Trace the energy transition through the lens of Europeanization: case studies of France, Poland, and the UK

by

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Abstract

With the effective period of Directive 2009/28/EC comes to its end, this research intents to investigate the energy transition which took place during the last decade through a perspective of the circular Europeanization in the cases of France, Poland, and the UK in order to understand how national energy strategies are formulated by EU policy making process and formulate the latter at the same time. The analysis will take all three models of Europeanization into account and put into the historical context of EU energy policy development. Results show that the missing of a competent and accountable formal institution designated to Renewable Energy Source deployment is the common problem to energy transition in all three cases. Low efficiency bureaucracy and nepotism are also damaging to the development of renewables. Essentially, it is the misalignment of energy strategy and its underling interests between member states and the EU that hindered an energy transition towards renewable energies.

Introduction

Energy has been one of the priorities of the European Union since 1973 oil crisis. From 1990s onward, climate change became the attention center of media, academia, civil society, and policy makers over the world including the EU. The promotion of Renewable Energy Source (RES) naturally turned from the solution to Energy dependence into an answer of the handling of global warming. Commission Green Paper on RES in 1996 (COM/96/583) and White Paper "Energy for the Future: Renewable Sources of Energy" in 1997 marked a milestone in EU energy policy history. The EU started its first attempt to build a harmonized European energy market with a European system of tradable renewable energy credits to encourage RES deployment and mitigate the negative consequences of national supports schemes. After the Commission gained competence from the commitments to the Kyoto Protocol, it launched the European Climate Change Programme (ECCP) to ensure that the EU meets its target for reducing greenhouse gas (GHG) emissions. At this point, a distinct EU energy policy field has been established. Entering the 21st century, the EU put RES higher on its agenda and adopted several laws regarding RES promotion, attempting to harmonize the European energy market.

Despite the enormous efforts, the EU seems have difficulties reaching its energy transition targets. To be honest, the promotion on RES is in itself, a difficult task for every country. First and foremost, energy transition is a long process thus requires consistent commitments and resources. Papież and fellow researchers (2018) find that the energy mix in 2014 is determined largely by the circumstances in 1990s among the EU. Geographic location also plays an important role in the deployment of RES which some countries (Belgium and Luxembourg) are inherently deprived. On the policy level, the balance between risk and profitability of investment is hard to keep (Held, Ragwitz & Haas, 2006). Feed-in Tariffs provide high investment security and low administrative barriers thus encourage investments with the relatively low profits and additional costs on consumers. On the contrary, Tradable Green Certificates are easier to implemented and have a higher profit margin. However, high profits come with high risk thus lower incentives for investments. In 2010, the renewable energy share was 3.38% (12% targeted) in EU energy consumption and the share of renewable energy in electricity consumption in 2012 was 14.2% (22.1% targeted) which suggests a failure to reach the initial goals set by the Directive 2001/77/EC. By 2019, the EU has reached a share of 18.88% (20% targeted) of renewable energy in gross final energy consumption and 8.88% (10% targeted) of renewable energy in transportation. 14 out of 28 Member States has

achieved their national goals while three Member States (Belgium, France, and Poland) was considered "at severe risk of failing to do so" and two Member States (The Netherlands and Luxembourg) "at moderate risk of not meeting the target" by the Commission in the 2020 progress report. Although Directive EU/2018/2001 (RED II) just became effective at the beginning of 2021, whether the EU will meet its targets embedded in this Directive is uncertain. Only 12 Member States set its NECP (National Energy and Climate Plan) 2020 baseline higher than its 2020 RES targets and countries who are lagged the most behind (noticeably Belgium and Ireland) even lower their baseline. It is hard to grasp why with high level of political commitment, relatively early actions, and a completed policy regime, the EU has constantly been bumped in the process of RES promotion and why "southern" countries can be blamed as usual at first glance. This mystery may only be solved by considering the scattered interests of the Member States and the contests between them as well as within domestic markets in the context of European Integration. To understand that, the development of the EU RES policy will be briefly reviewed at first.

