problems, it is possible to say that Commission plays an important entrepreneurial role in the fluid EU agenda-setting and policy-making processes (Tosun et al., 2015a, p. 3).

Going further, the Commission itself is not a black box. The Commission is divided along different policy lines where important in the given context issues are evaluated and discussed, that itself can cause an ambiguity meaning a tendency of certain policy issues to go in parallel with different policy fields (Ackrill et al., 2013, p. 877).

Indeed, on the supranational level, the Commission plays an important role defining the targets to achieve and principles to be followed by using the different defining strategies to shape the agenda that are based on its respective preferences (Biesenbender, 2015; Tosun et al., 2015b).

Copeland and James (2014) described the Commission's behavior as policy entrepreneur at the time economic reform agenda in 2010. Authors argue that the Commission played the role of "purposeful opportunist" outlining the most significant policy issues for policy-makers to pay attention to, taking responsibility for setting policy agenda and increasing the number of available policy solutions in times of open window of opportunity (Copeland & James, 2014, p. 14). From the functional point of view, the role of the Commission is not restricted by just submitting policy proposals, but the Commission has the significant but limited ability to determine the policy priorities (Kreppel & Oztas, 2017, p. 1122).

Researching the hedge funds issue, Moschella (2011) also contributes to the understanding of the Commission's role as policy entrepreneur stating that the its agenda-setting capacity is not determined only to finding the consensus among member states

regarding a particular problem. By tracing the Commission's proposals on hedge funds regulation in the 2005-2009 period, author suggests that the Commission's agenda-setting capacity was strong enough to define this problem as a part of the EU's response to the international crisis and to increase the issue salience enough to make it more attractive for the change (Moschella, 2011, p. 258).

Another issue should be considered in this regard. The Commission as any other organization faces a number of inter-institutional constraints that affects its decisional ability (Kassim et al., 2017; Rauh, 2018). Following the consecutive treaty reform that enhanced legislative powers of the European Parliament, the Commission faces the procedural constrains (Rauh, 2018, p. 3). It is merely explained by the decision-making procedure, according to which the Commission needs to find an agreement on the legislative proposal between co-legislators – the Parliament and the Council of the EU (Ibid.). Another explanation to the procedural constraints is the growing legislative power of the Parliament, that plays a crucial role in the designating the Commission President (Ibid.).

The political constraints that limit the Commission's agenda-setting power are inter-institutional bargaining (Ibid., p. 5). The political affiliation within the Council as the co-legislator and the accession of the new member states to the EU impacts the legislative output of the Commission, as the increasing variety of actors makes the bargaining process more complex and time-consuming (Ibid.).

Finally, the Commission agenda-setting powers are constrained by organizational limitations meaning that administrative resources, internal conflict and other intra-organizational factors may shorten the agenda-setting abilities of the Commission (Kassim et al., 2017; Rauh, 2018). The difference in the Directorates-General political and sectoral orientation, difference in their administrative capabilities also influences the final decisional output of the Commission (Rauh, 2018, p. 6). Horizontal intra-institutional relations within the Commission are widely addressed by scholars (Hartlapp et al., 2013; Kassim et al., 2017; Trondal, 2011). However, the vertical dimension of the intra-institutional relations within the Commission is underestimated (Kassim et al., 2017).

Since its establishment, the Commission was a fragmented institution and the Commission President used to have limited influence over the institutional agenda-setting and policy-making (Kassim et al., 2017, p. 657). However, since the late 2004 the Commission Presidency has been transformed in a way, that the President received mostly full control over the agenda-setting (Ibid.). Three factors contributed to this change.

Firstly, the successive treaty reforms. The Treaty of the European Union contributed to the strengthening of the President due to the newly established personalized selection of the President, powers of dismissal, assignment and appointment of the office and the policy leadership role (Ibid., p. 659). Moreover, the *Spitzenkandidaten* procedure introduced by the Treaty of Lisbon increased the control of the European Parliament and the Council of the EU over the selection of the Commission President that is resulted in the strengthening of the President's role in political terms (Ibid.).

Secondly, the development of the Commission's administrative abilities contributed to the strengthening of the President's powers. The request for better inter-institutional cooperation realized through the Strategic Planning and Programming powers contributed to the Commission's centralized capacities (Ibid., pp. 659–660). Indeed, following the Kinnock reforms, the Prodi Commission created a new organizational framework to adopt to the long-term planning and contribute to the centralization of legislative powers in the hands of the Commission (Kassim, 2004; Kassim et al., 2017).

Thirdly, the incumbents' entrepreneurship is another reason for strengthening the President's position. The internal institutional changes initiated by Prodi, and continued by Barroso and then Juncker resulted in the centralization of decision-making powers in the Commission and its increasing control of the President over legislative agenda-setting (Kassim et al., 2017). Claiming in favor strong presidential leadership, Barroso converted the Secretariat General into the Commission Presidency's personal service, that has transformed the administrative capacity of the President (Kassim, 2013, pp. 152–153; Kassim et al., 2017, p. 660).

Indeed, following the Müller's (2016) argument, the Commission's President has an agenda-setting, inter- and intra-institutional bargaining and public leadership objectives. Therefore, the role of the Commission's President is understood as ability to successfully

overcome the institutional limitations and create the opportunities and resources to achieve and affect the mutually beneficial and publicly supported political goal over a given period (Müller, 2016, p. 69). All in all, the Commission's leadership is a factor that influences the Commission's agenda-setting activism and, therefore, may have an impact on the EU legislative outputs (Kassim et al., 2017, p. 661).

Summarizing the arguments, it can be drawn that the transformation of the Commission's Presidency has an impact on the centralization of decision-making power in the hands of the Commission President giving a control over institution's agenda-setting outcomes (Kassim et al., 2017, p. 661). Therefore, the Presidency in the Commission, as in any other international organization, influence not only the internal operation but also the overall output of the organization the leader presides over (Ibid., p. 670).

1.4. The EU Energy Policy Context

One of the most significant issues today is energy policy, that covers not only economic and environmental aspects of energy development but also issue of secure energy supply, energy poverty and social aspects of energy. Since the establishment of the European Coal and Steel Community, the energy policy has been an issue of high importance for the EU in general and European integration in particular.

Beginning from the roots, the Treaty of Paris founded the ECSC in 1951 established control over the energy sources, and the Treaty of Rome established the legal constitutional framework for the Common Market building due to attempts to gradual turn to the border-free market (Börzel 2005, p. 218). The achievement of peace in Europe was the main objective (Matláry 1997, p. 15). The energy sector was chosen for two reasons: firstly, the sectoral economic integration was expected to result in full economic and political integration, and secondly, coal was the main resource for steel production necessary to war. Therefore, it should be under control (Ibid., p. 16).

Since the coal played an important role in energy consumption, ECSC prohibits governments from subsiding the coal producers (tariffs and quotas) and obliges coal producers to establish non-discriminatory prices but allows MSs to choose their line of foreign-trade policies, establishing free market (Mueller, 1965). However, the warm

winters made the coal surplus that affected the German and French economies negatively due to ECSC's High Authority's attempts to reinforce the free market in the circumstances of low coal demand (Matláry 1997). Therefore, the High Authority's actions had strictly community character neglected the states' national interests in the decision-making processes, which led to the situation when national and market actors had to resolve the problems while the dysfunctional supranational institution (Ibid.).

In 1957 the European Atomic Energy Community (Euratom) was established along with the European Economic Community (EEC). The main aim was to ensure the stability in the Community and to unite the nuclear systems of each MS to obtain more energy with the prospective to sell its surplus to the third parties. The main objective of Euratom is similar to the ECSC's one: to facilitate the political and full economic cooperation through sectoral convergence (Matláry 1997).

Euratom regulates the nuclear energy sector, so at the time of signing the Treaty of Rome, the future role of oil in the world industry was quite underestimated (Ibid.). However, the cooperation objectives were interrupted by previously emerged MSs' competition. Particularly, France was a leading MS in the field of nuclear research buying the uranium from the US. Therefore, France supported the Euratom only in terms of widening the scope of nuclear energy export, simultaneously supported only cooperation in separate economic areas and rejecting the idea of common market building (Ibid.).

The extraordinary external shock to the EC's continuing integration was the 1973-74 oil crisis. The continuous tensions in the region, wars, and the decolonization process allowed the small economically and socially underdeveloped countries to impose their will through the Organization of Arab Petroleum Exporting Countries (OAPEC) (with the OPEC majority) to the industrialized world (Issawi, 1978). In the case of 1973-74 crisis, oil became a leverage tool in international relations: the oil production cut-off by the 25% with the future additional 5% appeared to have huge influence on the world economy, and the EC's growing concerns about the security of supply, import dependency and environmental issues dedicated to oil production (Labbate, 2013; Matláry, 1997)

Being on rails of market liberalization and opening, the three energy packages were adopted. The first energy package is consisted of 1996 Electricity and 1998 Gas

Directives defining the ground for the first internal gas and electricity markets opening (Dudău & Simionel, 2011; Eikeland, 2011). The second package came into force in 2003 revised these directives and facilitated the integration process, making the prices affordable for consumers even while the price per barrel was increasing (Ibid.). The Third Energy Package consisted of again revisited directive and three regulations dedicating the cross-border grid access conditions: vertical integration of transport system operators, non-discriminatory access for "third parties" and autonomous energy regulators among the common energy market (Dudău & Simionel, 2011). At the same time, the EU Climate Action program was also adopted after negotiations and legislative harmonization at the end of 2008 in accordance with the Kyoto protocol.

The scholarship is arguing also in favor for the 'hesitant supranational turn' in the energy policy-making, as far as after Lisbon Treaty energy policy has lost its strictly national character, that was enhanced by the implementation of the Third Energy Package that implied further harmonization and coordination along with more intensive energy market liberalization (Eikeland, 2011; Szulecki et al., 2016; Tosun et al., 2015a). All these measures including the Energy Union initiative provide a form of regional energy governance.

The EU Climate Action program states the importance of positive environmental change and the security of supply maintenance. The 20/20/20 Strategy concentrates on a 20% reduction of CO_2 emissions, 20% energy system development, and 20% renewables share increase in overall energy consumption in comparison with the 1990's numbers. It also establishes the Emissions Trading system that allows the companies to trade the emission allowances and put huge importance on technological innovations in the energy sector (Tol, 2012). The 2030 Framework is developed in accordance with the 2020 Strategy's goals and sets the further development of its measures, arguing that the positive scenario will be reached. The Low-Carbon Economy is expected to meet by 2050, according to the prospects of the EU Climate Action Program (Ibid.).

The third energy package was proposed in 2007 and adopted in July 2009, after the Ukrainian gas crises in 2008-2009. Happened right after the Russo-Georgian war 2008, crisis was an outstanding example of interdependent conflict between Russia and Ukraine (Lee, 2017; Talseth, 2017), when Russia uses the Ukraine's pipelines as a way to deliver

natural gas to the European market, and Ukraine needs these transitions to get the benefits from the fees and support its economy (Pirani et al., 2009).

Incapability to agree on transit fees led to the conflict between Russia and Ukraine when Russia cut all the gas transit through Ukraine in the very beginning of January 2009. Therefore, Eastern European countries seriously lacked gas supply even on the 12th of January (Ibid.). The conflict was solved with the EU's involvement in the negotiations when the mutual agreement was signed.

The crisis facilitated discussion inside the EU relating to the dependence on Russian gas, lack of suppliers' diversification and improving the energy security of the Union. According to the research, it the case of prolonged conflict, the EU would suffer from a ¾ lack of energy in 90 days (Rodríguez-Gómez et al., 2016). Thus, the 2009 Russian-Ukrainian gas dispute posed an issue of vulnerability of the EU's energy system, especially the vulnerability of Eastern European states to the energy supply disruptions, fostered a demand for the collective action to deter the possible energy crisis in Europe (Neuman, 2010).

Then, the Crimea crisis happened in March 2014, Moscow's warmongering in Eastern Ukraine expressing concerns whether Russia as an energy partner worth trust (Neuman 2010, p. 342; Talseth 2017, p. 3). Currently, the main goal of energy security of the EU is defined as the achievement of energy sustainability, efficiency, competitiveness and security of energy supplies including the aim of energy suppliers diversification (Winzer 2012, p. 36).

The development goes further with the adoption of Governance of the Energy Union regulation, which is highly interconnected to the EU Climate Action Program. This regulation aims to ensure the meeting of the 2030 Framework's goals, further integration will reduce the administrative burdens of MSs that will result in the better regulation of the energy sector ensuring that the integrated national energy and climate plans will be met. The progress of regional cooperation has been already monitored by the Commission.

Indeed, the energy policy of the EU has always been an integral part of the EU policy. It covers a multitude of policy areas including economic, environmental, security and social

aspects of energy, and even the foreign affairs dimension of energy policy (Kustova, 2017; Tosun et al., 2015b). Beginning from the character of energy policy representation in the 1960s, currently, this area of the EU policy developed to the energy market convergence and integrity of energy interconnection networks (Biesenbender, 2015). Then, energy policy is meant to attain also environmental policy goals along with previously described ones (Tosun et al., 2015a).

Today energy policy tackles several issues like the technological development, renewable energy, single market for gas and electricity, energy consumption, production, and transit, etc. (Talus, 2013; Tosun et al., 2015a). Especially after the adoption of Lisbon Treaty, EU energy policy became a policy area where the European Commission achieved increasing competencies in agenda-setting and decision-making over time (Maltby, 2013; Tosun et al., 2015a).

The Commission used is capacity as agenda-setter and agenda-shaper to frame the energy market liberalization issue on the EU-level as one of the competition character (Herweg, 2015). Using opened policy windows the Commission shaped the energy security issue as a matter of market effectiveness and competition, as adoption of the Single European Act gave this institution a room for maneuver (Ibid., p. 94).

Similarly, the Commission acted as a policy entrepreneur in framing the issue of the European electricity market (Jacobs, 2015). Discussing the negotiations in the EU regarding the funding instruments for the establishment of the renewable electricity market, Jacobs (2015) shows that the Commission as agenda-setter proposed two rather contradicting solutions in circumstances of intensive policy debates. First of them is focus on the establishment of the common renewable electricity market residing on the spot markets short-term trading, and the second is concentrating on the zero-emissions economy along with the development and promoting of renewable energy technologies (Ibid., p. 123).

Another important finding in this regard that the Commission exercises its ability to influence member states' decision-making processes in the area of energy policy through state-aid guidelines where the floating premium for supporting renewable energy solutions is offered (Ibid.).

Along with the abovementioned energy policy issues the Commission became more and more concerned with the energy security framing it as an EU-level problem (Biesenbender, 2015; Bouzarovski & Petrova, 2015; Thaler, 2016). In this regard, Commission addressed both direct and indirect instruments to fight energy poverty and implement more explicit mechanisms to ensure the security of energy supply arising from the Third Energy Package (Bouzarovski & Petrova, 2015, p. 142).

However, not all the energy-related issues are actively promoting by the Commission in terms of agenda-setting and agenda-shaping. For example, the issue of carbon capturing and storage does not receive explicit attention from the Commission, as well as hydraulic fracturing problem, and the agenda-setting power it these areas are allocated in hands on the Council of the EU and the European Parliament (Tosun et al., 2015b, p. 252). In other words, the two abovementioned issues are addressed by the Commission in a passive way (Ibid., p. 253).

Researching the agenda-shaping processes in the field of energy policy, the Commission was focused on proposing the internal energy-market solutions as a major instrument to achieve the overarching EU energy targets (Biesenbender, 2015). Especially after the Treaty of Lisbon enforcement, the energy policy agenda becomes one of the supranational importance, not only the explicit point of concern of member states' administrations (Szulecki et al., 2016, p. 549).

Another study is relevant in this regard. Isoaho, Moilanen, and Toikka (2019) research the major policy priorities behind the building of the Energy Union. Authors gathered more than 5000 Commission's policy documents and analyzed them using the quantitative text approach – Latent Dirichlet Allocation (LDA) in order to reveal how the Commission uses its agenda-setting powers to promote the objectives of the Energy Union (Isoaho, Moilanen, et al., 2019). Authors found that the Energy Union as a concept cannot be considered as a "floating signifier", as the Commission actively promotes decarbonization and energy efficiency agenda issues and draws new paths on how to develop the renewable energy (Ibid., p. 37).

Researching how the Energy Union agenda is shaped by both the Commission and four member states' administrations (Germany, Norway, Poland, and France), Szulecki et al. (2016) revealed the pattern of policy cleavage in the field of energy. They argue, that the

Commission's plan to create the Energy Union caused tension between the Commission's view on the EU energy policy and national plans in this area (Szulecki et al., 2016, p. 549). In other words, while the Commission is concentrated on the unified energy policy based on the member states interdependence, member states, especially the major ones, are still tent to pursue their views and interpretations on the energy policy development (Ibid., p. 563).

The notion of this "supranational turn" in the EU energy policy was also observed in previous research. Studying the EU policymaking in the field of energy policy, Eikeland (2011) concluded that the proposal for a Third Internal Energy Market Package is an attempt of the Commission to obtain more overarching supranational powers for regulating this field (Eikeland, 2011, p. 258).

Indeed, taking into account the energy policy's supranational shift, member states always perceiving energy as the scope of their interest begin to see the agenda shift to the EU level as one of their interests (Wettestad et al., 2012). In other words, the vertical integration led by the Commission was perceived by the member states as a possible threat for their national interests (Ibid., p. 77). That is also another evidence for the assumption that the EU-level institutions play an entrepreneurial role, especially the Commission due to its exclusive position in the European institutional design (Ibid., p. 82).

Another important finding is the security turn in the EU energy policy. The EU energy policy is characterized by the *"energy policy triangle"* – security of supply, competitiveness and energy sustainability (Szulecki et al., 2016, p. 549). And this emphasis on energy security seem to coincide with not only external event but also with the new EU policy cycle (Ibid., p. 551).

Jean Claude Juncker who became a Commission President in November 2014, strengthened the Commission's control over the EU-level policy areas that *"has a potential to be more effective than national regulations"* (Bürgin, 2018, p. 1). Juncker conducted reorganizational reforms within the Commission to strengthen the vertical coordination between the EU institutions and member states' administrations (Ibid., p. 3). This reorganization contributed to the Commission's success in the leadership in the

environmental and energy policy agendas and helped to achieve better inter-institutional coordination in these areas (Bürgin, 2018, p. 11).

Some scholars see the security turn in the EU energy policy as a part of the securitization process. The Juncker's and Tusk's proposal for the creation of the European Energy Union based on competition, solidarity, and cooperation is a solution that appeared in the circumstances of the external armed conflict occurred near the EU borders (Vinois, 2017, p. 45). So, the increased demand for the energy securitization appeared, and the creation of the Energy Union is a solution for the appeared problem (Boersma & Goldthau, 2017; Franza & Van Der Linde, 2017).

So, the incorporation of energy market liberalization is the policy means that aims to strengthen the EU energy security in a long-term perspective (Franza & Van Der Linde, 2017), while the creation of the Energy Union is dedicated to enhancement of the EU from the external perspective, focusing no more explicitly on the internal market development (Boersma & Goldthau, 2017). So, it is argued that the EU's attitude becomes increasingly securitized, and the role of the Juncker Commission in this process is high due to the internal top-down reforms (Boersma & Goldthau, 2017, p. 108; Kassim et al., 2017).

In summary, EU energy policy is quite dynamic area and agenda in this field is sensitive to political debates and external events on the international level (Boersma & Goldthau, 2017; Franza & Van Der Linde, 2017; Kustova, 2017; Szulecki et al., 2016; Tosun et al., 2015a). Energy policy being an actively developing but well-established on the EU level field is open for new legislative initiatives (Princen, 2013; Tosun et al., 2015a). Therefore, it is one of the EU policy areas suitable to research the content of the agenda and its development, as the EU becomes more responsive to certain issues over time (Ibid.).

2. Methodology & Research Design

The time covered by the study is September 2009 – November 2019. This time range begins with the José Manuel Barroso re-election on the 16th of September 2009 and ends with the last day of the Jean-Claude Juncker Commission term – 31st of October 2019.

Previous research shows that both Barroso and Juncker used the enhanced Commission Presidency powers to restrict the scope of the Commission's legislative agenda-setting result (Bürgin, 2018; Kassim et al., 2017; Müller, 2016). Also, both of them perceived the expansionist bureaucracy of the Commission as a constraint for its legitimacy (Bürgin, 2018; Kassim et al., 2017). Both of them defined the political objectives of the new Commission term and exercise the extensive control over the Commission's agenda-setting and shaping abilities (Kassim et al., 2017; Pansardi & Battegazzorre, 2018).

Additionally, this time frame includes the time of adoption and ratification of the Treaty of Lisbon, which came into force on the 1st December 2009 and when the European Commission received extended competencies in agenda-setting in the field of energy. Indeed, as it was mentioned previously, the Treaty of Lisbon established a more specific way for activities in the energy policy areas: regulation of the energy market, security of the energy supply, energy efficiency promotion, development of the renewable energy sources and management of energy interconnection networks (Biesenbender, 2015; Szulecki et al., 2016).

Moreover, according to the MSF and PET, the agenda is quite sensitive to the external events, and the energy policy agenda is especially vulnerable due to its partly international nature (Andersen et al., 2017; Kustova, 2017; Tosun et al., 2015b). In this case, the 2009-2019 time frame was chosen, because in 2014 not only the new EU legislative cycle began (Goetz, 2009; Goetz & Meyer-Sahling, 2009; Kovats, 2009) but also it coincided with the Crimea annexation by Russia and Moscow's warmongering in Eastern Ukraine that can be seen as a major external event that may promote the legislative agenda change (Boersma & Goldthau, 2017; Franza & Van Der Linde, 2017; Szulecki et al., 2016; Talseth, 2017).

For the research, it was decided to combine MSF and PET theoretical approaches. It is stated that a major external event can cause a shift in the policy agenda. Policy or legislative agenda is defined as the policy image, which change is caused by the shift in

agenda interpretation or change in the emphasis made by the successful policy entrepreneur. Taking into account the bounded rationality assumption and complexity of policy issues, it is impossible for policymakers to pay attention to the whole set of issues laying within the policy problem. It is necessary to mention here that it is stated in the theoretical framework that the policy image inevitably consists of a set of subtopics characterizing it (Nowlin, 2016). Therefore, the research question is the following: How the policy image changes in response to the external crisis? And it is assumed that the agenda change caused by the external event is characterized by the shift in the policy image interpretation by the main policymaking actors.

