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The influence of political culture on renewable energy development in the United Kingdom, Germany and Russia

MSc European Spatial Planning & Environment Policy

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List of Abbreviations

EU – European Union

FiT – Feed-in-Tariff

GHG – Greenhouse gas

NPP – Nuclear Power Plant

RE – Renewable Energy

RES – Renewable Energy Source

RO – Renewable Obligations

The UK – the United Kingdom

The USSR – the United Soviet Socialist Republics

Abstract

The energy transition might be affected by numerous factors, however, the way it develops varies from country to country based on the existing political culture and behavior of its bearers. Which characteristics of political culture favor the energy transition, and which hamper it is the main question of the study. The analysis focuses on three cases: the UK, Germany and Russia. It appeals to policy documents, scientific research to identify the main features of political culture and energy trends to make a comparative analysis, supported by expert interviews. In result, the UK demonstrates a liberal inclusive culture with a strong influence of conventional energy lobby formed during the last century which hampers the RE transition in some sectors. Germany has a very inclusive culture and strong engagement with supportive civil society leading to high level of RE development, while Russia is a closed system with the exclusive right of political participation which does not provide any space for RE coalitions to break in and promote their ideas. Therefore, such factors as openness of the political system, public support, presence of lobby, market regulation and external/internal shocks composing the national political culture may play a crucial role in RE deployment.

1. Introduction

1.1. Context

The modern world is faced with a dilemma of how to provide for a growing population with its resource demands and not to harm the planet. One of the solutions is energy transformation, implying the transition from polluting conventional sources to alternative energy sources which can be continuously resumed and replenished using natural forces. These include solar energy, wind energy, water energy (hydro and tidal), geothermal, and energy generated by biomass (Gross et al. 2003, p.105). The energy transition is an embracing process which uses several rationales. Firstly, natural resources are exhaustible and will be depleted at some point. This process will be accompanied by gradual price growth due to increasing scarcity of the sources and profit-making opportunity for producers (Freeman 1973; York 2015; Brown 2011). This means that governments will have to take actions for searching a new source of energy, whether it be now or at a later point. Secondly, use of traditional energy leads to global warming (Lovins 1977; Paris agreement 2015). Energy use is the biggest emitter of greenhouse gas, therefore, energy transition is one of the solutions for the climate problem. Thirdly, using traditional energy leads to energy dependence where a government does not have access to any domestic gas or oil fields. Uneven spreading of natural resources (Helm et al. 2012) determine a foreign policy of a state: due to energy needs a country will cooperate with an exporter country, and there is a risk of them becoming an import-dependent country (Romanova, 2009, Van der Meulen 2009; Ghosh 1991; Stern 2006). Finally, in a long-term perspective, competitive fight for energy sources will stand to the fore (D 1981, Reuveny et al. 2001). There is a great example which illustrates the energy dependency: oil embargo 1973 (Gülen 1996; Matthews 1976) which actually created a huge energy crisis, and demonstrated to oil-importers their Achilles' heel. This situation resulted in significant recognition being brought to the oil cartel.

At the same time, modern processes such as globalisation, migration, and liberalisation aggravated the issue of energy sources depletion and climate change (Bradshaw 2010). These problems can be solved by cooperation at the global level, and as more countries are engaged in the interaction the more effectively the world will be able to repel challenges of climate change and energy crisis. In reality, our planet possesses huge opportunities for producing the RE which are not yet discovered (Figure 1; Destouni et al. 2010).

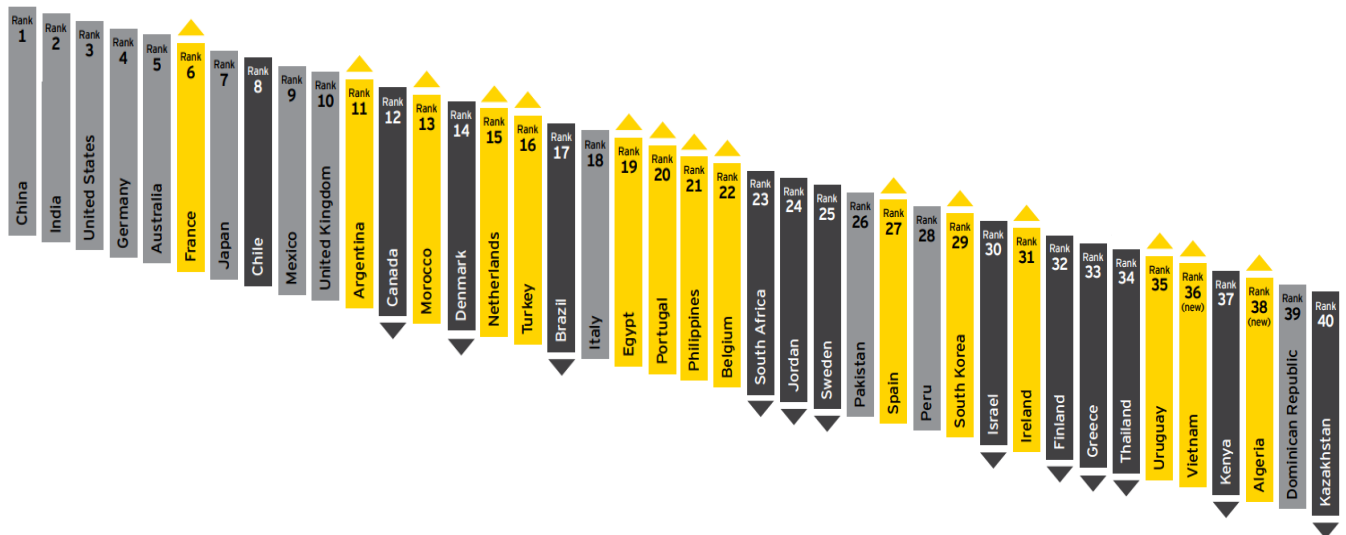


Figure 1: Renewable Energy country Attractiveness Index 2017. Source: Renewable Energy Attractiveness Index 2017. EY.

1.2. Research scope

Discussions on the importance of the energy shift had started more than 2 decades ago (Woodliffe 1991) and now it is one of the most important agendas for policymakers and international organisations. Energy transition as any other innovation is a political concept, and politics is a field which creates an arena for the future transition, obstacles as veto actors, managers as governors, arbiters, and other attributes (Meadowcroft 2011). Politics impacts on economic climate and innovations including energy transition and states the regulatory basis and involves different political, economic and civil actors into the discussion. Politicians are entitled to state special programmes encouraging or discouraging development (Idem.). Thus, the role of politics in process of energy transition is significant and the process by itself depends on specific characteristics of the system and political culture which shape decision making in a country.

Political culture is a very embracing notion (Dobbin 2012; Ball 1988; Formisano 2001; Dittmer 1977). Before it appeared as an autonomous term some scientists had been already thinking

about the influence of history on decisions made today (Lipset 1990; Hartz 1969; Hall and Taylor 1996). Unique historical conditions determine preferences and change the outcome. RE development, as with any other political decision, is shaped by the culture of the decision makers and the decision making itself. Although there is plenty of research dedicated to energy transition and the social factors affecting it, political culture is an undiscovered aspect which remains to be barely considered in the studies. However, characteristics of political culture such as openness of the political system, configuration of relationships between political and energy players, market regulation and external/internal shocks may play a crucial role in RE deployment.

1.3. Research Aims and Objectives

Regarding chosen research scope, the main goal of the research is to identify how political culture influences the development of RE. To achieve this aim, the study asks several research questions:

1. What is political culture and how is the term operationalised?
2. How does political culture differ in the chosen countries?
3. What are the main trends and status-quos of RE development in the chosen countries?
4. How does political culture influence the development of the renewable sources of energy in the chosen countries?

The analysis focuses on three different cases: the UK, Germany and Russia. In spite of their very different political cultures and history in the energy sector, the first two countries demonstrate successful results in RE deployment. Russia illustrates even more contrasting political culture but at the same time opens space for RE introduction at the regional level.

The first question is dedicated to the operationalisation of the object of the study, political culture. Answering this will allow the researcher to understand the notion better, and to formulate the research design correctly. Then aspects of political culture and the main trends in the “path” towards clean energy are need to be examined to compare the cases. The identification of the relationship between political culture, and its features as an independent variable, and RE development, as a dependent variable, is the main research question of the paper.

1.4. Structure

The study begins with the literature review on the impact of social and political factors on RE development. Besides that, the operationalisation of the object of the study 'political culture' takes place in the same chapter. It concludes by the building of theoretical framework that narrows the wide concept of political culture down, and makes it usable for the paper. This is followed by an overview of the research strategy and methods used in the study. The findings of the study are outlined and discussed in the third chapter, which answers the remaining three research questions of the paper and explains the relationship between the object and subject of the research. The thesis ends with a chapter presenting main conclusions and recommendations based on the results obtained by analysis. It also explores ideas for further research and possible limitations present in this research.

2. Literature review

This chapter represents an expanded review of existing literature and is divided into two main subsections: RE and social factors, which may predict or influence on energy transition outcomes; and political culture, searching for suitable definition and formulation of the theoretical framework of the paper. The second section of the chapter answers the first research question of the paper and set the theoretical framework for further analysis.

2.1. Renewable energy development

2.1.1. General factors of RE development

The realisation of energy transition importance comes to governments non-simultaneously, and most often it is caused by different motives. For example, many countries develop a RES due to awareness of energy security (Helm et al. 2012; Romanova, 2009, Van der Meulen 2009; Ghosh 1991; Kohl 1978; Stern 2006). Indeed, energy dependency might threaten the sovereignty of the state, especially in the case of lack of natural domestic fields. Some states consider it a problem, while the rich fossil fuel producing states do not even include it to the political agenda (International Energy Statistics 2015).

Another drive to launch the sustainable transition is climate change (Lovins 1977, Paris agreement 2015, York 2015). Low-carbon energy sources play the role of mitigating the effect of human activity. For the great majority of people, reduction of energy consumption is a very painful process, as it is very difficult to break already established habits and turn to the opposing path of energy conservation. In addition, energy is an integral part of every-day life, and that angles the willingness of people against significant changes that hamper its ease of use.

Although sunlight, wind, water, etc. are free to utilise, the RES incur huge capital expenses due to the need to manufacture and erect significant infrastructure installations (Traber 2009) and the period of time before it will pay off is sometimes undetermined (Brown 2011, Goldemberg 2007), so political decisions on energy transition are always taken with due consideration to the impact upon the national budget. The study of Bayulgen and Ladewig (2017) claims that countries with higher GDP rate more willingly implement the energy transition due to a higher level of energy consumption (Brown 2011) and availability to cover the expenses (Bayulgen and Ladewig 2017). In other words, states develop RE sources only in cases where there are sufficient financial resources for implementation. In practice, the leading positions in RE development are currently

taken by the European Union and the United States (British Petroleum Statistical Review 2018), whose GDP values are much higher than in other parts of the world. The exception here may be made by China and India (Renewable 2016, Global Status Report), who have very low GDP values but still invest in RE. However, their governments' concerns are connected to very high population growth, and due to existing political system they are able to promote RE and invest in this domain (Kennedy 2013; Sovacool and Vivoda 2012).

Doubtless, financial programmes provided by the government is another economic factor (Garciano 2011). Countries increase the attractiveness of the RES for citizens and business by various means: taxes reduction, subsidies and compensations, support of research and engineering in the RES area, smart building, discounts for clean energy usage, loans for RES introduction, fines for GHG emissions, FiT (Energy saving trust 2017), green certificates, etc. (Directive 2009/28/EC). Scientists still argue which economic method is the most effective, some scientists stand for tax systems (Sawyer 1985; Zhang et al. 2016; Sadmo 2008) while others support strict and coercive regulations and setting standards (Park 2015). Alternatively, a third group advocate market-based instruments such as FiT (Lauber 2012). Despite the different opinions on the most productive mechanism, all the studies demonstrate that in general economic factors are particularly effective at stimulating the usage of renewables. Conversely, if a state sets a target on the usage of the RES and does not provide any financial stimulus, the transition will very likely fail or take a considerably longer period of time.

The territorial system of state or polity also does have an influence on renewable transition (Lauber and Schenner 2011, p. 512), the impact of this is much clearer in federative states. For example, the United Kingdom represents a unitary state, but consists of 4 partially autonomous regions. According to Cowell (2017), authorities on energy issues are presently distributed between Welsh and UK government and often it becomes a problem for Wales to implement decisions made by federal power especially when those are not supported by Welsh population (Cowell 2017). The problem of responsibilities distribution might bring collisions during the decisions implementation phase, especially in the realms of energy policy since it is entwined with other spheres of life. It becomes even more problematic if one of these spheres had been already transferred to local government authority. Therefore, the task of federal government is to identify the border in local and federal authorities, and the problem of saving the sovereignty of the country seems particularly complicated. The energy transition as any other innovation or

reform might happen more smoothly in unitary states or in a federation with equally empowered regions. In Britain the devolution happened unevenly: Scotland got a wider range of powers than other countries and it facilitated the massive RE deployment there. Thus, the polity of the state plays an important role in setting energy policy.

2.1.2. Characteristics of political system

All the innovations require a window of opportunity to be implemented which opens only when a specific set of political characteristics merge and initiate political changes. Thus, Frank Geels (2011) called this a 'socio-technical transition' - a possible systematic change which mitigates or solves contemporary environmental problems. His multi-level model consists of the socio-technological landscape (an exogenous environment which includes urban layout, political culture and ideology, values, beliefs, economic trends, concerns, etc.) which impacts on niches (the level where innovations are made). At the same time, due to presence of problem or necessity in change landscape, this puts pressure on the socio-technical regime (the level characterised by a complex of different regimes, such as policy, science, culture, economics and industry, which interrelate and determine the regime), destabilising it and opening the windows of opportunities for well-developed innovations from niches. These innovations penetrate and embed in the regime adjusting it or even completely changing it.

The concept was applied in analysis of the energy innovations that occurred in Brazil, France and the USA. They came to the conclusion that Brazil had handled the transition to sugarcane-ethanol fuel with the assistance of strong governmental support, funding new research and technology development. The favorable socio-technical regime contributed to the process: military government eliminated the opposition and involved economic actors and stakeholders to support the shift. The socio-technical landscape there facilitated the transition due to the struggles in the automobile sector. The French case has some similarities with the Brazilian in that the government had also used subsidies for R&D. In addition, the government had suppressed the nuclear opposition and even could gain a public support due to the fact that the absence of any energy importer convinced the population of the appropriateness of the nuclear policy. The US's transition had failed due largely to lack of solid idea at the niche level. Beyond that, the regime could not agree on specific scenario for development (Solomon and Krishna 2011). This study demonstrates that there is a special set of characteristics of the political system which merges into a favorable constellation for the energy transition, which is individual for every state and depends on the socio-technical landscape and problems thereof, thus there are plenty

of variations of the factors which may make transition successful, and no universal approaches which are applicable to every country.

The other set of influencing factors may include a new distribution of authorities and newly appearing configurations of local governments in a deferral state after devolution. Thus, an important role in energy development in Scotland was played by policy communities, business associations, and a clear distribution of energy responsibilities and duties. In Wales, Northern Ireland, and England some of these characteristics were developed insufficiently and the configuration of the government was different. Interaction with business associations were weaker, fragmentation of bodies responsible for the RES development were more apparent, and other regional problems were more important (such as development of rural areas). These circumstances contributed Scotland's emergence as a British RE leader and the other countries could not (Cowell et al. 2017). In this case, although the energy transition could happen at the same time (devolution), due to the combination of factors the window of opportunities opened only in Scotland.

Combination of promoting factors may also include planning systems, financial support systems, an activity of landscape protection organisations and ownership patterns. These institutions as formal or informal procedures and norms have become embedded in policy or political economy with time. In a cross-national comparative study (Toke et al. 2008), the authors consider the importance of rules of the game set long before today's political decisions, and this is the same approach used in this study. This paper appeals to political culture as a complex of historically shaped views which later institutionalise in governmental structures and influence on decision-making today and in future (Dobbin 2013). However, this paper focuses on the configuration of political actors as they directly represent the culture of decision-making in the energy domain.

Political factors also include the public support, strong government, opposition and history. This combination facilitated the promotion of nuclear energy in France and hampered it in Germany (Wiliarty 2013). Although there were plenty of touchpoints in energy status-quo in two countries, nuclear power has developed in opposite scenarios. The protest in France was suppressed by strong governmental power, while in Germany, the Green party had won and came to the Bundestag. Also, due to French nationalism and willing to demonstrate a technological advantage over Germany after recognition as a poorly developed country during the Second World War, France sought to develop nuclear power while Germany avoided unsafe and dangerous

technologies (Idem.). The author calls the combination of factors as 'political opportunity structure' and this approach seems similar to the logic of this paper. The author had addressed historical and cultural events impacting on politics to explain the nuclear energy deployment and this paper aims to do the same with RE development.

History also matters in nuclear energy development in the UK. Amongst possible reasons of atomic energy crisis in a country being at one time a nuclear state, scientists highlight historical events such as radioactive waste and statistics on the increasing rate of childhood leukemia disclosure, Chernobyl 1986, war threat after WWII (Blowers and Pepper 1987). On the other side, political factors such as policy-making, the power of protest and communities had impacted the process of nuclear displacement. Indeed, one of the drivers for the 'political opportunity' may be activity of relevant communities and networks. The political network itself represents a complex of structural interrelationships between political institutions of government and civil society in different sectors of politics (healthcare, education, energy, etc.) engaged to decision-making process. In these networks, actors may exchange resources and build connections or coalitions to successfully influence the decision-making processes (Marsh and Rhodes 1992). Energy political community consists of policy-makers, nuclear energy producers, trade unions, associations and shaped under interrelations or interdependence between these actors to promote the desired policy. Type of the networks may vary through the time depending on existing configuration of political institutions. Although the network remains unchanged the environment of decision-making constantly evolves thereby changing the role and the influential power of the community (Saward 1992).

All mentioned combinations include public support, which plays an important role in democracies (Inglehart 2011), and is very important in the sustainable transition (Lauber 2012; Aklin and Urpelainen 2013; Royle 1994). The population needs to share the same ideas about clean energy and support the government in the RES introduction and vice versa: public demand for clean energy needs to be satisfied by the government (Lauber 2012), otherwise it risks losing the power during the next political cycle (Broekel and Alfken 2015, Pasqualetti 2011; Vachon and Menz 2006).

This section aimed to list the political aspects which may accelerate the RE in different countries. Although some of the mentioned studies research nuclear energy it is easily may be applied to

the analysis of RES. The window of the opportunities, or political opportunity structure with configuration of political networks, the decision-making process and political practice based on a history of decision-making, public opinion, all these factors compose individual national political culture and influence on the RES.

2.2. Defining political culture

This study focuses on such characteristic of the political system as the political culture, which may determine the energy policy in the state. Although the political side of the energy issue has been explored in several studies (Destouni and Frank 2010; Borenstein 2012; Bayulgen and Ladewig 2017, Meadowcroft 2011), the investigation of political culture established in the national energy sector is new for the field. Political culture is considered in the study as an integral part of the political system which includes historically settled and stable views and models of behavior expressed in the activity of actors engaged in the decision-making process (Dobbin 2013). This subchapter examines the notion of political culture and its main constituents, which are important in developing a theoretical framework of the research. This subsection also answers the first research question about the substance of political culture.

2.2.1. Culture and political culture

Political culture is a very complex notion which has several interpretations proposed by many political and social scientists. To sort out what political culture means, it is worth addressing the definition of 'culture'. The concept of culture may be defined as the customary beliefs, social forms, and material traits of a racial, religious, or social group; also the characteristic features of everyday existence (such as diversions or a way of life) shared by people in a place or time (Merriam-Webster online dictionary 2017). Culture include both characteristics of everyday experience and attitudes shaped over a period of time, and determining behavior nowadays (Gullerstrup 2009). The term 'culture' can be used to describe how human heritage determines decision-making in the contemporary world on different scales. In practice, cultural context influences on the wide range of day-to-day actions, from public service delivery to the way of settlement (Davoudi et al. 2009). It absorbs all elements of life, revises it and builds the outlook. This paper focuses on political culture, albeit this is also very comprehensive.

The term political culture first appeared in the middle of the last century, and was extremely popular and attractive to scientists even without having a clear established meaning. It was an "Umbrella" term due to its ambiguity (Formisano 2001, Dittmer 1977). Moreover, by that time the "Chicago school" of political science had just started its development, and a behavioural

revolution happened (Berndtson 1987): many questions came to the surface, numerous studies had gotten an opportunity to be realised and as consequence, many terms and definitions appeared. Another important factor is that at the after-war period attention to democracy researchers had grown rapidly (Formisano 2001; Almond and Verba 1989) and political culture there played a role of one of the factors identifying a political system.

One of the main interpretations of political culture (Chilton 1988, Formisano 2001) was suggested by Gabriel Almond and Sidney Verba in their book "The Civic Culture: Political Attitudes and Democracy in Five Nations". In the book, authors raised the topic of an influence of the culture of a population on political processes. Civic culture is a mixture of political cultures existing within a democratic state which includes three types of political participation attitudes (Table 2): parochial, subject and participant political cultures (Almond and Verba 1989). Parochial political culture implies lack of citizens' interest to participate in political process, in reality, people do not play any role in the political system. In countries with subject culture citizens are aware of the political process, however, they are convinced that political decisions made by government are the most correct and population do not see the point to participate. Often participation is impeded by law. Finally, in participant political culture citizens are involved to participate in political process. This definition illustrates the influence of historical path on citizens' participation behaviour and attitudes and how they may shape the political process.

Parochial	Subject	Participant
Lack of interest in political process	Occasional participation	Active participation
Mexico	Germany, Italy	The UK, USA

Table 1: Types of political culture by Almond and Verba (Almond and Verba 1989)

Criticising Almond and Verba for their vague and unclear definition, alternative interpretations had been appearing at the time (Dittmer 1977; Pye 1991). All of these visions of political culture were built on the basis of public participation culture and relations between public and state. Political culture played a role of the bridge connecting people with the politics. Taking this path many scientists went deep into the origin of the term and in result came to the psychological side of the notion using other relevant terms such as socialisation, the process of raising children, political ideology, the institution of childhood, etc. (Pye 1972; Gorer and Rickman 1945).

This view on political culture put the individual to the centre, however, this fact is quite controversial. It is hardly possible to assess the whole nation based on the behaviour of one individual and, as it was noted by Stephen Chilton, the Weimar Republic and the Third Reich were formed by the same German citizens (Chilton 1988). Moreover, the population is not the only bearer of political culture, there are also decision-makers who might be even more important in the political process. This suggests that the definition of political culture should reflect the other domains besides connection between government and population, it still needs to embrace the population and political system together. This paper sees the political culture from the other angle which will be analysed in details in the next section.

2.2.2. Political culture as a framework for decision-making

Before political culture appeared as an autonomous term, some scientists had been thinking about the influence that history had on decisions of the present. They believed the history predetermines the political decisions and behaviour of decision-makers (Lipset 1990; Hartz 1969; Hall and Taylor 1996). The unique historical conditions may determine preferences through the institutions, and that in turn would affect the outcome. Institutions are understood here as rules of the game and structural mechanism. The further logic of historical institutionalism was developed into the concept of path dependency which implies that history creates institutions which with the time turn into a specific path and this path is followed even if there are better options (North 1990). This paper shares this concept and admits the likelihood that development of some political institutions may influence on particular sectors including RE development.