The first policy cycle of RES promotion began with the proposals for Directive 2001/77/EC on RES-Electricity and Biofuel Directive 2003/30/EC. Conflicts mainly came from definition of RES, targets, and support schemes. Around the definition of RES, France pushed the inclusion of large hydropower due to its proportion in the national energy mix structure (second after nuclear power). Along with Italy and the Netherlands, the UK secured the inclusion of municipal waste and landfill gas which developed under its Non-Fossil Fuel Obligation (NFFO) program. The 12% target of RES in EU primary energy consumption and 22.1% of electricity consumption by 2010 and mandatory national RES goals were initially proposed by the Commission and the European Parliament while the Council rejected the mandatory national goals. With the only supports for such binding targets coming from Denmark and Germany, the compromise ended up with non-binding RES targets for Member States while the 12% EU goal remained. There are also conflicts of support schemes between Feed-in Tariffs (FITs) and Tradable Green Certificates (TGCs). Countries which were familiar with FITs like Germany and Spain were highly critical about the TGCs preference and its underlying market approach of the Commission and European Parliament. Due to its national plan to adopt FITs, France sided with those two renewable energy frontrunners. On the contrary, the UK as the first Member State to liberalize its energy market, naturally supported the TGCs scheme. In the end, there was no harmonized support scheme. However, pioneers like Denmark, Germany and Spain influenced the shape of RES-E policies in other Member States which led to the gradual spread of FITs to countries like Italy and the Netherlands. Advocates of TGCs such as the UK also gave countries like Poland the inspiration to adopt similar support schemes. Regarding the implementation of those two Directives, regardless their relatively high level of engagement, neither France nor the UK has met their indicative targets by 2010 with other five Member States. As part of the requirements for joining the EU, then candidate countries seemly had to accept the RES-E share written in the EU accession treaty.

Moving forward to the next stage, the Commission proposed an ambitious and mandatory 20-20-20 objective for the 2020 Climate and Energy Package (CEP): a 20% GHG emission reduction, a 20% improvement in energy efficiency and a 20% RES in EU final energy consumption with a sub-target of 10% of RES in transport. This time, new Member States like Poland after 2004 enlargement entered the debates thus brought new disputes of interests. During the negotiation, the UK initially acted relatively proactively like it did in the last one. The CEP itself can be contributed to the 2005 British Presidency in the European Council with the efforts of then Prime Minister Tony Blair. Although the attempt to promote TGC was failed again due to vetoes by Germany and Spain, conflicts around support schemes were eventually settled by non-trading flexibility led by the UK and Poland: instead of binding prescription of national support schemes, joint support schemes, joint projects and statistical RES transfers provides chance for voluntary cooperation between Member States. Like

its previous records, France acted reactionarily and ambivalently. France took a negative stance on mandatory national targets at first because of the dominance of nuclear power industry, its attitudes eventually changed with the new government lead by Sarkozy in 2007 and its 2008 presidency in European Council. Distracted by the revision of the EU emission trading scheme (ETS), except for criticizing the national targets, Poland did not pay much attention to the RES part of the CEP. Ultimately, as part of CEP, Directive 2009/28/EC (Renewable Energy Directive Ⅰ) introduced the mandatory national targets and grant the possibility to the Commission to issue recommendations for Member States that fail to achieve their national targets. The diffusion of two main types of support schemes (FITs and TGCs) are more obvious in this period where the UK started to adopt FITs to encourage small-scale technology (Busch & Jörgens, 2012). However, the EU targets are not likely to be achieved again. France, the UK, and Poland all lagged behind their national targets despite their distinctive conditions, attitudes and implementation.