This chapter is structured in the following way. Firstly, the methods will be described, its advantages and limitations will be discussed. Secondly, the thematic analysis overview will be given. Thirdly, a description of gathered data and sample justification will be described. Finally, the model selection process will be presented and justification for its reliability and validity will be given.

2.1. Structural Topic Modeling

A huge amount of work in any organization is conducted through text (Banks et al., 2018; McKenny et al., 2018). Indeed, currently, a lot of information is published in digital form – Twitter microblogs, governmental texts, political debates, judicial opinions, propaganda documents and other resources for social science research allows scholars to include computational tools to investigate features of big amount of texts (Egami et al., 2018; Roberts et al., 2014). As a main method of analysis for this paper, the Structural Topic Modeling (STM) was chosen, as it allows a researcher to trace the effect of additional variables while analyzing the document corpus.

Computational text analysis varies in a degree of automation. For example, analysis tools commonly associated with grounded theory require a low degree of automation, as researcher needs to manually code gathered texts according to a methodologically specific algorithm (Banks et al., 2018, p. 447). So, the content analysis approach requires researcher to generate a text-driven categorization dictionary in special programs (e.g. ATLAS.ti or NVivo) that can be used for thematic analysis (Banks et al., 2018, p. 447).

Then, bag-of-words or count-based text analysis allows to conduct classification and categorization of given texts in a fully or partly automated manner. Here corpus of selected documents is analyzed in a certain fashion that assumes the text sample to be a mixture of topics disregarding the word order in given sentences (Banks et al., 2018, p. 449). Count-based text analysis can be either supervised or unsupervised, that depends on the research context and whether the researcher defines in advance what exactly s/he is looking for (Ibid.). Conduction a supervised analysis, researcher provides the program both input and output, while the system calculates the connection between them based on texts (Ibid.). The unsupervised method of text analysis is to some extent similar to the abovementioned thematic analysis. However, here the automated approach is used to identify words and classify it to the clusters, that constitute topics (Ibid.).

The Natural Language Processing (NLP) is a nearly completely automated method of text analysis that consists of a big number of techniques depending on research objectives and textual data characteristics. NLP techniques include sentiment analysis, image-text combinations and other approaches to analyze documents (Ibid.). However, the application of SMT to the research is possible only in case when the time frame is clearly defined (Isoaho, Gritsenko, et al., 2019, p. 17).

In this paper, it was decided to use an unsupervised bag-of-words approach for the text analysis for the following reasons. The method is called Structural Topic Modeling (STM) that is the unsupervised method suitable to analyze large amounts of textual data and requires a human insight to interpret the results. Unlike latent Dirichlet allocation (LDA), STM not only classifies words into topics, but it also allows to incorporate the additional covariates into the model and trace whether these covariates have an impact on the topic allocation (Banks et al., 2018, p. 449).

STM provides a toolkit for a machine-assessed reading of text corpora, that allows investigating the relationship between text and this text metadata for more insightful results (Roberts et al., 2014). According to the STM framework, a *topic* is a *"mixture over words where each word has a probability of belonging to a topic"* (Ibid., p. 2). Therefore, each document in a *corpus* – a given text sample - is a mixture of calculated topics, meaning that each document may constitute several topics at the same time (Roberts et al., 2014).

Also, it is necessary to describe and define the main concepts of STM despite topics and corpora. The process of topic definition and words allocation generates *topical prevalence* – the extent to which a document in question is associated with a given topic/topics, and *topical content* – the exact words that were associated with a given topic ((Roberts et al., 2014). Both topical prevalence and content can be explained by metadata *covariates* – additional document features allocated to each of them, that can be used as predictors; the choice of covariates depends on the research objectives (e.g. author, date, ideological affiliation, publisher, etc.) (Ibid.).

All in all, it was decided to use the STM method to reveal latent topics from the agenda policy document for several reasons:

1) STM allows to analyze a large amount of textual data that cannot be processed manually by reading;
2) Analyzing a huge policy document corpora can provide some insights regarding how specific policy issues were presented by policy-makers (Isoaho, Moilanen, et al., 2019);
3) STM provides a toolkit to analyze how the revealed topics were developing through time because it is possible to include covariates in the calculated model;
4) In the EU context, it is additionally insightful, as STM allows a researcher to trace an entrepreneurial behavior of the main formal agenda-setter of the EU - the European Commission. In particular, how the Commission presented and formulated policy problems along with shaping the policy image (Isoaho, Moilanen, et al., 2019)

Even though STM allows researcher to analyze a large number of data and documents' metadata without manual coding, it has several limitations. First limitation is that STM requires a certain amount of human involvement on the stage of interpreting the results (Banks et al., 2018). For example, it is necessary for researcher to manually label calculated by program topics. Also, it is necessary to include tuning parameters in a model formula, that purely depends on the research objectives (Ibid.). Additionally, it can be argued that only policy documents cannot extensively cover all the policy challenges. However, by statistically allocating documents' words to the topics, STM can provide a

descriptive picture of the agenda-setting content suitable for research of their contextual, representational and/or semantic meaning (Isoaho, Gritsenko, et al., 2019, p. 20)

2.2. Thematic Analysis

One of the main discussions regarding the Thematic Analysis is how to accurately interpret computational analysis results, especially if topic modeling was conducted using the policy documents corpora? To correctly describe and interpret the results researchers advise to use several textual analysis methods: content and classification methods as the first group and discourse and representation method as the second (Isoaho, Gritsenko, et al., 2019).

In order to answer to the research question of this paper, the best interpretation strategy seems to be the *thematic analysis* that allows a researcher to identify, analyze and reveal the patterns or themes within the data (Braun & Clarke, 2006; Isoaho, Gritsenko, et al., 2019). The thematic analysis seems to be the best fit for Topic Modeling output interpretation as this method combined with the social science theory may help to identify and describe the salience of issues found after the computational analysis of the multidimensional policy documents and draw a picture of content structure (Isoaho, Gritsenko, et al., 2019; Nowlin, 2016).

In a nutshell, thematic analysis is a *"search for themes that emerge as being important to the description of the phenomenon"* (Fereday & Muir-Cochrane, 2006, p. 82). This method aims to organize and describe the text data for further detailed interpretation (Braun & Clarke, 2006; Isoaho, Gritsenko, et al., 2019). Thematic analysis is a method of embedded design that in a given perspective allows to identify and analyze the themes appeared in the data in a systemic way (Isoaho, Gritsenko, et al., 2019, p. 12). Therefore, in this paper, the application of thematic analysis aims to estimate the revealed topics' consistency within the multidimensional energy policy field and present a full picture of energy policy content structure (Ibid., p. 13).

Talking about the limitations of the thematic analysis, it is necessary to outline the issues that may arise from the mixing quantitative and qualitative approaches. Firstly, it is possible that computational analysis will not clearly allocate the corpora words to the

topics (Isoaho, Gritsenko, et al., 2019). Therefore, these non-thematic topics may cause problems for further analysis. Secondly, to accurately define, describe and analyze the topics' content it may be necessary to address not only the most frequent and the most unique words but also investigate the documents associated with revealed topics to increase the validity of the results (Ibid.)

2.3. Data Sample

In order to assess the text sample and its suitability for count-based text analysis and consistuency with the research objectives, it was decided to use the framework suggested by Banks et al. (2018). Authors suggest several steps necessary for validation, evaluation, and interpretability of the future model. In the case of text sampling, they suggest following steps to evaluate it (Banks et al., 2018, p. 450):

1) *Data type* defines which type of data is suitable to achieve the research objectives;
2) *Quality of writing* may affect the analysis results, as texts of lesser quality may present less interpretable and reliable results;
3) *Length of responses* stands for the number of words in each document in the sample;
4) *Sample size* depends on the research objectives and theoretical and methodological considerations, and requires to assess not only the number of documents involved in the sample but also the document-level analysis;
5) *Covariates* are methodological or theoretical moderators that are used as independent variables to test whether revealed topics are interpreted differently depending on the given sub-category.

2.3.1. Data type

To answer the given research question, it was decided to gather agenda-related policy documents, that reflect energy policy decision-making processes in the EU institutions. As the main paper objective is to reveal how the formal agenda-setter – the European Commission – defines the policy image, it was decided to gather the Commission's preparatory documents on different dimensions of energy policy for a given period (2009-2019).

It is assumed that issues presented by the European Commission in the form of the preparatory documents contain a high degree of *legislative agenda* – those problems that are prepared for policy decisions (Bache, 2013; Biesenbender, 2015; Kingdon, 2014; Princen, 2007).

Also, it was decided to choose both expired and in force documents. Even though by the moment of writing of this paper the legislative document is not already in force, on the moment of the issue was formulated discussed in the document, it constituted a problem that was considered to be important enough to take a governmental action. Consequently, taking only in force documents for the analysis has a risk of biased results in a way that only long-term or recent initiatives will be observed, not the full picture of agenda-setting within the chosen time frame.

The data for analysis was gathered from the official site of European Union law and other public documents of the European Union – EUR-Lex, all of them are in English. Preparatory documents and their metadata downloaded from EUR-Lex are constituted by the following documents, according to the EUR-Lex descriptor:

1) COM – proposals, communications, reports, green papers, and other documents adopted in the legislative framework of the EU;
2) JOIN – joint proposals, reports, papers and other documents prepared by the European Commission and the High Representative of the Union for Foreign Affairs and Security Policy;
3) SWD/SEC – impact assessments, summaries of them and staff working papers.

Considering the topics, that are covered by this data sample, it is necessary to say that Energy Policy was defined according to EuroVoc Thesaurus - multi-disciplinary thesaurus covering a multitude of policy areas of the EU. It is assumed that the detailed description provided by EuroVoc Thesaurus is suitable enough to cover all the possible issues related to the Energy Policy of the EU. In particular, documents were gathered according to the following categories and their subcategories provided by the given Thesaurus:

- (66) ENERGY
  - (6606) energy policy;

- o (6611) coal and mining industries;
- o (6616) oil industry;
- o (6621) electrical and nuclear industries;
- o (6626) soft energy.

For preparatory documents, the corrigendum legal acts were excluded. As corrigenda are these legal documents that are created and published to adjust already published document related to legislative decision-making, only amendments and new documents has a meaning in the light of the paper objectives.

2.3.2. Quality of Writing and Length of responses

The preparatory and legislative documents taken for the current paper as a sample are official documents of the EU created with a high degree of accuracy and precision. For these reasons, it is possible to argue that gathered preparatory documents are well-readable and well-written, and that is why it is expected from them to constitute interpretable results.

Considering the length of responses, it is necessary to give some descriptive indicators. The length is usually assessed by using the word count per document. In the given sample of documents, the minimum word count is 3166, while the maximum count is 1 257 327, and the mean value is 95 732.53. In practice there is no minimum count of words needed, the main problem compromises from the overwhelmingly large documents (Banks et al., 2018). The main rationale here is that their size may negatively affect the results of the analysis due to too high number of words. In other words, as STM allocates words to topics basing on their frequency per corpora and per document, too large documents may cause bias in calculations.

Therefore, taking into account the big difference between the mean value and the maximum value, it was decided to remove too large documents to avoid the uneven topic allocation. So, the documents consisting of more than 500 000 and less than 5000 words were removed from the analysis. So, the minimum number of word count per document is 5008, the maximum count is 495961, and the mean is 71814.76.

2.3.3. Sample Size

The sample size consists of 792 documents. In the light of a chosen method, it is not a big number for the text statistical analysis. However, STM as any other machine learning approach is not a uniform method, so the sample size is determined by the research question and theoretical considerations and sometimes requires even a certain level of creativity.

Other research papers in social sciences using STM as a method of analysis reflect the different number of sample size. For example, Genovese (2015) uses 34 encyclicals to research the political themes reflected in papal documents. Even though the sample size is quite small, it is compensated by documents' length (Genovese, 2015).

Another example can be drawn from the Rodriguez and Storer article (2019), where scholars attempted to conduct a descriptive analysis of large and unstructured text data – Twitter conversations dedicated to the reasons why one or another Twitter user left or stayed in the abusive relationships. To conduct the research, authors gathered 63.000 tweets, but only 5% random sample from them was used (Rodriguez & Storer, 2019).

In the present paper, the time frame was established (September 2009 – November 2019), so it is clear that the sample size is limited to the published preparatory documents of the chosen type. Moreover, the relatively low number of documents is compensated by the relatively high length of each document.

2.3.4. Covariates and Operationalization

As it will be recalled, covariates are those metadata variables that are tested in order to check their impact on the topic prevalence. Addressing the computational quantitative text analysis research, covariates are usually chosen according to the theoretical framework and posed research questions and/or hypotheses (Banks et al., 2018; Lucas et al., 2015). In other words, covariates included in the formula for the model calculation allow considering how the frequency of word use differ depending on the difference in the covariate variable and remain additive in specification (Lucas et al., 2015; Roberts et al., 2016, p. 991).

In this paper, the content of the European Commission's energy agenda setting is investigated in relation to the time (2009-2019) and in relation to the Commission terms: September 2009 – October 2014 and November 2014 – November 2019.

Therefore, the first covariate that is included in the STM model to calculate the it as *year-month*. It is expected that the year and month of the document will help increase the model fit. Here it is also necessary to note, that this variable in the model formula will be transformed into spline type in order to assess the non-linear relationship between it and topic prevalence. It is important to transfer the *year-month* variable because it is necessary to estimate its continuous effect on the topic prevalence (Roberts et al., 2014).

The second covariate included in the analysis is the Commission term. In order to operationalize it, the dummy variable was created for the Barroso Commission (0) and Juncker Commission (1). Therefore, the topic allocation will be calculated not only in relation to the time but also in relation to the more general dummy variable.

To check how the topics are allocated in relation to the Commission term, STM allows running a regression that estimates how the revealed topic proportions differ in relation to the time period. So, the above-described covariates in the model are independent variables, while the agenda topic proportion is the dependent variable. In other words, the estimate effect regression will show which topics are more likely to be associated with the 2009-2014 or 2014-2019 Commission term depending on its likelihood to appear in each document coded by time.

The development of the topics though time is assessed in this paper as theta variable change in relation to the *year-month*. Here theta variable is dedicated to revealing the topic proportion of each document, as one text may be attributed to several topics at the same time.

All in all, the paper fits the mixed-method approach, where both quantitative and qualitative frameworks are used. Firstly, it is planning to conduct a quantitative text analysis of the agenda-related policy documents, and then the thematic analysis of the revealed topics will be given to give an accurate interpretation of policy image dimensions. It is expected that the topic structure is affected by the time, as the PET longitudinal analysis framework states. Also, it is expected that the topic structure is

influenced by the external event. As the major external event coincided with the new EU legislative cycle, it was operationalized through the two main Commission terms, so the estimate effect regression will be conducted.

2.4. Model Selection

After a description of the data and research method, it is necessary to depict analysis step-by-step. The chapter is structured according to the algorithm provided by Banks et al. (2018). Firstly, the text preprocessing will be described, and then model reliability justification will be given. Finally, the model will be pictured, the topic correlation will be presented and described, and estimation regression results will be interpreted.

For the analysis, it was decided to use R software and its packages, main of those are:

1) *readtext* – the package to process downloaded documents in pdf format (Benoit & Obeng, 2019);
2) *quanteda* – the package for text preprocessing, cleaning and corpus management (Benoit et al., 2018);
3) *stm* – the main package used to conduct structural topic modeling analysis (Roberts et al., 2014);
4) *stminsights* – advanced package for better visualization, validation, and interpretation of structural topic modeling results (Schwemmer, 2018);
5) *ggplot2* – the package for data visualization (Wickham, 2016).

2.4.1. Text Preprocessing

The detailed text preprocessing cleaning algorithm is described by Schmiedel et. al (2019). First step suggested by authors is document and metadata transformation. Here it is necessary to note that Structural Topic Modeling usually requires text parsing – computationally automatized downloading of texts based on site pages' xml or html code. However, due to the specifics of the EUR-Lex site developer code, it was impossible to accurately extract textual data from the search page. Therefore, legislative and preparatory documents were extracted manually in pdf format, while their metadata were extracted separately. Then, after the full text processing in R, documents and metadata

were merged by the CELEX number of each document. Duplicates were also eliminated from the sample to avoid biases in the analysis results.

The next step is *tokenization* that includes text cleaning (Schmiedel et al., 2019). Tokenization here is a process of reducing sentences to the individual words, that are called *tokens* (Banks et al., 2018). Text cleaning refers to tokens management: removal of stop words, numbers, punctuation marks and other specific characters that may become an obstacle for words' allocation (Banks et al., 2018; Roberts et al., 2014; Rodriguez & Storer, 2019). Additionally, it is necessary to normalize words lowering the case (e.g. Japan => japan); this step is necessary to bring the words to the one readable format (Schmiedel et al., 2019).

As it was mentioned before, each document corpus requires an individual approach. Therefore, the additional step is added – removing non-sensical tokens from the analysis. Presumably, they appeared in the present text corpus because of pdf formatting specifics. In the case of present document corpus, site names, cites' URLs and non-sensical tokens were excluded from the analysis.

Another step is *stemming* – a computational process that reduces words with the same root to the common form (Lovins, 1968, p. 22). Usually, as a result of this computational process each word in the present document corpora is reduced by trimming the derivational or inflectional suffixes (Ibid.): e.g. words "unemployment", "unemployed" and "unemploying" will be reduced to the *stem* "unemploy". This step helps to reduce data noise and receive clear topics (Schmiedel et al., 2019). Moreover, this text preprocessing step allows receiving more accurately converged topics and assess the words' frequency-rank distribution in a more comprehensive way (Lovins, 1968).

So, it is necessary to conduct a term weighting. This is a text categorization task, that refers to the distribution of word frequencies among corpora documents (Lan et al., 2005). It was observed that the frequency of the word in a given sample inversely proportional to a given word's rank, which is an actual rule of computational linguistics named *Zipf's law* (Booth, 1967; Lan et al., 2005; Li, 1992). Therefore, to continue with text preprocessing it is necessary to look at the word-rank distribution and remove too frequent terms to avoid bias in final results and, also, to remove too rare terms, that are not statistically important and may lower the computational speed (Banks et al., 2018).

Figure 1. Term Frequency – Term Rank Words Distribution in the Text Corpus
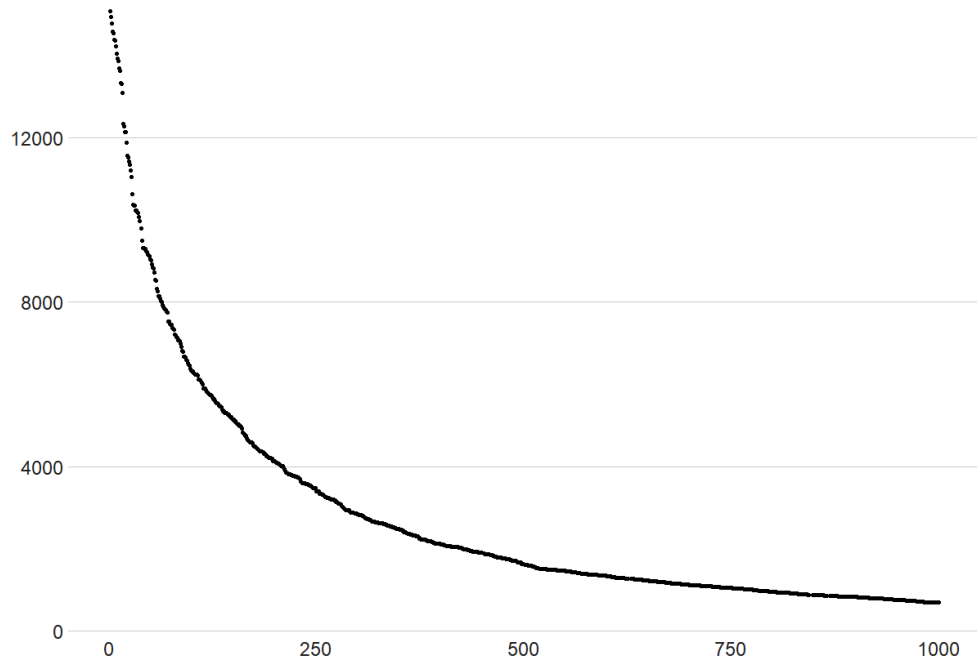
(Figure is based on the present analysis)

On the present graph, the frequency-rank distribution of the words in the text corpora can be found. All the words those count is higher than 13 500 were removed from the analysis as their frequency was significantly larger than the chosen higher bound. Also, too rare terms those frequency values are less than 50 were removed for the sake to improve the calculation speed.

2.4.2. Model Reliability and Validity

After the text preprocessing it is necessary to continue with the model selection. Even though model reliability is not a major concern for the researchers, it was decided to describe the algorithm of model evaluation. To obtain reliable results, researchers usually examine the number of topics that will accurately reflect the main theme categories in the text corpora (Maier et al., 2018). Here it is needed to examine held-out log-likelihood that measures the quality of each topic model (Fukumasu et al., 2012), residuals (Taddy, 2012), lower bound of the topic number (Cheng et al., 2015) and semantic coherence in relation to the proposed number of topics. Here lower bound measures the model

convergence, while semantic coherence captures how words co-occur together in topics (Roberts et al., 2014).

The tricky part on this stage is that choosing the number of topics often depends on the researcher choice (Banks et al., 2018; Genovese, 2015; Isoaho, Moilanen, et al., 2019). In this paper it was decided to run an automated estimation to increase the model's reliability. However, choosing the number of topics is always a trade-off between k-value and other variables for evaluation.

Running the number of topics estimation on a given sample of documents was conducted in two steps. Firstly, the calculation of model fit between 10 and 50 was conducted.