Based on the mentioned logic and in contrast of definitions provided in the previous section, the paper considers political culture as a composition of historical formal and informal governmental institutions (rules of the game) which are embedded to the political system. This 'angle of vision'

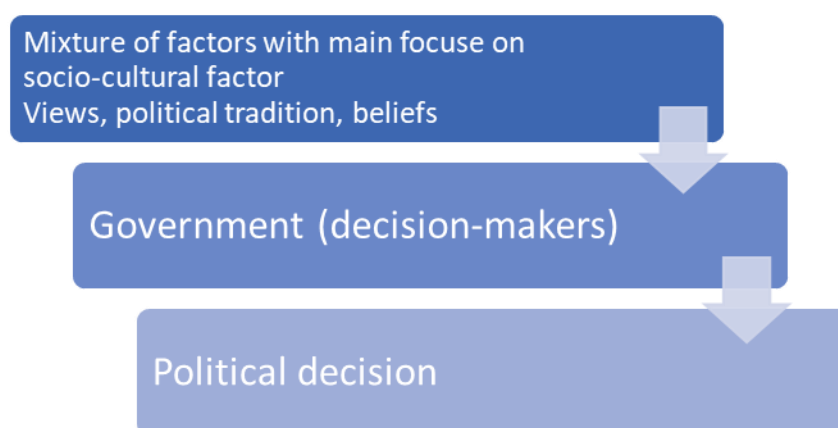


Figure 2: Political culture in Dobbin's understanding (developed by author)

is supported by sociologist Frank Dobbin, who identifies political culture as a complex of historically shaped views expressed by people who make political decisions, which is later institutionalised in governmental structures and influences on pursued policy (Dobbin 2013, Figure 2).

Political culture is as an integral part of the political system which includes historically settled and stable views and models of behavior expressed in the activity of actors engaged in the decision-making process. So the main object of political culture is the process of decision-making. Dobbin (2013) used the term while researching the differences between the political cultures in developing of industrial policies in France, the UK and the USA. In his understanding, political culture refers not only to citizens, but mainly to decision-makers who make political changes, who possess the ability to have a more direct impact on the pursued policy in different areas of life. This vision of political culture appeals to the socio-cultural aspect, on their personal views and the existing political practice and helps to identify 'trends' in decision-making based on historical facts which shaped national political culture. The Dobbin's study was inspirational for this paper and his interpretation of political culture has been selected as the current working definition. This research uses Dobbin's definition to identify the culture of RE development in the United Kingdom, Germany and Russia.

As it was mentioned before, the notion of culture may be applied to any field, and, much as Dobbin had used it in industrial policy, political culture in this paper focuses on energy sector, including RE and nuclear power development. Indeed, political culture itself is a comprehensive notion and it needs to be reduced to a specific field and cannot be used as a blanket definition of an entire state's policies. This is because a country may promote a liberal political culture in general but stay conservative in some fields. For example, liberal Britain, which always believed in the invisible hand of the market in all sectors including railway (Dobbin 2013), controlled its energy sector almost till the 1980s, and liberalised it only after Thatcher's policy of privatisation. Thus, national political culture operates in a wider level which might not be important for sectoral policy. The paper looks specifically at the energy political culture, or culture of energy policy in a state.

When discussing sectoral policy, it is worth addressing the configuration and role of existing sectoral networks and coalition groups in the decision-making process. Different level of

development of these communities impacts on RE policy, which may differ from region to region. For example, RE players in Scotland have been always more developed than in other parts of the UK and it became one of the reason why the RE integration there was more successful (Cowell 2015). Looking at an example of nuclear energy development, David Toke (2018) discovered why RE takes over studying four existing models of the behaviour of political actors and institutes. According to Toke (2018) the world witnesses a triumph of egalitarian-individualist (NGOs + business) model over hierarchists (government) in energy issues. Due to the climate issues and risks of atomic energy active, NGOs promote RE over nuclear among business and liberal politicians. New governmental safety standards increase the nuclear energy costs thereby repelling business and turning it towards environmentally-friendly logic. Business pushed by NGOs, public awareness of climate change, and high prices on nuclear energy promote the RE and pressure the government to switch as well (Toke 2018). Hence, the presence of active NGOs, liberal representatives of government and business in one state may influence on more productive RE development than in another state. The example illustrates that people who may affect the decision-making process need to unite into groups or communities based on their common beliefs and visions of policy to push their ideas more effectively. These groups involve politicians, business associations, scientific communities, industries, trade unions and other non-governmental organisations, etc. These groups also might be referred to as policy entrepreneurs (Kingdon 1995), coalitions (Sabatier and Jenkins-Smith 2007), interest or pressure groups, networks or communities (Walker 1977, Rhodes 2006), but they are united by the strong desire to participate in decision-making and to make a political change according to their beliefs and views. The configuration of the power between these actors is a part of the political culture which determines the opportunity for political change such as the energy transition.

Regarding the topic of communities, Paul Sabatier and Hank Jenkins-Smith (1993) suggested an advocacy coalition theory (ACF) explaining how actors form the coalitions and how they may influence the political process in a particular political subsystem. According to the scientists there are three levels of the belief system: secondary belief (instrumental knowledge in a specific policy area, which is easily changeable), policy core (fundamental beliefs and basic strategies in a policy area of interest, which is difficult to change) and deep core (fundamental and ontological knowledge of all policy areas, which is very difficult, at times almost impossible, to change) (Figure 3). Coalitions appear under the specific 'gluing agent' of politics uniting people with same beliefs, values, and preferences. The process of forming a coalition may take a decade or even more. This amount of time is necessary for actors to formulate their political views and beliefs. Due to the fact that it is a long-lasting process, it incorporates itself into the political culture of the country and becomes an integral part of it. These coalitions might appear only on policy core level, because this level includes some fundamental, but changeable, beliefs and values. In contrast coalition does not form on the deep core level and secondary belief level due to the lack of any shifts and lack of common beliefs, respectively (Sabatier and Jenkins-Smith 1993, p. 32). So political changes happen when the balance of power between coalitions moves (Figure 4): the initiative and leadership shift from one coalition to the other and it forms the political process. Thus, the winning coalition influence on future decision-making.

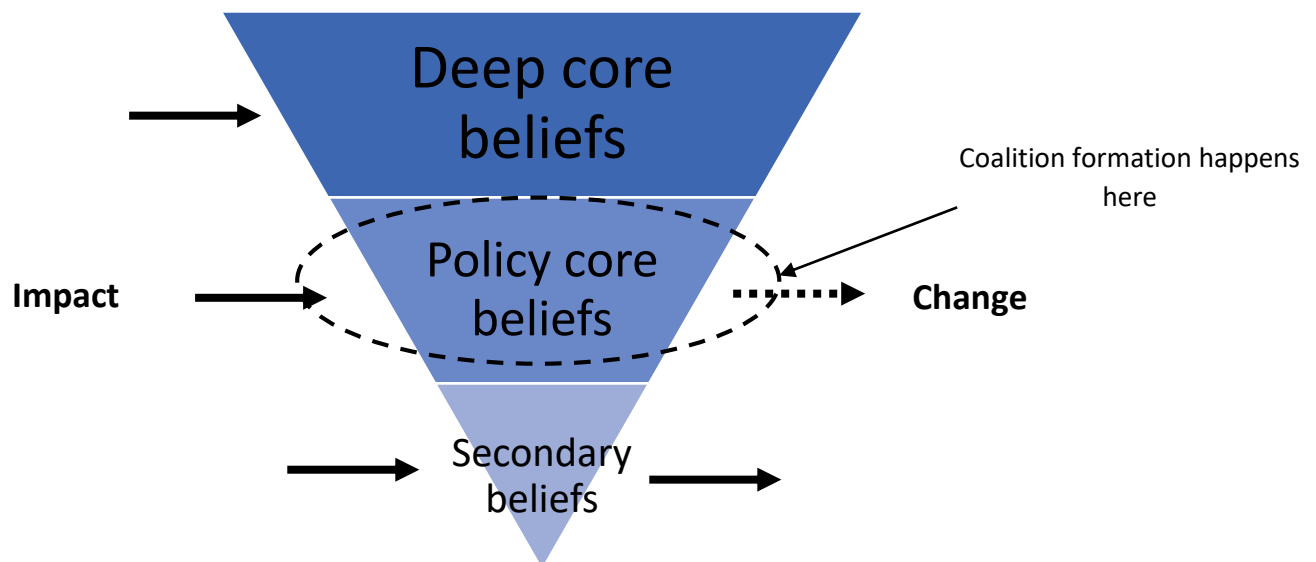


Figure 3: ACF Belief system (Sabatier and Jenkins-Smith 1993).

Taking the case to political culture, it can be assumed that the coalitions play a very important role in shaping this system. Beliefs and values of the winning coalition later translate to the policy. It means that its traditions form the political culture of the country until another coalition

appears. The situation when energy coalitions or networks influence the development of the specific sector is very common (Marsh and Rhodes 1992, Szarka 2010, Toke 2018). Thus, Joseph Szarka researched advocacy coalitions in wind energy development in European Union. He came to conclusion that, indeed clashes between coalitions facilitate the political development, however RE is a common good which does not bring any benefit to its proponents. That is why very often RE coalitions are not really effective comparing to representatives of other energy sectors such as nuclear power or fossil energy. The difference is concluded in seeing potential economic or political benefits while the goal of advocating RE is promoting energy security and environmental protection. Very often members of RE coalitions prioritise their personal interests over common or play a role of free-rider. That is why Szarka emphasised that although ACF is important for energy sector development it is also significant for coalition members to share the same interest and beliefs and give it the first priority (Szarka 2010).

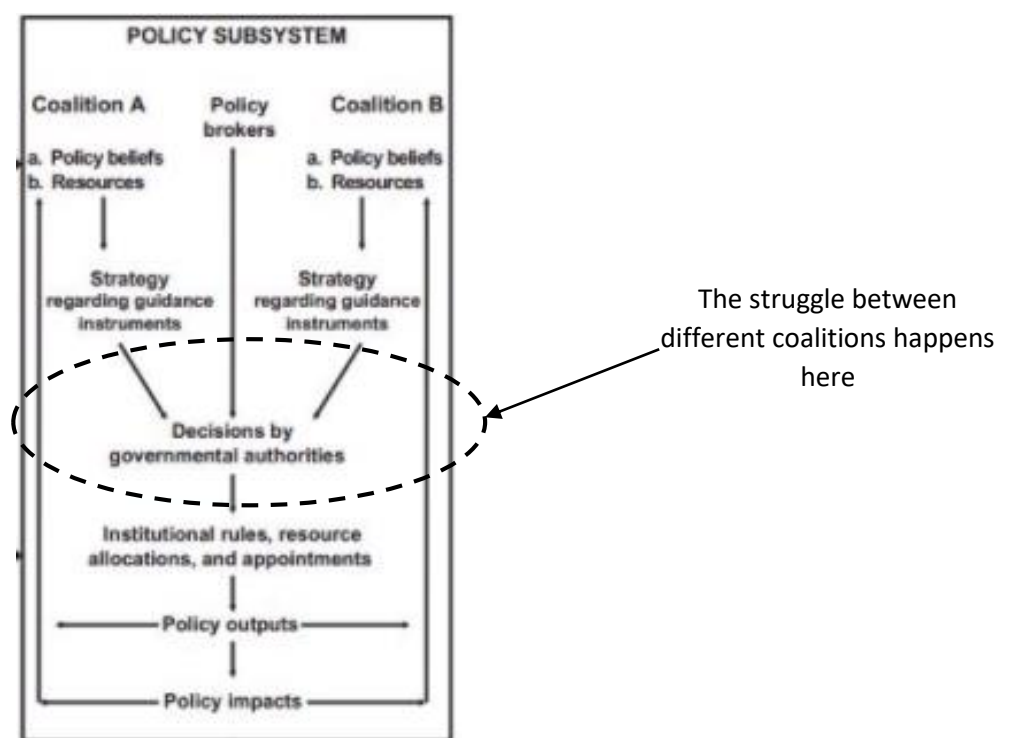


Figure 4: The political change in subsystems according to ACF (Adapted by author based on Sabatier and Jenkins-Smith 2004)

Based on these studies it is assumed that ACF might be applied to the energy sector. Whereas sustainable transition is truly a common good (Geels 2011, Szarka 2010), nuclear power brings benefits to a smaller, but powerful, group of people (producers, politicians, some consumers). Thus, the RE deployment in a state might be reduced to a confrontation between nuclear and RE communities, or in case of very weak RE network (or its lack), only to the power of nuclear coalitions. As it was stated before sustainability itself does not bring benefits and it is often

pushed by public sector or local governments with support of public sector and different NGOs. It means that the society needs to become developed enough and share same post-material ideas about environment and climate change problems before it will push the government to act (Inglehart and Welzel 2005). However, if there is nobody to declare the sustainable energy values, nuclear proponents take over and pursue the most beneficial policy and vice versa. In the cases of a strong RE community, the situation may change towards promotion of sustainable energy. As such, communities may play a role of latent veto-actors and influence on decision-making through constant denial of the strategy of the opposing coalition/s (Tsebelis 1995). The winning coalition gets the opportunity to change the policy in the current subsystem and set new institutions or rules of the game.

Often coalitions get the access to decision-making due to the opening of windows of opportunities (Geels 2011; Solomon and Krishna 2011; Wiliarty 2013). According to John Kingdon (1984), author of Multiple Streams Approach (MSA) policy entrepreneurs (including coalitions, interest groups, communities, etc.) compete between each other in developing of solutions to the existing problem. In cases where the stream of opportunity couples with the problem and the solution streams, the windows of opportunity opens, and the coalition reaches the political agenda and decision-making process. However, to open the window of opportunity, a combination of factors should coincide to destabilise the system and create room for innovations: either irresistible problem or ideological shift in political power. Often a wide-scale event might be not enough for political change. All these are accompanied with very strong desire of political entrepreneurs to win (Figure 5).

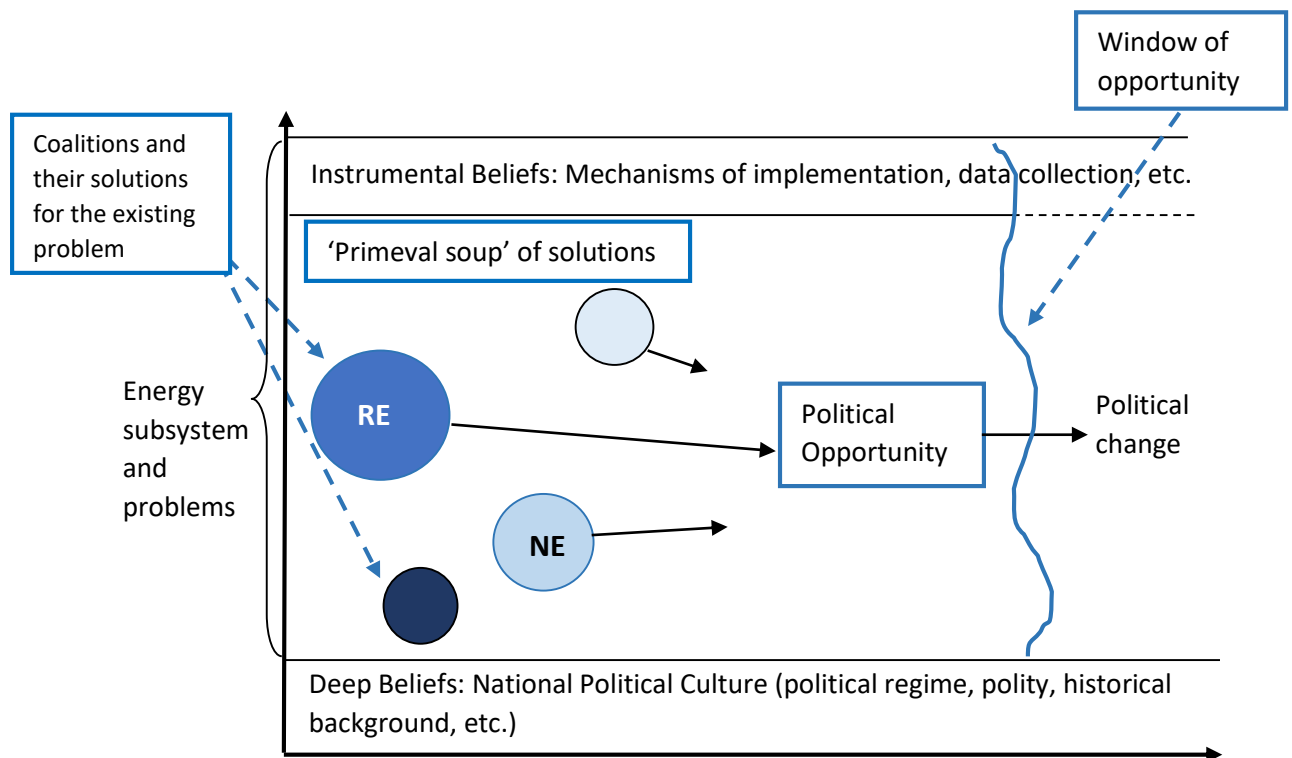


Figure 5: ACF and MSA in energy sector. Developed by author.

As it was mentioned above, the MSA consists of three streams which together open the window of opportunity and potential political change. One stream is a problem stream: there must be a problem which is capable of changing the system and which can be detected by indicators (trends, statistics, etc.), focus event (demonstrations, meetings, terroristic attacks, crisis, etc.) and feedback after the previous policy change. The next is a policies stream or solution stream or the 'Primeval soup'. It consists of solutions offered by different political entrepreneurs (coalitions, communities, interest groups, etc.), and, according to Kingdon, all these actors compete for developing the best solution and its implementation. The third stream is a political opportunity which includes public opinion, ideological shift, strong interest group. In cases where the streams are coupling, the window of opportunities open and the best solution (the most applicable and relevant) will reach the political agenda and change the policy in the subsystem (Kingdon 2003). New policy implies new mechanisms and regulations, and so changes the instrumental beliefs (the most alterable according to the ACF), but does not touch upon the political system in general and political culture (the least alterable according to the ACF).

Taking energy sector as a case, the climate change or high level of GHG emissions and sustainable transition in general might become a problem for the future policy change. To solve the problem, energy coalitions offer possible environmental-friendly and low-carbon solutions to reach the

political agenda, and if political factors will create a favorable constellation for change or window of opportunity, the coalition will be able to set a new policy. Existing actors adapt to the new conditions through the 'policy-oriented learning' (Sabatier and Jenkins-Smith 1993). It is a political adaptation of the actor implying slight changes in his beliefs and intentions as a result of getting new information and experience. Hence, nuclear energy positions itself as a low-carbon and not-polluting, an effective and clean source of energy. Depending on perception of RE in different countries, proponents of fossil fuels develop new less-emitting ways of energy extraction and integrate renewables to the production process. Besides, there is a relatively new, and in some countries very weak, energy entrepreneur – RE. In order to participate in coalition competition often negotiation with other coalitions ("cross-coalition learning or negotiation", Sabatier and Jenkins-Smith 1993) is required. This helps to solve the misunderstandings and reach agreements between two or more coalitions. Another way is to gain strong public support (Wiliarty 2013; Aklin and Urpelainen 2013; Royle 1994), but this is only a viable option in open political systems.

Political culture is formed by individuals, and this is why analysis of political actors and their behavior is important. The ACF and MSA together let to understand the process of decision-making and reaching the political agenda by political groups better, due to its systematic character. These two theories complement each other: the ACF structures the struggle between coalitions and their ideas, and MSA specifies the conditions for political change. Also, it demonstrates how non-political subsystem as the energy sector is embedded in the political dimension.

2.2.3. Components of political culture and theoretical framework

To make it clear what is going to be researched in this paper, it is important to split the concept of political culture into several components based on the theoretical conceptualisation. Since there are so many different definitions of the concept, scientists have not reached a consensus about its composing elements.

First of all, since the paper initially appeals to Dobbin's idea of political culture, it is worth looking at how he divided the concept into factors for future comparison. In order to research political culture in the industrial sector, namely development of railway policy, he chose four simple characteristics of industrial policy in the country which would demonstrate political culture the most:

1. Planning system (also in Toke et al. 2008);
2. Financial support (also in Toke et al. 2008);
3. Technical and managerial coordination
4. Price formation and competition (Dobbin 2013).

All these components define the future of railway development and, through looking at them, the author had come to a conclusion about political culture in the chosen countries. To contemplate the full picture, he appealed to historical facts of the country to identify political trends of decision-making. He compared how these four factors operate in three cases and in result could come to valid and reliable results about political culture in the selected countries.

Secondly, this paper will use policy style classification as a part of political culture. The book "Policy Styles in Western Europe" is a comparative research across six West European countries: West Germany (the book was published in 1982 before the German reunification of 1990), Norway, Britain, France, Sweden, and the Netherlands. According to the authors, policy style is "different systems of decision-making, different procedures for making societal decisions" (Richardson et al. 1982, p 2). It includes a complex of standard procedures of decision-making and decision-implementing, regulated by ruling norms and values defining the policy process (Idem.). That means not only the process of decision-making but also process of realisation of these decisions in practice. Based on this definition authors worked out a classification of policy style. There are two main characteristics of this classification: firstly, is its approach to problems solving, reactive, meaning the state takes action when the problem already happened, or anticipatory, which means that state tries to predict possible problems and develop measures to avoid it in advance. Secondly, the attitude of government's relationships with other political actors, so a government might negotiate with other participants of the political process and develop the political decision based on consensus, or it might impose its decisions upon the other actors (Table 3).

<div>Problem-solving</div> <div>Relation to political actors</div>	Reactive	Anticipatory
Consent	Consensus/reactive	Consensus/anticipatory

Imposition	Imposition/reactive	Imposition/anticipatory
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Table 2: Classification of policy styles according to Jeremy Richardson (developed by author)

The definition developed by Jeremy Richardson et al. (1982) seems to fit to the understanding of political culture. At the beginning of the book, the authors set the problem: although there are many ready-made effective solutions developed by scientists, in practice countries apply very different mechanisms and policies. The solution lies in different policy styles, however, at the same time these dimensions might play role of components of political culture of the state. Because policy style may also differ from domain to domain (Idem., p. 3-4) it is interesting to see how it may influence of RE development.

Thirdly, since political culture is understood as a phenomenon developed by individuals, it is important to look at political actors and their behaviour as result of established political tradition. Speaking of ACF, Sabatier and Jenkins-Smith selected several conditions under which new coalition may appear:

1. Special degree of consensus needed for major policy change (this factor also was discussed in Blowers and Pepper (1987), Wiliarty (2013) and Saward (1992));
2. Development of RE technologies (Geels 2011);
3. Openness of political system and role of other political actors (same sources and Geels (2011));
4. Overlapping societal cleavages (Sabatier and Jenkins-Smith 2007);
5. Historical background (Blowers and Pepper (1987), Wiliarty (2013), Saward (1992)).