Unlike the relatively smooth process to the agreement on RED I, Directive EU/2018/2001 (RED II) raised more tensions around authority once again. The Commission set its goal for the post-2020 Climate and Energy Framework: a 40% GHG emission reduction target by 2030, a 27% RES target and a 27% energy efficiency target. This time there was no mandatory national targets in consideration of flexibility. As usual, the Commission and the European Parliament wanted an ambitious binding RES target, Member States led by the UK preferred a technology neutral energy transition to achieve the GHG emission reduction target. It is understandable that France and Poland all take the side with those countries since they have missed their targets twice. Besides, economic crisis in 2008 and the setback of the Copenhagen conference in 2009 gave Member States other reasons to do so. In the end, the abandonment of national targets suggested a trend towards renationalization of the EU energy policy (Schoenefeld & Knodt, 2021).

As shown above, the integration and development of energy sector suffers from dispersed preference and capacity among Member States thus face the risk of failing the environmental visions of the EU. On the other hand, the policy field of renewable energy is nonetheless a typical example of EU policy making where the influence of Member States in the formulation of EU policies, the adoption and implementation of EU policies at the national level, in other words, the "two-way process" of uploading and downloading of policies intertwine and interact (Börzel, 2002). Besides, the learning and imitation of support schemes between Member States is another feature which defines the EU renewable energy governance in the absence of a harmonized European support schemes. This vertical and horizontal dynamic of EU policy making may be referred as Europeanization which has become the feature of EU policy making and one of the center topics of European Studies from the beginning of 21st century (Solorio, I. & Jörgens, 2017, p17).

The difficult European energy transition seemly will be better comprehended by tracing the policy changes of Member States and explaining their positions in the policy field of RES as part of the Europeanization process as observed in France, the UK, and Poland. Therefore, this article will try to answer how the EU policy making influences national energy policy in those three cases. Meanwhile, it is also a good chance to further develop Europeanization as an analytical framework. In the next section, the analytical framework based on Europeanization theory will be discussed. For each case, the circle of Europeanization will be traced in chronological order to understand how national RES policies are evolving during the period of circa. 2005 to 2020. Meanwhile, the process of energy transition will be monitored by using RES share in primary energy consumption and in electricity consumption as indicators. In the end, it may be possible to explain the relatively difficult energy transition during 2009-2020 by combining the changes of national RES policies and the energy transition process. The rationale for case selection will be explained in detail in the "Methodology" section. Data collection and data analysis will be presented in this section as well.

Theory

As famously defined by Radelli (2004), "Europeanisation consists of processes of a) construction, b) diffusion and c) institutionalization of formal and informal rules, procedures, policy paradigms, styles, 'ways of doing things' and shared beliefs and norms which are first defined and consolidated in the EU policy process and then incorporated in the logic of domestic (national and subnational) discourse, political structures and public policies". According to Solorio and Jörgens (2020), it is a way to understand how "EU institutions and policies are becoming more politicized and contested domestically and how authority is being renegotiated between the EU and its Member States." At the beginning, Europeanization is considered as a "two-way process" where Member States put their influences on EU policy making and adapt to those EU policies (Börzel, 2002). Those vertical interaction are also described as "uploading" and "downloading" of policies. Later studies put more attention on the policy diffusion between Member States and consider it as horizontal Europeanization. Especially in policy field like renewable energy where the EU has limited legislative competence and little consensus can be found among Member States, horizontal Europeanization might play a more important role to build for policy change and convergence of national policies towards EU targets (Bulmer & Padgett, 2005).

Before the discussion of Europeanization, the intellectual disputes around the nature of the EU governance should be addressed first. There are two main approaches to understand the policy-making on the EU level. The first one is the (liberal) intergovernmentalism where national governments are undoubtedly the main actors in this kind of Europeanization, and they show distinct behavioral modes through the negotiation. The preference and capacity on different policy issues determine the bargaining position of the national executives thus lead to dynamic outcomes of negotiation. In this version of EU governance, supranational bodies seem gone missing or simply act as a loyal agent which is heavily criticized by the neo-functionalists. Stone Sweet and Sandholtz (1997) argue that the expansion of transnational exchange will eventually lead to the prevail of supranational organizations since they can respond to the needs of transnational actors instead of national governments. Therefore, the key factors should be domestic interests (firms, trade unions, regions) and supranational actors (Börzel,2003a). This article is not intended to discuss which approach suits better with the progress of European Integration. Instead, a framework of intergovernmentalism will be taken since the contests around scattered interests of the Member States are evident as showed in the introduction while the convergence is not well observed. Another reason to use an intergovernmentalism model is to include domestic interests as a driving force in the process of Europeanization.