Figure 2. Diagnostic Values for Finding the Appropriate Number of Topics –
from 10 to 50.
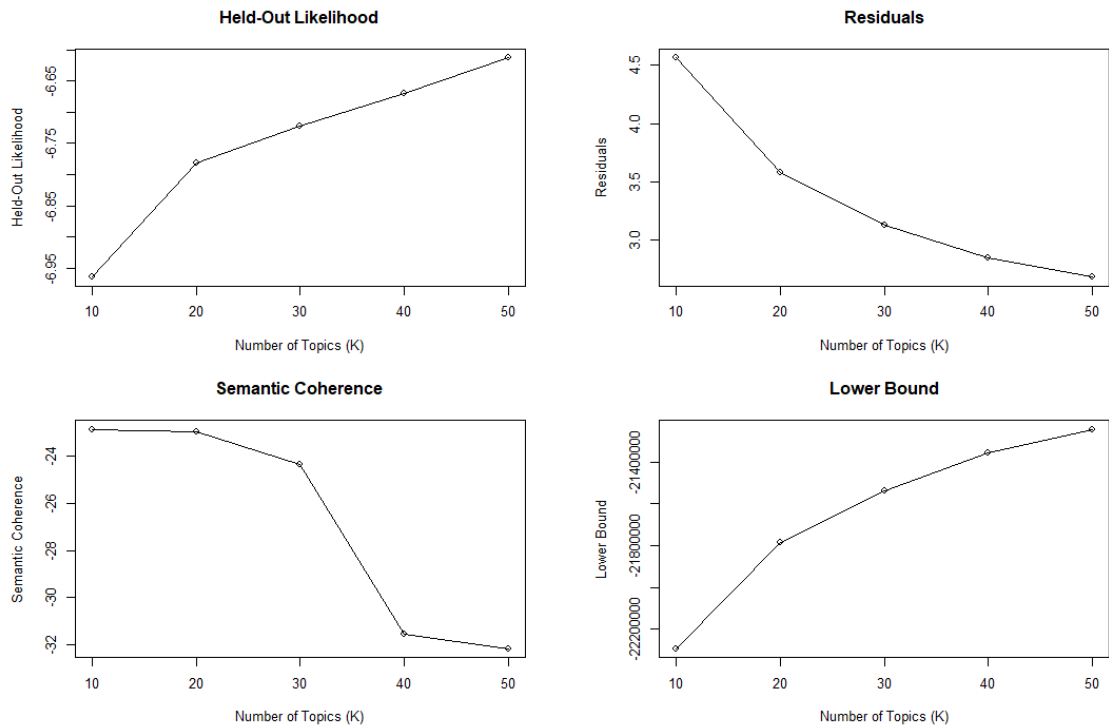
(Figure is based on the present analysis)

It is seen that given values indicate that the appropriate number of topics lays around 30. It is impossible to continue with the interval between 10 and 20, as all the given indicators show less reliable values having too high residual score and too low held-out likelihood, and, consequently, worse model quality. Then, the topic count range between 40 and 50 also cannot be applied for further estimation, as the semantic coherence score tends to have too low values illustrating calculation of the less coherent topics that will be hard to

identify and analyze. At the same time, values fall in between 27 and 33 may draw more prominent results being coherent and clustered well enough to proceed with further interpretation of energy policy agenda topics to be revealed.

Figure 3. Diagnostic Values for Finding the Appropriate Number of Topics – from 27 to 33
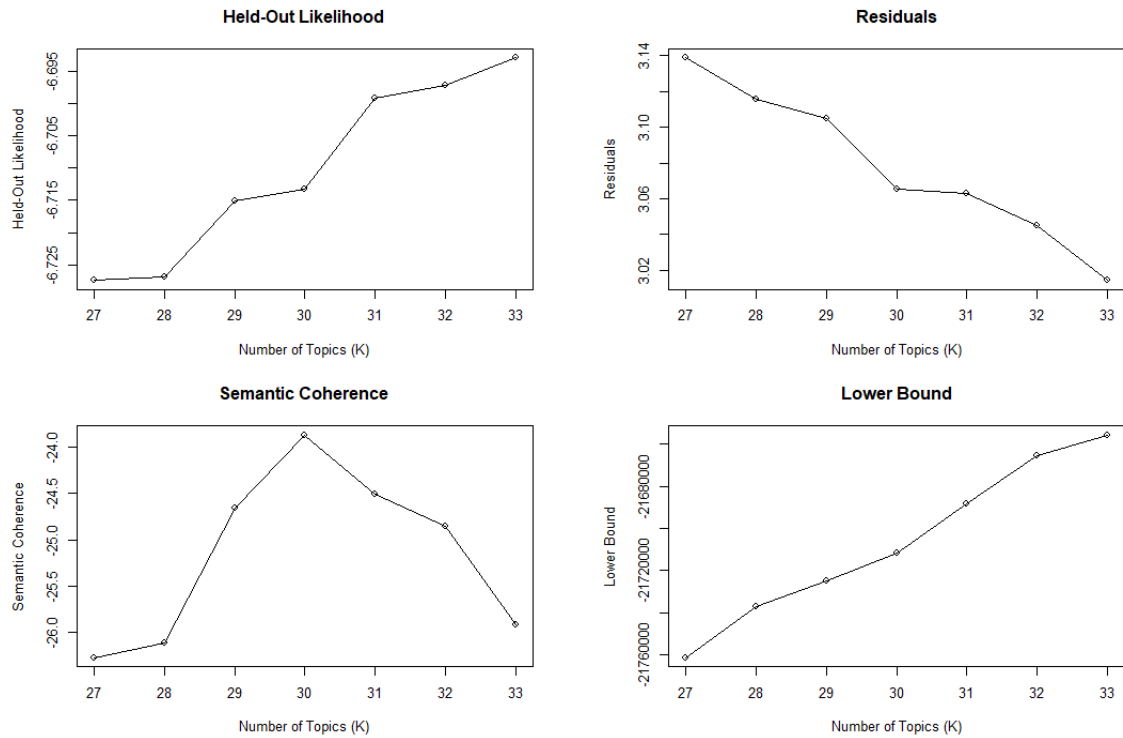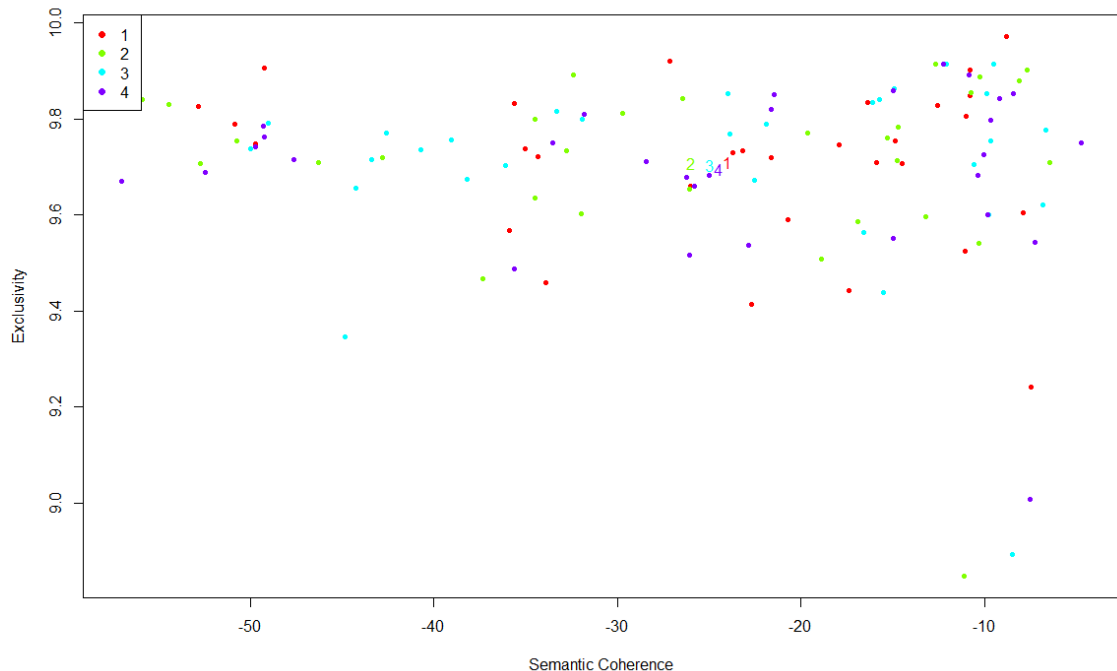

(Figure is based on the present analysis)

The present graph shows quite unusual but easily interpretable results. Recalling the notion that the number of topics choice is always a trade-off, it was decided to take the K = 30 for further model calculation as it shows relatively appropriate results. Indeed, K=30 has a very good semantic coherence score that is significantly higher than other values present while held-out likelihood reflects the appropriate model quality and lower bound value illustrates the appropriate model convergence level. Here it can be argued that model with K=31 seems to show better model quality having higher held-out likelihood and similar values on other indicators. However, more topics do not mean a better model fit, as sometimes an increased number of topics increases the chance to receive lower quality of word-per-topic distribution, and, consequently, increase the possibility for topics to have non-sensical and non-interpretable (Mimno et al., 2011). Moreover, K = 31 model tends to have lower semantic coherence value meaning the less coherent word

co-occurrence within topics. That is why it was decided to calculate a model consisted of 30 topics.

Another step here is the to calculate and select the best model based on the topic exclusivity and semantic coherence. Semantic coherence estimates how words co-occur together in generated topics (Mimno et al., 2011; Roberts et al., 2014), whereas topic exclusivity captures if the highly frequent words from one topic appear in the same manner in other topics (Reisenbichler & Reutterer, 2019).

Even though in practice the evaluation of topic models are still underdeveloped area of research due to the complexity and sensitivity of the topic models to the data observed, it is necessary to select the best-fitted one with desirable properties and increase the model validity (Maier et al., 2018; Roberts et al., 2014). Moreover, in this paper, the relatively small number of topics requires careful consideration, as default spectral initialization used to huge amounts of data consisting of more than 10 000 words tends to overgeneralize the word-per-topic allocation (Roberts et al., 2014).

Figure 4. Calculated STM Models with the Highest Held-Out Likelihood

(Figure is based on the present analysis)

Four models are pictured on the graph according to their exclusivity and semantic coherence. It is seen that model 1 (red dots) does not cluster well having too wide range

on both exclusivity and coherence scales. It means that topics generated within the 1st model are not coherent enough and may overlap with each other. While 2nd (green dots), 3rd (light-blue dots) and 4th (deep-blue dots) models have the same values on the semantic coherence scale, the 4th model seems to have better-defined clusters and higher exclusivity, that is why it was decided to proceed with it.
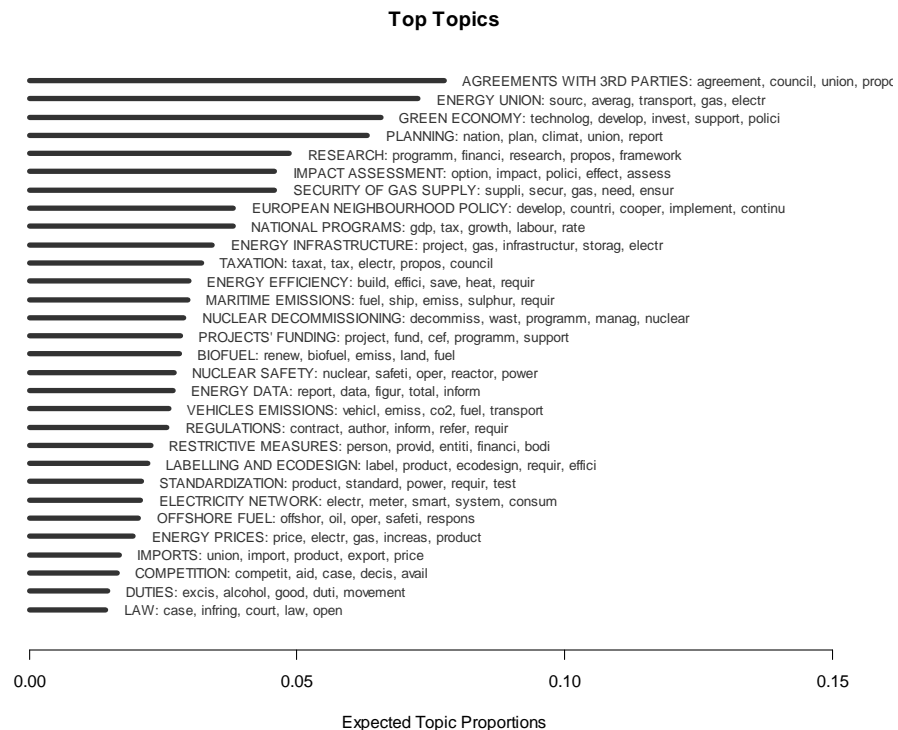
3. Analysis: Topic Modeling

The next step after completing initial analysis is building the selected model, label the topics and interpret the received results. Firstly, in this chapter, the topic model with labeled topics will be presented and interpreted to characterize the EU energy policy image. Secondly, the results of estimate effect regression will be described, which provides insights which of the revealed latent topics tend to be associated with the 2009-2014 or 2014-2019 Commission term.

3.1. Topic Model

After the selection of the best-fitted model using coherence-exclusivity parameters, topics were labeled. Labeling requires human insight and based on the most frequent and the most exclusive words (FREX) per each topic in accordance with the documents each topic assigned for (Roberts et al., 2014). Top-50 most frequent and FREX words can be found in the Appendix.

Figure 5. Graphical Description of Estimated Topic Proportions

Top Topics

AGREEMENTS WITH 3RD PARTIES: agreement, council, union, propc
ENERGY UNION: sourc, averag, transport, gas, electr
GREEN ECONOMY: technolog, develop, invest, support, polici
PLANNING: nation, plan, climat, union, report
RESEARCH: programm, financi, research, propos, framework
IMPACT ASSESSMENT: option, impact, polici, effect, assess
SECURITY OF GAS SUPPLY: suppli, secur, gas, need, ensur
EUROPEAN NEIGHBOURHOOD POLICY: develop, countri, cooper, implement, continu
NATIONAL PROGRAMS: gdp, tax, growth, labour, rate
ENERGY INFRASTRUCTURE: project, gas, infrastructur, storag, electr
TAXATION: taxat, tax, electr, propos, council
ENERGY EFFICIENCY: build, effici, save, heat, requir
MARITIME EMISSIONS: fuel, ship, emiss, sulphur, requir
NUCLEAR DECOMMISSIONING: decommiss, wast, programm, manag, nuclear
PROJECTS' FUNDING: project, fund, cef, programm, support
BIOFUEL: renew, biofuel, emiss, land, fuel
NUCLEAR SAFETY: nuclear, safeti, oper, reactor, power
ENERGY DATA: report, data, figur, total, inform
VEHICLES EMISSIONS: vehicl, emiss, co2, fuel, transport
REGULATIONS: contract, author, inform, refer, requir
RESTRICTIVE MEASURES: person, provid, entiti, financi, bodi
LABELLING AND ECODESIGN: label, product, ecodesign, requir, effici
STANDARDIZATION: product, standard, power, requir, test
ELECTRICITY NETWORK: electr, meter, smart, system, consum
OFFSHORE FUEL: offshor, oil, oper, safeti, respons
ENERGY PRICES: price, electr, gas, increas, product
IMPORTS: union, import, product, export, price
COMPETITION: competit, aid, case, decis, avail
DUTIES: excis, alcohol, good, duti, movement
LAW: case, infring, court, law, open

0.00   0.05   0.10   0.15

Expected Topic Proportions

(Figure is based on the present analysis)

Figure 5 shows which policy agenda topics were found in the policy documents adopted from September 2009 to November 2019. The expected topic proportion scale here illustrates the relative importance of each revealed topic. It is possible to say that *Agreements with Third Parties, Energy Union, Green Economy* and *Planning* topics are ones of greater importance for the Commission's policy agenda-setting and shaping through a decade. The second-importance cluster is comprised of *Research, Impact Assessment* and *Security of Gas Supply* topics. The third-importance cluster consists of *European Neighbourhood Policy* and *National Programs* topics.

However, to consistently interpret the topics according to the thematic analysis framework, it is necessary to group topics according to the most prominent energy policy image dimensions: economic, environmental, security, social and foreign affairs areas (Tosun et al., 2015b).

The interpretation will be given according to the thematic analysis of topics. Firstly, for each topic in the dimensional field, the words with the highest probability and FREX ones will be analyzed. These word groups reflect the main substantive stems to define the topic content: while the *highest prob* stems are dedicated to these words that are most frequent, the FREX words are also the most probable ones but they are unique for the given topic meaning that it is not widely shared with other topics. The list of most frequent and FREX words can be found in Appendix II.

Another necessary data for interpretation is document-topic proportion over time, that shows how topics were addressed through a decade. It is assessed as a change of theta variable in time. Development of topic through time is not an issue for explicit interpretation but it provides the illustration of the difference between topics within each policy image dimension. Plots can be found in Appendix V.

3.1.1. Economic Dimension

The topics associated with the economic dimension of energy policy are the following, given in the descending order of the topic prevalence: *Green Economy, National Programs, Taxation, Projects' Funding, Research Regulations, Offshore Fuel, Energy Prices, Imports, Competition* and *Duties.*

Green Economy topic reflects the innovations, technologies and other measures that are dedicated to boost the development of the European Bioeconomy – such economy that aims to achieve sustainable development in an environmentally friendly way. The stems 'challeng', 'plan', 'strateg', 'help' reflect that Green Economy achievement is most probably seen as a challenge that needs action and strategic planning. The intention for the joint development through implementing innovation and discovering new technologies is also reflected in the revealed set of words.

Green Economy is dedicated to the development of European Bioeconomy aiming to link the economy, environments and social development of the EU. In particular, documents reflect Green Employment Initiative aiming to create more job places in environmentally friendly industries. Apart from this, the documents attributed to the topic provide an indication of competitive, climate-neutral and circular economy development. Additionally, documents demonstrate such initiatives as reduction of greenhouse harmful emissions for the member states along with the enhancement of the low carbon technologies within the Strategic Energy Technology Plan that aims to facilitate the

Topic *National Programs* is constructed in the following way. A lot of attention was paid to the economic indicators that is reflected in the attributed to the topic stems: 'gdp', 'labour', 'unemploy', 'employ', 'debt', 'fiscal', 'poverti'. From another point of view, this topic tackles social policy issues, e.g. pension, education, youth policy and so on. *National Programs* topic refers mainly to the National Reform Program of the EU, and the logical question here arises: Why National Reform Programs appeared in the EU Energy Policy legislative documents?

The answer to this question lays in the nature of the National Reform Program. Among the numerous indicators used to evaluate the economic development of the EU member states, there is a group of rates dedicated to the green jobs and employment that includes such parameters as shares of green jobs in the total employment rates, percentage of greenhouse emissions per worker and indicators dedicated to public transport evaluation and other.

Another explanation can be found in the documents attributed to this topic. Most of the documents that consist of the topic are Commission Staff Working Documents dedicated to the assessment of the programs of member states. Indeed, each of them has the

assessment energy sector of member state in question and desirable guidelines to achieve the most effective performance: renewable energy targets, emission reduction measures and diversifications of resources are set in these documents.

The next topic in this group is *Taxation.* From the stems attributed to the topic, it is seen that mostly it reflects the tax harmonization measures for member states and their administrative authorities – 'franc', 'kingdom', 'sweden', 'scotland', 'corsica', 'italian'. Also, a number of stems dedicated to fossil fuels can be found that can be interpreted is an indicator of the fact that it is more likely that the taxation of fossil fuels is regulated.

Indeed, looking closely into the attributed to the topic *Taxation* documents, it is possible to see that most of them are dedicated to the taxation requirements for petrol and gas motor fuels, gas oil and liquid petroleum gas applied as fuel for heating purposes. The next set of documents reflects special measures on value-added tax on fuel expenditure. Another cluster of documents can be also identified, they are dedicated to implementing requirements for electricity tax to vessels at berth in a port, which is also reflected in a set of top-50 stems. However, the computational analysis shows that fuel taxation is one of the main concerns for the Commission's energy policy agenda.

Interpreting the *Projects' Funding* topic, the first eye-catching point is a lot of abbreviations that are dedicated to the public-private partnership entities and programs. First group of them are dedicated to the financial instruments of the EU. So, stem 'eib' stands for European Investment Bank, 'cip' goes for The Competitiveness and Innovation Framework Program dedicated to providing small and medium-sized enterprises access to funding opportunities to stimulate technologies development and facilitate innovation.

Stem 'erdf' means the European Regional Development Fund, whose aim is not only to support innovation and research but also to contribute to the low-carbon economy innovations. 'esif' stem is European structural and investment fund, those are 5 funds over which the EU funding is channeled to facilitate the research in the low-carbon and sustainable resources management fields. Stem 'cef' stands for Connecting Europe Facility, which aims to support technological initiatives dedicated to strengthening the EU's energy security. Finally, stem 'efsi' is the European Fund for Strategic Investments – the initiative started by EIB and European Investment Fund together in order to solve the problem of the investment gap.

Stem 'fch' means Fuel Cells and Hydrogen Joint Undertaking dedicated to the technological development in the field of clean energy. Stem 'jti' is Joint Technology Initiative that addresses the research initiatives crucial to the competitive environment in the EU. The JTIs became part of the Horizon 2020 initiative after its creation in 2014. Stem 'imi' means Innovative Medicines Initiative public-private partnership dedicated to developing innovative medical treatments and procedures to improve European citizens' health. Finally, 'inea' stands for Innovation and Networks Executive Agency that contributes to the financial and technical management efficiency. Stem 'dcis' is plural for Digital Social Innovation, that aims to support projects that aim to provide a solution to social and environmental challenges in different fields from democratic participation to healthcare.

Indeed, most of the presented stems are attributed to the public-private partnership, its development and support. According to the revealed stems, it is possible to argue that *Research* topic is mainly referred by the Commission as research in the field of fusion energy ('iter', 'fusion') and formulated in the same manner as *Projects' Funding.*

Topic *Regulations* seems to be quite fractured that makes the interpretation more difficult. Considering top-50 words attributed to the topic, it is possible to say that it reflects the regulation of the relations between private parties and establishing common market rules, e.g. stems 'contract', 'procur', 'author', 'bodi', 'tender', 'procedur', 'public', 'servic', 'entiti', 'compet', 'oblig', 'undertake', 'carri', 'fulfil' and 'purchas'.

Also, stems 'may', 'appropri', 'oblig', 'concern', 'compli' and 'necessari' reflect the regulatory character of the topic. Indeed, looking at the topic's documents it is possible to trace that they bear advisory and governing character, as documents reflect the member states' compliance with sustainability criteria, procurement regulations, establishment of rules and procedures, guidelines for energy infrastructure and progress assessment.