These conditions are important for changing the configuration of power between coalitions and in turn shapes the political culture of the state. Due to the types of resources, the energy sector is full of different coalitions and interest groups, so these conditions are important in coalition formation and, consequently, its potential energy policy.

Besides, ACF reckons for the factors of policy change. There are external and internal shocks, policy-oriented learning and negotiated agreements. The two latest influence the instrumental beliefs of the dominant coalition, while former two may destabilise the subsystem and bring along real changes (Sabatier and Jenkins-Smith 2007). The MSA, in turn, clearly emphasises that political change might happen in case of a very serious problem which threatens the sustainability of the system in general or ideological shift of political power which entails a significant change in the political system in general including all the domains (Kingdon 2003).

All mentioned components together build the political culture. Although the theories describe the configuration of the political system in general, all of them might also be applied to the specific subsystem. This paper focuses on energy sector, mainly RE development and the behavior of nuclear power. Therefore, besides analyzed factors, the study is still required to include some specific characteristics of energy system inherent to that particular domain (Table 4).

Group	Component	Question
Energy sector	Status-quo in the national energy sector	What are the main trends in energy policy, targets, production, new policy, etc.?
	Environmental issue and climate change	What is the main motivation for the state to develop RE? What is the governmental policy on climate change?
	Orientations and values	Do population support the energy transition? Are there any landscape protection organisations?
	Main rationale for using RE	Does the state develop RE because of the energy security, or awareness of climate change or economic profitability?
	Technological development	Is RE technology developed enough for the energy transition?
Decision-making and policy style	Problem-solving	Is it reactive or anticipatory?
	Relation to political actors	Is it consent or imposition? Who and how may participate in decision-making (besides elections)? Who is the final decision-maker? Who can be a policy initiator? Role of coalitions, NGOs, association?
	Veto-players and role of opposition	Are there many veto-players in the government? Is the power strong enough to suppress the opposition?
	Political stability and historical background	Is the political regime stable in the country?
	ACF + MSA	Utilising internal or external shocks (very serious problem, ideological shift, catastrophe, demonstration, crisis)? What is the role of RE or nuclear power coalitions (interaction)?
	Form of state/Polity	How the process of decision-making work in different levels of state (regions)?
	Ownership	How is energy sector regulated (Planning, Financing, technical and

Economic aspect of energy policy		managerial coordination, price formation)? Who sets the production and consumption goals? Centralised/Decentralised energy market?
	Financial support	Who invest in the RES development? State or private sector?

Table 3: Components of political culture which will be considered in this paper. Developed by author based on previous analysis

This table was developed based on previous analysis of political culture and some other factors based on features of the energy market, RE specificity and elements of the political system which impact on political culture. This table plays a role of the theoretical framework or a guide for the future case study, the questions in the last column are answered during the analysis of the cases.

This subsection was devoted to an analysis of existing literature on political culture and development of the theoretical framework for future research. It also answered the first research question about operationalisation of political culture. In result, the notion is split to several factors and questions which will be answered during the case study. The next chapter demonstrates methodology used in the paper in details.

3. Methodology

The purpose of the methodology chapter is to justify the process and techniques of answering the research questions. The chapter is structured as follows: it starts with describing the ontologies, epistemologies and strategies of the paper. The next section is devoted to methods of data collection and data analysis. Then potential limitations and possible mitigation techniques are discussed, followed by ethical consideration.

3.1. Philosophy of the study

Since the study considers the political culture as a set of historically shaped characteristics of the political system which are assumed to exist in reality, but which may be interpreted differently, it takes the constructivism/Interpretivism ontological stance (Bryman 2012, Gee 2005). Political culture is the result of human activity, and in that sense, individuals are the main actors who influence decision-making (Dobbin 2013). The way the history of decision-making process has been reflected in the mindsets of the people who make these decisions and how it shapes their behavior is the substance of the object of this research (Burr 2003). The research is devoted to understanding how political culture constructs the existing political system in the energy sector. Thus, constructivism perfectly describes the general design of the research and fits the idea of political culture.

Whilst talking of epistemology, it is worth admitting that defining political culture is partially based on political practice and experience of decision-making in the energy sector of the country. This experience determines a direction for future decisions and shapes the political culture. So as there is no right or wrong culture, it is very individual for different countries and depends only on its own national political practice, history, political tradition and beliefs (Solomon and Krishna 2011, Wiliarty 2013, Toke et al. 2008 and others). The research applies a deductive approach and is based on combination of existing theories, it is interested in looking how these theories work in practice in chosen countries. The paper does not aim to elaborate a new theory (Saunders et al. 2015), however it is directed to applying existing ones to a subject which has not been studied from this point of view before. Finally, the theory will help to identify how specific elements of political culture may impede or facilitate the RES development.

The study uses qualitative data with supplementary statistical data and qualitative methods of analysis (Remenyi et al. 1998). This approach is useful to discover unexplored areas of existing fields, in case of this paper – the influence of political culture on RE development. It helps to

define main trends, opinions, and also make a deep and thorough analysis of the problem (Bryman 2012). Moreover, the research questions of the paper do not imply to be answered by measurable phenomena, they can be answered only by means of qualitative analysis. As it was mentioned before, this research does not aim to generalise results (Yin 2014), it only looks at three cases and qualitative study helps to investigate the cases more carefully than quantitative because due to its ambition to generalisation it often concentrates on very superficial statistical analysis and does not include important details, while qualitative study really seeks to reveal the very foundation of the problem. In addition, the quantitative approach does not discover the substance of political culture completely since the concept includes many different fields and often it is impossible to measure in figures or quantities. All methods and type of data are outlined in Table 5.

Since the literature review's main purpose is to provide the reader with the analysis of the problem and demonstrate the significance of considered concepts, it was more logical to start the chapter with answering the first research question about the essence of political culture. Otherwise it might be difficult to get the understanding of the term. However, at the same time operationalisation of political culture is a separate necessary task which requires analysis of numerous academic literature and formulation the working definition for the paper for the further research.

Research question	Method	Data type
1.What is political culture and how the term might be operationalised?	Academic literature analysis	Qualitative
2.How does political culture differ in chosen countries?	Documentary analysis (Policy, analytics, scientific reviews) + Expert interviews as a supportive method	Qualitative
3.What are the main trends and status-quo of renewable energy development in chosen countries?	Documentary analysis(Policy, analytics, scientific reviews, energy profile) + Expert interviews as a supportive method	Qualitative
4.How does political culture influence the development of the renewable sources of energy in chosen countries?	Comparative method + Expert interviews as a supportive method	Qualitative

Table 4: Summary of research strategy. Developed by author

To answer the research questions, the study uses analysis of academic literature and policy documents, with comparative analysis and expert interviews as supporting methods. Since a case study strategy does not impose usage of specific methods (Yin 2012), which may confuse the research, the chosen techniques seem to be ideally suited to the objectives of the research and research questions.

3.2. Multiple case study strategy

The research uses multiple case study strategies due to its ability to provide an intensive investigation of a phenomena, person, or any other unit of study (Jacobsen 2002). The approach offers a very comprehensive analysis of one or several cases, which might be researched using different methods. The selection of the most appropriate techniques leads to high-quality research and ability to develop upon already existing theories (Baxter and Jack 2008).

In this paper, several countries are considered as cases, so it is considered a multiple case study (Yin 2003). The main difference between one case study and a multiple case study is the appearing element of comparative study: in a situation with several units of study, the researcher seeks to collect the most detailed information about it to compare it and make conclusions. Moreover, a multiple case study provides a choice to a researcher to examine cases with similar reasons and different outcomes, or, in contrast, cases with similar outcomes but different inputs (Yin 2003). This helps to focus on aspects which are really connected to the analysis. In this situation, a multiple case study defines the value of results (Eisenhardt 1991), however, the researcher should justify the choice of cases carefully before conducting the strategy.

This strategy was used in a number of cross-national studies dedicated to RE development (Lauber 2012; Solomon and Krishna 2011; Toke et al. 2008; Wiliarty 2013). Using the multiple case study methodology, these papers managed to conduct an analysis of the cases and at the same time compare energy development in several countries according to the chosen research framework. As a result, scientists got very valid and reliable data about the energy situation in different countries which can be used for the further investigation. Indeed, case study strategy is highly advantageous. The results of case studies are very often recognised as strong and reliable (Baxter and Jack 2008) and comparison of cases makes the results even more valuable, more convincing and solid. In addition, the strategy allows scientists to expand the research question

and include more factors for comparison due to the particularity of every chosen case (Eisenhardt and Graebner 2007, Silverman 2004, Bryman 2012).

Since independent variables in research plays the role of the factors which may affect the dependent variable (Krishtanovsky 2006), the multiple case study assumes that political culture influences the RE development and with any changes the configuration of energy share produced by different fuels may switch. Political culture may be applied to any sector including energy and it defines the policy pursued in that particular sector. Thus there is a one-sided dependence from culture to the policy and different countries are taken as cases to demonstrate that connection. A dependent variable in the analysis is the success of the RES in the country. The best indicator for it is the share of RE in electricity production due to its stable existing technology. Some conclusions about the effect of particular characteristics of political culture are made. Comparative method of study fits the research strategy very well due to its ability to demonstrate how different characteristics of political cultures in chosen countries meet and promote or, on the contrary, hamper the penetration of clean energy to the national energy market. The element of comparison expands the applicability of results and may even give an opportunity to make recommendations or predictions about future of clean and sustainable energy in chosen countries and about political culture itself.

3.3. Data collection and analysis

3.3.1. Selection of cases

The study considers the problem of RE deployment in three cases: The United Kingdom, Germany, and the Russian Federation. The choice of cases is not random. It had started from the UK which demonstrates a unique political culture (Dobbin 2013): being an EU member it always had been keeping its distance from the EU bureaucratic regime, saving its identity and sovereignty, disobeying some of the common rules of the Union, and dictating its own conditions. Indeed, the country has specific territorial and administrative system (Cowell 2017) with quite independent regions – countries and precedential legislative model (Zweigert et al. 1998; Dobbins 2010; Gennaioli and Shleifer 2006). At the same time, the UK has quite a high rate of renewables production when compared to other countries (Eurostat 2018) and even takes one of the leading positions in the development of offshore wind RE (Toke et al. 2008, Wind in power 2017).

Choosing the second case was propelled by the intention to look at different characteristics of political culture and production of RE. Germany fits well to these requirements: it is one of the EU founder countries (European Union 2018) with decentralised political system, energy system and a unique historical background (for example, East Germany and West Germany division left its unique mark on the political culture). At the same time, the state takes one of the leading positions on renewables production in the world (Renewables 2017).

The third choice was based on searching for a different political culture regardless of the level of RE development. The EU member country does not fit to the context due to the possible convergence of political systems including political culture (Richardson et al. 1982, Gullerstrup 2009, Sutherland 2005): according to some scientists, European Union bureaucracy has a great footprint in national systems. In addition, it was interesting to compare the quite a liberal system of values of the UK and Germany with something opposite. Thus, Russia was chosen as the third case in this research. It is not a EU country, the political system there defers significantly, with the same as energy profile. RE production in Russia (exclude hydropower) is quite low, however, its CO₂ emission per capita as not the highest (Table 6). Taking into account that Russian energy case seems to be undiscovered nowadays from a scientific stance, it is curious to find the reasons in political culture.

Country	CO ₂ Emissions
The UK	5,9 tCO ₂ /person
Germany	9,8 tCO ₂ /person
Russia	11 tCO ₂ /person

Table 5: CO₂ Emissions in selected cases, in tonnes of CO₂ per person. Source: (Global Carbon Atlas 2016).

In addition, as it was mentioned before, a case study does not oblige any specific algorithm for choosing the cases (Yin 2003). Beyond the methodological reasons, all three cases represent personal interest for the researcher. At the same time, this combination of cases has never been researched before, which serves to make the results of the study more interesting and valuable.

3.3.2. Data collection

All the necessary data for the research is qualitative (except some statistical figures) and it is collected using several methods: documentary analysis and expert interviews. The choice of techniques allows following interpretivist epistemology which undermines understanding the

meanings and going deep to the basis of the studying phenomenon (Bryman 2012). Political culture is a social construct which is formulated by individuals and their behavior, and only deep analysis brings reliable and valid results.

Data for documentary analysis

The data referred to in the first, second and third research questions are needed for future documentary analysis, a method of interpretation of documents according to chosen topic (Bowen 2009). Analysis includes policy documents, official websites and reports, newspaper articles, meeting protocols, etc. The process of the documentary collection includes coding and grouping of themes same as interviews (Bowen 2009). The method is advantageous due to the huge amount of potential data which can be used for analysis, and it also serves to create further opportunities for more comprehensive study.

The first research question answered in the Literature Review required secondary data, which was collected from the academic literature. The sources are classified and divided into groups, which allows making quality operationalisation of political culture and selecting the main features for further analysis in the case study. The second question is based on political documents, analytics, historical facts and scientific reviews. The national political culture is based on theoretical framework formulated in the first research question. However, characteristics of political culture also might be traced in various documents such as policy acts, federal laws, ministerial protocols, statistical data, historical outputs and others, that is why research uses several sources of data. Academic sources are analyzed to identify some specificities of political culture in selected cases.

The third research question appeals to policy documents and statistical data. Information provided by the government and relevant ministries/departments is collected. Statistical data here is important in identifying the energy status-quo, main trends and its targets for different types of sources. This information has a supplementary character in this part of research: its role to shape a general picture of the national preferences between two types of energy which is possibly based on existing political culture.

Semi-structured expert interview

The expert interview is a technique which helps to get special knowledge from experts' experience and practice (Bogner et al. 2009) and can be used at any stages of research (Bernard 2000). The method does not address the specific question of the research but plays a role of a supplementary method which helps to confirm or refute some details discovered during the case studies.

Since the method is used as support for the case study, the data gathered by this method simply tests the validity of comparative analysis of three cases and provides some more information connected to practical or even informal knowledge. It does not aim to discover missed factors of the case study and create new knowledge (Idem.) but it is helpful for justifying the results of the comparative analysis. Every case is complemented with interviews with respondents somehow connected to the country. Thus, 10 oral interviews were arranged, and one additional interview was conducted in a written form due to the interviewee's time constraints. Mostly as experts for the interviews representatives of Academy, NGOs and trade associations were asked (Table 7).

Interviewee	Case	Description	Notes
1	The UK	Academic	Academy + energy policy expertise
2	The UK	Practitioner	Trade association, closely related to the local government
3	The UK	Academic	Academy + energy policy expertise Refused to be recorded but notes were taken
4	Germany	Practitioner	International RE Association (promoting RE at the international level)
5	Germany	Practitioner	RE Association embedded to political power (aggregation and articulation of RE NGOs and private companies' interests and delivery to the political level)
6	Germany	Practitioner	Analyst in Scientific advisory body which is closely related to the federal government (providing policy papers, assessment plans, strategies for development)
7	Russia	Academic	Research activity in RE department Due to poor connection the conversation was recorded partially
8	Russia	Academic	Research activity in Centre for Environmental and Natural Resource Economics
9	Russia	Academic + Practitioner	Research energy center + closely related to local government (providing policy papers, assessment plans, strategies for development)
10	Russia	Practitioner	Ecological INGO cooperating with local government (energy policy expertise)

-	Germany	Academic	Academy (written interview due to lack of free time)
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Table 6: Interviewee profiles

Due to the fact that RE deployment often depends on energy networks and coalitions in particularly and informal communication the choice of interviewees was limited by people closely related to RE in political sector or to research in the field in chosen countries. The interview is semi-structured, which does not fix the number of questions and gives to researcher freedom to slightly change the questions depending on the case and answers of interviewees (Bryman 2012) (Appendix E). This allows the selection of different strategies of conversation depending on received answers, to adapt to it and gain the maximum information from the experts.

2.3.3. Data analysis

The study uses qualitative methods of data analysis. All the gathered information (documentary-based, interviews, secondary data from academic sources) is formalised, processed, analysed and interpreted. After data collection and the transcription of the interviews, a report with the main trends, prognosis, optimal decisions, and judgments is made (Warren 2002). Concepts used in building of theoretical framework creates aspects or codes, which can be used to sort the information and to group it into several categories. Creation of connections between the categories is the main part of data analysis (Bryman 2012). Identification of these linear or hierarchical connections creates new knowledge. This thematic analysis is one of the most common types of qualitative data analysis (Idem.) and it perfectly fits aims and objectives of the research and also will create valid and reliable results for each case study.

Comparative analysis is the other main method of data analysis in this paper. This type of analysis compares several pathways to understand the causal relationships between different factors and results of the development of the RES across several cases (Idem.). To conduct the comparative study, several key factors are selected based on theoretical concepts described in the Literature Review. The next step is the assessment and scaling the selected factors in each case within a given context. The comparison is concluded to the comparative matrix (Table 8). The matrix helps to pinpoint the factors or combinations of factors which impact the development of RES in three countries, so it allows the determination of the linkages between input and outcomes.

3.4. Ethics and Limitations

As the research requires usage of expert interviews it causes some ethical concerns as it implies direct communication with people. The research assumes to interview people on existing energy policy, and it is quite possible that the respondents may not want to reveal some information publicly. However, to avoid any misunderstandings the informed consent to have an interview is asked in advance. Interviewees are aware of the topic of research, research objectives and research questions and the fact of recording the conversation. All interviews are conducted only with the informants' consent to participate in research. Although the interviewees are labelled according to their professional activity (researcher, practitioner, etc., Table 7) all information about interviewees is kept confidential before, during and after the research. Since all interviews are conducted after collecting and analysis of all the data for case studies it is more important to structure the questionnaire in a way to avoid the subjectivity and staying unbiased even after all results are already on the desk.

The process of collecting data for documentary analysis requires exploring a significant number of documents, which can be highly time-consuming (Idem.). The necessary data often may be hidden and it brings additional difficulties for research. To produce quality research, all used sources should be able to be confidently deemed credible. The other problem lies in research design of the study. A case study itself does not allow generalisation of the results, taking only three cases cannot be sufficient in forming any conclusions on other countries (Silverman, 2010). Since political culture is very national and depends on historical background, political system, economic factors, the research still allows to make conclusions about some impact of particular aspects on RE deployment and based on it build some recommendations for other states. Moreover, the results of the research are helpful for further study of selected cases and theories about RES.

All in all, multiple case study is appreciated for its reliable and valid results due to deep analysis of the cases and, complemented by comparative analysis, the results of the study should be recognised as credible. Hence, despite all mentioned limitations, the research provides great scientific and societal contribution.

4. Findings and discussion

This chapter is devoted to the results and main findings of the analysis, answering the second, third and fourth research questions and discussion. It is structured as follows: the first section will answer the second RQ and describe the main features of political culture in three countries and the main difference between them. The main section examines the results of comparative analysis of the cases, and the third one is dedicated to the explanation of most important aspects of political culture in the energy sector.

4.1. Political culture in selected cases

Political culture, considered as historically settled and stable views and models of behavior expressed in the activity of political actors (Dobbin 2013; Melnikov 2013; Formisano 2001), is demonstrated by the cases quite differently. Historical constituent played a very important role in the formation of the political system, behavior of political actors and population and energy sector particularly. Selected countries illustrate very different approach of government towards RE and particularly it is connected to totally different historical backgrounds of actors who participate in decision-making processes.

The British case illustrates an example of laissez-faire policy in every sector including RE, slightly directed by government since it touches upon security of the state but with minimal intervention to the market. Being a state with strong liberal beliefs and parliamentary system of government open to ideas outside of political process (Elgie 2016, Shugart and Carey 2004) the UK has aimed to provide the conditions and full freedom for market regulation. Starting with the Thatcher's Energy Act 1983, implying liberalisation and privatisation of energy sector, the government has been seeking the role of observer rather than a regulator. The future Energy Acts (2003, 2006, 2008, 2009, 2010, 2011, 2013, 2016) and some other policy documents dedicated to energy (Appendix A) aim to provide secure energy supply by extending the freedom for efficient competition between private companies, whilst at the same time protecting the interests of consumers through consultations and numerous funding systems. The same model of policy was applied in the railways (Dobbin 2013). The government was not willing to intervene in the autonomous dynamic growth of the market and has been seeing its goal in the protection of the citizens and providing an arena for the fair competition. Although the main energy policy nowadays is low-carbon economy including development of the RES, British government took its time to refrain from the use of conventional sources due to strong lobbying from fossil energy

supporters emerging and taking roots during the last century, when the country was rich endowing with domestic fossil fields which remain very influential to the day (Interviewee 3; Fouquet and Pearson 1998).

German political culture, mostly shaped by historical events of the 20th century, acquired its specific features such as seeking the most transparent and adversary policy style (Toke and Nielsen 2015; Strohmeier 2006; Interviewee 5, Interviewee 6) and avoiding the possibility of concentration of power. To pursue the idea of inclusive political process government has always been very attentive to the demands of various interest groups, associations, trade unions and other communities expressing public opinion (Deutscher Bundestag 2017; Transparency International 2014). Thus, with commissioning the first NPP in 1961, debates about hazardous radioactive waste had been already spread around and caused the public protests which had led to opening of the first wind park in 1983 and conceiving of the future Energiewende (Lauber and Jacobsson 2016; Jacobs 2012; Blackbourn 2014; Wiliarty 2013; Interviewee 4, Interview 5). The other example is Fukushima accident 2011, which officially consolidated the nuclear phase-out due to rising awareness of publicity (Interviewee 5, Interviewee 6; Lauber and Jacobsson 2016) straight after official postponing in 2010 (Energiekonzept 2010, Appendix B). Consequently, German government ended up with consensus format of democracy where political actors have to listen to the interest groups and satisfy all of them in order to gain votes for the next political cycle (Lauber 2012; Broekel and Alfken 2015; Aklın and Urpelainen 2013; Royle 1994).

The Russian case is entirely different in comparison to the previous two. It is a federal state with transitional or, according to some indexes, an authoritarian political regime (Freedom House 2018; Democracy Index 2017). Comparing to liberal Britain and Germany, Russia represents a case with limited human rights and weak engagement of civil society into the political process. It may be explained by behavioral aspect, due to the fact that people inhabiting the territory of the modern state may have never experienced a strong connection to the political process. Historically during the Empire and Soviet periods, the country was governed by one leader or group and population never could influence the political decision-making (Evans 2011; Hahn 1991; Lussier 2013). It can be traced in modern political culture including political process and public participation. At the same time the history of the 20th century and confrontation between West and East to some extent determined the approach to energy policy. The awareness of energy dependency, climate change, sustainability had permeated in energy policy Western countries much earlier, and the Soviet regime used it as a demonstration to its citizens of the

positive effects of socialism through cheap energy and lack of necessity to save it (Interviewee 8, Interviewee 10). Obviously, availability of solid resource reserves impacted on the political culture in the country and, together with a planned and centralised economy, formed an oligopoly in energy sector (Ahrend and Thompson 2005; Pirog 2007).

Hence, all three cases illustrate contrasting political cultures in energy sector. The next section examines a comparison of the three cases in order to select the most important characteristics of political culture which may facilitate introducing the RE into the national energy mix.

4.2. Comparison of three cases

This section is dedicated to comparison of existing political systems and energy policies in the three focus countries. Based on Table 4 developed in the Literature Review chapter, the main aspects for comparison are brought together in the comparative matrix (Table 8) for a clearer understanding of the differences between three political cultures and the energy policies pursued by them.

Component		UK	Germany	Russia																																										
Energy sector	Status-quo in the national energy sector	<p>ELECTRICITY PRODUCTION 2015</p> <table><thead><tr><th>Source</th><th>Percentage</th></tr></thead><tbody><tr><td>Gas</td><td>30%</td></tr><tr><td>Coal</td><td>22%</td></tr><tr><td>Nuclear</td><td>21%</td></tr><tr><td>RE</td><td>23%</td></tr><tr><td>Hydro</td><td>3%</td></tr><tr><td>Oil</td><td>1%</td></tr></tbody></table>	Source	Percentage	Gas	30%	Coal	22%	Nuclear	21%	RE	23%	Hydro	3%	Oil	1%	<p>ELECTRICITY PRODUCTION 2015</p> <table><thead><tr><th>Source</th><th>Percentage</th></tr></thead><tbody><tr><td>Coal</td><td>44%</td></tr><tr><td>RE</td><td>27%</td></tr><tr><td>Nuclear</td><td>14%</td></tr><tr><td>Gas</td><td>10%</td></tr><tr><td>Hydro</td><td>4%</td></tr><tr><td>Oil</td><td>1%</td></tr></tbody></table>	Source	Percentage	Coal	44%	RE	27%	Nuclear	14%	Gas	10%	Hydro	4%	Oil	1%	<p>ELECTRICITY PRODUCTION 2015</p> <table><thead><tr><th>Source</th><th>Percentage</th></tr></thead><tbody><tr><td>Gas</td><td>49.6%</td></tr><tr><td>Coal</td><td>15%</td></tr><tr><td>Nuclear</td><td>4%</td></tr><tr><td>RE</td><td>0.4%</td></tr><tr><td>Hydro</td><td>16%</td></tr><tr><td>Oil</td><td>1%</td></tr></tbody></table>	Source	Percentage	Gas	49.6%	Coal	15%	Nuclear	4%	RE	0.4%	Hydro	16%	Oil	1%
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Main trends in energy policy	Diversification of the energy balance and low-carbon economy (nuclear and RE)	Transition to renewable energy, nuclear energy phase-out with reservation from fossil fuels	Modernisation of the current energy system, increase production and export of fossil fuels																																											
Main rationale for using RE	Economic efficiency + Energy security + Climate change	Climate change + Energy security + Economic efficiency	Economic efficiency																																											

	Orientation s and values	Support	Strong support	Apathy/weak support
	Technologic al developme nt	Developed	Well-developed	Technology for RE are developed, connection to grids is hampered (politically and physically)
Decision-making process and Policy style	Problem- solving	Reactive	Anticipatory	Anticipatory/Reactiv e (depends on sector)
	Relation to political actors	Consent	Consent	Imposition
	Veto- players	There are veto- players but they do not use their right to veto that often	There are veto-players but they do not use their right to veto that often	There are veto- players who use their right to veto often
	Political stability and historical background	Very stable democracy rooted for long period of time Moderate risk of instability	Due to instability during the 20 th century population and government seeks to Stable democratic regime Low risk of instability	Unstable hybrid regime/authoritaria nism followed by centuries of monarchy and totalitarian power High risk of instability but in practice the government is strong to suppress any opposition
	ACF + MSA	External shock: crisis 1973 Internal shock: Thatcher's liberalisation policy	External shocks: crisis 1973, Chernobyl 1986, Fukushima 2011 Internal shock: WWII, reunification of East and West	Internal shock: Break down of Soviet Union 1991, shock therapy and liberalisation 1992
	Form of state/Polity	Unitary state consisting of several countries which are unequally independent, distribution of powers between countries is different: some regions can set their own energy policy, some have to	Federal symmetric state with strong federal government. Even though the representation in Bundesrat is not equal they still get same powers in energy sector and obey the federal legislation Energy policy is mostly downloaded	Federal asymmetric state. Regions may implement their own policy non- contradictory to the federal legislation: everything is allowed if not prohibited by federal law

Economic aspect		download federal policy		
	Ownership pattern	Market Decentralised energy market	Mixed Decentralised energy market	Mixed but mostly state Centralised energy market
	Financial support	Mostly from private sector	Private and governmental financial support	Renewable Energy is financed mostly from private sector But traditional energy get financial support from budget

Table 7: Comparison of RE development and political culture aspects in the UK, Germany and Russia. Developed by author.

Energy sector

With respects to current trends in energy policy nowadays, the British government deploys low-carbon policy and increases the energy efficiency (Appendix A). Being a coal mining country and turning into a big exporter of fossils found in the North Sea, then a nuclear power giant, the UK now develops the RE as a part of the low-carbon energy transition along with nuclear energy development and the decline of using conventional sources (Table 9). The government does not set very high targets for RES, instead, it seeks to a diversification of the national energy mix by means of RE and nuclear power with support of natural gas and coal phase-out (Table 9; Appendix A; Climate Change Act 2008; Energy Act 2011, 2013).

	1973	1995	1999	2015
Oil production	0.6 Mtoe	136.6 Mtoe	143 Mtoe	47 Mtoe
Oil import	118.3 Mtoe	51.4 Mtoe	46.4 Mtoe	52.3 Mtoe
Oil export	3.3 Mtoe	88.3 Mtoe	95.4 Mtoe	34.9 Mtoe
Gas production	24.4 Mtoe	63.7 Mtoe	89.2 Mtoe	35.6 Mtoe
Gas import	0.7 Mtoe	1.5 Mtoe	1 Mtoe	37.6 Mtoe
Gas export	-	0.9 Mtoe	6.5 Mtoe	12 Mtoe
Nuclear production	7.3 Mtoe	23.2 Mtoe	24.8 Mtoe	18.3 Mtoe
Renewables production	-	0.1 Mtoe	0.1 Mtoe	4.2 Mtoe
Coal Production	75.9 Mtoe	32.1 Mtoe	22.3 Mtoe	5.1 Mtoe

Table 8: Dynamic of energy production in the UK from 1973 to 2015, in Million tonness of oil equivalent. Based on International Energy Agency 2015.

Today British electricity balance is divided between imported gas, nuclear, RE and domestic coal. Oil and gas are used less partially due to expensiveness of the mining and extraction process. Although the geographical position of the country provides favourable conditions for the development of wind and tidal energy (Figure 6) and legislation implies achieving RE targets, nowadays government distribute subsidies illogically to expensive offshore wind facilities

(Industrial Strategy 2017) and fossils (Pickard and Burg 2015) while cheaper onshore wind, solar and tidal are kept ignored (Interviewee 1, 2; Merrick 2018).

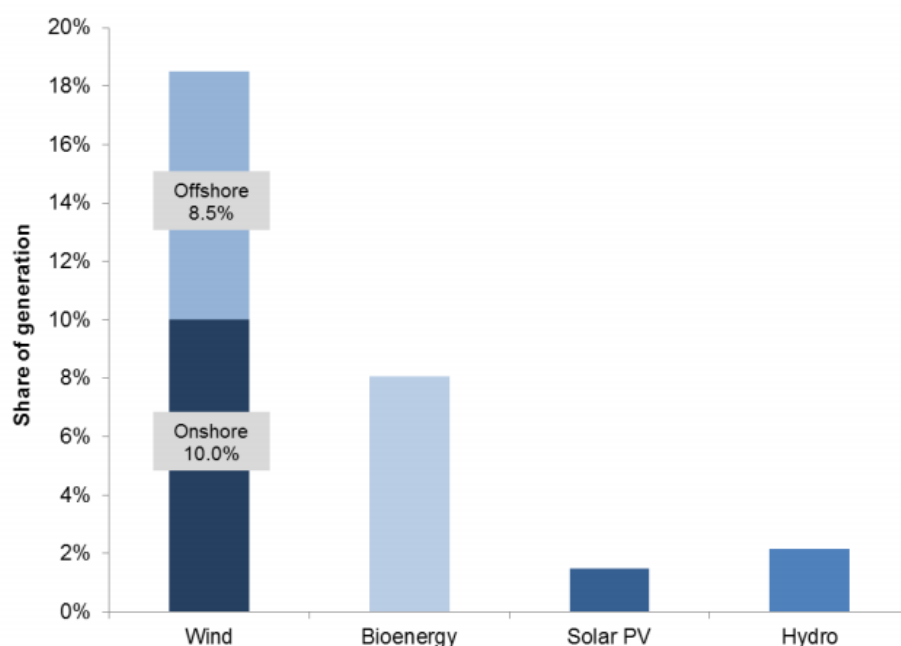


Figure 6: Renewables' share of electricity generation 2017. Source: Energy trends 2017, GOV.UK 2018

In energy policy British government is guided by several aspects including energy security of the country. Due to expensiveness and gradual depletion of fossils and necessity to export resources from other countries, the UK has to integrate additional sources of energy to make the energy system more self-sufficient. At the same time political documents demonstrate big anxiety about the environment and growing CO2 emissions (Appendix A, Interviewee 1) and hence, setting the low-carbon policy the UK seeks to find an affordable, sustainable and secure source of energy. However, according to some experts this approach is simply is not extensive enough:

"I don't think that they [government] provide sufficient support. The policy position is illogical. We're paying more than we need for the electricity. We also pay more we need for more polluting forms of electricity"

Interviewee 2;

"My opinion is UK government is not very committed [to climate change]"

Interviewee 3;

There are still plenty of instruments which would stimulate RE development, however the government misses out on opportunities, or traditional energy coalitions provide more efficient projects. It is worth to notice that RE production in the UK still grows and which does suggest that the policy to some extent bears fruit. In December 2017 Department for Business, Energy & Industrial Strategy conducted a survey devoted to Energy and Climate Change Public Attitudes among the population. In results, the department came to a conclusion that people support the low-carbon energy policy due to different reasons. Respondents are aware of climate change and GHG emissions issues but at the same time, they are interested in reducing the prices for bills or at least stopping its rise (Energy and Climate Change Public Attitude Tracker 2018, GOV.UK 2018). Majority of population support the expanding of RE sources but at the same time admit particular development of nuclear power. Respondents consider the mix of energy sources as a possible solution for British energy sector and government successfully meet the demand.

In contrast, German energy policy is based on *Energiewende* – complete nuclear energy phase-out towards clean alternative sources with reservation from fossils. Renewables play a key role as it is clean, safe, cheap, efficient and even peaceful (Interviewee 5, 6) energy source. The energy transition in Germany was driven by population and had started mainly with an argument about the hazardous nature of nuclear power, which the Chernobyl 1986 and Fukushima 2011 disasters reaffirmed (Jacobs 2012; Blackburn 2014; Wiliarty 2013; Lauber and Jacobsson 2016; Interviewee 4, Interviewee 5). The first *Energiewende* 1986 did not change the energy mix dramatically, nuclear power had kept safe its position, but the second shift in 2011 brought about the start of a change to the nuclear sector. With the *Energiewende* coal production reduced, but since German government admits small share of fossil sources as a supportive source of energy during the energy transition, the export of coal (especially cheap coal and lignite) and natural gas has been increasing (Table 10). Due to the unstable positions of RE in national market, imperfections of current energy grids system and strong import dependency of the country government does not set any targets for coal energy reduction, even though coal is one of the biggest CO₂ emitters.

	1973	1986	2011	2015
Oil production	6.9 Mtoe	5.6 Mtoe	3.4 Mtoe	3.2 Mtoe
Oil import	124.9 Mtoe	85.3 Mtoe	92.1 Mtoe	92.7 Mtoe

Oil export	0.1 Mtoe	-	0.4 Mtoe	0.3 Mtoe
Gas production	16.4 Mtoe	15.7 Mtoe	10.9 Mtoe	6.3 Mtoe
Gas import	12.4 Mtoe	35.3 Mtoe	75.1 Mtoe	85.9 Mtoe
Gas export	0.1 Mtoe	1 Mtoe	14.7 Mtoe	27.2 Mtoe
Nuclear production	3.2 Mtoe	36.2 Mtoe	28.1 Mtoe	23.9 Mtoe
Renewables production	2.5 Mtoe	6.8 Mtoe	33.3 Mtoe	43.1 Mtoe
Coal Production	141.4 Mtoe	145 Mtoe	46.7 Mtoe	43 Mtoe
Coal import	15.2 Mtoe	13.8 Mtoe	33.4 Mtoe	37.5 Mtoe
Coal export	18.3 Mtoe	13.5 Mtoe	1 Mtoe	1.4 Mtoe

Table 9: Dynamic of energy production in Germany from 1973 to 2015, in Million tonnes of oil equivalent. Based on International Energy Agency 2015.

Nowadays RE share in energy consumption mix grows gradually and the lion share of this belongs to wind energy (Figure 7). The share of RE in electricity generation has already reached 42% (Energy charts 2018).

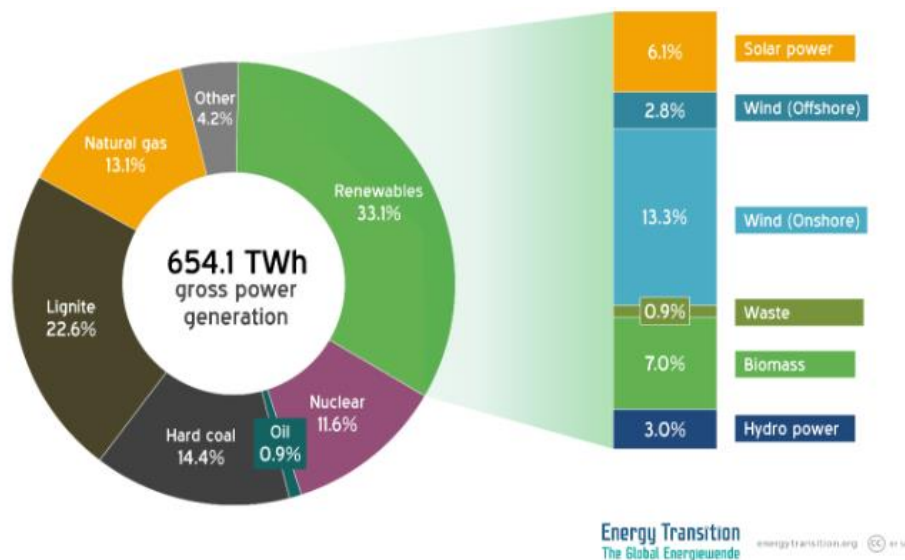


Figure 7: Gross power generation mix in Germany 2017. Source: German Energy Transition 2018

The main idea behind the Energiewende is firstly nuclear phase-out. As it was mentioned before it was conceived straight after commissioning of the first NPP when the anti-nuclear movement expressed their protest. The population is aware of consequences of Chernobyl 1986 and Fukushima 2011 and radioactive waste and it is ready to pay more for sustainable energy. Another important rationale of nuclear energy phase-out is a potential danger in military action (Wiliarty 2013; Uekoetter 2012; Grunden et al. 2005; Interviewee 5, 6):

“And in terms of global relevance of renewables, I think, that’s quite important because fossil fuels have been the call for many wars and many conflicts and it still are. So those terms renewables also can be a creator of peace”

Interviewee 5;

“In Germany we had women parliament movements or peace movements, etc. We had environmental movements growing heavily in 1970-1980s which was entirely connected to nuclear and this disarmament movement of course. And there was a specific danger in Germany during cold war” **Interviewee 6.**

At the same time Germany has always been an importer state and especially after WWII it had to recover the economy and literally rebuild the country from scratch which requires huge energy costs. The awareness of energy security might be taken as the second rationale for the country (Interviewee 5).

Due to the strong dependency on energy imports, the government has to pay attention to maintaining of relations with exporter countries and pursue farsighted policy of comprising ways of retreat in case of failure of supply. The export dependency threat to the sovereignty of the country (Helm et al. 2012; Romanova, 2009, Van der Meulen 2009; Ghosh 1991; Kohl 1978; Stern 2006) and together with awareness of climate change and nuclear unsafety German government builds national energy balance consisting of sustainable, safe and affordable clean energy with minimal transactional costs.

Whilst the UK and Germany actively domesticate clean energy, the Russian government does not set any ambitious RE targets (Appendix C) and the energy policy there, in general, is directed to enlargement of production and export of fossil energy, development of nuclear energy. Energy strategy aims to modernise the energy production, which means to increase the energy efficiency during the production process itself and decrease the costs connected to transportation and outdated equipment (Energy Strategy 2035). It may be explained using several rationales, first of all, Russian possesses huge, low cost domestic energy reserves which are easy to mine. Germany does not have any and Britain has, but those it does are very costly to mine. Due to the natural allocation of fossil fields, Russia has never experienced such issues as an import of energy

sources, energy safety, energy deficit. Especially nowadays against the economic recession, fluctuating GDP, drop in production and continuous growth of energy extraction lead to the surplus of energy sources (Interviewee 7, 8, 9, 10). The UK and Germany are both importers of fossil sources from Norway, Russia and some OPEC countries (Office for National Statistics 2016; Eurostat 2018). Due to high dependency of Russia on energy export, the only thing threatening the local energy market is lack of customers. Thus, the questions of energy dependency and searching for a new reliable source of energy are very logical ones for the UK and Germany, but not for Russia.

However, remote regions show interest in clean energy. Historically Siberia and the Far East were provided with energy by means of coal, water energy plants, and the most remote settlements used diesel generators, which often do not provide 24/7 access to the electricity (Yelistratov 2016). In addition, the regions are not connected by grids and networks, making developing the RE the most rational and pragmatic solution (Interviewee 7, 8, 9, 10). This already started to bear fruit in Murmanskaya Oblast, Belgorodskaya Oblast, Respublika Yakutiya, Altai region (Berdin et al. 2017; Andronov 2017). Moreover, public support in these regions facilitated the introduction of RE since the constant increase of the coal burning in growing cities of this part of the country might lead to social discontent (Komsomolskaya Pravda 2012; The Moscow Times 2018; Meduza 2018).

In terms of the whole country, the main possible driver for alternative energy deployment is economic profitability. First of all, it is connected to the already mentioned fact of the sufficient and even surplus of the energy sources. The process of energy production on numerous fields and transportation has been already adjusted for decades what makes the RES uninteresting for development. The second possible driver can be the environment and climate change but due to the current economic situation, a high percentage of the population lives below the poverty line, as such these people do not have an opportunity to worry about sustainability (Interviewee 9, 10). According to post material values theory developed by Ronald Inglehart, society starts to concern about post material values such as human rights, politics, environment, sustainability only after material needs such as economic and physical security are satisfied (Inglehart 1997). The population of Russia still share survival values instead of values of self-expression (Inglehart and Welzel 2014), meaning the environmental driver does not work. Even the Chernobyl accident could not impact on the public opinion, it had happened somewhere far from population and their personal economic issues were more important. Some citizens of the area did not even

evacuate (Smetannikova et al. 2016). International pressure could drive the transition but today's confrontation with Western countries makes the government and the population act independently to protect the sovereignty of the country from a "Western conspiracy" (Interviewee 8, 9, 10; Marcus 2018; Tsygankov 2012; Rynning 2015). So the only possible rationale for the Russian government to introduce the RES might be economic aspect (Interviewee 8, 9, 10) and not energy security or climate change. In a case of renewable facilities being cheaper and more affordable for citizens, the energy transition can take place:

"The main drivers are support and price. Price has to be very low. If the cost of facilities [RE] for private consumers and households is very low, it will call in question consistency of all existing systems and existing failures in energy networks"

Interviewee 8.

"I personally think, the issue [sustainable energy transition] is not in politics, in reality it is in money"

Interviewee 9.

Answering the third research question of the study, all three cases demonstrate different values, rationales, and approaches to RE deployment and consequently it leads to different energy trends and future perspective. The next section examines political reasons for the diversity in approaches.

Decision-making and policy style

All three cases demonstrate different political systems and consequently contrasting political culture and decision-making process in every sector including energy. At the same time, as it was established in Chapter 1 of the paper, political change in different political cultures is possible if a combination of factors happens and opens a window of opportunity for political entrepreneurs to break into political system (Kingdon 2003). Coming back to the ACF and MSA the integration of the RES becomes feasible when RE network reaches the political agenda. This section analyses political process in all three cases to clarify the factors shaping the access to decision-making for the RES.

First of all, it is worth considering the problem-solving type and relation to other actors, components of political style developed by Richardson et. al (1982). German Energiwende demonstrates a clear example of the anticipatory approach, the country takes measures to prevent the possibility of nuclear accidents. While the UK historically formed the reactive approach and precedent legal system (Zweigert et al. 1998; Dobbins 2010; Gennaioli and Shleifer 2006). In contrast with Germany, Britain's reaction to a nuclear accident in Sellafield in 1957, which was ranked as a 5 out of 7 on the International Nuclear Event Scale, was mainly concluded in a renovation of the station and new regulations on nuclear safety being issued (Blowers and Pepper 1987). At the same time, Russia illustrates an ambiguity in problem-solving approaches. In cases with the most interest for the government sector, it pursues very active anticipatory approach, while other sectors not arousing the interest of political elite get attention only after precedent has happened (Akimov and Porfiriev 2012). For example, recently the waste accident happened in Volokolamsk, Russia: a group of children were intoxicated by gas emitted by the local dump. Only after this incident, local government has taken measures to demolish the dump (Meduza 2018; The Moscow Times 2018).

The path with which the government solves the problems determines the reaction on external and internal shocks, which may collapse the political stability and bring a change of structure, allowing an innovation breakthrough (Sabatier and Jenkins-Smith 1993). Germany tries to protect the system from different shocks, reaction to nuclear accidents clearly demonstrate it. In case of extraordinary situation, it will follow the already prepared plan. However, obviously, the German government cannot predict external shocks. Following the Richardson et al.'s (1982) logic, the British reactive approach should make the system more vulnerable for shocks since it does not have preventive basis, however, in practice, although the government does not control the market, it takes into account various scenarios and pursues energy policy consisting of several types of energy sources instead of choosing the main one. In the British case, the problem-solving classification does not explain the reality. Shocks that are able to destabilise the Russian political system need to be wide-scale enough to affect both the population and political elite. Since neither Chernobyl 1986 nor Fukushima were demonstrative enough for Russian energy policy (Interviewee 9), the event should impact the country directly to provoke the government into a reaction.

Another important aspect is a consensual or imposing relation to other political actors (Richardson et al. 1982). Analysis of British and German political culture demonstrates them as open systems which are willing to engage with the public in different extent. For example, although public participation is consolidated in British political process and there are plenty opportunities to express one's voice, a right of legislative initiative, such as petitions of opposition (ParliamentUK 2018), a right to publish a petition online (Petitions 2018), consultancies with the market and civil society (GOV.UK), some lobby groups remain to be more influential than the others even though according to the logic of open and transparent government everyone in the state may promote his ideas in the same way (Guidance for civil servants: contact with lobbyists 1998). Thus, British consensus system of government (Lijphart 1997) is indeed very inclusive and open for participation of private companies, local governments, and NGOs (Osipova 1992, ParliamentUK), but in some sectors the biggest role in decision-making is often played by specific interest groups and big business.