The next topic in the economic category reflects offshore fuel extraction and offshore operations' safety. Indeed, the topic is well-clustered, and it is possible to trace that the offshore oil and gas extraction operations mainly referred to installations in the Arctic area. A cluster of attributed to the topic documents support this claim, as they are annual reports on the offshore oil and gas operations safety.

Additionally, such stems as 'damag', 'liabil', 'accid', 'spill', 'risk' and 'environment' illustrate the environmental part of the topic. In this regard, it is possible to say that *Offshore Fuel* topic lays at the intersection of the economic and environmental dimension of the EU energy policy.

Considering the documents attributed to the topic, they, in fact, can be divided into two major topics: offshore operations regulations, and environmental security linked to these offshore oil and gas installations. In particular, a number of documents are dedicated to the marine pollution caused by ships and offshore industry environmental regulations

Another well-clustered topic is *Energy Prices* that consists of reports on commodities prices in Europe and regulations concerning the improvement of commodities' prices' transparency. Documents support this assumption; however, they also represent the measures for internal energy market building, which includes internal gas and electricity markets. Nevertheless, it is not illogical, because looking deeper into the internal energy market documents it is possible to trace that all of them tackles the issue of energy prices and energy import dependence, which is crucial for strategic planning.

Continuing the imports' theme, there is a topic representing this area. *Imports* topic mainly tackles biodiesel imports from US, Canada, Argentina and Indonesia (stem 'goi' stands for Government of the Republic of Indonesia). But it is done not in the general meaning. Most of the documents are Commission's proposals on establishing and extending of the anti-dumping and definitive countervailing duties on the biodiesel imports that are indicative of protective measures in relation to imports. Indeed, such stems as 'investig', 'concern', 'recit', 'injuri' support this assumption. Also, documents reflect the establishment of definitive anti-dumping and provisional duties on solar products' imports.

Additionally, one of the unique stems within this topic is 'cpo' that refers to crude palm oil in this context. Indeed, the documents support this assumption, as several of them are dedicated to the custom duties applied to several types of heavy oils and other products similar to them.

In this regard, it is logical to continue the interpretation with *Duties* topic, which illustrates the arrangements for excise duties. Referring to the topic correlation plot, topics

Imports and *Duties* are closely linked together, and the latter merely is a subtopic. Here the general regulations for excise duties are presented and imposition of duties on alcoholic beverages and heavy oils are given.

Competition topic consisted of Commission preparatory documents dedicated to the EU competition policy reports. Indeed, the most frequent and FREX words reflect the competition supporting measures suggested by the Commission: 'cartel', 'antitrust', 'aid', 'judgement', 'competitor', 'court' and others.

Again, looking into the documents' content, it is possible to say that these annual reports reflect the energy and environmental challenges the EU and its member states face through time. Also, these documents describe the stance of competition in the field of green economy and gas, oil and electricity markets. Also, another point of competition policy reports is the security of energy supply, in particular, ensuring the reliability of energy suppliers and their diversification.

Considering the development of the topics through time, it is possible to see that *National Programs* topic stands out over the other topics attributed to the economic dimension of the EU energy policy agenda. The *National Programs* topic reached its peak in the middle of 2012 while other topics were relatively equally addressed by both Barroso and Juncker Commissions.

All in all, the economic dimension of the EU energy policy agenda is characterized by several features. Firstly, the Commission puts a strong emphasis on technological development and implementation of innovations to achieve a more sustainable but highly effective economy. Secondly, the Commission plays a regulatory tole in building the internal energy market and tax harmonization. Thirdly, in the case of imports of energy commodities and other commodities-related products, the Commission suggests protective economic measures to be imposed.

Additionally, the suggested reports on competition stance in the EU supports this assumption providing another evidence of the fact, that the Commission aims to focus on internal market development. Finally, it is possible to say that economic dimension is strongly connected with the environmental dimension of the energy policy agenda, as economic measures suggested by the Commission aim not only to improve the investment

and industrial efficiency but also to build the environmentally-friendly economy, that should go along with the overall economic development of the EU and ensure the societal factors such es employment.

3.1.2. Environmental Dimension

The environmental dimension of energy policy is characterized mainly by the following topics: *Biofuel, Vehicles Emissions, Nuclear Safety, Maritime Emissions* and *Nuclear Decommissioning*.

Biofuel topic is dedicated to the development and promotion of environmentally friendly sources of energy. Interestingly, according to the revealed stems, the main emphasis Commission draws here is the development of biofuel produced in the area of agriculture. The abbreviations 'iluc' and 'frl' found in stems are referred to Indirect Land Use Change and Forest Reference Levels respectively. However, the Commission documents regulate also other bio-commodities: biomass, bioliquid, oil, bioethanol.

Vehicles Emissions topic mainly illustrates the emissions monitoring. According to the most frequent and unique stems attributed to this topic, mostly the emissions from the public and private transport are assessed. Indeed, stems 'hdv' and 'hdvs' means heavy-duty vehicles in singular and plural forms, while stem 'lev' refers to low emission vehicle and stem 'zev' is dedicated to zero-emission vehicles. Also, here the notions of alternative fuels can be found (stems 'hydrogen', 'batteri', 'electr').

Assessing the *Nuclear Safety* topic, it is possible to say that it refers to operational safety and working condition on nuclear plants (stems 'safeti', 'oper', 'design', 'protect', 'accid', 'stress'). 'iaea' stem here refers to the International Atomic Energy Agency, and 'hfr' stands for High Flux Reactor. Interestingly, that here the notion of Fukushima incident can be found (stems 'fukushima', 'seismic', 'flood', 'earthquak').

Finally, topic *Nuclear Decommissioning* refers to Nuclear plants shutdown, in particular, to the Kozloduy plant in Bulgaria and Ignalina plant in Lithuania. Another topic *Maritime Emissions* refers to the environmental safety and pollution prevention from ships. This includes the monitoring and fuel and bunker safety (stems 'pollut', 'control', 'emiss', 'bunker', 'maximum'). Here also it is necessary to mention that the stems abbreviations

'imo' and 'mrv' mean International Maritime Organisation and monitoring, reporting, verification scheme respectively.

Addressing the development of topics over time, it is seen that there is a downward trend for *Biofuel, Maritime Emissions,* and *Nuclear Safety* topics, while topics *Emissions* and *Nuclear Decommissioning* were actively addressed during the 2009-2014 and 2014-2019 Commission terms.

Summing it up, it is possible to say that the environmental dimension of the energy policy agenda has an advisory and monitoring character. Indeed, the Commission tackles the issues of emissions' monitoring, operational safety and products' contamination along with assistance in Nuclear power plants decommissioning and in biofuel promotion.

3.1.3. Energy Security Dimension

Topics labeled as *Energy Union, Planning, Energy Efficiency, Security of Gas Supply, Energy Infrastructure,* and *Electricity Network* can be attributed to the energy security dimension.

Energy Union topic mainly consists of statistical energy data. Indeed, stems 'averag', 'eurostat', 'source', 'share', 'gdp' and 'increase' support this assumption. Additionally stems 'gas', 'electr' 'transport', 'renew' and 'solar' reflect the indicators that received the most attention from the Commission. Moreover, it is possible to find several country names in the FREX stems group, which means that the Commission's attention is also dedicated to the member states' situation in the field of energy and their degree of preparedness for the Energy Union establishment.

Considering the documents attributed to the topic refer to the state of the Energy Union. Here it is possible to find the country factsheets and numerous reports related to the status of the Energy Union. This topic is well-clustered and well-compromised.

Planning topic is closely related to the previous one, as it is dedicated to the National Energy and Climate Plans for the EU member states, as it is seen from the attributed to the topic documents. However, revealed stems may provide additional insides. Indeed, the main stems here are 'nation' and 'plan' but 'climat', 'target', 'recommend',

'greenhous', and 'renew' and characterize the Energy and Climate Plan to be focused mostly on the environmental issues which needs to be solved.

Also, these plans are drawn individually for each state, however, the countries' names are not included nor in the most frequent words, neither in the FREX group. This can be interpreted as National Energy and Climate Plans put the abovementioned objectives in a uniform way, and the targets and guidelines are mostly similarly formulated.

The topic *Energy Efficiency* is dedicated to the development and promotion of energy savings and responsible consumption of energy. Mainly the agenda is dedicated to the promotion of zero-energy buildings (stems 'nzeb', 'build', 'residenti') that includes the building new homes and renovating existing ones. Here the stems 'epbd' and 'eed' represent abbreviations for Energy Performance of Buildings Directive and Energy Efficiency Directive respectively, whereas stem 'epc' stands for Energy Performance Certificate.

Apart from the energy-efficient buildings, the agenda focuses on cogeneration of electricity and heat, technological development and financing of environmentally friendly initiatives. Also, stem 'neeap' here stands for the National Energy Efficiency Action Plan, that means that the Commission aims to set the guidelines for member states' energy consumption and efficiency improvement. These Plans were set also in order to encourage member states to achieve the EU energy and climate 2020 targets under the Energy Efficiency Directive.

Another energy security topic is *Security of Gas Supply.* Interpreting the revealed stems, it is possible to say, that the security of supply is aimed to be achieved through cooperation, including regional cooperation, through coordination mechanisms and through improving the overall resilience of the European gas system. Stems 'risk', 'disrupt', 'prevent', 'need', 'stress', 'crucial' and 'vulner' illustrate that the security of supply constitutes a challenge from the point of view of the Commission, and this challenge has to be faced with appropriate measures (stems 'ensur', 'effect', 'regulatori', 'develop', 'transpar', 'mitig' and 'approach').

Considering the topic's documents, they are mostly attributed to the gas system resilience, risk-preparedness and preparedness for disruptions and safeguarding measures to ensure

the security of supply. This also includes preventive seasonal measures to ensure the security of supply, in particular, in the winter and autumn periods.

Topic *Energy Infrastructure* is almost dedicated to the building of the electricity (stems 'cabl', 'electr', 'grid') and gas interconnectors – gas pipelines and LNG terminals ('pipelin', 'lng', 'storag', 'termin'). The Baltic Interconnector, aiming to link Finland and Estonia, also appeared in the revealed stems. Again, the energy infrastructure aims to be achieved jointly (stem 'psi' – Project of Common Interest) thorough creation a energy network, that will prevent the European Energy system from disruptions.

Stems 'eepr' and 'ccs' stand for European Energy Program for Recovery and Carbon Capture and Storage respectively. Indeed, most of the documents attributed to the topic reflect the implementation of the abovementioned Program for Recovery. Another set of documents is dedicated to the development of the European energy networks and the ling-term vision on this issue.

Documents that appeared within the *Electricity Network* topic are also connected to the previous one. Indeed, stems strongly illustrate the measures necessary for building the European electricity grid to achieve electricity balancing, establish guidelines for the energy consumption ('smart', 'meter' – smart metering initiative), develop the transmission system operators and reach the efficient energy distribution.

Looking at the time-topic proportion graph, it is possible to notice that all of the topics experience a rise in 2015. However, the *Energy Union* and *Planning* topics tend to upsurge in the period between the second half of 2014 and 2017 while other topics received a modest attention by the Commission through a decade.

Summing it up, it is possible to say, that the energy security dimension is characterized by strong Commission guidance over member states. The Commission sets the targets, objectives and guidelines for member states along with monitoring of these objectives' achievement. Additionally, the Commission puts an emphasis on the interconnection and interdependence of the EU member states, that requires the joint action in this field: building of the gas and electricity interconnectors and promotion of transmission system operators.

The energy security dimension is characterized also by measures to improve energy efficiency. It means that energy security is understood to be achieved not only by the safeguarding and protecting measures but also by energy use and consumption measures. So, the Commission agenda here is formulated according to the broader understanding of energy security, that includes not just restrictive means, but also supportive ones: environmental, economic and technological measures.

3.1.4. Social Dimension

Such topics as *Labelling and Ecodesign* and *Standardization* are dedicated to the social dimension and energy policy.

Topic *Labelling and Ecodesign* illustrates the ecological requirements and energy efficiency labelling measures for products, including energy-related ones. These are tyres, game consoles and lamps (stems 'tyre', 'game', 'console', 'lamp', 'video', 'databas'). Looking at the documents within the topic, it is possible to say that also the regulations on fuel quality are included here (stems 'diesel', 'fuel', 'petrol').

Topic *Standardization* is connected to the previous topic. Here also the measures for various products' labelling unification, and the following stems support this assumption: 'product', 'standard', 'standardis', 'washer', 'dryer', 'refrigir', 'display', 'lumin', 'household'.

Considering the topic proportion over time graph, it is seen that both topics received low degree of attention throughout a decade. However, the *Standardization* topic experienced in upsurge after the middle 2017, while *Labelling and Ecodesign* topic was addressed in the 2015 but then the downward trend is seen.

Summing it up, the social dimension of energy policy of the EU is characterized by the regulating measures dedicated to the energy efficiency measurement and marking of the various products.

3.1.5. Foreign Affairs Dimension

The external relations dimension of energy security consists of topics labelled as *Agreements with 3rd Parties, European Neighbourhood Policy* and *Restrictive Measures*.

Agreements with 3rd Parties topic consists of the documents referred to the energy agreements with non-EU parties and agreements on certain air services. The most frequent and FREX stems, however, illustrate the provisional character of the topic: stems 'agreement', 'council', 'union', 'communiti', 'treati', 'parti', 'ministri', 'intergovernment', 'decis'.

In the same manner the topic *European Neighbourhood Policy* is formulated. Indeed, the stems 'develop', 'countri', 'cooper', 'implement', 'continue', 'dialogu' indicate the provisional but cooperative and continuous measures addressed by the Commission in its preparatory documents. The most interesting case here are FREX words that reflect the various countries: Azerbaijan, Armenia, Moldova, Georgia, Israel, Jordan, Ukraine, Lebanon, and others.

Another interesting topic here is *Restrictive Measures*. Stem 'egf' here stands for the Globalisation Adjustment Fund, while stem 'cfsp' refers to the Common Foreign and Security Policy. Indeed, stems 'prohibit', 'follow', 'bodi', 'entiti', 'person', 'concern' and 'relat' illustrate the restrictive character of the proposed by Commission measures, whereas FREX words and topic's documents help to identify the countries, against which these measures are established: Iran, Somalia, Iraq and Syria.

Assessing the topic proportion-time picture, all of the topics tend to receive less attention over time. However, the *Restrictive Measures* reached its peak in the 2012, while two others experience the decrease throughout the given time (2009-2019). It can be explained by the conflicts in the Middle East that were followed by the EU's response in relation to the armed conflicts. Indeed, the policy documents related to the restrictive measures in relation to these countries can be found in the *Restrictive Measures* topic.

All in all, the foreign affairs dimension is related to the spreading of the EU political influence externally by the means of cooperation and/or convergence programs and regulatory measures in response to the external conflicts.

3.1.6. Procedural Dimension

There are also several topics that cannot be strictly attributable to one or another energy policy dimension. Those are *Impact Assessment, Energy Data* and *Law*.

The topic *Impact Assessment* is formulated in a quite vague way that makes it more difficult to interpret its character. Stems 'option', 'impact', 'polici', 'effect', 'scenario', 'prefer', 'effect', 'assumpt', 'evalu' and 'problem' refer to the possible policies' alternatives assessment and problems analysis.

Stems 'report', 'data', 'figur', 'tabl', 'inform', 'number' and 'monitor' helps to define and conceptualize the *Energy Data* topic. Indeed, the documents attributed to this topic reflect various annual reports dedicated to the transport fuels quality, offshore operations, emissions monitoring and energy commodities' prices evaluation. A number of stems in the FREX group allows to say that there reports also tackles the monitoring for the EU member states ('germani', 'netherland', 'franc', 'finland', 'denmark' and other country-related stems).

Another vague topic in this group is *Law*. This topic consists mostly of Commission Staff Working documents referred to the monitoring and application of the EU law. The stems 'case', 'infring', 'court', 'law', 'complaint' and 'transposit' illustrate the normative character of the topic. It is assumed, that this topic appeared in the energy policy agenda documents because here the various un/solved energy legislative cases appeared.

Addressing the development of topics through time, the all topics have low topic proportion through all the given time, that means that they were not widely addressed by the Commission. Comparing the three revealed topics it is also possible to say that there is a pattern in issue addressing. In particular, all the topics are extensively addressed at the end of the Commission term, that makes it possible to say that the topics are ones of continuous, procedural matter, aiming to monitor major developments achieved by the Commission in five years.

3.2. Topic Proportion in Relation to the Commission Term

The covariate of interest in this paper is the dichotomous variable associated with the Barroso Commission (0) and Juncker Commission (1). This estimation will help to reveal whether topics can be attributed to the Barroso or Juncker Commission. Statistically speaking, the calculated regression estimates how topics' proportions are allocated in relation to one or another Commission term – which from them are more likely to be associated with the Barroso term and which of them can be associated with the Juncker Commission term depending on the topic proportion values. The significance values for each topic can be found in Appendix VI. In order to validate results, the *Political Guidelines for the Next Commission* (2009, 2014) will be used according to the assumption about continuing vertical integration within the Commission followed by the administrative reforms.

Figure 6. Graphical Presentation of Topical Proportion Difference in Relation to the European Commission Term.
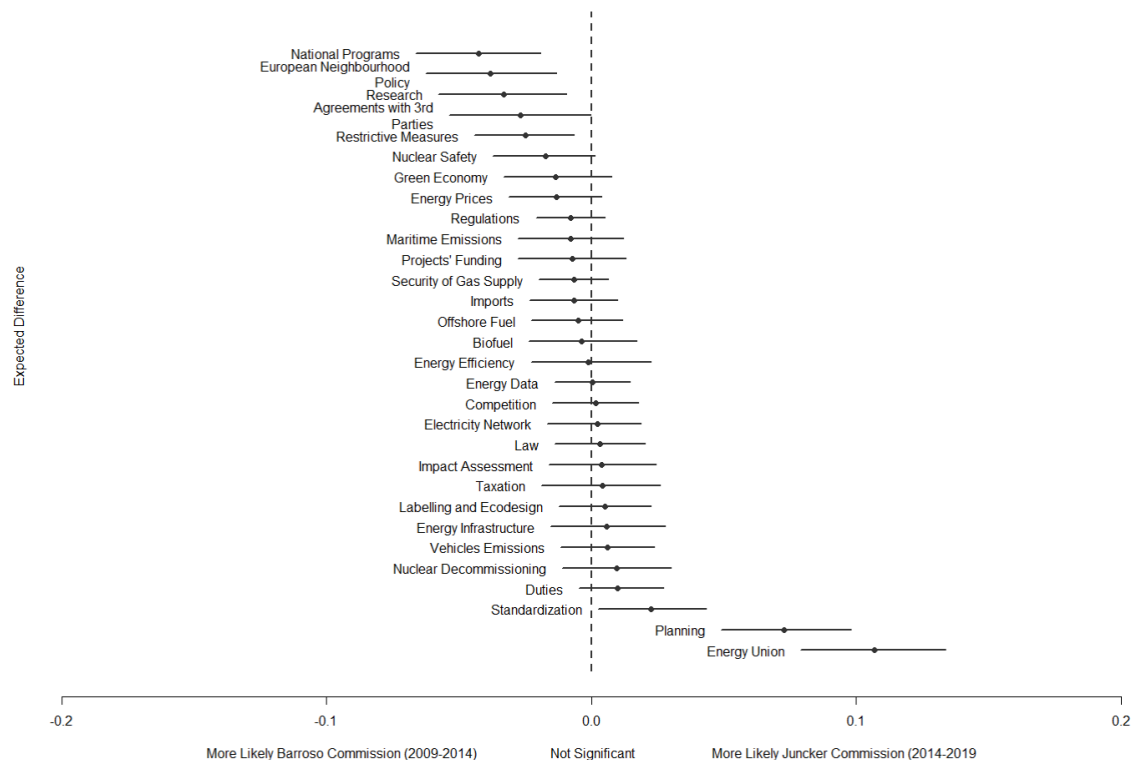
(Figure is based on the present analysis)

Looking at the Figure 6 it is possible to see that topic *National Programs* is strongly associated with the Barroso Commission, while topics *Planning* and *Energy Union* are attributable to the Juncker Commission. At the same time, the regression results demonstrate, that there are other topics obtaining lesser significance but still can be attributable to one or another Commission term. Topics *Restrictive Measures, Agreements with 3rd Parties, European Neighbourhood Policy* and *Research* can be associated with the Barroso Commission term whereas *Standardization* topic is more likely to fall under the Juncker Commission Term.

One of the main patterns that can be derived from the estimation analysis is that the residuals for the majority of topics are quite big. However, this is explained by the fact, that all the presented topics were addressed by the Commission throughout the decade to some extent. Therefore, the higher the residuals are, the more attention was drawn to the topic by the Commission in a given period of time. Therefore, the significance values are main indicators which illustrate if the topic can be associated with one or another period.

Taking into account high residuals for each topic, it is impossible to argue, e.g. that economic dimension was addressed explicitly by the Barroso Commission. Discussing the economic dimension of the EU energy policy image, the topics *Research* and *National Programs* are argued to be attributed to the 2009-2014 Commission term with high degree of probability. However, topics *Green Economy, Energy Prices, Offshore Fuel, Taxation, Imports* and *Duties* are relatively equally addressed during both Commission terms. This observation is derived from the topics' position in relation to the insignificance dashed line.

The same logic is applied to all outlined dimensions of the EU energy policy image. The social dimension is characterized by two topics – *Labelling and Ecodesign* and *Standardization*, and only one of them has a minor significance for the 2014-2019 Commission term. The same situation is seen considering the security dimension of the image, where only *Planning* and *Energy Union* topics can be attributed to the Juncker Commission period with a high degree of probability.

Topics *Impact Assessment, Energy Data* and *Law* are laying strictly on the insignificance line meaning that they were addressed during the whole decade, so they cannot be strictly attributable to one or another period of time, that is supported by the time development

graphs. Another policy dimension that received equal attention during both periods is the environmental one, which topics did not receive high significance values. So, procedural and environmental dimensions were relatively equally important over ten years.

The opposite situation can be seen discussing the foreign affairs dimension of energy policy image. All three topics presented in this category are attributed to the Barroso Commission term with the various degree of probability (from approximately 0.001 to 0.01 rates). Therefore, it is possible to say that the external dimension of energy policy image received more attention during the 2009-2014 period than during 2014-2019.

Indeed, the regression shows that there is a shift in the Commission's energy policy image. According to the MSF, the major external event causes the agenda change, while PET states that the nature of such a multifaceted agenda depends on the problematic issue interpretation. The results show that the EU energy agenda was interpreted by the Barroso Commission mainly focusing on the external and economic dimensions of energy policy image.

After 2014 the "securitization shift" happened with the plan for Energy Union creation. So, the transition happened within EU energy policy image: policy was interpreted not in terms of internal market development but in the light of the energy security enhancement.

The previous research in the energy policy and EU energy agenda field found that in this area there was a change from the national to the supranational policymaking (Eikeland, 2011; Szulecki et al., 2016; Wettestad et al., 2012). Additionally, previous research confirms that there is a "securitization shift" in the understanding of the EU energy policy image (Boersma & Goldthau, 2017; Franza & Van Der Linde, 2017; Szulecki et al., 2016). So, describing nature of change, it is possible to assume that there is a "hesitant supranational turn", however, the results of the regression confirm only shift in the agenda image definition.

In this regard, it is interesting, why *Standardization* topic falls into the 2014-2019 Commission term. The received significance level (approximately 0.01) illustrates that this topic can be quite collaterally attributed to the Juncker Commission. However, it is possible to assume, that the products standardization measures were continued to be established as the extension of the unification measures.

Therefore, following the logic of the theoretical framework and the bounded rationality statement, it is possible to say that the "securitization shift" in the EU energy policy image happened. However, the shift is characterized by the energy agenda interpretation transition, as only the emphasis on different policy dimensions has changed.

It was stated that the Commission President received greater control over agenda-setting and overall legislative output due to the administration reform (Becker et al., 2016; Bürgin, 2018; Cini, 2008; Cini & Šuplata, 2017; Kassim, 2013; Kassim et al., 2017; Müller, 2016). So, to validate the results, it is necessary to refer to the political documents written by the Commission Presidents in the light of growing vertical integration.

According to the *Political Guidelines for the Next Commission* (2009), Barroso focuses primarily on internal market development and social policy. He also emphasizes the importance of joint action, economic convergence and closer cooperation between the EU member states. Considering the internal market development, Barroso focuses on the more effective immigration policy, development of industries, services, maritime and agriculture sectors of economy along with boosting the research and innovation and financial markets regulation. He also defines the 2009-2014 Commission term as an opportunity to promote the "people's Europe", meaning the enhancement of employment policies, upgrading the quality and distribution of education.

Additionally, Barroso emphasizes the economic power of the EU on the international arena and declares the EU to be *"natural Champion for the global governance"* (Barroso, 2009, p. 15) while talking about 2009 Russia-Ukraine gas dispute. Barroso expresses the necessity for the EU to act in a way to promote solidarity values in political, economic and social dimensions, as *"solidarity is a cornerstone for European society and its social market economy"* (Ibid., p. 12).

Addressing the vision on the EU position on the international arena, Barroso outlines the role of the EU as the leader of global governance that is a prerequisite for opening of a *"new era of Global Europe"* (Ibid., p. 33). However, he addresses the EU's position as the facilitator of transnational cooperation and globalization achieving by the political and economic means. Barroso also emphasized the importance of the EU's foreign affairs dimension for facilitating relations with 3rd countries and multilateral organizations. Moreover, the EU should seize the opportunity to use its external dimension to pursue the

objectives of *"prosperity, security, climate change, energy, and fighting poverty"* (Barroso, 2009, p. 34)

Considering the energy policy agenda set in the *Political Guidelines for the Next Commission,* Barroso frames the energy policy issues as ones of the economic matter, focusing on energy sustainability, renewable energy research and electricity interconnectors building. Indeed, energy agenda is addressed by the Barroso as an issue that needs to be solved by the internal market measures, e.g. creating more low-carbon industries boosting low-carbon economy, that, consequently, will create more environmentally-friendly employment opportunities that will potentially solve the unemployment problem and improve the European citizens' prosperity (Ibid.). Apart from this, Barroso pays attention to the development and promotion of clean technologies aiming to find new sources for sustainable and efficient economic growth and potentially solve the climate change negative effects.

Indeed, looking at the STM analysis results, the topics *National Programs, Restrictive Measures, Agreements with 3rd Parties, European Neighbourhood Policy* and *Research* are seen to appear more likely during the Barroso Commission term (September 2009 – October 2014).

National Reform Programs topic illustrates the measures suggested by the Commission to be taken in order to achieve the economic growth and social prosperity for the European citizens along with the implementation of green employment initiatives. So, the model reflects the Barroso economic initiatives. The *Research* topic is closely connected to the *Projects' Funding* topic and gives an extensive understanding which area of energy research are ones of the great importance in the Commission's energy policy agenda. Indeed, mostly the research within the EU is understood as a public-private partnership and concentrates on the renewable and fusion energy, green economy and low-carbon technologies research.

Moreover, the reflected in the Political Guidelines EU's external dimension is widely reflected in the model. Topics *Restrictive Measures, Agreements with 3rd Parties* and *European Neighbourhood Policy* constitute the foreign affairs dimension of the energy policy agenda within the analysis and contributes to understanding how the cooperation and arrangements with 3rd countries are achieved and how sanctions are applied. Also,

these topics contribute to the identification of the countries reflected in the Commission's agenda.

Juncker's political guidelines (2014) are dedicated to crisis management and further internal market integration. Juncker sets 10 policy priorities for his Commission term. Most of them are dedicated to internal market development, as it was emphasized previously by Barroso. Juncker outlines the importance of regulatory environment improvement, enhance the conditions for entrepreneurship and job creation (Juncker, 2014). Also, he puts attention to the digital single market advancement by means of strengthened data protection and telecoms rules, modernized rules for online and digital purchases and boosting the promotion of digital skills (Juncker, 2014).

Apart from this Juncker looks forward to enhancing the EU's industrial base, and reinforces control over banks through a Single Supervisory Mechanism (Ibid.). Additionally, he emphasizes the necessity to strengthen the control over taxation system encouraging to find a solution for tax evasion and tax fraud (Ibid.). Juncker also strongly encourages to launch non-/legislative initiatives to deepen and strengthen the Economic and Monetary Union and makes an emphasis on the social impact assessment importance for the further reform maintenance and development of the social market economy. Again, these measures are echoing the Barroso proposals.

Juncker emphasized also the role of the EU that goes beyond the common market, as the EU is also a *"Union of shared values"* (Ibid., p. 9) that is expressed in the Treaties and Charter of Fundamental Rights of the European Union. Juncker states that the EU as a global international actor should contribute to the protection if human rights and fundamental freedoms, to the combating of cross-border crime and to the promotion of judicial cooperation. In this regard, it is necessary to note that development of new migration policy is addressed by Juncker as a measure aiming to promote the spirit of solidarity and trust that will contribute not only to the fairer migration management but also to the securing of the EU's borders by preventing *"uncontrolled influx and illegal migration"* (Ibid., p. 11).

Considering the EU's external dimension, Juncker describes the main Union's objectives as to become stronger political actor in the international arena. Here he addresses the resent crises the EU faced and encourages the development of new effective mechanisms

to cope with them and mitigate negative consequences (Juncker, 2014). Apart from this, Juncker states that it is necessary *"to work on a stronger Europe when it comes to security and defence matters"* (Ibid., p. 12). Additionally, he discusses the EU's enlarging capacity, stating that even though the cooperation with neighborhood countries will be continued, no further enlargements is planned in 2014-2019 (Juncker, 2014). Apart from that, he emphasizes the necessity of the *"reasonable and balanced"* trade agreement with the US that aims to contribute to the unification of products' standards and taxes and duties harmonization (Ibid.).

Juncker also addresses the Ukrainian crisis (2014) in his speech and connects it to the necessity of development resilient European Energy Union and enhance the European role on a global arena (Ibid.). In this regard, he suggests reorganizing the EU's energy policy in a way to build the strong Energy Union that will enhance European capabilities to pool and manage resources, build and maintain energy infrastructure facilities and improve the EU's negotiating power with 3rd counties (Ibid.)

He frames the energy policy issues as ones of a great importance, and the third of his 10 policy priorities is dedicated to the creation of the "resilient Energy Union". Other than this, Juncker outlines the necessity of further expansion of energy networks, promotion of renewable energy and alternative energies research. Indeed, Juncker sets the goal for the EU to become a world leader in renewable energy production and development (Ibid.). Connected to this, he sets targets for climate and environment action that aims to significantly enhance European energy efficiency and contribute to the mitigation of climate change (Ibid.).

Also, Juncker argues in favor of diversification of energy resources, reducing member states' energy dependence and build more connected energy infrastructures. Indeed, in his speech, Juncker expresses his concern with the dependency of the European energy market from the Eastern neighbor states (Ibid.). He states that *"the price for energy from the East becomes too expensive, either in commercial or in political terms"* (Ibid., p. 7), and that is why it is necessary to find and develop other energy supply channels and secure the supply routes.

According to the conducted quantitative text analysis, topics *Energy Union, Planning* and *Standardization* are more likely to be associated with the Juncker's Commission. Indeed,

topics *Planning* and Energy Union are closely connected, as, recalling the interpretation given above, both of them are dedicated to the creation of energy Union. There the assessment of the member states' degree of preparedness for the Energy Union creation and their circumstances in the energy area. Here the Commission's agenda is concentrated on the advisory, monitoring and preparatory measures necessary for enhancing the energy and environmental cooperation between the EU member states.

The Standardization topic is also attributed to the Juncker's Commission term. However, the statistical significance of this topic is lower than the significance of two previous topics. Nevertheless, this topic goes along with the Juncker's objective to improve the unification and standardization of products in the context of international trade. From the other point of view, this topic is associated with a social market economy that targets to contribute to the European citizens' prosperity. In this regard, the standardization aims to improve the energy efficiency and put control over energy consumption to ensure the development of a strong green economy.

All in all, the EU energy policy image shift is characterized by changed interpretation emphasis from the foreign affairs and economic measures to the measures applied for the enhancement of energy security. While it is possible to identify the highly attributable to the Commission terms topics, the majority of them received the relatively equal attention during 2009-2014 and 2014-2019 periods. Therefore, in terms of energy policy image structure, the analysis shows the transition in the policy issues interpretation caused a change of policy image.

Conclusion and Discussion

The thesis has delved into the content of the EU energy policy image. Also, it described this image shift in relation to the major external crises considered to be important for the given policy area. The time frame 2009-2019 was operationalized as the second Barroso term (September 2009 – October 2014) and Juncker Commission term (November 2014 – November 2019), as here the new EU legislative cycle coincided with the major external event – warmongering in Eastern Ukraine followed by the Crimea annexation. According to the bounded rationality assumption laying behind the Multiple Streams Framework and Punctuated Equilibrium Theory, the shift should be characterized by the transition in the interpretation of problems that requires a governmental action to be solved.

The preparatory policy documents drawn by the Commission were taken as data, as it was assumed that these documents contain the legislative policy agenda and express the problem interpretations. In order to research a huge number of textual data, the Structural Topic Modeling was chosen as the main method that allows revealing the main topics within the multifaceted by nature EU energy policy image. Thematic Analysis was chosen as a supplementary research method to interpret the Topic Model results.

Recalling the research objectives, it is possible to outline the several implications of the research. Firstly, the EU energy policy image was structurally characterized. The complex nature of the image was presented, and its dimensions were described in detail. In particular, there are five main revealed dimensions of the EU energy policy image: economic, environmental, security, foreign affairs, and procedural ones. However, not all of them were equally attributable to the one or another Commission term, as the majority of the issues were relatively equally addressed by the Commission through a decade.

However, the shift in the energy policy agenda was shown. While during the 2009-2014 the Commission interpreted the energy policy image in economic and external affairs terms, after 2014 the image was interpreted mainly in the energy security terms. The finding is supported by the previous research conducted on the energy policy of the EU. However, it is suggested that the structural approach for policy image research may provide more detailed insight on the policy agenda definition. Therefore, in this paper it was argued that the policy image was changed in relation to the external event, as the definition of problems that require a governmental action also changed. This confirms the

assumption stated by previous research that the EU energy policy agenda is sensitive to the major external events, so, the policy image content changes in relation to crisis (Kustova, 2017; Szulecki et al., 2016).

Another observation can be discussed in this regard. Comparing the actual Commission's legislative energy agenda and agenda proposed by the Commission Presidents in the Political Guidelines, it is possible to say that the assumption proposed by scholars (Becker et al., 2016; Bürgin, 2018; Cini, 2008; Cini & Šuplata, 2017; Kassim, 2013; Kassim et al., 2017; Müller, 2016) may be traced by the present analysis. Researchers argue that due to the increasing presidentialism tendencies followed by the administrative reforms within the Commission, the Commission President received enhanced capabilities to control the overall legislative output of the Commission. Indeed, comparing the Barroso's and Juncker's political guidelines to the analysis results, it is possible to assume that proposed energy agenda correlates with an actual legislative outcome. Therefore, this observation is up for further research and does not constitute the explicit inference of the present paper but was used as an instrument to validate the results.

So, the paper presented some insights on how the EU energy policy image is defined by the European Commission and how the policy problem definition changed in relation to the major external event.

References

Ackrill, R., Kay, A., & Zahariadis, N. (2013). Ambiguity, multiple streams, and EU policy. *Journal of European Public Policy*, *20*(6), 871–887. https://doi.org/10.1080/13501763.2013.781824

Alexandrova, P., & Timmermans, A. (2015). Agenda Dynamics on Energy Policy in the European Council. In J. Tosun, S. Biesenbender, & K. Schulze (Eds.), *Energy policy making in the EU. Building the Agenda.* (pp. 41–61). Munich: Springer.

Andersen, S. S., Goldthau, A., & Sitter, N. (Eds.). (2017). *Energy Union: Europe's new liberal mercantilism?* London: Palgrave Macmillan.

Bache, I. (2013). Measuring quality of life for public policy: An idea whose time has come? Agenda-setting dynamics in the European Union. *Journal of European Public Policy*, *20*(1), 21–38. https://doi.org/10.1080/13501763.2012.699658

Banks, G. C., Woznyj, H. M., Wesslen, R. S., & Ross, R. L. (2018). A Review of Best Practice Recommendations for Text Analysis in R (and a User-Friendly App). *Journal of Business and Psychology*, *33*(4), 445–459. https://doi.org/10.1007/s10869-017-9528-3

Barroso, J. M. (2009). Political Guidelines for the Next Commission. President of the European Commission Documents/Reports, 2 September 2009, Brussels: European Commission. Retrieved from https://sbe.org.gr/newsletters/eflashnews/2009_21/Barroso_Political_Guidelines _2009.pdf

Baumgartner, F. R., & Jones, B. D. (1993). *Agendas and instability in American politics.* (2nd ed.). Chicago: University of Chicago Press.

Becker, S., Bauer, M. W., Connolly, S., & Kassim, H. (2016). The Commission: Boxed in and constrained, but still an engine of integration. *West European Politics*, *39*(5), 1011–1031. https://doi.org/10.1080/01402382.2016.1181870

Béland, D., & Howlett, M. (2016). The Role and Impact of the Multiple-Streams Approach in Comparative Policy Analysis. *Journal of Comparative Policy Analysis: Research and Practice*, *18*(3), 221–227. https://doi.org/10.1080/13876988.2016.1174410

Benoit, K., & Obeng, A. (2019). *readtext: Import and Handling for Plain and Formatted Text Files.* R Package Version 0.75. https://CRAN.R-project.org/package=readtext

Benoit, K., Watanabe, K., Wang, H., Nulty, P., Obeng, A., Müller, S., & Matsuo, A. (2018). quanteda: An R package for the quantitative analysis of textual data. *Journal of Open Source Software*, *3*(30), 774. https://doi.org/10.21105/joss.00774

Benson, D., & Russel, D. (2015). Patterns of EU Energy Policy Outputs: Incrementalism or Punctuated Equilibrium? *West European Politics*, *38*(1), 185–205. https://doi.org/10.1080/01402382.2014.936707

Biesenbender, S. (2015). The EU's energy policy agenda: Directions and developments. In J. Tosun, S. Biesenbender, & K. Schulze (Eds.), *Energy policy making in the EU. Building the Agenda.* (pp. 21–40). Munich: Springer.

Boersma, T., & Goldthau, A. (2017). Wither the EU's Market Making Project in Energy: From Liberalization to Securitization? In S. S. Andersen, A. Goldthau, & N. Sitter (Eds.), *Energy Union: Europe's New Liberal Mercantilism?* (pp. 99–114). London: Palgrave Macmillan.

Booth, A. D. (1967). A "Law" of occurrences for words of low frequency. *Information and Control*, *10*(4), 386–393. https://doi.org/10.1016/S0019-9958(67)90201-X

Börzel, T. A. (2005). Mind the gap! European integration between level and scope. *Journal of European Public Policy*, *12*(2), 217–236. https://doi.org/10.1080/13501760500043860

Bouzarovski, S., & Petrova, S. (2015). The EU energy poverty and vulnerability agenda: An emergent domain of transnational action. In J. Tosun, S. Biesenbender, & K. Schulze (Eds.), *Energy policy making in the EU. Building the Agenda.* (pp. 129–144). Munich: Springer.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Bürgin, A. (2018). The impact of Juncker's reorganization of the European Commission on the internal policy-making process: Evidence from the Energy Union project. *Public Administration*, 1–14. https://doi.org/10.1111/padm.12388

Burns, C., Clifton, J., & Quaglia, L. (2018). Explaining policy change in the EU: Financial reform after the crisis. *Journal of European Public Policy*, *25*(5), 728–746. https://doi.org/10.1080/13501763.2017.1301535

Cheng, D., He, X., & Liu, Y. (2015). Model Selection for Topic Models via Spectral Decomposition. *Proceedings of the Eighteenth International Conference on Artificial Intelligence and Statistics (AISTATS '15)*, 183–191.

Cini, M. (2008). Political Leadership in the European Commission: The Santer and Prodi Commissions, 1995–2005. In J. Hayward (Ed.), *Leaderless Europe* (pp. 113–130). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199535026.003.0007

Cini, M., & Šuplata, M. (2017). Policy leadership in the European Commission: The regulation of EU mobile roaming charges. *Journal of European Integration*, *39*(2), 143–156. https://doi.org/10.1080/07036337.2016.1275607

Cohen, M. D., March, J. G., & Olsen, J. P. (1972). A Garbage Can Model of Organizational Choice. *Administrative Science Quarterly*, *17*(1), 1–25. https://doi.org/10.2307/2392088

Copeland, P., & James, S. (2014). Policy windows, ambiguity and Commission entrepreneurship: Explaining the relaunch of the European Union's economic reform agenda. *Journal of European Public Policy*, *21*(1), 1–19. https://doi.org/10.1080/13501763.2013.800789

Dudău, R., & Simionel, T. (2011). The Politics of the Third Energy Package. *Petroleum Industry Review*, September, 70-73.

Egami, N., Fong, C. J., Grimmer, J., Roberts, M. E., & Stewart, B. M. (2018). How to Make Causal Inferences Using Texts. ArXiv Preprint ArXiv:1802.02163. Retrieved from https://arxiv.org/abs/1802.02163v1

Eikeland, P. O. (2011). The Third Internal Energy Market Package: New Power Relations among Member States, EU Institutions and Non-state Actors? *JCMS: Journal of Common Market Studies*, *49*(2), 243–263. https://doi.org/10.1111/j.1468-5965.2010.02140.x

European Commission (2014) Communication from the Commission to the European Parliament and the Council - European Energy Security Strategy. Retrieved from

https://www.eesc.europa.eu/resources/docs/european-energy-security-strategy.pdf

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *International Journal of Qualitative Methods*, *5*(1), 80–92. https://doi.org/10.1177/160940690600500107

Franza, L., & Van Der Linde, C. (2017). Geopolitics and the Foreign Policy Dimension of EU energy security. In S. S. Andersen, A. Goldthau, & N. Sitter (Eds.), *Energy Union Europe's New Liberal Mercantilism?* (pp. 85–98). London: Palgrave Macmillan.

Fukumasu, K., Eguchi, K., & Xing, E. P. (2012). Symmetric Correspondence Topic Models for Multilingual Text Analysis. *In Proceedings of the 25th Annual Conference on Advances in Neural Information Processing Systems (NIPS)*, 1295–1303.

Genovese, F. (2015). Politics ex cathedra: Religious authority and the Pope in modern international relations. *Research & Politics*, *2*(4), 1–15. https://doi.org/10.1177/2053168015612808

Goetz, K. H. (2009). How does the EU tick? Five propositions on political time. *Journal of European Public Policy*, *16*(2), 202–220. https://doi.org/10.1080/13501760802589214

Goetz, K. H., & Meyer-Sahling, J.-H. (2009). Political time in the EU: Dimensions, perspectives, theories. *Journal of European Public Policy*, *16*(2), 180–201. https://doi.org/10.1080/13501760802589198

Guiraudon, V. (2000). European Integration and Migration Policy: Vertical Policy-making as Venue Shopping. *JCMS: Journal of Common Market Studies*, *38*(2), 251–271. https://doi.org/10.1111/1468-5965.00219

Hartlapp, M., Metz, J., & Rauh, C. (2013). Linking Agenda Setting to Coordination Structures: Bureaucratic Politics inside the European Commission. *Journal of European Integration*, *35*(4), 425–441. https://doi.org/10.1080/07036337.2012.703663

Herweg, N. (2015). Against all odds: The liberalisation of the European natural gas market—A multiple streams perspective. In J. Tosun, S. Biesenbender, & K.

Schulze (Eds.), *Energy policy making in the EU. Building the Agenda.* (pp. 87–105). Munich: Springer.

Isoaho, K., Gritsenko, D., & Mäkelä, E. (2019). Topic Modeling and Text Analysis for Qualitative Policy Research. *Policy Studies Journal*, 1–25. https://doi.org/10.1111/psj.12343

Isoaho, K., Moilanen, F., & Toikka, A. (2019). A Big Data View of the European Energy Union: Shifting from 'a Floating Signifier' to an Active Driver of Decarbonisation? *Politics and Governance*, *7*(1), 28–44. https://doi.org/10.17645/pag.v7i1.1731

Issawi, C. (1978). The 1973 Oil Crisis and After. *Journal of Post Keynesian Economics*, *1*(2), 3–26.

Jacobs, D. (2015). Designing financing mechanisms for electricity from renewable energy sources: The role of the European Commission as an agenda shaper. In J. Tosun, S. Biesenbender, & K. Schulze (Eds.), *Energy policy making in the EU. Building the Agenda.* (pp. 107–128). Munich: Springer.