In Germany, the consensus political culture implies the creation of coalitions and reaching the consensus in the decision-making process. It is logical for parliamentary groups to unite and gain more votes to promote the legislation together than compete. This is also a way to avoid a veto of other political actors (Strohmeier 2006). The German Parliament considers the engagement with interest groups and trade unions as a great advantage to its decision-making process, and regularly invites interest groups and experts of public opinion to work together on the Bill (Deutsche Bundestag 2018). Historically German culture pushed people to be a member of different societies: sports clubs, baking lovers, political parties, trade union etc. Citizens have been participating in some groups as leisure activities from the middle of 19th century. Later it had developed to the expression of interests and with time it has embedded and institutionalised to the political system. Development of the system, technological progress, economic growth, globalisation and new challenges increase the willingness of people to be heard in political context. The idea of participation in a political process named Germany a “society of associations” (Speth 2014) and nowadays this culture of participation still exists and the number of groups grows every day. To be able to participate in Parliamentary Committee meetings the interest group needs to be registered in the association list of the German Bundestag. Nowadays the list contains 2325 associations (Deutscher Bundestag 2017) specialised in various fields, however, the most important sector for lobby remains to be those which are not liberalised completely: energy, industry, health, financial market and banks, transport, and defense. At the

same time, the German political system includes several veto-players, however the veto right belongs to the large political groups like Bundestag or Bundesrat, embracing the opinion of all represented political parties or Lands (Strohmeier 2006). Hence, the German political system can be recognised as open and decision-makers are willing to cooperate with interest groups and listen to demand from the public sector. This is an integral part of German political culture which determines future political process in different sectors.

Russian decision-making process is rather an imposition than consensus. According to the Russian legislation different NGOs should be included in the political process, and in practice, while they do exist and are present, their opinion is barely heard. Moreover, there is a tendency to create fictitious NGOs organised by the government, with aims that actively support governmental policy in legislative committees and public sector (Interviewee 10). Historically, during the Empire epoch and Soviet time, the country was governed by a single ruler, or a small group of rulers, and this style has transferred to the modern time. The political system is open to specific groups and political entrepreneurs who share same interests with the government (Interviewee 8, 9). At the moment, RE and climate policy are not included to the government's interests and that is the reason for ignoring the opinion of NGOs and RE companies. The government may easily frame the policy up using the veto. For example, the President had vetoed Bill on Renewable Energy Sources in 1999 due to poor economic and political situation (Velkin et. al 2013) and RE in Russia still has no legislative basis (Appendix C). Hence, closed political system and veto players, sufficient reserves of conventional energy resources, lack of public interest and stimulating event have caused the absence of driving interest for RE.

The most important variable included to the ACF and MSA is shocks destabilising the political system. In reference to Britain and Germany, it has facilitated the RE integration. The UK is a very stable democracy some external shocks, such as oil crisis of 1973 demonstrating its dependency on fossils and threatening its national sovereignty, and internal shocks, such as Thatcher's liberalisation policy in the UK, created space for private actors to participate in competitive energy market including RE actors. Although it was not that easy to overcome the impact of historically set fossil and nuclear lobbies, which still influence policy now, but RE nonetheless has permeated. Germany is even more stable after the WWII which was a huge internal and external shock, the Oil Embargo 1973 and two nuclear accidents convincing German population to quit

the nuclear sector and thereby giving a chance to RE. These shocks cracked the political stability in the state and opened the system so RE coalitions could permeate the political process and reach the agenda (Figure 8, 9). In both jurisdictions, the stream of problem/reaction on shocks and the stream of solutions, such as RE development, coupled. This gave an opportunity for alternative energy to integrate into the energy balance.

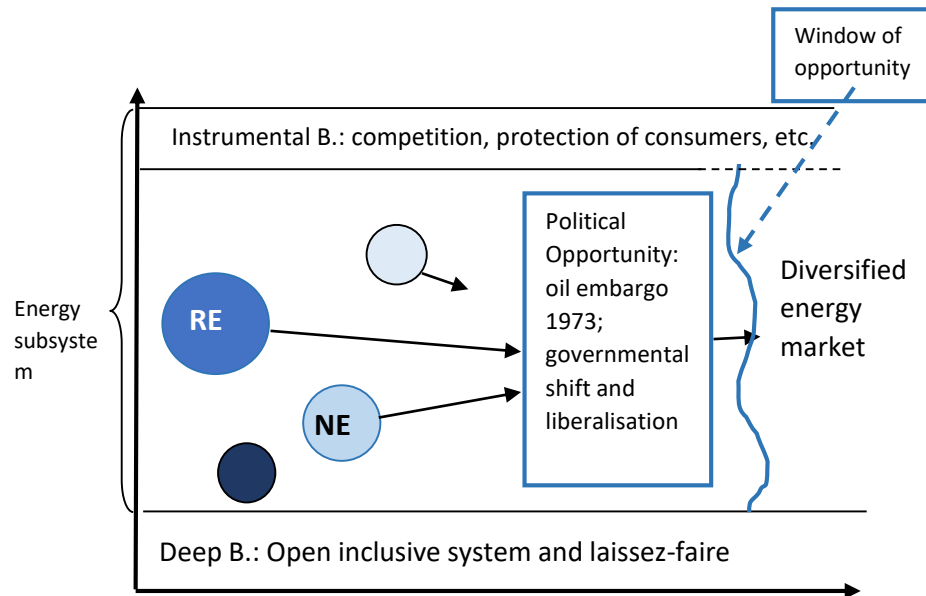


Figure 8: Application of ACF and MSA to RE development in the UK

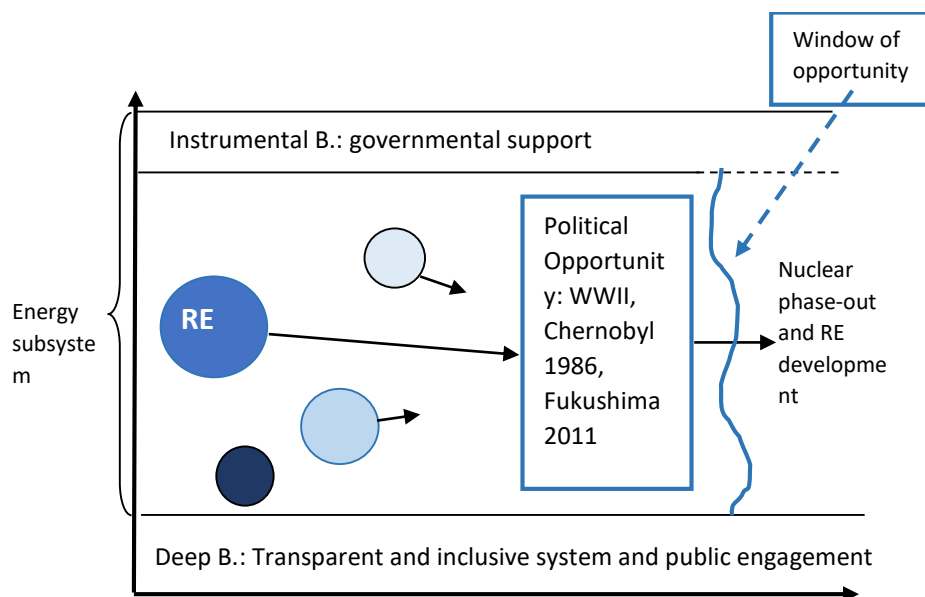


Figure 9: Application of ACF and MSA to RE development in Germany

In Russia, in contrast, no shock event happened to stimulate energy transition. Neither Chernobyl 1986 nor Fukushima affected the energy policy and public opinion:

“The last [nuclear] accident we had in Japan...too far to impact on the public opinion”

Interviewee 9.

The WWII, Oil Embargo 1973, and Cold War had never threatened the security of Russia's energy supply. Even the break-up of the Soviet Union 1991, followed by an ideological shift which is considered by Sabatier and Jenkins-Smith as an internal shock (Sabatier and Jenkins-Smith 1993), and which could make the change, had not really opened the window of opportunity. This can be explained by the poor level of economic development in the country, shock-therapy 1992-1996 and liberalisation did not facilitate to increase of incomes of the population (Figure 10).

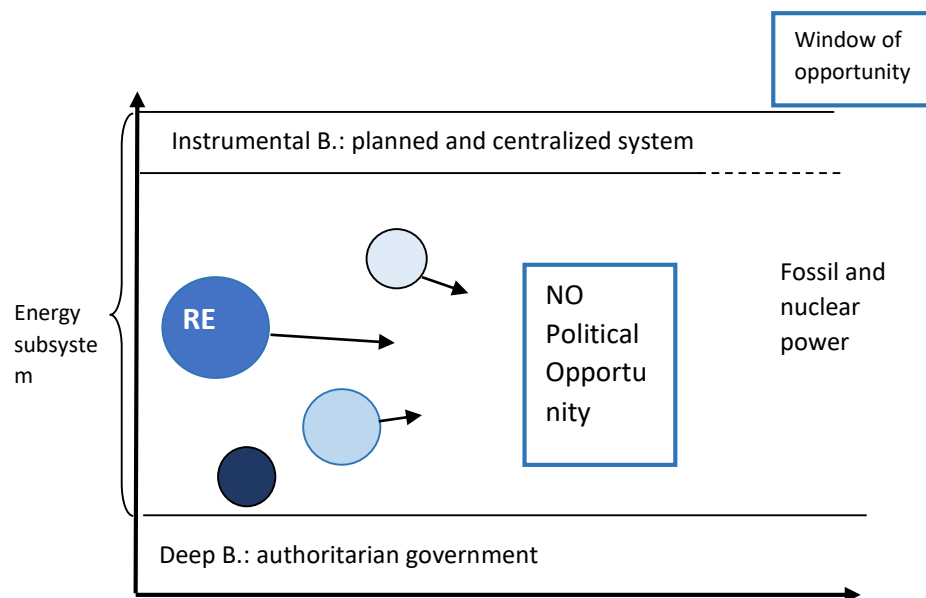


Figure 10: Application of ACF and MSA to RE development in Russia

Due to the feeling of economic insecurity, the population did not think about alternative energy. At the moment of the ideological shift, the “solution stream” was not developed enough to permeate to the political process. The breakdown itself did not create a shock situation, although the country had chosen a democratic pathway, the political transition did not happen at once. After the Soviet collapse, the energy sector was still nationalised for some time, and then transferred to authorities of state corporations (companies regulated and financed by state). Additionally, sufficient amount of domestic reserves did not contribute to increasing the interest for it. In a nutshell, the energy system did not change and until government pursues its personal interest and benefits it will not provide room for new players in the energy market:

“There is no political interest, there is an interest in using of fossil fuels, there are players, there are interests of lobbyists. It is not just an interest of private companies The aims are innovative, but our economics are not innovative, they are imitational. We have imitation of process, imitation of objectives, imitation of results, that’s it. The main interest is interest of traditional companies [including state owned]. Their interests are satisfied; they are all right. And these environmentals, why do we need them”

Interviewee 8.

The last factor which may adjust the political culture, but by no means least important, is the polity in three countries which makes the RE penetration develop in different scenarios. The British political territorial system is interesting as, although it consists of several partially independent countries, it is declared as a unitary state with a devolution of powers between countries. Germany is an example of clear symmetric federation with equal rights and powers among regions, while Russia is an asymmetric federation with regions with different status. Development of energy sector in three cases varies, to be more precise, varies from region to region within every case. In the UK for example, Scotland gets much more freedom in energy policy compared to Wales and it leads to very different results on RE introduction (Cowell 2017). Development of RE in Germany happens evenly from Land to Land, however, the main problem there is connected to geographical position. At the moment, RE facilities mostly prevail in Northern regions due to favorable climate conditions while Southern regions have to use fossil energy (Interviewee 6; Appunn 2018). Nevertheless, the federal policy on RE goes down to the regions and implements according to the local particularities. In the Russian case, the federal government provides freedom to the regions to choose their own policy and the main requirements are to not contradict the federal policy (Constitution of the RF, Ch.3, S. 71). That is why the position of the local government on RE is very important for some regions. For example, new governor of Murmanskaya oblast personally supports the energy transition and that is why he interacts with local NGOs very actively, promoting RE private companies, stimulating the RE penetration with accessible economic tools, and it leading to the increase of RE share in energy balance of the region (Interviewee 10; Berdin et al. 2017). At the same time, former governments were connected to the conventional energy sector and hampered the RE development

(Interviewee 10). The territorial system of three countries provides different conditions for the deployment of renewables from region to region within one state. Every country within the UK and subject of federation in Russia represents an independent political system with individual political culture. It is important to take this point into account in the formulation of possible recommendations.

Economic aspect of energy policy

The configuration of the energy market, and its level of centralisation, is very important for RE integration. Liberalisation of energy markets in Britain and Germany have facilitated the development of the RES. In 1983, the Energy Act implying liberalisation and privatisation of energy sector came into force in the UK. From that moment government transferred the duties in the sector and aimed at ensuring that market functions properly and with efficient energy production and distribution. The Office of Gas Supply (which later emerged with the Office of Electricity Regulation) aimed at protecting the interests of consumers was found. It started with setting the maximum price for private companies and cancelled it at the beginning of the 2000s when the gas sector was fully privatised and the private companies settled into a condition of competition. Now the authority issues licences to companies willing to operate in electricity and gas sectors and sets the rules of the game and regulations. The same thing happened to nationalised electricity: Central Electricity Generating Board existed from 1957 to 1990s and aimed to produce, transport and provide consumers with electricity in England and Wales. During the liberalisation, the duties and assets of the CEGB were privatised by three energy generating companies, PowerGen, National Power and Nuclear Electric (now EDF), and an energy transport company, the National Grid Company. The number of energy companies grew with the time and nowadays there are ten large-scale energy company: EDF Energy, E.ON., RWE., Scottish Power, Centrica, SSE, Drax Power Limited, International Power/GDF SUEZ SA, Intergen, ESBI and numerous small companies.

The German electricity sector has never been monopolised by the government (Dickhaus and Dietz 2004: 47), however, there were “territorial monopolies”, meaning that 8 energy supply companies: RWE, VEW, EnBW, BEWAG, HEW, PreussenElektra AG, BayerwerkAG and VEAG had demarked the areas of operating. So the National Energy Act 1998 provided the liberalisation of the energy market in terms of the “territorial” monopoly and gave the opportunity to other private companies to enter the competition in electricity sector. The process of liberalisation was

accompanied by the establishing of the Federal Network Agency aimed to regulate the electricity and gas markets and to ensure fair competition and overseeing the transmission networks (Lauber 2017). Nowadays, German electricity production is provided by numerous company as well, but with the largest share belonging to just four: RWE, E.ON, EnBW and Vattenfall Europe, which mainly produce the electricity from conventional sources. However, there are plenty of smaller companies and households which actively use RES. Transmission of energy is provided by several companies: Amprion, TenneT, EnBW Transportnetze and 50Hertz Transmission.

Although the biggest energy players in the UK and Germany have saved their positions, or transformed to new companies with same aims and views, the market itself was expanded through the participation of small and medium companies promoting the RES. The German market transformation demonstrates more successful example due to very strong public opinion, hence a high activity in introducing the RES technologies (Lauber 2015):

“It’s [model of ownership] been extremely helpful and instrumental because without all these citizens we wouldn’t be where we are because people invested not only to make money but also they wanted to change something. That was an opportunity to do it and that creates a huge market”

Interviewee 4.

Providing fair competition is the main objective for energy legislation in both countries (Appendix A and B), in order to make the market open for other players. Although the strong influence of conventional energy incumbents still exists, there are ways to permeate for RE companies. In contrast, the Russian energy market is not liberalised completely. Nowadays there are six wholesale thermal power-generating companies, 14 territorial generating companies and international investors (E.ON, (German) RWE, (Italian) ENEL, Finnish Fortum). Nearly all Water-Power-Plants are controlled by state-owned RusHydro, nuclear power is controlled by ROSATOM. The 60% of total gas and oil production and national reserves belongs to state-owned ROSNEFTEGAZ (including shares in Gazprom and Rosneft) which explains the interest of the government in the development of these sectors. Due to the decentralised and liberal energy markets in the UK and Germany, new energy players received an opportunity to enter the market

and compete for the consumers. The Russian energy sector is closed and politicised, there are only several companies in energy production which have already set up the tooled process of energy production, domestic fields, pipelines system, contacts, technologies and clientele, and renewable companies do not have room to reach the competition and participate in energy market (Interviewee 9).

It is worth to note that in Germany and the UK, the main force for energy transition was played by small and medium RE companies. In turn, they were stimulated not only by the interest in environmental protection but also in financial mechanisms policy pursued by the government. Thus, despite of Renewable Obligations (RO) suitable for big energy companies (Ofgem 2018), there are Feed-in Tariff (FIT) for smaller ones and several other financial incentives launched by the government such as Renewable Energy Guarantees of Origin (REGO), Energy Company Obligations (ECO), Non-Fossil Fuel Obligations (NFFO), Renewable Transport Fuel Obligation (RTFO), Renewable Heat Incentive (RHI), etc. Germany was the first country to implement FIT under the Feed-in-Tariff Electricity Act 1990 (Appendix B: Renewable Energy Sources Act 2004, 2009). It led to the successful result, and Germany demonstrates high indicators in RE sector. In 2017 the government introduced new means of support – auctions which cancel FIT and provides subsidies based on a bidding process. German government believes that the cut of subsidies will not stop already launched energy transition but will help to reduce the governmental cost of RE development without retardation of Energiewende.

The Russian energy sector found financial support from the federal budget, however this is mainly sent to the conventional energy sector. The distribution of the budget seems to be very illogical, since the sector is self-sufficient and generates huge profits yet it still gets support. The tradition to support fossils and nuclear remained from the past and now strong lobby and personal interest of government only accelerate it (Interviewee 8, 10). The situation changes at the regional level where regions might coordinate their own budget and invest to RE. Although there is no legislative basis devoted to RE in Russia, no special incentives or financial support mechanisms are set to stimulate the RES deployment.

With regards to SMEs, which played an important role in RE development in the UK and to a greater extent in Germany, there is no such driver in Russia. From the economical point of view, the layer of middle class has not formed yet, the inequality and the gap between rich and poor people is huge. Moreover, Russian legislation hampers the formation: RE SMEs and private

householders willing to integrate the RE are required to follow a wide list of rules (Appendix C) and pay high taxes to connect to the national grid (Interviewer 10). Should the system of connecting to grids become easier, small and middle size RE companies will strengthen and increase the RE share, decentralising the market and threatening the centralised system, which would completely contradict the interests of the government.

Different types of energy market, and different mechanisms of support, definitely determine the development of the RES (Garciano 2011; Sawyer 1985; Zhang et al. 2016; Sadmo 2008; Park 2015; Lauber 2012). Selected cases illustrate that liberalisation of the energy sector is necessary to create a chance for other players to permeate to the energy competition. Alternatively, the government must show an interest in RE to such an extent as to include it in their policy plan (e.g. China). The Russian government is closely related to fossils and nuclear and this strong interest does not allow RE entrepreneurs either reach a political agenda or to get financial support.

4.3. Role of political culture in renewable energy sector

Comparative analysis of political culture in three countries demonstrates the strong connection of today's policy and some settled models of behavior arising from historical precedence and rooted in the political system. Furthermore, it can be traced not only in actions of political actors but also in population behavior. German and Russian cases here illustrate two opposing forms of public support. As it was already mentioned, the discourse of *Energiewende* in Germany initially had appeared due to public awareness and then population played an important role of driver for the energy transition. Of course, there were some political issues on the way, such as the coming into office of the social-democratic coalition, which has always supported interests of big companies (Interviewee 4, 5, 6) and which even revised the original idea of nuclear phase-out in 2010 (Appendix B, *Energiekonzept* 2010). However, even though political lobby for conventional energy companies exists, interests of the society have been heard and RE develops constantly.

On the other side, political actors are involved in cooperation with civil society to listen to the demands and that is also a part of German political culture in every sector of politics. The history of the 20th century left an indelible print in German political culture which pushed the government to create maximally open and transparent political system with high level of inclusiveness of civil society to the political process (Strohmeier 2006). Thus, the configuration of relations between government and society is determined by historical lessons. Like everywhere else, energy issues in Germany are subject to lobbying. Political interest groups operate in this sector more actively than in others because it is still not liberalised completely, and some issues

might be only solved by government. That is why lobbying is one of the ways of influencing the political process, and traditional energy communities remain strong everywhere.

Impact of public opinion in Russia has developed from a totally opposing scenario. Due to the fact that the country has been always governed by a political elite, the population never had faith in its ability to instigate change. Unfortunately, this mindset is still widespread nowadays, public participation is based on a belief that the government knows best, and the individuals vote is not able to have any effect upon the political climate or direction anyway. The parochial civil culture hampers the penetration of innovative ideas from the bottom. The situation is changing now, but predominantly in big cities where the percent of highly-educated people is greater. However, the behavior of government also yields to a historically formed model of the behavior of an authoritarian ruler. The size of the country and diversity of the regions and their needs requires a stronger power capable of uniting and restraining them. At the same time, the access to political power is limited and only certain group of people can affect the political decision-making. Nowadays the privilege of affecting the policy-making belongs to traditional energy network (Interviewee 8, 9, 10), and due to embeddedness of the industry to political system through state corporations, other players can act only at the regional level. This logic is traced in today's political power and together with parochial civil participation might last for an undefined length of time. Applying these features of Russian political culture to the energy sector with the surplus of energy reserves makes the idea of energy transition almost impossible.

In terms of public participation, the British case is different due to a very stable democratic political regime. Some historical events such as civil wars in the 17th century, and the Protectorate, inculcated awareness of radical reforms and taught to appreciate stability and order. At the same time, seeds of the Parliamentary form of government had taken root (Osipova 1992, Mackenzie 1955). The political system has been evolving all the time including new elements and adapting old ones without making very radical reforms. The balance between government and limitations imposed on it is the main characteristic of British political culture which had been in formation over many years. The right of opposition, accountability of government to parliament and voters, and the system of checks and balances are attributes which have been accompanying the political system in the UK. The other important part of British political culture is the legitimacy of the political system provided by the government. Due to the openness of political system and numerous opportunities to get involved, British citizens trust the government and follow the rules and regulations. In its turn, thanks to support of civil society,

the government can operate autonomously and efficiently whilst staying accountable to its citizens (Osipova 1992, ParliamentUK). Analysis of energy trends in the UK does not allow one to state that public opinion played an important role in the development of chosen low-carbon energy policy. International pressure and awareness of climate change could be more effective drivers for it.

The role of traditional energy lobbyists is highly important in all three cases:

“There is very strong influence of nuclear, oil and gas lobby which does not leave the room for RE!”

Interviewee 3 (British case);

“Because they [government] are too close to the old energy industries and that’s the old story. Many of those are old state owned utilities. So many politicians still, they move after they stop being ministers, they walk to one of these companies, they get real paid jobs there”

Interviewee 4 (German case);

“Lobby is here, let’s speak frankly. Naturally, oil and gas lobby is very strong and it will always get much more support”

Interviewee 10 (Russian case).