Jones, B. D. (2003). Bounded Rationality and Political Science: Lessons from Public Administration and Public Policy. *Journal of Public Administration Research and Theory*, *13*(4), 395–412. https://doi.org/10.1093/jopart/mug028

Juncker, J.-C. (2014). A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the Next Commission. *Opening Statement in the European Parliament Plenary Session. Strasbourg*, 37 p.

Kassim, H. (2004). The Kinnock Reforms in Perspective: Why Reforming the Commission is an Heroic, But Thankless, Task. *Public Policy and Administration*, *19*(3), 25–41. https://doi.org/10.1177/095207670401900304

Kassim, H. (2013). Leadership in the Commission. In H. Kassim, J. Peterson, M. W. Bauer, S. Connolly, R. Dehousse, L. Hooghe, & A. Thompson (Eds.), *The European Commission of the Twenty-First Century* (pp. 152–180). Oxford: Oxford University Press.

Kassim, H., Connolly, S., Dehousse, R., Rozenberg, O., & Bendjaballah, S. (2017). Managing the house: The Presidency, agenda control and policy activism in the European Commission. *Journal of European Public Policy*, *24*(5), 653–674. https://doi.org/10.1080/13501763.2016.1154590

Kingdon, J. W. (2014). *Agendas, alternatives, and public policies* (Second edition, Pearson new international edition). Essex: Pearson.

Kovats, L. (2009). Do elections set the pace? A quantitative assessment of the timing of European legislation. *Journal of European Public Policy*, *16*(2), 239–255. https://doi.org/10.1080/13501760802589255

Kreppel, A., & Oztas, B. (2017). Leading the Band or Just Playing the Tune? Reassessing the Agenda-Setting Powers of the European Commission. *Comparative Political Studies*, *50*(8), 1118–1150. https://doi.org/10.1177/0010414016666839

Kriesi, H., Adam, S., & Jochum, M. (2006). Comparative analysis of policy networks in Western Europe. *Journal of European Public Policy*, *13*(3), 341–361. https://doi.org/10.1080/13501760500528803

Kuhlmann, J. (2016). Clear enough to be proven wrong? Assessing the influence of the concept of bounded rationality within the multiple-streams framework. In R. Zohlnhöfer & F. W. Rüb (Eds.), *Decision-making under ambiguity and time constraints. Assessing the multiple-streams framework* (pp. 35–50). Colchester, UK: ECPR Press.

Kustova, I. (2017). Towards a comprehensive research agenda on EU energy integration: Policy making, energy security, and EU energy actorness. *Journal of European Integration*, *39*(1), 95–101. https://doi.org/10.1080/07036337.2017.1258757

Labbate, S. (2013). Italy and the development of European energy policy: From the dawn of the integration process to the 1973 oil crisis. *European Review of History: Revue Europeenne d'histoire*, *20*(1), 67–93. https://doi.org/10.1080/13507486.2012.697875

Lan, M., Sam-Yuan Sung, Hwee-Boon Low, & Chew-Lim Tan. (2005). A comparative study on term weighting schemes for text categorization. *In Proceedings. 2005 IEEE International Joint Conference on Neural Networks*, *1*, 546–551. https://doi.org/10.1109/IJCNN.2005.1555890

Lee, Y. (2017). Interdependence, issue importance, and the 2009 Russia-Ukraine gas conflict. *Energy Policy*, *102*, 199–209. https://doi.org/10.1016/j.enpol.2016.11.038

Li, W. (1992). Random texts exhibit Zipf's-law-like word frequency distribution. *IEEE Transactions on Information Theory*, *38*(6), 1842–1845. https://doi.org/10.1109/18.165464

Lovins, J. B. (1968). Development of a stemming algorithm. *Mechanical Translation and Computational Linguistics, 11*(1), 22–31.

Lucas, C., Nielsen, R. A., Roberts, M. E., Stewart, B. M., Storer, A., & Tingley, D. (2015). Computer-Assisted Text Analysis for Comparative Politics. *Political Analysis*, *23*(2), 254–277. https://doi.org/10.1093/pan/mpu019

Maier, D., Waldherr, A., Miltner, P., Wiedemann, G., Niekler, A., Keinert, A., Pfetsch, B., Heyer, G., Reber, U., Häussler, T., Schmid-Petri, H., & Adam, S. (2018). Applying LDA Topic Modeling in Communication Research: Toward a Valid and Reliable Methodology. *Communication Methods and Measures*, *12*(2–3), 93–118. https://doi.org/10.1080/19312458.2018.1430754

Maltby, T. (2013). European Union energy policy integration: A case of European Commission policy entrepreneurship and increasing supranationalism. *Energy Policy*, *55*(4), 435–444. https://doi.org/10.1016/j.enpol.2012.12.031

Matláry, J. H. (1997). *Energy Policy in the European Union*. London: Macmillan Education UK.

Mayer, S. (2008). Path dependence and Commission activism in the evolution of the European Union's external energy policy. *Journal of International Relations and Development*, *11*(3), 251–278. https://doi.org/10.1057/jird.2008.12

McKenny, A. F., Aguinis, H., Short, J. C., & Anglin, A. H. (2018). What Doesn't Get Measured Does Exist: Improving the Accuracy of Computer-Aided Text Analysis. *Journal of Management*, *44*(7), 2909–2933. https://doi.org/10.1177/0149206316657594

Mimno, D., Wallach, H., Talley, E., Leenders, M., & McCallum, A. (2011). Optimizing Semantic Coherence in Topic Models. *In Proceedings of the Conference on Empirical Methods in Natural Language Processing. Association for Computational Linguistics*, 262–272.

Moschella, M. (2011). Getting Hedge Funds Regulation into the EU Agenda: The Constraints of Agenda Dynamics. *Journal of European Integration*, *33*(3), 251–266. https://doi.org/10.1080/07036337.2010.546844

Mueller, H. G. (1965). Communications Efficiency of Resource Use: The Case of the European Coal and Steel Community. *Southern Economic Journal (Pre-1986)*, *32*(2), 222–225.

Müller, H. (2016). Between Potential, Performance and Prospect: Revisiting the Political Leadership of the EU Commission President. Politics and Governance, 4(2), 68-79. https://doi.org/10.17645/pag.v4i2.581

Neuman, M. (2010). EU–Russian Energy Relations after the 2004/2007 EU Enlargement: An EU Perspective. *Journal of Contemporary European Studies*, *18*(3), 341–360. https://doi.org/10.1080/14782804.2010.507918

Nowlin, M. C. (2016). Modeling Issue Definitions Using Quantitative Text Analysis: Nowlin: Modeling Issue Definitions. *Policy Studies Journal*, *44*(3), 309–331. https://doi.org/10.1111/psj.12110

Pansardi, P., & Battegazzorre, F. (2018). The discursive legitimation strategies of the president of the commission: A qualitative content analysis of the State of the Union Addresses (SOTEU). *Journal of European Integration*, *40*(7), 853–871. https://doi.org/10.1080/07036337.2018.1482286

Pirani, S., Stern, J., & Yafimava, K. (2009). The Russo-Ukrainian gas dispute of January 2009: A comprehensive assessment. *Oxford: Oxford Institute for Energy Studies*, 1–66.

Princen, S. (2007). Agenda-setting in the European Union: A theoretical exploration and agenda for research. *Journal of European Public Policy*, *14*(1), 21–38. https://doi.org/10.1080/13501760601071539

Princen, S. (2010). Venue shifts and policy change in EU fisheries policy. *Marine Policy*, *34*(1), 36–41. https://doi.org/10.1016/j.marpol.2009.04.006

Princen, S. (2011). Agenda-setting strategies in EU policy processes. *Journal of European Public Policy*, *18*(7), 927–943. https://doi.org/10.1080/13501763.2011.599960

Princen, S. (2012). Agenda-setting and the formation of an EU policy-making state. *Constructing a Policy-Making State*, 29–45.

Princen, S. (2013). Punctuated equilibrium theory and the European Union. *Journal of European Public Policy*, *20*(6), 854–870. https://doi.org/10.1080/13501763.2013.781822

Princen, S., & Rhinard, M. (2006). Crashing and creeping: Agenda-setting dynamics in the European Union. *Journal of European Public Policy*, *13*(7), 1119–1132. https://doi.org/10.1080/13501760600924233

Rauh, C. (2018). An agenda-setter in decline? Legislative activity of the European Commission 1985-2016. *Paper Presented at the Annual Conference of the European Political Science Association*, 1–39.

Reisenbichler, M., & Reutterer, T. (2019). Topic modeling in marketing: Recent advances and research opportunities. *Journal of Business Economics*, *89*(3), 327–356. https://doi.org/10.1007/s11573-018-0915-7

Roberts, M. E., Stewart, B. M., & Airoldi, E. M. (2016). A Model of Text for Experimentation in the Social Sciences. *Journal of the American Statistical Association*, *111*(515), 988–1003. https://doi.org/10.1080/01621459.2016.1141684

Roberts, M. E., Stewart, B. M., & Tingley, D. (2014). stm: R Package for Structural Topic Models. *Journal of Statistical Software*, *10*(2), 1–41.

Rodriguez, M. Y., & Storer, H. (2019). A computational social science perspective on qualitative data exploration: Using topic models for the descriptive analysis of social media data*. *Journal of Technology in Human Services*, 1–32. https://doi.org/10.1080/15228835.2019.1616350

Rodríguez-Gómez, N., Zaccarelli, N., & Bolado-Lavín, R. (2016). European ability to cope with a gas crisis. Comparison between 2009 and 2014. *Energy Policy*, *97*, 461–474. https://doi.org/10.1016/j.enpol.2016.07.016

Schmiedel, T., Müller, O., & vom Brocke, J. (2019). Topic Modeling as a Strategy of Inquiry in Organizational Research: A Tutorial With an Application Example on Organizational Culture. *Organizational Research Methods*, *22*(4), 941–968. https://doi.org/10.1177/1094428118773858

Schwemmer, C. (2018). *stminsights: A "Shiny" Application for Inspecting Structural Topic Models*. R Package Version 0.3.0. https://CRAN.R-project.org/package=stminsights

Sheingate, A. D. (2000). Agricultural Retrenchment Revisited: Issue Definition and Venue Change in the United States and European Union. *Governance*, *13*(3), 335–363. https://doi.org/10.1111/0952-1895.00137

Simon, H. A. (1972). Theories of bounded rationality. *Decision and Organization*, *1*(1), 161–176.

Szulecki, K., Fischer, S., Gullberg, A. T., & Sartor, O. (2016). Shaping the 'Energy Union'': Between national positions and governance innovation in EU energy and climate policy.' *Climate Policy*, *16*(5), 548–567. https://doi.org/10.1080/14693062.2015.1135100

Taddy, M. A. (2012). On Estimation and Selection for Topic Models. *In Proceedings of the 15th International Conference on Artificial Intelligence and Statistics. New York: Association for Computing Machinery*, 1184–1193.

Talseth, L.-C. U. (2017). *The Politics of Power: EU-Russia Energy Relations in the 21st Century*. Cham, Switzerland: Palgrave Macmillan.

Talus, K. (2013). *EU energy law and policy: A critical account*. Oxford: Oxford University Press.

Thaler, P. (2016). The European Commission and the European Council: Coordinated Agenda setting in European energy policy. *Journal of European Integration*, *38*(5), 571–585. https://doi.org/10.1080/07036337.2016.1178252

Tol, R. S. J. (2012). A cost–benefit analysis of the EU 20/20/2020 package. *Energy Policy*, *49*, 288–295. https://doi.org/10.1016/j.enpol.2012.06.018

Tosun, J., Biesenbender, S., & Schulze, K. (2015a). Building the EU's energy policy agenda: An introduction. In J. Tosun, S. Biesenbender, & K. Schulze (Eds.), *Energy policy making in the EU. Building the Agenda.* (pp. 1–17). Munich: Springer.

Tosun, J., Biesenbender, S., & Schulze, K. (2015b). Building the EU's Energy Policy Agenda: Insights Gained. In J. Tosun, S. Biesenbender, & K. Schulze (Eds.), *Energy policy making in the EU. Building the Agenda.* (pp. 247–263). Munich: Springer.

Trondal, J. (2011). Bureaucratic Structure and Administrative Behaviour: Lessons from International Bureaucracies. *West European Politics*, *34*(4), 795–818. https://doi.org/10.1080/01402382.2011.572392

True, J. L., Jones, B. D., & Baumgartner, F. R. (2007). Punctuated equilibrium theory: Explaining stability and change in public policymaking. In P. A. Sabatier (Ed.),

Theories of the policy process (2nd ed., pp. 155–187). Boulder, CO: Westview Press.

Vinois, J.-A. (2017). The Road to Energy Union. In S. S. Andersen, A. Goldthau, & N. Sitter (Eds.), *Energy Union: Europe's New Liberal Mercantilism?* (pp. 27–50). London: Palgrave Macmillan.

Wendon, B. (1998). The Commission as image-venue entrepreneur in EU social policy. *Journal of European Public Policy*, *5*(2), 339–353. https://doi.org/10.1080/135017698344027

Wettestad, J., Eikeland, P. O., & Nilsson, M. (2012). EU Climate and Energy Policy: A Hesitant Supranational Turn? *Global Environmental Politics*, *12*(2), 67–86. https://doi.org/10.1162/GLEP_a_00109

Wickham, H. (2016). *Elegant Graphics for Data Analysis*. Springer-Verlag New York. https://ggplot2.tidyverse.org

Winzer, C. (2012). Conceptualizing energy security. *Energy Policy*, *46*, 36–48. https://doi.org/10.1016/j.enpol.2012.02.067

Zahariadis, N. (2008). Ambiguity and choice in European public policy. *Journal of European Public Policy*, *15*(4), 514–530. https://doi.org/10.1080/13501760801996717

Appendices

I.   Number of Documents per Year

Number of Documents per year
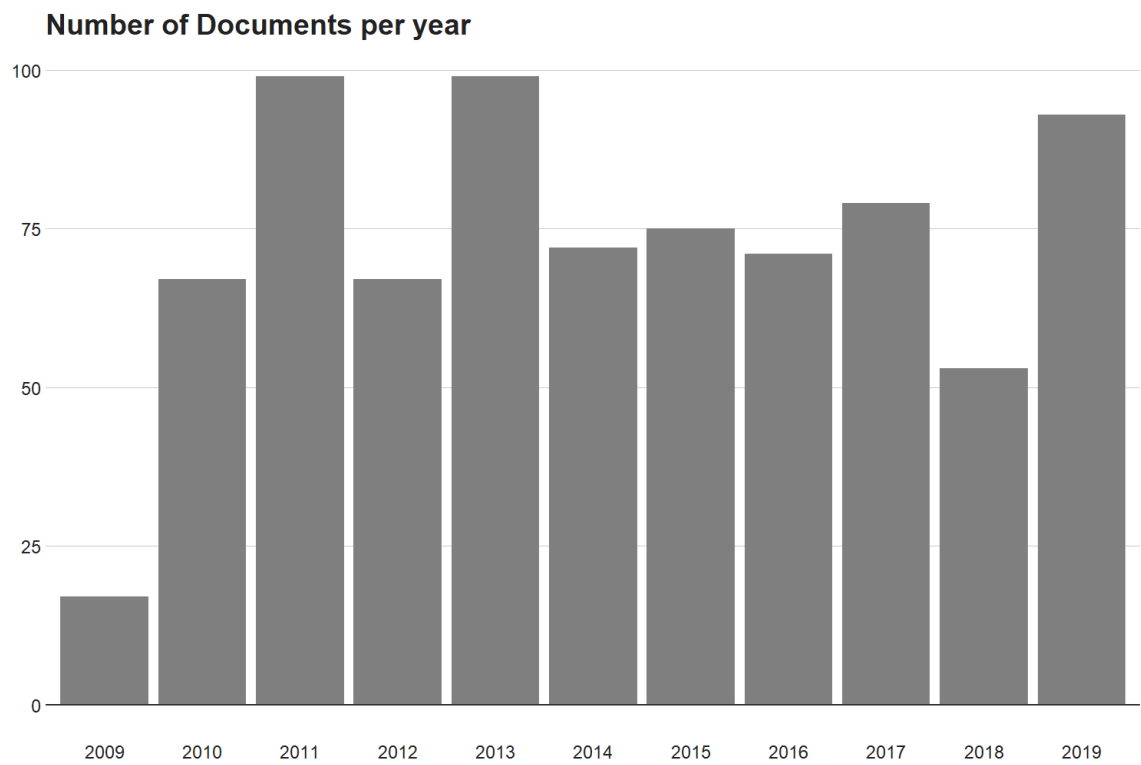
II.   Top-50 Words for the 30-topic STM Model

1. Standardization

Highest Prob: product, standard, power, requir, test, standardis, light, manufactur, set, equip, valu, model, mean, mode, mandat, specif, point, cen, inform, sourc, consumpt, household, union, display, star, follow, unit, function, technic, effici, applic, council, refer, wash, part, control, temperatur, applianc, one, tabl, rate, condit, repres, oper, import, programm, parliament, offici, cycl, avail

FREX: cen, cenelec, compart, standardis, star, sleep, wash, ssl, dryer, refriger, washer, display, etsi, mode, spectrum, mandat, voltag, lumin, tec, repair, comput, temperatur, colour, weld, eei, light, applianc, test, machin, imag, standbi, mark, qualifi, ambient, monochrom, eso, dri, gear, dishwash, standard, configur, spare, epa, watt, desktop, toler, cabinet, explos, household, model

2. Law

Highest Prob: case, infring, court, law, open, applic, new, union, report, rule, complaint, monitor, transposit, nation, annual, polici, pilot, file, right, area, end, non, implement, procedur, late, financi, public, main, citizen, concern, regist, tfeu, servic, transport, failur, memo, requir, judgment, legisl, transpos, refer, follow, enforc, communic, protect, sector, justic, work, environ, consum

FREX: infring, complaint, transposit, court, late, memo, pilot, open, file, transpos, law, judgment, referr, failur, tfeu, citizen, justic, resid, regist, chart, case, incorrect, ispa, resolut, fail, citizenship, preliminari, right, recognit, greec, annual, entrepreneurship, croatia, cyprus, rule, asylum, applic, handl, affair, migrat, properti, breach, romania, crimin, slovenia, portug, poland, enforc, monitor, luxembourg

3. Green Economy

Highest Prob: technolog, develop, invest, support, polici, industri, innov, new, sector, need, sustain, research, effici, europ, action, renew, carbon, climat, public, system, framework, economi, product, low, can, global, competit, initi, resourc, increas, strategi, com, promot, fund, econom, chang, plan, base, growth, set, work, build, improv, challeng, potenti, integr, key, intern, reduc, activ

FREX: innov, technolog, green, roadmap, sustain, bioeconomi, carbon, strateg, citi, economi, bio, global, opportun, job, skill, chain, europ, challeng, develop, demonstr, growth, transit, today, leadership, recycl, help, clean, scale, circular, agenda, knowledg, research, invest, boost, partnership, com, climat, promot, batteri, collabor, support, resili, modernis, wind, creat, deploy, vision, decarbonis, mobilis, acceler

4. Nuclear Safety

Highest Prob: nuclear, safeti, oper, reactor, power, fuel, plant, euratom, materi, research, instal, review, design, accid, nation, requir, manag, implement, regulatori, intern, system, radioact, new, wast, protect, site, test, improv, high, iaea, radiat, generat, framework, develop, construct, assess, recommend, consid, level, provis, uranium, peer, sever, facil, emerg, activ, equip, follow, author, hfr

FREX: iaea, nuclear, hfr, reactor, uranium, peer, fukushima, safeti, irradi, accid, pwr, ensreg, npps, atom, radiat, isotop, stress, insc, euratom, seismic, enrich, fission, plant, fabric, materi, radioisotop, prolifer, site, licens, lto, cbrn, holder, safeguard, npp, licenc, review, flood, reprocess, radioact, infcirc, neutron, cycl, instal, australia, emerg, event, geolog, power, earthquak, flux

5. Duties

Highest Prob: excis, alcohol, good, duti, movement, product, oper, author, administr, procedur, export, system, custom, econom, emc, tax, provid, beverag, report, arrang, small, rate, produc, fraud, reduc, busi, respond, beer, problem, may, import, eec, denatur, evalu, transit, council, provis, consumpt, trader, legal, function, destin, territori, suspens, inform, refer, process, exempt, applic, classif

FREX: alcohol, emc, beer, excis, denatur, beverag, movement, cider, suspens, consignor, destin, fallback, distilleri, fraud, consigne, duti, computeris, good, trader, messag, dispatch, wine, classif, greenland, eec, exit, ferment, ofb, arrang, plato, brewer, strength, seed, diamond, custom, small, flavour, repli, respond, releas, pda, problem, administr, export, sweeten, rough, transit, cda, territori, autom

6. Imports

Highest Prob: union, import, product, export, price, produc, biodiesel, investig, industri, provision, claim, dump, recit, duti, concern, period, parti, consid, goi, indonesia, compani, origin, basic, follow, cpo, injuri, interest, provid, anti, sale, sampl, increas, ltd, applic, one, definit, blend, note, disclosur, set, comment, inform, profit, evid, made, level, data, modul, reject, solar

FREX: goi, dump, cpo, provision, biodiesel, indonesia, wilmar, countervail, indonesian, ltd, injuri, recit, disclosur, claim, blend, oppf, investig, reject, anti, modul, export, ptpn, comment, basic, produc, profit, invoic, alleg, prc, imposit, canada, usa, pme, argument, solar, subsidi, origin, argu, bioethanol, evid, import, palm, unrel, undercut, cell, taric, ester, sale, consign, argentina

7. Restrictive Measures

Highest Prob: person, provid, entiti, financi, bodi, steel, product, prohibit, follow, list, author, council, design, trade, relat, oil, transfer, equip, natur, concern, transact, special, fund, refer, authoris, export, compet, inform, item, control, technolog, servic, gas, iran, applic, egf, syria, union, materi, econom, good, contract, restrict, mine, decis, resourc, petroleum, activ, redund, process

FREX: egf, iran, steel, prohibit, syria, iranian, redund, cfsp, misconduct, alloy, syrian, item, transact, miner, broker, person, abus, manipul, entiti, softwar, nickel, militari, dilig, violenc, damascus, mad, transfer, laser, gold, special, humanitarian, civilian, petroleum, scrap, tel, frozen, bitumin, assad, bodi, repress, metal, personalis, globalis, list, insid, tungsten, mine, amaranth, restrict, wax