However, due to a combination of other factors (openness of the system for other players, the role of public opinion, public participation itself, economical aspect, political rationales for RE development, energy status-quo) intrinsic to different political cultures, the role of fossil fuels and nuclear communities appear differently. In Britain they tried to keep their positions and to find consensus, to follow new environmental standards and adapt the new trends to their activity (for example, through RO). In Germany they conceded their positions in favor of RE. In Russia they are tightly integrated to the political power.

The analysis provided above can be reduced to two important constituents of political culture in relation to energy policy, it is the extent of market decentralisation and openness of the political system for changes. Thus, it allows to range selected cases according to these two aspects (Figure

11): Russia represents a country with centralised energy market, closed political system and lack of access to decision-making for other actors; the UK with its decentralised market still struggles with influential interest groups which provide obstacles to the participation of RE political entrepreneurs; and Germany with decentralised market and extremely open political system including RE associations, supportive public opinion and RE private companies. In this analysis combination of history, features of political system, culture of public participation and governmental openness has led to the highest RE indicators in German case. German culture is an example of mix of factors lacking in Russian and British case once allowed to RE permeate to the system and supports its development till nowadays.

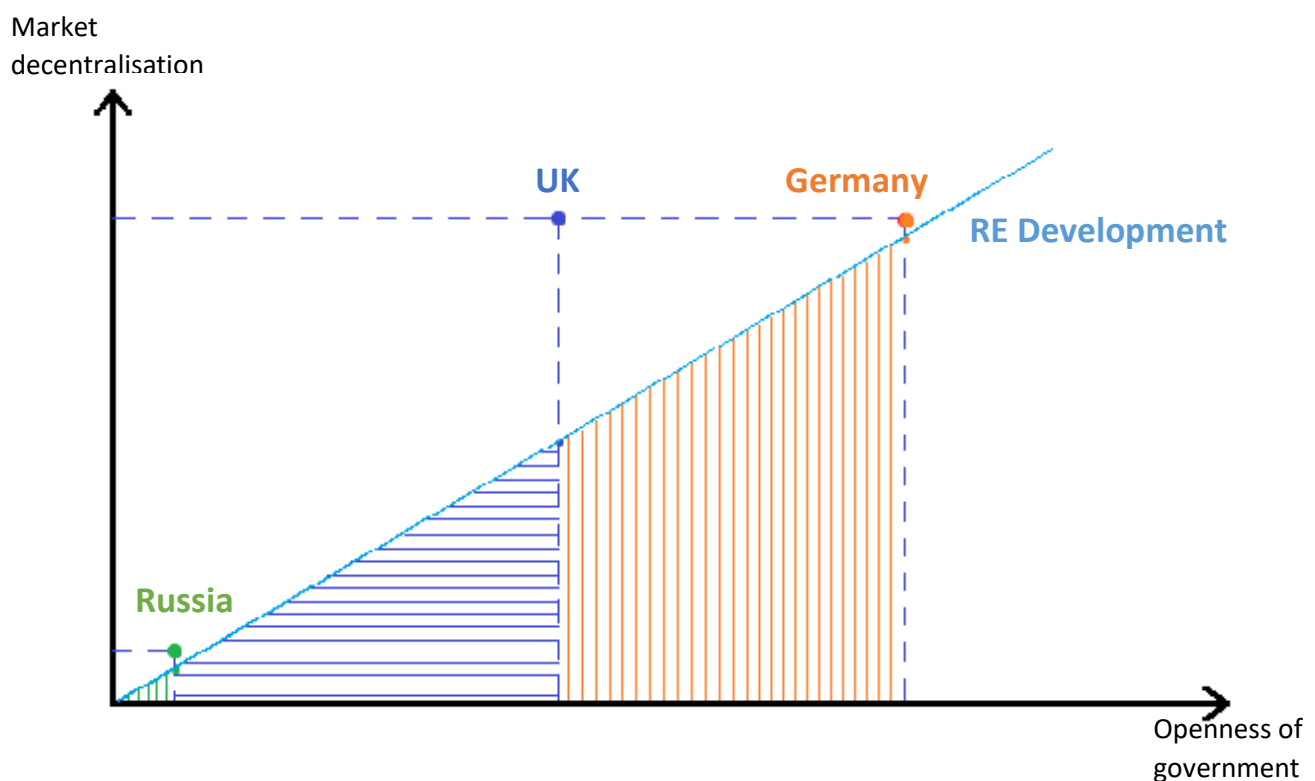


Figure 11: Classification of selected cases based on characteristics of national political culture (developed by author)

5. Conclusion

5.1. Main Findings to Research questions

What is political culture and how the term might be operationalised?

Political culture is a very complex and difficult notion to measure. This research used a non-classical vision of the term which is based not only on the type of public participation in the political process but mainly focuses on a composition of historical formal and informal

governmental institutions (rules of the game) embedded to the political system. The research appeals to political culture as a complex of historically shaped views expressed by people who make political decisions which later institutionalise in governmental structures and influence on pursued policy in future (Dobbin 2013). Therefore, political actors and their access to political agenda is the centre of the research. These actors unite by the strong desire to participate in decision-making and to make a political change according to their beliefs and views. The configuration of the power between these actors is a part of the political culture which determines the opportunity for political change such as energy transition. Political science approaches such as ACF (Sabatier and Jenkins-Smith 1993) and MSA (Kindgon 2003) explaining the opportunity of actors to impact on policy cycle and make the changes used in the paper to see how political culture in the energy sector in a state frame the decisions and access to making these decisions.

How does political culture differ in chosen countries and what are the main trends and status-quo of renewable energy development in chosen countries?

As it was expected German and British cases illustrate a very liberal approach to the new actors compared to Russia. The British government has been providing the conditions and freedom for market regulation and seeking the role of observer rather than a regulator. Although the main energy policy nowadays is low-carbon economy including development of the RES with acceptance of nuclear energy and reduction of using fossil energy, British government is taking its time to expel the use of conventional sources due to strong lobby from fossil energy supporters (Interviewee 3; Fouquet and Pearson 1998) which formed during the last century when the country was rich in endowing with domestic fossils fields. The government does not set very high targets for RES, instead, it aims to diversify the national energy mix by means of RE and nuclear power with the support of natural gas. The strategy kills two birds in one stone: it meets the commitment to reduce CO₂ emission and to fight against climate change, while at the same time it secures the energy balance. It benefits from a system where, in case of failure of one of the sources (or external shock), the government can easily compensate.

German political culture, mostly shaped by historical events of the 20th century, has been seeking to set inclusive political process and the government has always been very attentive to the demands of various interest groups, associations, trade unions and other communities which actively express a public opinion (Deutscher Bundestag 2017; Transparency International 2014). The German government ended up with consensus format of democracy where political actors

are forced to listen to the interest groups and satisfy all of them in order to obtain voter support for the next political cycle (Lauber 2012; Broekel and Alfken 2015; Aklin and Urpelainen 2013; Royle 1994). Hence, Energiewende, out-and-out nuclear phase-out and gradual shift from fossil sources towards renewables has happened significantly thanks to strong anti-nuclear movement and RE groups of support. Germany is an importer country; as such energy security is one of the main rationales for energy transition. To decrease the dependence on oil and gas imports, the German government has sought to set a domestic, accessible and reliable energy source which secure the energy balance from exogenous influence. In this it seems to have succeeded, and now RE composes more than 1/3 of total German energy mix.

In contrast, historically, lack of public participation and authoritarian political decision-making (Evans 2011; Hahn 1991; Lussier 2013) make the Russian political system stable, and closed for innovation and new players. At the same time, the history of the 20th century and confrontation between West and East to some extent determined the approach to energy policy perceiving all innovations coming from the West as negative or threat to the sovereignty of the country. The awareness of energy dependency, climate change, and sustainability are not the main focuses due to a poor economic situation, solid resource reserves, and a planned and centralised economy which formed oligopoly in the energy sector (Ahrend and Thompson 2005; Pirog 2007). The only trend in Russian energy policy set in energy legislation is modernisation of oil and gas extraction and production process. Due to global trends and arising awareness of climate change, the future of conventional energy is unpredictable and that is the reason why Russian fossil companies increase the production and export now. RE does not receive enough attention from the federal government due to its interest in fossils, however, a few regions do demonstrate some positive movement towards clean energy.

How does political culture influence the development of the RES in chosen countries?

Political culture directly determines any political change in the country. The history of the country institutionalises some practices and experiences, which later shape the decision-making process: it sets the configuration of political actors, their power in decision-making, their willingness to cooperate with other players, their approach to solve the problems and respond to shocks, their influence on the openness of the political structure. Moreover, political culture defines relations between non-political players such as associations, NGOs, business and private companies and the political structure itself. Such factors as the level of technological development, different types of financial support, and the territorial-administrative form of the country doubtless impact

the implementation of innovation including introducing the RES, however, it is pointless to look at it regardless differences in political culture.

There are plenty of studies examining factors which facilitate the RE deployment, however, only few consider impact of history and political tradition which actually may direct the decision-making in the sector. The idea of integration of the RES originally embodied the pursuing the common good which does not bring any profit: the facilities are expensive, the energy is not constant and may depend on the weather conditions, it not universal due to geographical conditions. However, the study demonstrates that nowadays, the discourse of RE implementation has changed and the outcome of the RE implementation became much more profitable than it was before. Governments of many countries may still discuss the climate change as a main motivation for energy transition, however, the three cases illustrate that there are other, much more tangible ideas behind it which render active many interested political actors and political entrepreneurs, who struggle between each other over the goal of influencing the decision-making process, and potentially instigate a political change.

In addition, the existing studies often offer the ideal set of factors which makes the integration of the RES successful, but, as has been previously mentioned, individuals who make the decisions bear very different political mind sets, leading to extremely varied communication and political processes from country to country and, moreover, from region to region. The culture of the political process is a very solid characteristic of a political system which has taken root with the history and which is reflected in decisions made today. It makes it impossible to apply some mechanisms successfully implemented in one country to another country due to individual political culture. There is no list of clear conditions necessary for political change suitable for every jurisdiction and that makes it difficult to generalise the results of the analysis and make practical recommendations for other countries. All the changes need to be considered from the perspective of existing political culture and historical context which formulated the culture. Energy transition here is understood as innovation and it requires the favorable environment to be launched and then stimulus to maintain the development,

“Energy transition is a very complex process embracing many other sectors of politics and requires concomitant changes in these sectors and also shift in public understanding of energy. It doesn’t happen in one day, it is a long-term process which meets many difficulties on the way”

Interviewee 7.

5.2. Limitations

The main limitation of the research is connected to conducting the expert interviews. Since the study is cross-national and most interviews were conducted by phone and Skype, it was difficult to set the suitable time and to provide good quality connection and recording. In result, one interview was not recorded until the end due to technical issues and one interview was collected in a written form due to the heavy workload of the respondent. Another concern was connected with the willingness to share the information, although in fact only one interviewee refused to be recorded.

The other limitation was time. Analysis of political documents could be more detailed and have included earlier legislative acts devoted to energy sector, but due to the time the research examines the latest energy acts and strategies adopted after the most important change in the sector: for the UK and Germany – liberalisation of energy market; for Russia - Soviet breakdown.

5.3. Recommendations for further research

Nowadays, the topic of RE is extremely popular in cross-national studies, however, researchers often do not efficiently account for the constituent of political culture which contributes to the framework of the decisions made in the sector. Hence, it is always very important to include the configuration of political actors influencing the process of decision-making in the analysis as a background aspect, and then consider others. The other recommendation is to look further to the regional level in case of some countries. As it was already mentioned the RE development in Wales and Scotland differs the same as in Murmanskaya Oblast and Kemerovskaya Oblast, however, all the regions follow the same federal legislation, it might be interesting to ascertain the factors influencing RE development work there.

Although Germany and the UK are two very popular cases for cross-national comparison, Russia is a largely unexplored frontier in terms of RE. In fact, the analysis of Russian political culture demonstrated the very closed political system and many processes embedded in the politics have an informal character which is often reflected in inaccessible information. At the same time

however, due to the fact that country is particularly expansive and includes regions which experienced very different historical events, shocks, the political culture, they may differ significantly, and these obviously determine political decisions there. And since energy questions are included both to the competence of the federal and local governments it makes it interesting to compare the regions or at least look at the configuration of influencing actors there.

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Appendices

Appendix A: RE in British Legislation

Year	Document	Content
1986	Gas Act	<ul style="list-style-type: none"> Gas Consumers Council is a corporate body designed to protect consumer rights and investigate complaints Abolishment of the British Gas Corporation The new Director General is appointed by the Secretary of State for a term of five years and may not be re-appointed. This Act also makes new provisions for the supply of gas through pipelines.
1988	White Paper Privatising Electricity	<p>The privatisation and liberalisation of the energy market start with this document. The main ideas:</p> <ul style="list-style-type: none"> Restructuration of state monopoly, Dissolution of the vertical integration, Liberalisation of energy generation
1989	Electricity act Does not include Northern Ireland	<ul style="list-style-type: none"> Consolidates White Paper 1988 Liberalisation of energy market, Energy production is running by four new energy companies Licensing system on energy production, distribution and sale (every energy company needs to get the license from the government)
1995	Home Energy Conservation Act	<p>The document set the target</p> <ul style="list-style-type: none"> to increase domestic energy efficiency by 30% over 10-15 years; to reduce emissions of carbon dioxide (CO₂) (around 20%), local authorities get the duty on energy efficiency all Energy Conservation authorities (all district, metropolitan, unitary authorities) prepare a report on energy conversation activities and potential results in the district including the cost of carrying out the works and the CO₂ savings. Funding on competitive basis
2000	Utilities Act Does not operate in Northern Ireland	<ul style="list-style-type: none"> Formation of new regulatory bodies: <ul style="list-style-type: none"> the single Gas and Electricity Markets Authority The Gas and Electricity Consumer Council (conflict solution, providing information, advocating interests) balance between interest of consumers and stakeholders Office of the Gas and Electricity Markets – the main regulatory body for electricity and gas energy. Its main tasks: <ul style="list-style-type: none"> Providing the efficient competition Protection of the consumers' interests Assistance in taking measures towards environmental protection Assistance in investment promotion

		<ul style="list-style-type: none"> - Financial penalties on utility companies for breaches of license conditions
2003	Energy White Paper "Our energy future – creating a low carbon economy"	<p>The document sets the energy needs to be developed in combination with economic growth and environmental safety – "sustainability".</p> <ul style="list-style-type: none"> • cutting carbon dioxide emissions by 60% by 2050 • maintaining the reliability of energy supplies (avoiding over-dependence on import) • promoting "competitive markets in the UK and beyond" • ensuring that every home is adequately and affordably heated • Regulatory Impact assessment of security of supply and the environment by Ofgem • consultation on the need for a special administrator regime for network operators in the event that the operator of a network becomes insolvent. • an energy services group including Ofgem and energy suppliers to consider how to create an effective market in energy services • review the Renewables Obligation
2003	Sustainable Energy Act	<ul style="list-style-type: none"> • Consolidates White Paper 2003 • Regular reported by local and federal authorities about the progress in achieving the goals set in White Paper 2003 • Consultations and additional funding.
2004	Energy Act	<ul style="list-style-type: none"> • the Secretary of State is empowered to establish new regulatory arrangements for offshore electricity transmission (to be administered by Ofgem) • raising building and product standards, • creating an Energy Efficiency Action Plan for the UK • legal framework for offshore renewable energy projects - wind, wave and tidal - beyond the UK's territorial waters • Renewable Energy Zone (REZ), adjacent to the UK's territorial waters, within which renewable energy installations can be established • Award licenses for wind farm sites in the REZ on much the same basis as it currently leases sites within territorial waters.
2006	Climate Change and Sustainable Energy Act	<ul style="list-style-type: none"> • Main aim: to boost the number of heat and electricity micro-generation installations • To report on GHG emissions and mitigation techniques annually • To set the national microgeneration targets before March 2009 • Annual report on sustainable energy progress (Sustainable Energy Act 2003) • To impose a duty on energy companies to buy energy from microgeneration schemes • To allow microgeneration to operate without a planning permission

		<ul style="list-style-type: none"> • To promote community energy projects; • To promote the use of heat from renewable sources; • Modify the Electricity Act 1989 to enable Renewables Obligation Certificates to be issued to a wider range of people and organisations
2007	<p>Energy White Paper: Meeting the Energy Challenge</p> <p>Scottish government against the nuclear power and new nuclear power plant in Scotland</p>	<ul style="list-style-type: none"> • reducing the carbon dioxide emissions by 60% by 2050 • reliability of energy supplies; • competition on energy market; • affordable house heating; • installation 30-35 GW of new electricity generation capacity within 20 years • Establishing an international framework to tackle climate change, including the stabilisation of atmospheric GHG concentrations and a stronger European Union Emissions Trading Scheme • Legally binding carbon targets for the whole UK economy, reducing emissions through the implementation of the Climate Change Bill. • Encouraging more energy saving through better information, incentives and regulation • Providing more support for low carbon technologies • A new mandatory cap and trade scheme for organisations consuming more than 6,000 MWh of electricity per year, to be known as the Carbon Reduction Commitment. • Energy Performance Certificates for business premises and Display Energy Certificates for public sector organisations. • Low Carbon Transport Innovation Strategy Support for including aviation within the EU Emissions Trading Scheme • Measures to grow distributed electricity generation and distributed heat generation alongside the centralized system. • the Renewables Obligation, renewable energy should supply 10% of electricity generation by 2010, an 'aspiration' to achieve 20% by 2020 • The introduction of the Renewable Transport Fuel Obligation in 2008-2009, with a commitment that biofuels should provide 5% of transport fuel by 2010-2011.
2008	Planning and Energy Act (for England and Wales)	<ul style="list-style-type: none"> • Min. 10% of any new building's energy from RE, • Local councils are allowed to set targets for on-site renewable and low-carbon energy and energy efficiency standards in addition to national requirements • Feed-in-tariff
2008	Energy Act	<ul style="list-style-type: none"> • Consolidates Energy White Paper 2007 • Strengthen the Renewable Obligations • Strengthens the regulatory framework for offshore gas supply infrastructure to enable private sector investment • Creates a regulatory framework to enable private sector investment in Carbon Capture and Storage project

		<ul style="list-style-type: none"> • Strengthens statutory decommissioning provisions for offshore renewables and oil and gas installations to minimize the risk of liabilities falling to the Government • Improves the offshore oil and gas licensing regime in response to changes in the commercial environment and enable the Department for Business Enterprise and Regulatory Reform to carry out its regulatory functions more effectively • Ensures the operators of new nuclear power stations accumulate funds to meet the full costs of decommissioning and their full share of waste management costs
2008	Climate Change Act	<p>Reduce CO2 emissions by 80% by 2050 and by 34% by 2020 (risen regarding the UN Climate Change Conference in Copenhagen)</p> <ul style="list-style-type: none"> • to improve carbon management, helping the transition towards a low-carbon economy in the UK <ul style="list-style-type: none"> - 5 year carbon budget which put legally binding limits on the amount of greenhouse gases the UK can emit over a five-year period - New independent body, the Committee on Climate Change (CCC), which advises the government on carbon budgets and monitors progress in meeting them in an annual report". • to demonstrate UK leadership internationally <p>Potential results</p> <ul style="list-style-type: none"> • New green jobs opportunities • New energy efficient houses • 40% of electricity will be generated from low carbon sources (renewables, nuclear power and clean coal) • Gas imports will be 50% lower than would otherwise have been the case • The average new car will emit 40% less carbon compared to 2009 levels.
2009	The UK National Renewable Energy Action Plan	<p>The plan was formed regarding the Directive 2009/28/EC of the European Parliament and of The Council of 23 April 2009</p> <p>It sets the targets:</p> <ul style="list-style-type: none"> • Increase the share of RE by 15% by 2020 where <ul style="list-style-type: none"> - Around 30% of electricity demand, including 2% from small-scale sources - 12% of heat demand - 10% of transport demand. • Financial support for renewables • Unblocking barriers to delivery • Developing emerging renewable energy technologies
2009	Green Energy (Definition and Promotion) Act	<p>Definition and promotion of the Green energy.</p> <ul style="list-style-type: none"> • Reviewing and revision of microgeneration strategy

		<ul style="list-style-type: none"> • Changes of development rights in planning to promote the installation of domestic-scale wind turbines or air source heat pumps • ensuring that any increase in the value of a domestic property caused by the installation of energy efficiency measures or microgeneration systems will not result in higher council tax or, similarly, in higher rates bills for non-domestic properties.
2010	Energy Act	<p>The main attention is paid for Carbon Capture and Storage mechanisms.</p> <ul style="list-style-type: none"> • Sets the target to reduce GHG emissions by 34% by 2020 and by 80% by 2050 • Maintain security supply • Maximise economic opportunities • Protect vulnerable consumers • Carbon capture and storage incentive to support the construction of up to four UK demonstration projects, to be chosen in a competition • for mandatory social price support to reduce energy bills for the most vulnerable • increases the powers of the regulator, Ofgem, to deal with exploitation of electricity distribution constraints by generators • increases Ofgem's power to fine companies • Ofgem's goals: tackling climate change, ensuring secure energy supplies and the role of measures other than competition in protecting the interests of consumers
2011	Planning our Electric Future: a White Paper for secure, affordable and low-carbon electricity	<p>Seeks to achieve safe, affordable and sustainable energy supply. Aims to set a flexible, smart and responsive electricity system, diverse and secure low-carbon sources of electricity, demand management, storage and interconnection; competition between low-carbon technologies, in result the electrification of our transport and heating systems.</p> <ul style="list-style-type: none"> • long-term contracts for both low-carbon energy and capacity; • institutional arrangements to support this contracting approach; • continued grandfathering, supporting the principle of no retrospective change to low-carbon policy incentives, within a clear and rational planning cycle • encouraging investment to the low-carbon energy • boosting the competition at the energy market • ensuring a liquid market that allows existing energy companies and new entrants to compete on fair terms • long-term contracts in the form of Feed-in Tariffs with Contracts for Difference (FiT CfD), providing clear, stable and predictable revenue streams for investors in low-carbon electricity generation

		<ul style="list-style-type: none"> • Carbon Price Floor (CPF) to reduce uncertainty, put a fair price on carbon and provide a stronger incentive to invest in low-carbon generation now • Emissions Performance Standard (EPS) set as an annual limit equivalent to 450g CO₂ /kWh at baseload • Carbon Capture and Storage (CCS) • Engaging with consumers
2011	Energy Act	<ul style="list-style-type: none"> • Carbon Emissions Reduction Obligation • Carbon Saving Community Obligation, requires suppliers to fund insulation and connections in low income areas, and a proportion rural. • Home Heating Cost Reduction Obligation, individually targeted fuel poverty alleviation, requiring energy companies to fund Green Deal qualified projects. • Green Deal Framework: a new financing model to enable the provision of fixed improvements to the energy efficiency of households and non-domestic properties, funded by a charge on energy bills that avoids the need for consumers to pay upfront costs. • Nuclear power is one of the drivers to low-carbon energy system • Ideas set in White Paper 2011 were consolidated not completely
2013	Energy Act	<p>Extention of the Energy Act 2010:</p> <ul style="list-style-type: none"> • decarbonisation targets, • reforming the electricity market • development of nuclear power and new Office for Nuclear Regulation • Government may privatise the Government pipelines and storage system • Office for Nuclear Regulation • Contracts for Difference (CFD) – when the buyer/seller get the difference between initial and final price of the contract • Postponement of emission targets set by Climate Change Act 2008
2016	Energy Act	<p>Establishment of a new Oil and Gas Authority (a quasi-NGO) which is needed for</p> <ul style="list-style-type: none"> • Minimising public expenses • Provide secure energy supply • Storage CO₂ • Innovation and technology • Mediating between government and public sector • Encouragement of investments • Ability to participate in meetings with operators and energy providers