8. Planning

Highest Prob: nation, plan, climat, union, report, polici, target, integr, object, recommend, assess, council, effici, renew, level, monitor, implement, contribut, achiev, parliament, final, progress, ensur, oblig, provid, govern, need, emiss, legisl, draft, impact, take, requir, specif, account, sector, process, period, set, particular, inform, relev, dimens, greenhous, well, system, relat, ambit, effect, gas

FREX: climat, plan, integr, recommend, nation, target, dimens, draft, ambit, object, progress, oblig, streamlin, polici, achiev, parliament, greenhous, report, union, semest, contribut, underpin, govern, pari, updat, effort, monitor, renew, necp, assess,

element, collect, interact, legisl, latest, repeal, submit, fit, coher, everi, comprehens, notabl, final, forward, alongsid, reflect, acqui, take, ensur, sectori

9. National Programs

Highest Prob: gdp, tax, growth, labour, rate, employ, increas, programm, public, govern, sector, term, reform, debt, improv, educ, social, expenditur, chang, financi, target, polici, servic, unemploy, bank, system, remain, structur, fiscal, age, econom, work, low, high, implement, revenu, balanc, recommend, deficit, nation, progress, net, reduc, long, expect, indic, risk, new, averag, project

FREX: labour, unemploy, gdp, debt, fiscal, age, deficit, pension, growth, educ, wage, reform, employ, forecast, ratio, incom, expenditur, csr, peopl, budgetari, gross, consolid, stabil, school, lend, spring, mto, poverti, revenu, net, skill, social, bank, adjust, inflat, macroeconom, loan, structur, youth, nrp, medium, care, women, popul, tax, tertiari, capit, converg, retir, young

10. Agreements with 3rd Parties

Highest Prob: agreement, council, union, propos, decis, communiti, parti, adopt, amend, parliament, treati, provis, accord, act, establish, legal, follow, third, forc, iga, may, intern, implement, committe, inform, law, concern, set, applic, refer, relat, pursuant, provid, non, appli, countri, negoti, joint, deleg, govern, function, procedur, basi, subject, posit, eea, rule, enter, cooper, particular

FREX: iga, agreement, communiti, treati, parti, ministeri, amend, negoti, forc, decis, propos, council, claus, intergovernment, pursuant, adopt, text, act, eea, deleg, behalf, committe, enter, parliament, union, entri, third, opinion, verd, bilater, cod, secretariat, cape, legal, repeal, memorandum, presid, hereinaft, confer, enc, vienna, explanatori, provis, subject, sign, agre, joint, bind, republ, mutual

11. Biofuel

Highest Prob: renew, biofuel, emiss, land, fuel, chang, product, forest, biomass, greenhous, ghg, sustain, gas, requir, produc, feedstock, target, heat, indirect, sourc, agricultur, increas, electr, carbon, scheme, estim, transport, report, account, impact, res, crop, oil, valu, area, can, develop, criteria, fossil, save, model, avail, methodolog, high, share, countri, bioliquid, achiev, level, addit

FREX: forest, biofuel, feedstock, biomass, crop, bioliquid, land, iluc, frl, harvest, biodivers, lulucf, wood, ghg, soil, greenhous, res, agricultur, forestri, renew, cultiv, cropland, ifpri, indirect, wheat, convers, deforest, sugar, sustain, fossil, bioenergi, biof, mirag, veget, maiz, bioethanol, emiss, palm, chang, grassland, expans, carbon, ethanol, pathway, rapese, residu, criteria, nreap, stock, food

12. Energy Infrastructure

Highest Prob: project, gas, infrastructur, storag, electr, invest, lng, network, capac, pipelin, interconnect, new, connect, construct, complet, suppli, grid, transmiss, line, permit, grant, develop, implement, oper, termin, eepr, offshor, region, final, ccs, prioriti, support, interest, border, integr, europ, secur, sourc, increas, wind, baltic, plan, studi, system, cross, north, procedur, addit, decis, exist

FREX: eepr, pipelin, lng, ccs, interconnect, termin, storag, bcm, baltic, infrastructur, interconnector, permit, corridor, project, pcis, cabl, wind, south, east, eastern, connect, grid, construct, transmiss, north, rout, entsog, pci, west, tran, onshor, underground, complet, revers, hvdc, flow, captur, subopt, substat, gas, delay, diversif, network, prioriti, western, finalis, offshor, tyndp, fid, farm

13. Labelling and Ecodesign

Highest Prob: label, product, ecodesign, requir, effici, consum, tyre, petrol, fuel, save, surveil, inform, manufactur, diesel, sampl, provid, sale, complianc, consumpt, test, studi, relat, class, report, voluntari, specif, group, non, ron, improv, environment, model, game, implement, consol, propos, impact, industri, agreement, databas, set, can, action, qualiti, per, review, mandatori, paramet, avail, perform

FREX: tyre, label, ron, ecodesign, consol, game, petrol, surveil, class, projector, diesel, voluntari, ppm, video, sampl, unlead, sale, cstbs, lamp, databas, rescal, preparatori, mandatori, applianc, paramet, dealer, product, grade, min, self, forum, player, twh, layout, ecofi, life, grip, top, wet, signatori, complianc, test, studi, sold, purchas, consum, ambit, display, fqms, vapour

14. Competition

Highest Prob: competit, aid, case, decis, avail, sector, rule, court, coal, bank, servic, compani, investig, mine, general, merger, concern, may, enforc, new, adopt,

public, continu, price, see, object, polici, eur, product, cartel, econom, scheme, antitrust, financi, oper, judgment, singl, tax, elojad, isef, consum, ensur, invest, support, innov, activ, effect, agreement, grant, import

FREX: elojad, isef, cartel, merger, antitrust, aid, coal, mine, competit, fine, press, judgment, restructur, comp, rapid, airlin, competitor, closur, prolong, lenienc, bank, card, airport, generic, gber, googl, settlement, court, hard, exm, investig, enforc, domin, inquiri, pharmaceut, broadband, acquisit, ncas, deutsch, postal, sgei, mastercard, ecn, block, uri, decis, digit, case, distort, telecom

15. Offshore Fuel

Highest Prob: offshor, oil, oper, safeti, respons, sea, pollut, liabil, damag, marin, industri, emsa, activ, accid, environment, gas, water, well, spill, major, risk, maritim, incid, instal, author, vessel, loss, requir, compani, provid, may, financi, arctic, econom, emerg, environ, agenc, servic, equip, claim, legisl, capac, law, avail, practic, protect, establish, region, respond, resourc

FREX: arctic, spill, emsa, offshor, damag, incid, liabil, deepwat, coastal, sea, accid, marin, cleanseanet, pollut, drill, blowout, atlant, osd, vessel, hazard, maritim, ocean, bodili, oil, explor, insur, loss, opol, compens, disast, claimant, norway, hydrocarbon, fault, satellit, respons, civil, water, prepared, basin, injuri, shelf, fractur, jurisdict, regim, emerg, nsoaf, north, focal, mediterranean

16. Energy Efficiency

Highest Prob: build, effici, save, heat, requir, perform, system, consumpt, eed, epbd, renov, final, implement, oblig, can, public, provid, instal, calcul, inform, cool, target, polici, effect, nation, scheme, new, achiev, improv, action, servic, residenti, sector, minimum, level, exist, technic, ensur, set, must, financ, exampl, provis, part, altern, individu, point, addit, result, primari

FREX: epbd, eed, renov, build, save, residenti, epc, heat, cool, cogener, neeap, effici, district, nzeb, perform, optim, mtoe, audit, space, hous, esco, stock, thermal, bill, eeap, hot, calcul, ventil, eeo, boiler, primari, chp, oblig, apart, owner, refurbish, count, exampl, minimum, guidanc, scheme, park, instal, inspect, esd, certif, individu, consumpt, must, altern

17. Vehicles Emissions

Highest Prob: vehicl, emiss, co2, fuel, transport, manufactur, target, car, new, hdv, road, option, reduct, technolog, consumpt, effici, fleet, set, reduc, standard, altern, monitor, save, duti, impact, passeng, heavi, level, averag, specif, lev, type, requir, increas, oper, van, charg, data, registr, electr, low, improv, hydrogen, differ, report, point, light, hdvs, infrastructur, limit

FREX: hdv, lev, hdvs, vehicl, refuel, fleet, co2, vecto, oem, car, van, truck, zev, heavi, road, aerodynam, automot, passeng, manufactur, emiss, hydrogen, buse, lorri, recharg, uptak, trailer, registr, cng, weight, engin, transport, hybrid, freight, altern, charg, simul, coach, batteri, target, zero, mass, hgvs, intermod, pool, acea, fuell, fuel, cabin, rear, wltp

18. Regulations

Highest Prob: contract, author, inform, refer, requir, system, may, public, procedur, oper, provid, ensur, servic, mean, bodi, accord, nation, entiti, point, appropri, provis, appli, art, procur, product, specif, oblig, concern, set, applic, new, compet, establish, notifi, assess, necessari, relev, protect, econom, technic, rule, carri, follow, condit, criteria, activ, purpos, adapt, undertak, suppli

FREX: contract, art, procur, entiti, notifi, bodi, tender, par, conform, author, award, procedur, criteria, refer, mean, adapt, recit, compet, appropri, oblig, undertak, point, notic, notif, subparagraph, carri, purchas, fulfil, inform, may, prejudic, compli, subject, provis, servic, laid, necessari, public, accord, principl, appli, must, examin, ensur, specifi, purpos, certif, justifi, protect, chapter

19. Impact Assessment

Highest Prob: option, impact, polici, effect, assess, current, increas, level, object, addit, stakehold, differ, benefit, consult, administr, result, sector, scenario, baselin, limit, support, howev, analysi, relat, consid, signific, compar, approach, term, public, higher, econom, reduc, effici, one, main, problem, evalu, possibl, studi, product, can, lead, base, respond, posit, expect, legisl, risk, due

FREX: option, impact, baselin, stakehold, scenario, prefer, problem, respond, approach, analysi, burden, assum, consult, lead, negat, current, question, coher, administr,

higher, posit, similar, polici, extent, driver, effect, usual, assumpt, benefit, compar, assess, even, complex, studi, lack, suggest, evalu, differ, overal, favour, bau, difficult, rather, howev, strong, uncertainti, impli, object, expect, might

20. European Neighbourhood Policy

Highest Prob: develop, countri, cooper, implement, continu, support, programm, law, region, intern, nation, action, govern, project, partner, reform, right, report, work, ukrain, new, polici, progress, sector, area, adopt, particip, organis, establish, remain, protect, educ, moldova, plan, azerbaijan, increas, human, econom, improv, africa, public, agreement, georgia, ministri, social, final, servic, issu, activ, dialogu

FREX: azerbaijan, moldova, georgia, israel, jordan, enp, eap, armenia, lebanon, egypt, palestinian, ukrain, africa, isra, african, elect, neighbourhood, gaza, dialogu, democraci, partner, ministri, corrupt, traffick, refuge, conflict, reform, elector, migrat, youth, acp, cultur, egyptian, peac, drug, edf, women, dcfta, polit, partnership, democrat, freedom, educ, lebanes, polic, minist, civil, children, societi, twin

21. Security of Gas Supply

Highest Prob: suppli, secur, gas, need, ensur, region, level, risk, countri, cooper, assess, plan, effect, intern, can, coordin, mechan, capac, action, rule, border, exist, time, emerg, possibl, particular, third, improv, make, import, cross, impact, regulatori, identifi, take, develop, standard, infrastructur, provid, author, framework, situat, role, well, prevent, inform, increas, transpar, protect, crisi

FREX: secur, suppli, coordin, mechan, emerg, crisi, risk, role, border, region, cooper, transpar, flow, disrupt, prevent, cross, situat, neighbour, need, stress, ensur, identifi, third, packag, vulner, often, crucial, solidar, even, tool, regulatori, better, flexibl, prepar, suffici, proper, gas, citizen, mitig, notabl, approach, clear, across, wide, make, fulli, possibl, highlight, exampl, countri

22. Energy Data

Highest Prob: report, data, figur, total, inform, number, tabl, nation, provid, estim, monitor, countri, assess, project, compani, germani, invest, present, differ, public, franc, relat, annual, period, activ, indic, time, base, analysi, technolog, research, per, sourc,

result, level, plan, million, netherland, see, spain, avail, organis, main, industri, itali, manag, set, demonstr, sector, one

FREX: figur, data, tabl, report, germani, total, netherland, franc, finland, databas, denmark, number, belgium, estim, present, demonstr, spain, inventori, itali, statist, sweden, austria, compani, czech, inform, analysi, aggreg, romania, iea, overview, corpor, ireland, assum, estonia, gap, comparison, poland, latvia, slovenia, greec, monitor, qualit, interview, malta, fill, portug, republ, annual, organis, consist

23. Energy Union

Highest Prob: sourc, averag, transport, gas, electr, union, sector, final, share, consumpt, eurostat, emiss, increas, renew, base, import, invest, target, price, decreas, effici, fuel, indic, eur, nation, total, polici, million, intens, countri, region, contribut, relat, industri, gdp, product, level, compar, period, toward, valu, strategi, data, primari, ghg, consum, air, economi, trade, mtoe

FREX: eurostat, averag, decreas, mtoe, intens, sourc, share, patent, primari, slight, gross, cohes, ghg, residenti, freight, luxembourg, gdp, austria, nap, passeng, inland, interconnect, estonia, transport, ireland, latvia, consumpt, eea, cyprus, final, toward, around, czech, slovenia, malta, portug, mix, denmark, finland, specialis, largest, greec, air, deficit, hungari, economi, croatia, concentr, household, sector

24. Energy Prices

Highest Prob: price, electr, gas, increas, product, oil, industri, fuel, demand, capac, plant, sourc, invest, intens, import, sector, consum, suppli, power, europ, natur, generat, level, tax, figur, refin, differ, consumpt, averag, crude, competit, can, produc, case, low, refineri, scenario, supplier, compon, household, trade, impact, signific, carbon, countri, wholesal, coal, term, lower, higher

FREX: refin, refineri, crude, price, mwh, intens, gasolin, unconvent, demand, rise, wholesal, shale, evolut, levi, iea, fossil, coal, mix, margin, oil, compon, middl, plant, gasoil, retail, bbl, japan, driven, china, petroleum, spot, recover, scenario, signal, supplier, distil, kwh, household, trend, capac, cep, variabl, euro, tile, india, decreas, volatil, rose, industri, figur

25. Electricity Network

Highest Prob: electr, meter, smart, system, consum, network, oper, benefit, generat, transmiss, roll, grid, balanc, price, capac, respons, consumpt, custom, distribut, demand, function, regulatori, new, servic, deploy, bill, gas, cba, avail, scenario, effici, acer, implement, integr, invest, tariff, particip, develop, competit, provid, data, power, condit, tsos, agenc, instal, point, manag, supplier, design

FREX: meter, cba, smart, roll, acer, tsos, transmiss, dso, bill, grid, balanc, electr, nemo, tariff, network, consum, distribut, entso, unbundl, bid, dsos, adequaci, deploy, generat, benefit, intraday, outcom, coupl, peak, custom, scenario, cacm, boundari, read, ahead, load, system, demand, tso, nras, imbal, regulatori, ito, plc, congest, discriminatori, function, retail, supplier, code

26. Research

Highest Prob: programm, financi, research, propos, framework, appropri, euratom, initi, action, manag, implement, activ, contribut, budget, total, iter, union, impact, expenditur, multiannu, council, joint, object, head, commit, line, eur, specif, fund, administr, fusion, resourc, particip, support, undertak, estim, establish, provid, financ, million, number, project, payment, staff, evalu, develop, indirect, relat, requir, may

FREX: iter, multiannu, fusion, head, euratom, research, expenditur, budget, appropri, financi, bbi, programm, initi, joint, framework, scientif, decim, commit, staff, undertak, payment, diff, jrc, fraud, output, contribut, abb, indirect, propos, swiss, ceil, horizon, line, durat, abm, titl, action, budgetari, human, int, audit, manag, switzerland, resourc, train, atom, envelop, administr, sne, dissemin

27. Maritime Emissions

Highest Prob: fuel, ship, emiss, sulphur, requir, imo, transport, exposur, standard, content, marin, medic, maritim, monitor, level, mercuri, protect, health, sourc, implement, radioact, complianc, port, radiat, mrv, report, ensur, sea, limit, air, dose, activ, inform, control, materi, oper, intern, method, pollut, area, follow, qualiti, environ, devic, provis, new, valu, practic, accord, water

FREX: imo, mrv, mercuri, sulphur, exposur, dose, ship, marpol, seca, medic, dcs, radiat, marin, combust, radionuclid, maritim, abat, hass, port, content, contamin,

reprocess, radon, sox, radiolog, carrier, flag, devic, substanc, health, bunker, voyag, radioact, patient, sea, feed, cargo, maximum, worker, method, so2, pollut, compound, human, msv, concentr, dioxid, air, align, verif

28. Taxation

Highest Prob: taxat, tax, electr, propos, council, rate, appli, fuel, authoris, reduct, decis, reduc, polici, level, exempt, area, applic, product, gas, object, oil, request, franc, per, region, period, minimum, union, provid, vessel, general, accord, side, shore, author, kingdom, unit, concern, particular, eur, port, addit, heat, price, motor, provis, consum, petrol, specif, impact

FREX: taxat, shore, tax, authoris, exempt, side, motor, vessel, kingdom, derog, port, etd, rate, reduct, vat, appli, island, litr, franc, berth, differenti, minimum, petrol, station, unlead, lpg, request, geograph, french, gbp, sweden, unanim, scotland, mainland, subsidiar, expir, letter, reduc, restructur, corsica, propos, board, italian, per, electr, council, introduc, demin, mwh, decis

29. Nuclear Decommissioning

Highest Prob: decommiss, wast, programm, manag, nuclear, fund, radioact, spent, implement, facil, fuel, reactor, project, nation, unit, plan, financi, assist, plant, dispos, lithuania, support, bulgaria, oper, power, dismantl, activ, safeti, slovakia, financ, progress, provid, safe, report, end, level, period, kozloduy, site, work, ignalina, process, current, million, jrc, bohunic, perform, council, three, closur

FREX: decommiss, kozloduy, bohunic, spent, dismantl, wast, ignalina, ndap, radioact, dispos, safe, lithuania, hlw, slovakia, bulgaria, reactor, npp, ilw, facil, closur, vllw, shut, llw, programm, shipment, assist, manag, jrc, mff, hkg, ebrd, repositori, fund, site, schedul, plant, defuel, nuclear, decontamin, cpma, inpp, unit, shutdown, radiolog, ispra, program, mid, delay, hall, progress

30. Projects' Funding

Highest Prob: project, fund, cef, programm, support, financ, invest, financi, sector, infrastructur, transport, instrument, eur, grant, implement, public, fch, network, develop, object, budget, evalu, europ, privat, call, connect, digit, contribut, servic, action,

provid, area, cross, million, billion, particip, initi, eib, border, prioriti, deploy, alloc, stakehold, manag, innov, work, bond, achiev, cohes, need

FREX: cef, fch, eib, bond, digit, fund, jus, jti, cohes, call, financ, cell, project, hydrogen, efsi, instrument, billion, imi, grant, sky, investor, telecommun, privat, elig, core, synergi, broadband, loan, esif, leverag, erdf, connect, budget, alloc, deploy, infrastructur, portfolio, eur, tran, equiti, cip, clean, support, dsis, prioriti, attract, success, complementar, inea, cross

III.   Semantic Coherence – Exclusivity Distribution
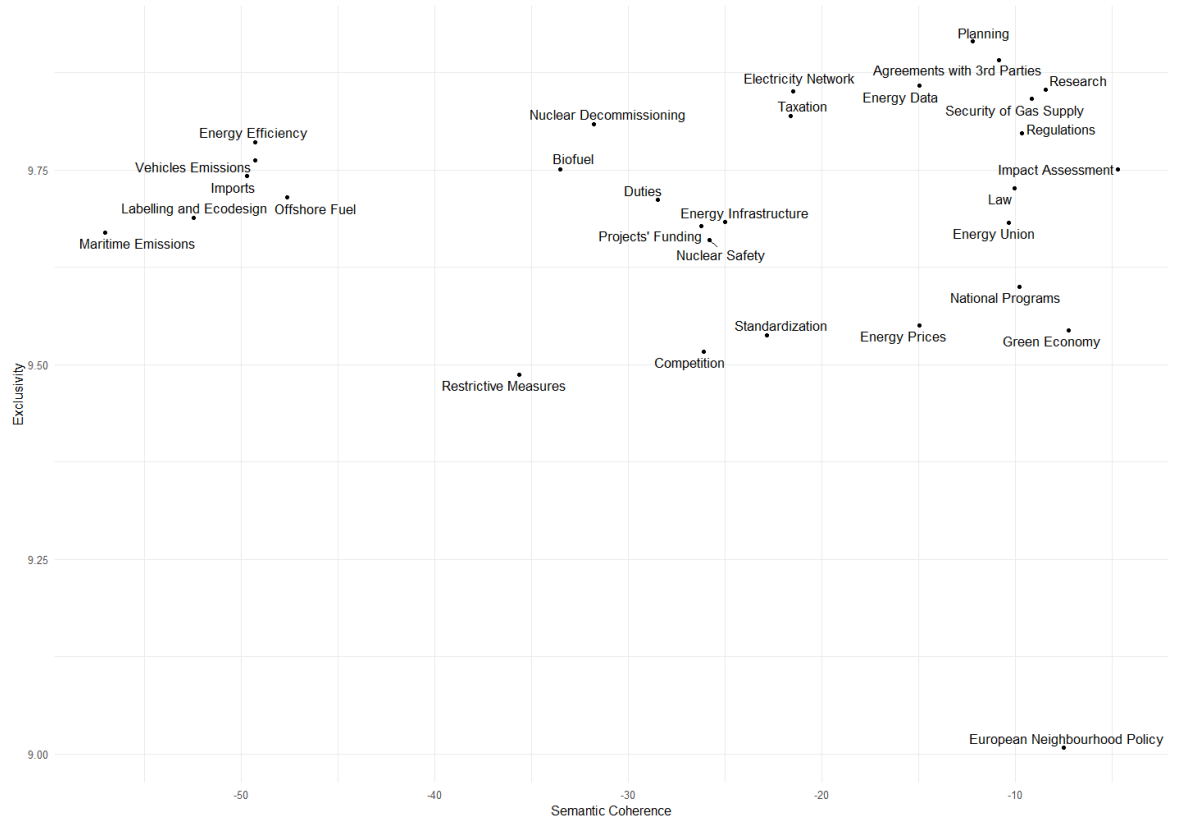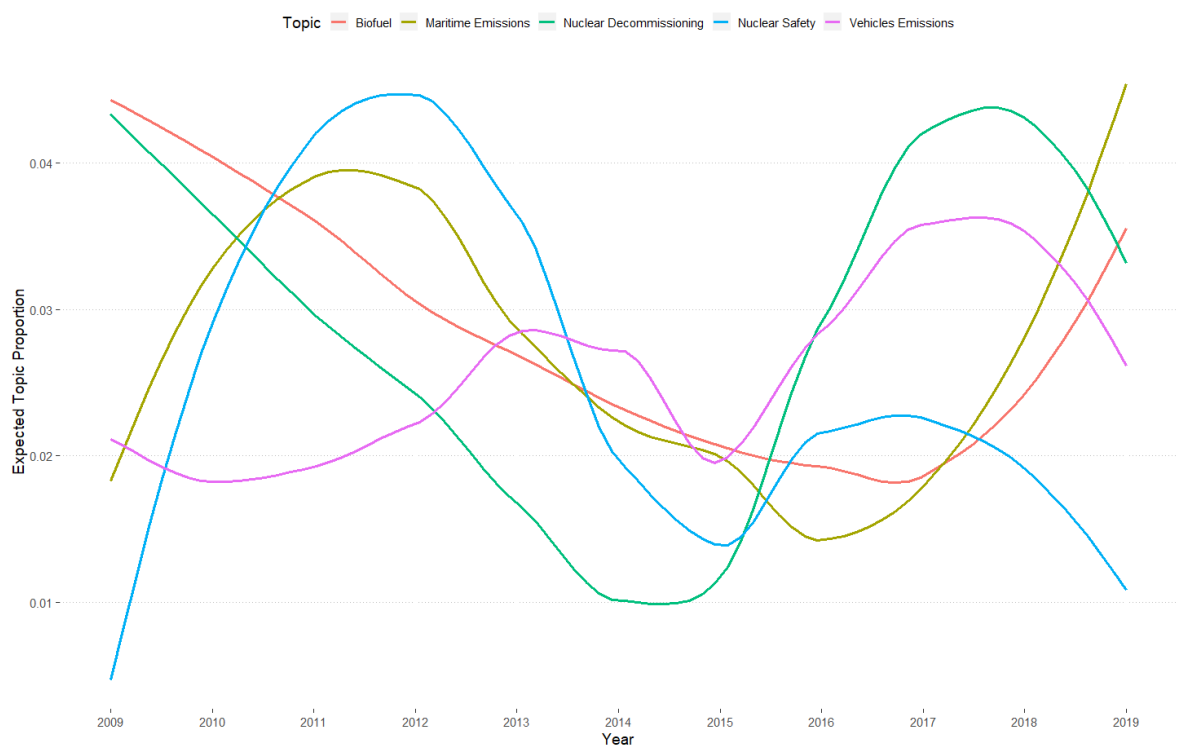
IV.   Topic Correlation
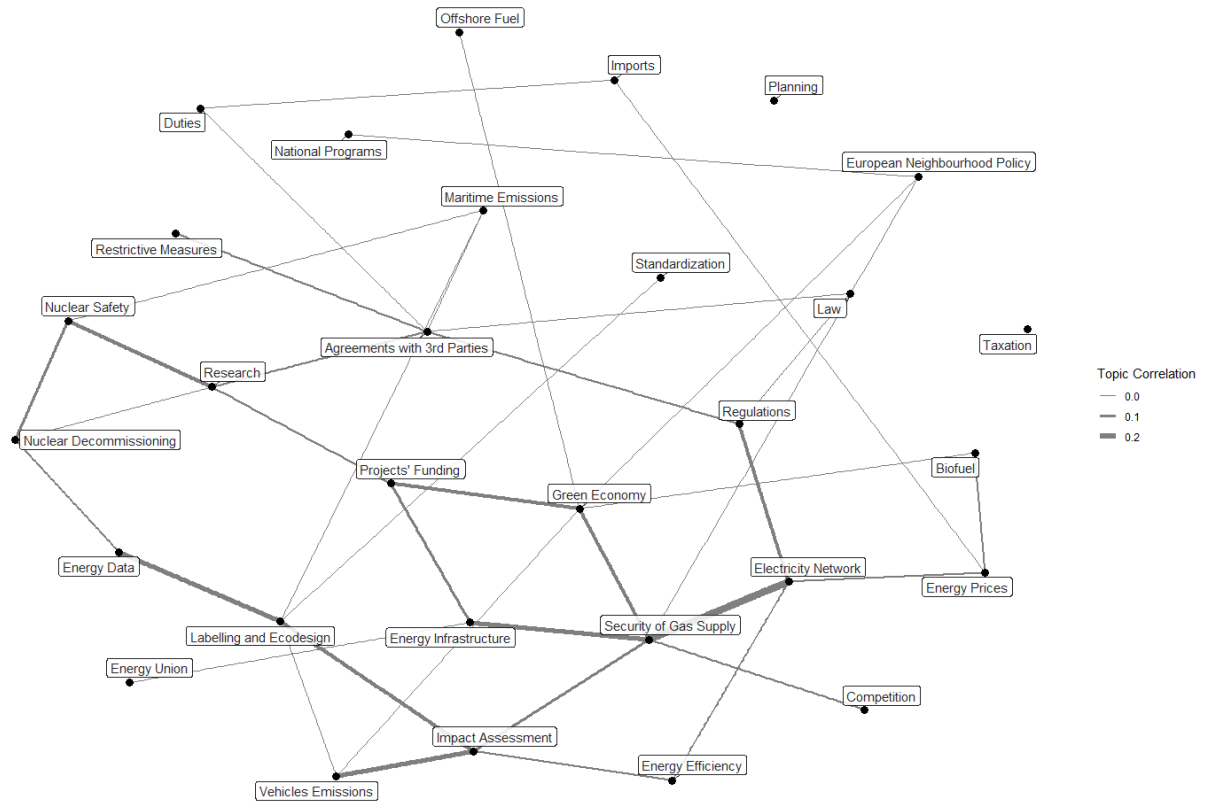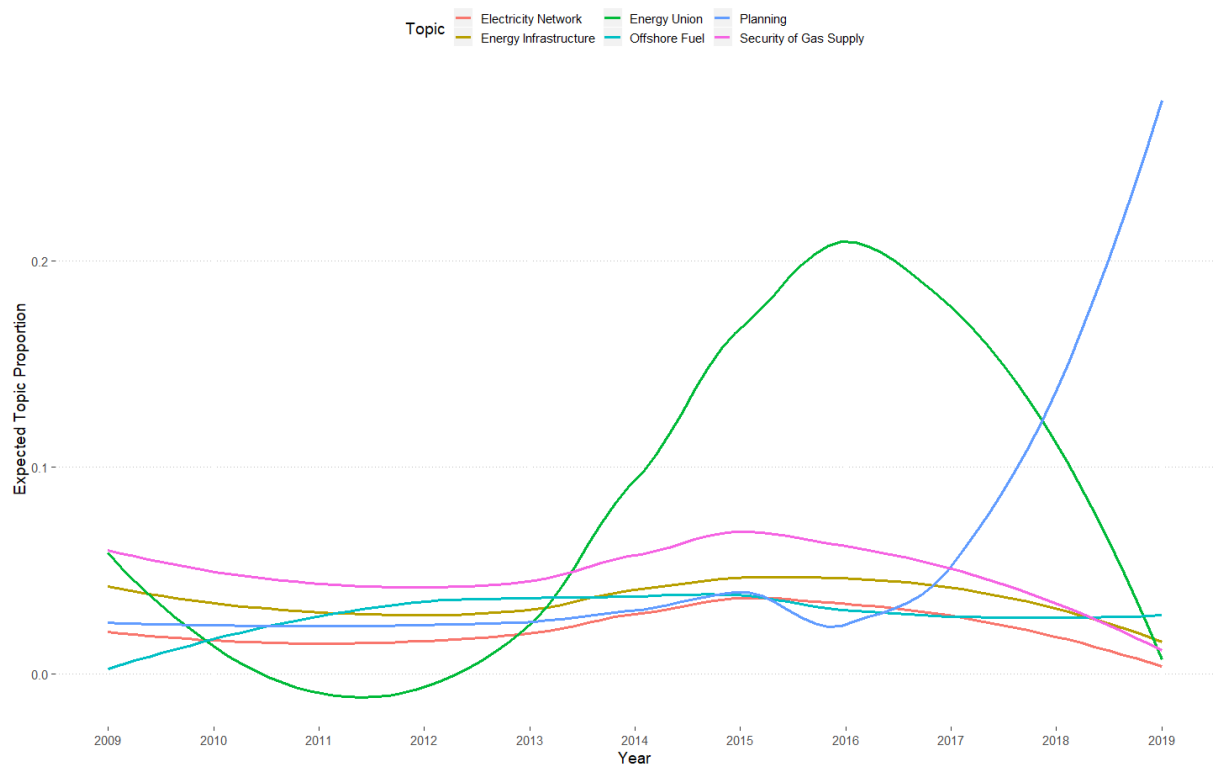
V. Topics' Development through Time

Economic Dimension of the EU Energy Policy Image - Development over Time
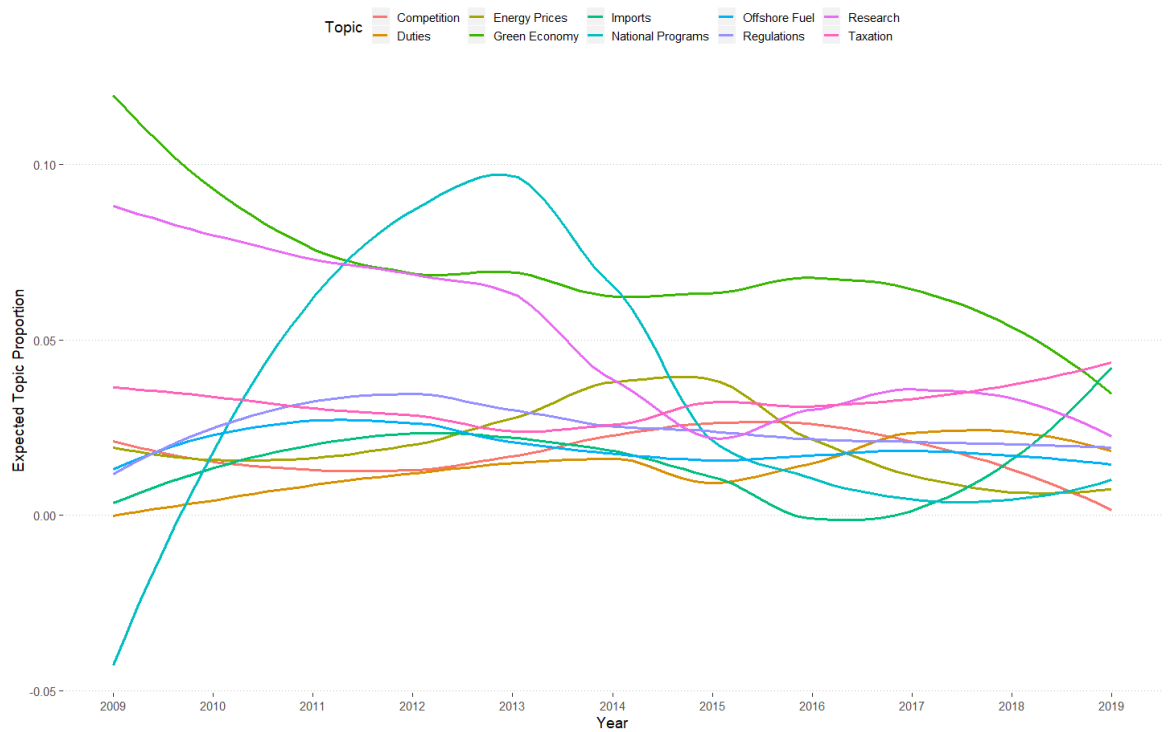

Environmental Dimension of the EU Energy Policy Image - Development over Time
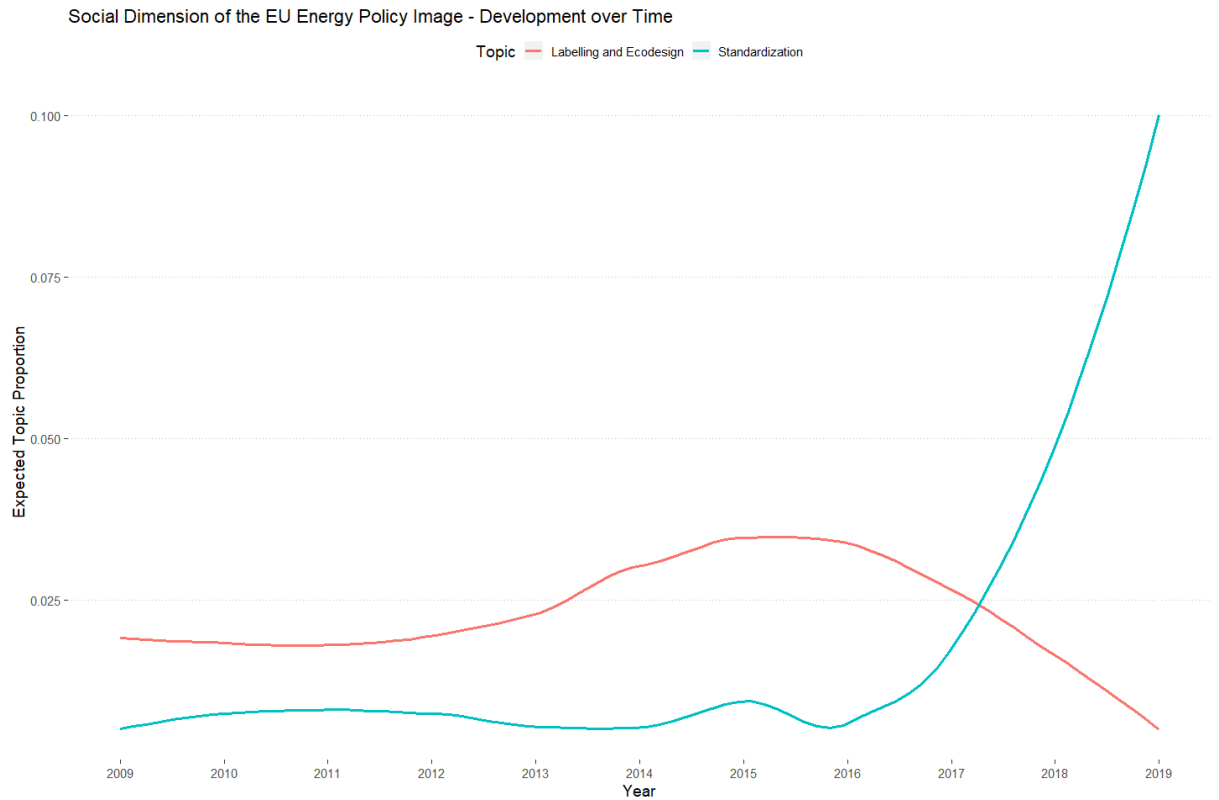
Security Dimension of the EU Energy Policy Image - Development over Time

Foreign Affairs Dimension of the EU Energy Policy Image - Development over Time

Social Dimension of the EU Energy Policy Image - Development over Time

Procedural Dimension of the EU Energy Policy Image - Development over Time
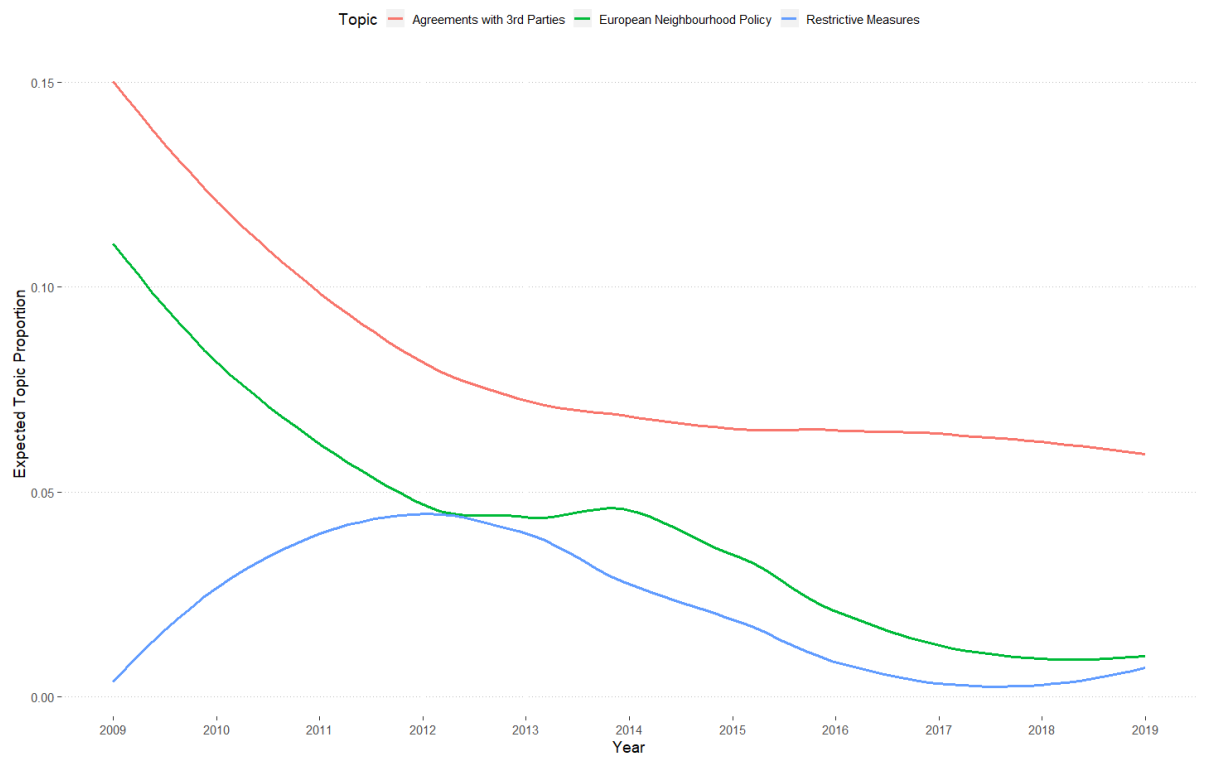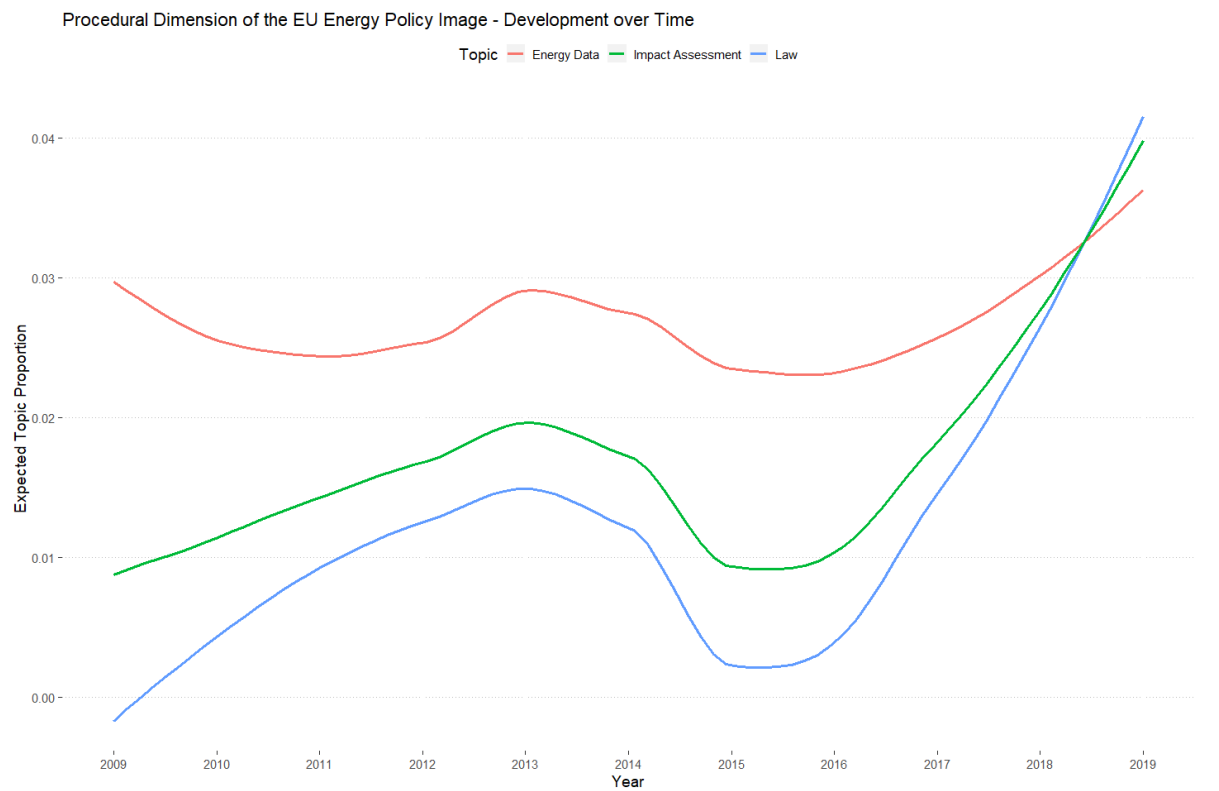
VI.   Estimate Effect Regression Results – Topics' Distribution

ID	Topic	EstimateEffect
1	Standardization	0.022669 *
7	Restrictive Measures	-0.024750 **
8	Planning	0.072971 ***
9	National Programs	-0.042025 ***
10	Agreements with 3rd Parties	-0.026964 *
20	European Neighbourhood Policy	-0.038165 **
23	Energy Union	0.106973 ***
26	Research	-0.033322 **
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'		