Appendix B: RE Legislation in Germany

Year	Document	Content
1991	Electricity Feed-in-Tariff Act/"Stromeinspeisungsgesetz"	<ul style="list-style-type: none"> • The first Feed-in-tariff in the world • The access to the grid for RE. • Feed-in-tariffs: utilities pay premium price for the electricity produced from RE. • The price recalculates annually. • Wind and solar plants get the highest remuneration (90%). • The feed-in-tariff is paid by consumers as a small surcharge, government does not pay.
1997	Kyoto Protocol	<p>International Agreement was the first which obliged Germany as the world's sixth largest emitter to cut CO2 emissions to reduce GHG emissions to 21% between 2008 and 2012. The target was achieved in 2008</p>
1998	National Energy Act	<ul style="list-style-type: none"> • seamless liberalisation; • access to the transport net had been regulated by the "negotiated access" • "separation of accounts" (separation on segments)
2000	Renewable Energy Sources Act/ Erneuerbare Energien Gesetz	<ul style="list-style-type: none"> • Replaces Feed-in-tariff 1990 (by that time red-green government came into office in 1998). • Nuclear phase-out: to shut down all the NPPs by 2022. • Feed-in-tariff. Energy generated from a renewable electricity facility receives a confirmed feed-in tariff for the next 20 years. • Grid operators are required to set before electricity generated by RE over traditional and nuclear sources. In result, more actors may be included to the energy market: SMEs, energy cooperatives (Genossenschaft), farmers, and households. • Innovation by decreasing feed-in-tariffs. • Additional nationwide compensation scheme with the aim of spreading the remuneration burden on grid operators across all electricity utilities. • Roofs programme: low-interest loans for PV installations on the roofs until 2003.
2002	Act for the Orderly Termination of the Use of Nuclear Energy for the Commercial Generation of Electricity	<p>19 nuclear energy blocks will be phased out by 2021 after Nuclear consensus 2000.</p>
2003	Amendment to Renewable Energy Sources Act/ Erneuerbare Energien Gesetz	<p>New 'special equalisation scheme' (Besonderen Ausgleichsregelung) implies decrease of the EEG surcharge paid by consumers</p>

2004	Renewable Energy Sources Act	<p>Expanded tariff system and more opportunities to get the benefit from the using RE (lower requirements)</p> <p>Increase of the tariffs (biomass, solar and geothermal energy)</p> <p>Setting the targets:</p> <ul style="list-style-type: none"> • 12.5% of RE in total energy mix by 2010 • 20% of RE in total energy mix by 2020
2009	2020 European plan on Climate and energy package	<p>RE promotion and setting the targets:</p> <ul style="list-style-type: none"> • Decrease the GHG emissions by 20% by 2020 • To produce 20% of energy in the EU from the RE by 2020 • To increase the energy efficiency by 20% by 2020 <p>Introducing new Emissions trading system (ETS): enterprises get tradable quotas on GHG emissions, in case of emitting more than it is allowed the company needs to buy extra credits or pay fine</p> <p>German target on RE in total energy mix is 18% by 2020</p>
2009	Renewable Energy Sources Act	<p>Expanding the benefits from using the RE.</p> <p>Solar:</p> <ul style="list-style-type: none"> • Tariffs reduced. <p>Onshore wind</p> <ul style="list-style-type: none"> • the tariff increased • recovery bonus (changed outdated turbines with new ones Repoweringbonus) increased • additional bonus system Systemdienstleistungen or SDL) was introduced <p>Offshore wind:</p> <ul style="list-style-type: none"> • raise of the tariff. • 'early starter bonus' • Additional loan programme: €5 billion operated by KfW bank <p>Biomass:</p> <ul style="list-style-type: none"> • Bonuses for different types • 'sustainability ordinance' (Nachhaltigkeitsverordnung or BioSt-NachV) – environmental requirements for biomass <p>New self-consumption system: granted tariffs for solar energy for energy used in the houses of PV operators.</p> <p>Hydroelectricity and geothermal</p> <ul style="list-style-type: none"> • Increase of the tariffs • Increase the cogeneration bonus for geothermal <p>'Green power privilege' (Grünstromprivileg):</p> <p>Exempt suppliers from EEG surcharge (in specific conditions)</p>

		<p>New targets: The share of RE in total electricity production - 35% by 2020, 50% by 2030, 65% by 2040, and 80% by 2050.</p>
2009	Renewable Energies Heat Act/EEWärmeG	<p>Objective: to increase the share of RE in heating by 14% by 2020.</p> <ul style="list-style-type: none"> • New buildings are obliged to use RE for heating and hot water. • To increase energy saving in new building by 15% • 50% of used energy in new buildings should be supplied from CHP • District heating with using of RE, waste heat or CHP.
2009	German National Renewable Energy Action Plan	<p>The plan was formed regarding the Directive 2009/28/EC of the European Parliament and of The Council of 23 April 2009 It sets the targets:</p> <ul style="list-style-type: none"> • Overall target: 18% of share of energy generated from renewable sources in gross final energy consumption; • Heating and Cooling: 15.5% of demand met by renewable energy sources; • Electricity: 37% of electricity demand met by electricity generated from renewable energy sources; • Transport: 13% of energy demand met by renewable energy sources. • Promoting RE in general • Establishing new stimulus and incentives
2010	Energiekonzept/Energy concept	<ul style="list-style-type: none"> • new lower energy targets • postponing the nuclear energy phase out by 12-14 years (so the shutdown of the last NPP was planned by 2036)
6th of June 2011	Amendments to the Energy concept	Nuclear energy phase out
2012	Renewable Energy Sources Act	<p>New targets on RE in electricity supply:</p> <ul style="list-style-type: none"> • 35% by 2020 • 50% by 2030 • 65% by 2040 • 80% by 2050 <p>The main principles of RE promotion are unchanged.</p>
2014	Renewable Energy Sources Act and Climate Action Programme 2020 (Aktionsprogramm Klimaschutz 2020)	<p>Decrease of feed-in tariffs, New auction system for PV capacity, Plan to achieve 2020 climate targets Deployment of RE and integrating it to the market</p> <p>Targets on the RES in total electricity consumption:</p> <ul style="list-style-type: none"> • 40%-45% by 2025 • 55% - 60% by 2035 • 80% by 2050

		<p>New body: Register (Federal Network Agency) which monitor/check the RES additions</p> <p>New subsidised/unsubsidised marketing systems and market premium (fixed tariff of the RE plant minus technology-specific monthly market value).</p> <p>It is planned to introduce tenders as financial support from 2017</p> <p>Support of small scale generators by FiT is unchanged</p> <p>Deployment corridor sets how much RE capacity may be built per year</p> <p>All energy generators are obliged to pay the surcharge</p> <p>Under Climate Action Plan 2020:</p> <ul style="list-style-type: none"> • To reduce GHG emissions by at least 40% by 2020. <p>Methods:</p> <ul style="list-style-type: none"> • Emission trading, European and international climate policy • Climate change mitigation in electricity generation, including by continuing to upgrade the conventional power station fleet and expanding the use of renewables
2014	EU Climate Action Programme 2020	<p>New targets:</p> <ul style="list-style-type: none"> • To reduce GHG emissions by 40% by 2030 • To produce 27% of total energy generation from RE • To increase the energy efficiency by 27% by 2030 <p>Increase of the cost of the energy system in 2030</p> <p>Launching of new governance system</p>
2015	Paris Summit	<p>195 participating countries agreed to limit the global average temperature increase above pre-industrial levels to well below 2°C, and to pursue efforts to limit the increase to 1.5°C.</p> <p>Target to reduce GHG emissions by at least 40% by 2030 compared to 1990 levels.</p>
2016	Climate Action Plan 2050/Klimaschutzplan 2050	<p>The main aim is to reduce GHG emissions and transit to RE</p> <p>Confirming principles and methods of transition established in Climate Action Plan 2030.</p> <p>Targets for all sectors to be achieved by 2050.</p> <p>Learning process</p>
2017	Amendment of the Renewable Energy Sources Act (EEG 2017)	<p>Bidding through an auction-based system for government subsidies, instead of automatic receiving.</p> <p>The process is organised and monitored by the Federal Network Agency (Bundesnetzagentur).</p> <p>Successful projects will receive contracts for duration of 20 years for sell of the produced electricity at the price that they bid during the auction process.</p>

		<p>Installations that need the least financial support to be viable will be approved.</p> <p>Exception:</p> <p>Small installations (<750kW capacity for solar, <150kW for biomass),</p> <p>Installations owned by private citizens</p>
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Appendix C. RE in Russian Energy legislation

Year	Document	Content
1996	Federal Law #28 on Energy Saving	Introducing the term RES No any details, targets, support mechanism
2003	Federal Law #35 on Electrical Energy	No provisions on the RES Electricity price regulation Role of governmental control in electricity production National electricity transmission
2003	Energy Strategy up to 2020	Necessity of the RES development is stated (along with development of coal and hydro energy) Necessity of technological development for RE facilities Necessity of RE legislation The main accent of the strategy in development of oil and gas sector
2007	Federal Law #250 on the Introduction of Amendments to Certain Legislative Acts of the Russian Federation in connection to the Accomplishment of Measures for the Reforming of the Unified Energy System of Russia	Basic measures of state support of renewable energy sources development: <ul style="list-style-type: none"> • to avoid corruption and to increase the efficiency of the support, the mechanism has to be applied after the project has launched and has to be related to energy capacity • support for energy which will be provided to the population mainly (not for business) • the support needs to be limited by time and differentiated by type of generation • Support of traditional energy to provide combined electricity production
2008	Presidential Decree #889 “On some measures to improve the energy and environmental efficient of the Russian economy”	Aim: to increase energy efficiency RE and clean technology get financial support from the budget Environmental aspect of energy sector development is taken into account
2009	Federal Law #261 on Energy Saving and on Increasing Energy Efficiency and on Introduction of Changes in Selected Legislative Acts of the Russian Federation	No provisions on RES Prohibition of using not-energy-efficient products Regular reports on energy efficiency of buildings, construction, utilities Using meters Energy Efficiency rules for the circulation of goods Energy efficiency programmes and support mechanisms (subsidies) Support of Energy-Saving Technologies.
2009	Government Decree #1715-r of 13 November 2009	Russia’s Energy Strategy to 2030: <ul style="list-style-type: none"> • set a renewables-based power generation target of 4.5% by 2020, excluding large hydropower. • 20% including large hydropower

		<ul style="list-style-type: none"> Realising this target would require a total development of renewable based power generation capacity of 15-25 GW by 2020 (depending on the mix), and total generation of about 80-100 TWh per year by 2030 (IFC, 2011)
2010	Federal Law No. 401-FZ, Amending the Federal Electricity Law	Introducing of financial support mechanism for RE - remunerating the installed capacity of renewable energy installations (something similar to FiT).
2010	Federal Law on the Electric Power Industry (Amendments)	Price regulation mechanism Compensation for using RE for electricity production
2012	Resolution of the Government #1839-r	Wind energy facilities expansion by 2020: 3.6 GW
2013	Governmental resolution #512-r	New RE targets: at least 2.5% by 2020 (before it was 4.5%)
2013	Resolution of the Government #861-r of Decree of the Government #449	Special contracts for power supply which provides pay back for large-scale energy plants used RE Introducing new RE power plants from 2014-2020
2013	Resolution of the Government #1247-p	New goals to 2018: Introducing biofuel energy especially in heating (waste) Increasing of biofuel generation (including peat and timber waste) Development of bioethanol production Monitoring and research of application of RE to existing heating system
2015	Decree of the Government #47	New instruments of support RE on the retail electricity markets Long-term tariffs regulated by government Financial support from government for RES facilities is limited
2015	Decree of the Government #1472-r	Prolongation of the Resolution of the Government #1839-r to 2024
2016	Resolution of the Government #850-r	Increase the share of RES by 2024 by means of new different types of RE facilities
2016	Government resolution #1634-r	Goals: to build 15 new wind power plants, with unit installed capacities of 100 MW and above, in the period up to 2030 (Total installed capacity is estimated at 4 851 MW) 13 new, large hydropower plants will be built and 14 existing plants, with capacities of 100 MW and above, will be redeveloped (Total power capacity is estimated at 64 GW)

Appendix D. Energy targets in the UK, Germany and Russia

British Energy Targets

Target	Year	
RE consumption, where	15% *	2020
Electricity demand	30%	
Heat demand	12%	
Transport demand	10%	
Share of renewables in electricity generation (Scotland)	100%	
Share of renewables in electricity generation (Northern Ireland)	40%	
Share of renewable energy in heat production (Northern Ireland)	10%	
Share of renewables in electricity generation (Wales)	Increase twice	
Marine energy production (Wales)	4 GW	
GHG Emissions reduction	34%	
	80%	2050
Hydropower	Not stated	-
Biofuel	6 GW	2020
Tidal power	0.3 GW	2020
Solar power	Not stated	-
Onshore wind power	13 GW	2020
Offshore wind power	18 GW	2020
	40 GW	2030
Nuclear power	16 GW	

German Energy Targets

Target	Year	
RE consumption, where	18%	2020
	60%	2050
Electricity demand	38.6%	2020
Heat demand	15.5%	2020
Transport demand	10%	2020
Share of renewables in electricity generation	35%	2020
	50%	2030
	65%	2035
	60%	2040
	80%	2050
Electricity consumption reduction	25%	2050
GHG Emissions reduction	40%	2020
	55%	2030
	80-95%	2050

Shutting down the NPPs	9 NPPs	2015-2020
Primary energy consumption reduction	20%	2020
	50%	2050
Hydropower	4.3 MW	2020
Geothermal	0.3 MW	2020
Biofuel	8.8 MW	2020
Tidal power	0	
Solar power	51.8 MW	2020
Onshore wind power	35.8 MW	2020
Offshore wind power	10 MW	2020

Russian Energy Targets

Target	Year	
Oil extraction increase (now 28%)	40%	2035
Hard-to-extract oil sources exploration (now 8%)	17%	2035
Increase of oil processing depth (now 72%)	90%	2035
Increase of oil export (compared to 2014)	24%	2035
Increase of gas production	40%	2035
Increase of gas export (compared to 2014)	51%	2035
Increase of coal export (compared to 2014)	32%	2035
Increase of share of nuclear power in electricity production	19-21%	2035
RE share (without hydro)	4,5%	2030

Sources: National legislations

Appendix E. Questionnaire

Theme	Questions
Energy system	Could you please, describe the current trend in British/German/Russian energy policy? Does the government pay enough attention to the climate change problem? What is the main motivation for the government to deploy the RE? (climate change/energy security/economic rationale)
	How, in your opinion, does the government decide on RE energy production?
	Why has the government decided to develop energy in this particular direction? What are the main obstacles for renewable energy deployment?
Political culture	How do you assess the openness of the government for changes in energy sector, including the RES?
	Does it involve different actors to decision-making? How do you assess the willingness of the federal government to engage with other political actors?
	How could you describe the impact of politics and economics on development of RE?
	What are the main obstacles for renewable energy deployment?
	Do you see any pattern in energy policy decisions: repeating methods and techniques, rules and regulations?
	What do you think about the role of coalitions, interest or pressure groups in energy decision-making?
	Do renewable energy groups or networks carry weight in decision-making (if there are any)?
	What is the public opinion about RE development in the country?
	Do you think it matters in choosing the energy policy?
	What do you think about financing system?
	What if the government could provide more funding opportunities to renewable energy sector?
	What is the public opinion about RE development in the country? Do you think it matters in choosing the energy policy? Is it able to influence on political process?
For British case	To what extent is the scope for renewable energy expansion in the UK affected by the stance towards nuclear power?
	What likelihood is there that this will change?

For German case	<p>Do you think the development of nuclear power and RE in Germany is predetermined by history?</p> <p>How have the events of the 20th century influenced energy policy? And how about the perception of energy among the population?</p> <p>How do you think the federative political structure of Germany helps/impedes the development of the RE?</p> <p>How does the system of ownership (private/public/corporate) influence development of RE in Germany?</p>
For Russian case	<p>Do you think the development of fossil fuels in Russia is predetermined by political system?</p> <p>How does the system of energy monopolies influence RE development?</p> <p>Is there any space for other players to permeate to the energy market?</p> <p>Do you think behavior aspect matters in energy transition in Russia?</p> <p>How do you think the federative political structure of Russia helps/impedes the development of the RE?</p>
Renewable energy in future	<p>What does the government need to change to increase the share of RE in energy mix, and how do you see the future of British energy market?</p>
	<p>Do you expect any changes around energy policy-making?</p> <p>[Of the above question] Why?</p>

Appendix D. Thematic matrix

Theme	Topic	Example	Interviewee and case
Willingness of government to engage	Governmental support	Well I suppose they could do more in various ways of course. They've got some good targets but it's debatable whether there are policies to achieve them.	1, case 1
		But the point bodies that the market structure, the incentives for instance, the government has a capacity mechanism which tends to enable advantage and conventional fossil fuels rather than renewable energy. And then of course we got the government wants nuclear power.	
		I don't think that they provide sufficient support. The policy position is illogical. So they don't support the cheapest forms of electricity.	2, case 1
		Well. The answer would be potentially yes if they allow that support to be provided tool forms of the new renewable energy, so wind and solar being seen allowed to compete to the same...same pots of money. So it's certainly not all bad, but it is not sufficient	
		Меры поддержки есть, конечно, можно перечислить, их много, вот пожалуйста пример, республика Алтай. Был проект построить солнечную электростанцию [описание поддержки, что-то типа FiT, 50% инвестиций из регионального бюджета + федеральный бюджет участвует].	8, case 3
		Но цели поставлены смешные: 2,5% в общем энергобалансе к 2024 году в объемах России — это смешно. Ну как я люблю говорить, лучше такая поддержка, чем никакой.	10, case 3
		Гораздо больше [поддержка традиционной энергетики]. Но даже сейчас последние тенденции, они пересматривают политику вот этих ДПМ, потому что первый этап закончился, и всё финансирование они уводят на теплогенерацию, на модернизацию теплоснабжения, при том что у нас и уголь существует и всякие дровяные ресурсы.	

		IDEA: there is insufficient governmental support, but support for fossil energy is much higher. However, the situation has been slightly changing towards RE support (very slow).	
	Lobby/ Interest groups	Up to a point except the government still has to set rules that define them, how competition occurs and it occurs through fairly tightly constrained channels as defined by the regulation. So when people talk about markets in anything well really they're always is what it is constrained by institutions, which may be connected with government to greater or lesser or more direct or indirect extent and certainly we've had a lot of objectives put in to the energy market, the electricity market more than gas market.	1, case 1
		You know maybe ministers have got an interest in the fossil fuel industry. Happens all the time.	2, case 1
		He appointed the secretary general of the party who is the partner of the chairman of the workers of the coal mine workers. That's how you can track it back to certain persons how strong the influence was from the fossil lobby and how directive was and that's just now that the trade unions side. Of course all these organisations play an important role and the renewable energy organisations, they are well represented but obviously they are not strong enough. And of course they are new and still diverse. It's also more difficult to come up with a unified voice than the traditional industry which hasn't struck just in 50 years here and they have President and spokesmen and they are very different.	4, case 2
		They are part of the general public and of course closely connected to the political process by hearing in Parliament, etc. So for structure of the democratic process itself, you have some kind of engagement of interest groups.	6, case 2
		Главный интерес – это интерес традиционных энергокомпаний. Их интересы осуществляется, у них все нормально. Ну а вот эти вот экологические, ну а зачем они нам. Ну то есть в мире эта движуха идет, но толку никакого нет. И это тоже объяснимо, вот вы можете представить, что Россия могла бы поставлять на федеральный рынок какие-нибудь технологии, связанные с ВИЭ, вот так масштабно? Уже все каналы, схемы наработаны. Клиенты есть, самое удивительное во всех вот этих обсуждениях для меня это то, что есть покупатели. Зачем вам делать что-то больше если есть покупатели пока. И эти покупатели очень хотят вашу энергетику.	8, case 3

	<p>Например, Камчатка с потенциалом использования геотермальной энергии. Ну есть там потенциал для геотермальной энергетики и есть даже есть там ветростанция, но Газпром прокопал там дырочку в земле и протянул трубу к Петропавловск-Камчатску и теперь люди должны покапать газ, чтобы Газпром могу окупить затраты. И какая бы не была себестоимость, это все дороже. Все это результат работы очень крепких лоббистов, которые настойчиво и очень эффективно работают, и проводят свою политику, поэтому очень сложно добиваться других результатов по на сегодняшний день маргинальным бизнесам, связанным с ВИЭ.</p> <p>IDEA: very strong oil and gas lobby which do not leave the room for RE.</p>	
	<p>Ну вот они как раз занимаются развитием ВИЭ, но мне кажется, они оказывают влияние. То есть компании, у которых есть деньги, и которые понимают, что эти деньги важно потратить именно на ВИЭ.</p> <p>IDEA: some RE which has financial potential to develop the RES may influence on political decisions.</p>	9, case 3
	<p>Еще такой момент, у нас в России очень много проправительственных общественных организаций, которые позиционируют себя как общественные, но по факту они просто одобряют действия правительства. Наглядный пример у нас был, не буду называть организацию, но тем не менее, вот у нас в Мурманской области приехала общественная организация, провела исследование и заключила, что загрязнение воздуха сероводородом, выбросами, идет не от нашей Кольской горно-металлургической компании, которая дочка Норильского никеля, а идет от Норвежцев, то есть якобы 50% загрязнений в Мурманской области это трансграничный перенос.</p> <p>Лобби есть, давайте говорить прямо, и, естественно, что нефть и газ всегда будет получать гораздо больше поддержки. Хотя по идее, по логике, наоборот, мы должны получать преимущества от использования ресурсов, но в России это не так как в Саудовской Аравии.</p> <p>IDEA: Lobby is very strong. In additions, there are plenty pro-government non-commercial organisations which position themselves as non-governmental but in fact they just encourage and promote governmental actions.</p>	10, case 3

		Political clout of coal lobby (power incumbents, labor union IBC); relative success of coal lobby rhetoric presenting coal-phase out as amounting to deindustrialiation of Germany when some 30 000 jobs are at stake and power is plentiful.	11, case 2
	Openness of the government	But it's probably better than it was	2, case 1
		Luckily we live in a democracy. We have representative democracy, so politicians are aware of public opinion.	6, case 2
		Тут дело в том, что очень много зависит от организации. Общественные я имею в виду. У каждой организации свое реноме, скажем так, свой опыт в этом плане, поэтому какие-то организации специализируются на атомной энергетике, какие-то на ВЭ.	10, case 3
		Ну вообще в последние несколько лет в России наступил такой момент, чуть больше открытости. То есть появляются какие-то общественные советы, общественные объединения при правительстве и других структурах. Но понятно, частные корпорации конечно ничего не делают, промышленная отрасль как была закрытый, так и осталась.	
		И очень много зависит на самом деле человека в регионах, как правило в регионах у всех складываются свои взаимоотношения.	
Political vision on the RES	Political preferences	IDEA: Sometimes it depends on the sector, some sectors are more open for participation than others. Nowadays, the situation with openness is much better than several years ago, however, there are still many closed sectors (industry) and much depends on the governor and his position on RE in regions.	
		So again this is an ideological preference for certain sectors and rather sectors all of which means that the energy system is less efficient or more expensive than it should be.	2, case 1
		And it was mainly driven by, let's say it crucial movements, movement driven by citizens that invested first without earning money or without earning much money and by some parliamentarians and the government never really was the driving force in this, German government never has been the driving force of this development	4, case 2
		I mean nobody in politics is doing something because he wants to help someone just that it's about their own interests. And if a government wants, for example, to have a certain legislation or stop	

		renewables from introducing the auction's and that did take place. It was clear because the government didn't want, I mean they didn't want to have too much discussion because they thought they just know what they want.	
		Well, that argument about costs which [UNCLEAR: demonstrates] that the government doesn't really care because onshore wind energy is really cheap.	5, case 2
		Well, more controlled, the willingness to have more control in the sector, willingness to limit the overall extension and the whole debate about costs.	
		Нет политического интереса, то есть есть интересы в использовании ископаемого топлива, есть игроки. Это интересы лоббистов, которые занимаются традиционным топливом в энергетике.	8, case 3
		IDEA: no political interest for the RES. Political preferences in development of conventional energy.	
		Но у нас ещё такой момент бывает, что у нас развитие зачастую делается недостаточно. То есть принимается закон, который принимается лишь бы принять. То есть сейчас, например, какая история происходит с развитием микро генерации по ВЭ: весь мир уже как бы эту технологию апробировал, активно идёт в Европе, Америке, люди там ставят солнечные панели, продают в сеть. Мы решили, что нам тоже надо этим заняться.	10, case 3
		IDEA: It often happens that the legislation is adopted only to be adopted without future development. This is the case with RE.	
Historical influence		The choice [Energiewende] was originally (1990, 2000) by parliament against government preferences	11, case 2
		So historically the North Sea oil and gas has played a big role in UK energy policy. So in the 70s when the oil crisis when other countries were developing district heating systems or improving efficiency or looking into biomass or other energy technology, the UK didn't bother with any of them because it had a domestic supply oil and gas.	2, case 1
		So Fukushima, in my mind, was more...well acceleration and continuation of the existing policy and the principal goals for increasing the share of renewables in our energy mix in Germany were changed in 2011 after Fukushima but the basic energy concept from 2010 remained the place. One important thing that needs to be emphasised the changed the equipment of nuclear only couple of months before the	5, case 2

		<p>Fukushima disaster the German government had decided to extent the running time of our nuclear energy reactors.</p> <p>Germany after WWII was modelled on the U.S. system of government un a way, so regions or as we call them Lande like Bavaria, they have their regional powers</p> <p>We've always been depended on energy import and RE gives us an opportunity to free ourselves from strong import dependence. And in terms of global relevance of renewables, I think, that's quite important because fossil fuels have been the call for many wars and many conflicts and it still are. So those terms renewables also can be a create of peace.</p>	
		There are many historical events and you can go back to different civil movements in Germany and in Europe. We had environmental movements growing heavily in 1970-1980s which was entirely connected to nuclear and this disarmament movement of course. And there was a specific danger in Germany during Cold war.	6, case 2
		<p>Переход на ВИЭ это вопрос культуры и времени.</p> <p>Transition to RE is the issue of culture and time.</p>	7, case 3
	Public support	That was more the social impact that would mobilise the antinuclear and pro-renewables movement.	4, case 2
		That has always been very very very supportive.	
		It's been extremely helpful and instrumental because without all these citizen we wouldn't be where we are because there was a market because people invested not only to make money but also they wanted to change something that was this opportunity to do it and that created a huge market	
		<p>Если мы говорим о гражданском обществе, то оно пока не очень заинтересовано.</p> <p>The civil society is not interested.</p>	8, case 3
		То есть я могу быть представителям общественного мнения, но с некоторой такой вот ссылкой на профессиональную деятельность. То есть мне кажется, если есть газ и атом в европейской части России, который нормально функционирует, нормально снабжает электричеством, и экологическая ситуация тут ну «ничего», то есть не так плохо, как где-нибудь в Кемерово, где угольная электростанция. То есть мне здесь в Петербурге нет острой необходимости добиваться,	9, case 3

		<p>чтобы развивалась ветряная энергетика. Моей маме вообще глубоко говоря все равно, мне кажется она о таких вопросах не задумывается и это, мне кажется, то как в Российском обществе по большому счету есть. Люди, которые этим профессионально занимаются, видят, что не во всех случаях ВИЭ является ответом на все проблемы. Те люди, которые профессионально этим не занимаются, про ВЭ это вообще последнее, о чем они задумываются. Здесь общественное мнение...возможно оказать влияние, да возможно, но наше общественное мнение занято совершенно другими вопросами.</p> <p>IDEA: people including energy experts do not feel necessity for energy transition, moreover, they have other issues (economic insecurity).</p>	
		Energiewende is considered by large majorities as one of the main issues facing the country. The only exception among political parties is the right-wing AfD.	11, case 2
	Federal – Regional RE policy	That is certainly something that has been rather beneficial and still is rather beneficial because, on the one hand, the state governments have always been able to kind of set up additional support schemes so they're doing it. You'll never have everybody supporting renewables but there are now some states which have become kind of advocates because wind energy for example is so strong in the northern states that they are kind of natural advocates for it.	4, case 2
		Ну скорее позитивно, потому что у нас так сложилось исторически, что очень многие инициативы можно делать на местах. Если они не сильно противоречат раз, и второе, сейчас говорят век современных технологий.	10, case 3
		IDEA: federal structure of the country allows regions implement their own RE policy.	
Energy sector	Governmental actions	So if they do nothing it [RE] won't grow fast enough	2, case 1
		They just should stop putting up artificial barriers. Technologies are there, renewables are cheaper. People want them. And what is happening and that's not only in Germany is that the governments are putting artificial barriers including something like solar taxes to prevent people from harvesting their own natural resources. So the governments are rather the problem than those trying to that's in most industrialised countries.	4, case 2

		We need more ambitious goals for extending wind, solar and biomass production but also geothermal and hydropower production should be included. And we do need to extend the renewables extension to the transport and to the heating sectors. And well, the government can help doing that with scrapping the subsidies for the fossil fuels which Germany uses still the subsidies more, well, getting rid off the coal, gas and oil heating to stop and promoting of RE deployment should be promoted by the government.	5, case 2
		On the other hand, of course, you have to start phase out of the fossils, you need fossils to go out from the energy mix to give room for RE, of course, you have to think about how to keep up the energy security, etc.	6, case 2
		Мне кажется в российском контексте гораздо проще эту задачу решить путем повышения эффективности использования тех энергоресурсов на тех предприятиях, которые есть сейчас. Но ВИЭ это отличный выход для удаленный и труднодоступных регионов страны. Там действительно очень дорогие другие виды топливо и легче ветряки поставить, чтобы у них было нормальное электроснабжение круглый год. Я не думаю, что государство что-то должно менять. С экономической точки зрения, мне кажется, лучше избавлять от систем центрального электроснабжения, потому что они у нас топят очень сильно, когда не надо. IDEA: I do not think government needs to change anything. To struggle with environmental problems, it is easier to increase the energy efficiency than make the energy transition and also, switch from centralised energy system to decentralised.	9, case 3
		Ну, во-первых, все-таки разобраться с локализацией и снизить процент локализации при поддержке со стороны правительства. Во-вторых, все-таки на поддержку государства пустить иностранные производства. Поддержка опять-таки, искать варианты поддержки, принимать апробированный в мире тот же зеленый тариф (FiT), green certificates вводить, но я не думаю, что это будет сделано в ближайшем времени. IDEA: decrease the localisation, let international companies to participate in energy market, launch approved by the world experience FiT, green certificates.	10, case 3
		The most important step now is to reduce the share of coal, especially of lignite-fired plants. More are in operation than needed or even useful.	11, case 2

	Ownership	Secondly to change the market structure which, well renewable energy proponents would argue is against the interests of renewable energy.	1, case 1
		Well, currently, very many renewable power plants belong to people. And that is good in terms of value added in the regions.	5, case 2
		Of course, ownership always matters. If you think about political economy of course, it's crucial. I mean it's the centre more or less. I mean, all the capital stocks of big energy producers are questioned. The system of ownership is interesting from the other perspective with regards to RE. So as I mentioned I mean at least they can be in start of decentralised energy system. And there is interesting side effect, it's not in the centre of the many developments and with regard [UNCLEAR]. Job situation. It's always important to look who owns the company especially with the fossils. [Unclear: but the example – Russia and system of ownership directs the energy policy].	6, case 2
		У нас проблема в том, что у нас как-то забывают про мелкий бизнес. Для всех любых экономик мелкий бизнес – двигатель экономики, а у нас проблемы мелкого бизнеса никого не волнуют. У нас драконовые налоги, прям очень большие, у нас зачастую 2/3 малого бизнеса работают в чёрных конвертах, потому что по-другому не выжить. Но если так посудить, то доход при белой бухгалтерии, с 1 рублях должен заплатить 48 копеек налога, практически 50%, это все социальные выплаты там пенсионный и так далее. Но это нереально, во всяком случае в нашей стране. Поэтому многие работают в чёрную. Им не приходится думать о том, чтобы там какие-то солнечные панели поставить, да плюс таки у нас огромное количество население живет за чертой бедности. У нас в России нет прослойки среднего класса, у нас есть бедные и есть очень богатые, а вот тех самых бургеров нет. А развитие то идет всегда за счет среднего класса.	10, case 3
		IDEA: there is no middle class in Russia which could be the main driver for energy transition in terms of RE facilities for households. There are only big corporations which impose their rules and private consumers who have to follow.	
		The system of feed-in tariffs favoured small-scale RE installations and ownership.	11, case 2
	Nuclear energy	I don't think in this country there's that much conflict between them: nuclear power - renewable groups, because they try not oppose each other because they got common trade interests and so you	1, case 1

		don't find much rhetoric of the two opposing...they might...they might some sometimes say: "Oh we're doing better than them".	
		We have kind of a treaty with the nuclear industry not to tackle them. Personally I think had they have a very privileged position for nearly 70 years within the establishment of UK Governments and Defence industry. They're trying to protect their privileged position even as they can see that the market is changing so quickly that. From the economic point of view, they have no future. But If they get one more power station, that's great because it keeps this another thousand or 2000 jobs 200 years. So they keep on pushing. I am sure that there is some interest in the military with doing it first. And the reason is because nuclear weapons.	2, case 1
		I mentioned to you the Chernobyl certainly was another catalyst, just a catalyst. It's not the main reason [of Energiewende], some people in the nuclear movement day they will tell you that it all goes back to the antinuclear movement which I think it's not the case. They've been anti-nuclear people who invested and became very active in renewable energy but also many people who invested in renewable energy had nothing to do with them (antinuclear movement).	4, case 2
		For example, the UK currently has planned Hinkley Point C to subsidise nuclear energy industry. Nuclear Energy has been subsidised for decades.	5, case 2
	Technology	Но даже технологии есть. Россия страна удивительная. Так вот есть технологии по производству жидкого биотоплива 3 поколения. Так вот представляете, можно запихать в какой-то чан отходы и получить жидкое очень чистое топливо. Это биотопливо считается очень эффективным и чистым, и оно стоит очень дешево, но сам процесс требует затрат, и никто не может сделать его дешевым. В Новосибирске придумали дешевый, при этом топливо получается дешевле и качественнее. Но никто не хочет его развивать, строить заводы по производству жидкого биотоплива, которое очень легко применимо не только для обычного транспорта, но и для авиатранспорта. Сегодняшняя проблема в мире — это выбросы CO2 от авиатранспорта. Растет контроль, потому что растут грузоперевозки, и никто не знает, что с этим делать. Россия могла бы предложить на рынок очень чистое и качественное биотопливо, но никто в это не вкладывается, никто этим не занимается. То есть потенциал есть, есть технологии, есть инновации, есть природно-ресурсный потенциал. Они очень большие. Есть инвестиции в высоконаучную деятельность, проектную деятельность. На сегодня нет ни одного стимула, который бы стремился развивать и нарастить ВИЭ в бизнес-сообществе.	8, case 3

		IDEA: there are plenty of RE technologies and innovative projects but the government is not interested and it does not invest.	
		Но в любом проекте по ВИЭ до 70% стоимости это аккумуляторные батареи. Как только появится такая батарея, а по словам Маска она появится в перспективе 5-10 лет, появится батарея, которая позволит аккумулировать огромное количество энергии, и будет стоить очень дешево, то все это как бы закроется, но постепенно.	10, case 3
		IDEA: the RE transition happens when the energy storage problem will be solved and at this moment Russia will be able to start gradual transfer from fossils.	
	Grid system	And it is a lot of this about access to the grid. So the grids and the distribution networks are both very congested. That means that in many places it's impossible to have new renewable energy.	2, case 1
		Well...I think the RE industries are one player. And there is also other player is the established the conventional energy production industry. There are the grid operators, the network operators want to have a say...because we should not forget...I mean with the increase importance of the renewable energy production the whole energy system changes from more centralised organised system of build power plants to different structured decentralised power system which has very many thousands production units all over the country. So that is quite turned around and it has its replication on the operation of power grids.	5, case 2
		Then the debate about insufficient grid infrastructure. We currently have a situation where the north of the country, the region of [UNCLEAR] particularly: wind power has to be cut due to insufficient grid infrastructure to transport the renewable power production into more southern regions and operators of wind turbines to get compensation for cut the wind power production. In the northern cost dramatically we have a situation in which the grid infrastructure hasn't been except the turbine have the same speed in terms of RE production. Shall we do a new power line.	
		For RE net itself, the energy net. You need capacity to storage energy, you need to have a net capacity and these issues, of course, are somehow obstacles.	6, case 2

		<p>Есть отдельные сектора или регионы, которые делают попытки. Это, скажем, те регионы удаленные, где нет подсоединения к сетям, удаленными не связанными сетями районы. Но это другой случай.</p> <p>Проблема: отсутствие сетей. Можно купить дешевые солнечные панели, но нужно куда-то сбрасывать энергию. Нужна общая сеть, но нужно чтоб это разрешили. Но доступ в сеть регулируется, может быть дадут, а может и нет. Если не дадут, то проект не состоявшийся, провал, затраты впустую. Домохозяйства зависят от доступа в сеть, если вам забанили доступ в сеть, но ничего не получится. Вряд ли кто-то захочет поставить свою маленькую электростанцию.</p> <p>IDEA: the main problem is grids system regulated by government.</p>	8, case 3
		<p>как раз в тех районах проще развивать определенные системы энергоснабжения, которые не завязаны на централизованной grid.</p> <p>IDEA: RE is suitable for regions which are not connected to national grid system (Siberia and Far East).</p>	9, case 3
	Rationales for RES deployment	PR/Image	<p>Many people wonder why Angela Merkel changed her mind. Many people say she's a natural scientist so she knows the risks before and after, it hasn't changed. But she understood that she made a big political mistake because that was a very controversial decision. So she could revise her decision just referring to what happened in Japan as a political excuse, a public excuse and then announce an Energiewende. That's rather a PR move then a substantial move. Because if in fact they revise their nuclear power decision.</p> <p>Нет, ну опять-таки, имидж никто не отменял. Знаете, я вам приведу пример. Помните, я вам говорил про губернатора нашего, который не очень был с экологией. У нас существует проект ветропарка, проекту уже лет 15, то есть 15 лет назад тогда выбрали площадку, но вот сейчас может быть его всё-таки построят, потому что они попали под эту программу поддержки, Enel Russia пришла при поддержке основного офиса, я думаю, что построят в течение 1-1,5 года. Когда губернатор, когда на всех федеральных мероприятиях, региональных его спрашивали о том, а что у нас по Мурманской области, он отвечал «Так у нас ветропарк строится». Там была только земля отчуждена, и поставлена измерительная матча, но по всем отчетам мы занимаемся. Да есть сложности, да есть трудности, но вы понимаете, сложные погодные условия, Арктика. Но мы в планах.</p>

		IDEA: some governors implement the RES just to increase the popularity among potential voters and somewhere it works (Murmanskaya oblast).	
	Environment/ climate change	<p>I think if the climate change issue didn't exist it's still overall see much the same sorts of strategies are being pursued. I mean It is quite clear that this country has its policies heading in a more low carbon direction anyway. So if that's the case the government will make...will make a virtue out of what's happening.</p> <p>Well of course yes. This is the lack of its factor of the conservatives being in power and they have interests who are within them...who were not so concerned with making climate change a big priority. Even though the policy of the government is to pursue climate change objectives has been a lot of opposition coming through the Conservative Party to onshore wind and onshore solar which means that the government is not in...not are...not showing much interest in offering contracts, long term contracts with any price really.</p>	1, case 1
		They didn't care about environmental impacts, most of those big companies, it's different now but, back then they just saw it as a crude commercial decision to cap off some kind of competitor [about 1970s].	2, case 1
		So, I don't think that, energy security or something like that is the main motivation in Germany other than in European countries maybe. Of course, energy security was used in discourse, actually by conservatives, right-wing parties which were more skeptical on Energiewende and used arguments against RE deployment. Of course, I mean, historically, the main motivation was climate change, I mean the Green party which was more or less leading force for debate on Energiewende approach and specific individuals also	6, case 2
		Экология? Люди, которые болеют, потому уголь что сжигается, и вся таблица Менделеева вдыхается детьми и их родителями. Нет, это не имеет значения и не является драйвером политики.	8, case 3
		<p>IDEA: Environment is not a driver at all.</p> <p>At first, climate change and nuclear power phase-out highly controversial in Germany, phase-out pushed after Chernobyl accident by Greens and SPD.</p>	11, case 2

	International pressure	<p>Какое-то внешнее давление. Мы страна климатической конвекции, это нас сможет заставить перейти к КИЭ. Ответ: на сегодняшний момент нет такого сценария, реального, где политика по климату привела к изменению энергетической политики.</p> <p>IDEA: international pressure does not affect Russian domestic policy</p>	8, case 3
		<p>Ну вот смотрите, Россия подписала Парижское соглашение, но не ратифицировала его. Мне кажется каждое государство имеет право выстраивать оптимальную для себя энергетическую политику. На мой взгляд, с экономической точки зрения еще не доказано что ВИЭ является оптимальным выбором для электроэнергетики. Вот если вы спросите меня как эксперта и как специалиста, то я скорее выскажусь за сбалансированную энергосистему, которая в том числе не игнорирует то что в стране есть, те ресурсы, которые у нас есть. У нас проблема не в том, что ВИЭ мало, у нас проблема в очень большой розни эффективности и использовании ресурсов.</p> <p>IDEA: every country is entitled to choose the most efficient and suitable policy for itself independently.</p>	9, case 3
		<p>Нет, опять-таки все зависит от того, какое соглашение. Мы очень не любим подписывать соглашения, в которых прописаны конкретные цели и санкции за невыполнение этих целей.</p> <p>Тут понимаете, в плане международного сообщества очень сложно прогнозировать сейчас, потому что геополитическая обстановка сейчас очень напряженная, и куда приведёт вся эта очередная волна противостояния восток-запад. Потому что, то что сейчас в России позиционируется, ну это мы возвращаемся в холодную войну и вот эти санкции. И вроде как адекватные люди понимают, что это как бы мы сами спровоцировали, с другой стороны, огромный поток патриотизма, который сейчас возвращается: что вокруг одни враги, что мы вот одни против всех, мы санкциями ответим на санкции.</p> <p>IDEA: nowadays it is difficult to talk about international influence especially due to latest political events on the international arena.</p>	10, case 3
	Costs	<p>More expensive technologies like offshore wind and gas from the other ones are competing against each other without being competing with the cheapest ones. So the overall price goes up for every electricity user. So every business and every individual and every household in the UK pays a lot more we need to.</p>	2, case 1

		Nuclear is just ludicrous because it's hardly expensive and it's inflexible. These legacy problems for thousands of years which require costs.	
		<p>Большинство территории РФ не имеет централизованного энергоснабжения, на которых проживает порядка до 40 млн. населения, это мы говорим о Центральной Сибири, о наших Северных территориях, в основном энергоснабжение там обеспечивается дизельным топливом и себестоимость электроэнергии доходит до таких астрономических цифр как 200 рублей за кВт/час и выше.</p> <p>IDEA: fossil energy is extremely expensive in Siberia and Far East and RE is the most beneficial option there.</p>	7, case 3
		<p>Главный драйвер — это поддержка и стоимость. Стоимость должна быть очень низкой. Если стоимость установок для частных потребителей и домохозяйств будет маленькая, то это поставит вопрос о состоятельности всех существующих систем и существующих провалах в электросетях. Но мы еще пока не находимся на этой стадии. Несмотря на то, что стоимость падает.</p> <p>Ну допустим, если мы не перейдем на ВИЭ, потому что оно становится все дешевле и дешевле, мы теряем конкурентоспособность для энергоемких отраслей. Это является аргументом? Как будто то бы должно быть, но это тоже не работает.</p> <p>IDEA: the RE needs to be cheaper to become popular in Russia, however, due to institutional aspect of energy system, it is impossible.</p>	8, case 3
		<p>Какие-то стимулы для процесса развития ВИЭ, но мне кажется, об этом сложно говорить в стране, где есть значительные запасы углеводородного сырья, которое достаточно легко извлекаемо, с небольшими издержками, и находится относительно близко к существующим транспортным магистралям, транспортным трубопроводам, железным дорогам и так далее.</p> <p>IDEA: fossil energy in Russia is very cheap and easy to extract.</p>	9, case 3
		Поэтому если говорить именно о стимулах, то на мой взгляд, было выбрано самое первое и правильное приложение сил — это удаленные поселения. У России огромные территории и	10, case 3

		<p>огромное количество удаленных поселений, в которых работают дизель генераторы. Дизель генераторы старые, есть до сих пор двадцать первом веке поселения, в которых электричество подается на 8 часов в день: 4 часа утром, 4 часа вечером.</p> <p>IDEA: fossil energy is extremely expensive in Siberia and Far East and RE is the most beneficial option there.</p> <p>Если мы говорим о правительстве, то там существует, конечно, лобби, которое...мы понимаем, что нефть и газ - не самые эффективные, но, тем не менее, оно у нас есть, оно дешево. Хотя опять-таки, нефть дешевеет, а бензин дорожает, задаются вопросом простые люди: почему так.</p>	11, case 2
		High cost (increasingly mythical as costs come down, but high legacy cost from early 2010s); excess capacity and generation from cheap lignite-fired plants (cheap as long as not paying for its carbon and other emissions)	