The first step of European policy cycle is the "bottom-up" Europeanization where Member States cast their influence on the formulation of EU policies in the initial stages (Radaelli, 2004). This process can either happen directly in the Council of Ministers (by discussion and votes) or indirectly through setting the terms in a policy field (as a pioneer). The first assumption is that Member States are rational actors who seek to maximize the benefits and minimize the costs of EU policies. Therefore, they have incentives to upload their national policy to the EU level. Uploading can reduces the transactional costs of adaptation in both legal and administrative sense. For countries hold higher regulatory standards, as many in the environmental policies, uploading can also protect their domestic industry from the competitive disadvantages brought by their counterparts from lower regulatory background in the single market. The third reason to upload is that transnational problems like pollutions and environmental protection cannot be solved within national borders and they must be addressed on the EU level instead.

According to the different position one state holds, Börzel (2002) divides them in to three categories: pace-setters, who push the policies that in line with their preferences in order to minimized the transition costs; foot-draggers, who block or delay the policies they find too costly in order to get more favorable compromises or compensations; fence-sitters, who have indifferent interests and mainly take neutral stances to coordinate pace-setters and foot-draggers. In the policy field of renewable energy, Germany, Spain, and Nordic countries have the long tradition of being "Green" thus they often show strong supports for more harmonization and further reforms of EU energy policy field. First of all, they have the political commitment as well as pressures from constituencies to address environmental issues. Secondly, the RES industries in those countries are relatively advanced and highly regulated. Those frontrunners also want to reduce the adaptation pressure especially in terms of support schemes where they have found the successful ones for their national markets. In contrast, countries like Poland who heavily rely on fossil fuels may find themselves in the opposition. Environmental problem is not a priority comparing to economic development and national regulations are relatively loose. Adapt to EU policies may indicate import a complete alien institutional setup thus bring unbearable costs. Other countries including France, Belgium and Luxembourg belong to fence-sitters for the most of times. Their regulation standards lay between the previous two groups and does not perceive much adaptation pressures. In the end, they form coalitions with either one side depends on the policy issues. It gives the impression that frontrunners in the renewable energy field tend to also be pace-setter, late-comer tend to drag the foot and countries in between fall into the third category. This can be explained by the economic conditions where rich countries have higher level of environmental awareness and advanced industry thus followed by stricter regulations while poor countries are lagged in this process. Although the strategic positions do not associate with the bargaining power necessarily, wealthier countries with completed industrialization also have advantages in their political capacity and administrative capacity of shaping EU policies (Börzel,2002). Political factors like votes in the Council and EU budget contribution seemly bear less explanatory power than administrative factors especially in the field of environmental policy (Börzel,2003b). Environmental frontrunners have more financial means, more experienced bureaucrats with expertise as well as coalition-building and interest accommodation which involve in the drafting and assessment process of EU policies (Börzel,2002). Cases outside the range of the intergovernmental model do exist across time and policy fields. For example, the attitudes shift of Germany and the UK in the 1990s cannot be understood without the domestic context (support schemes and energy resource potentials).

When policy cycle moves to the next stage, "top-down" Europeanization, the adoption and implementation (or not) of EU policies start to bring changes at the domestic level of Member States. Unsurprisingly, the implementation of EU policies cannot be predicted merely by the strategical positions of the Member States. Pace-setters can have bad compliance records and foot-draggers can perform relatively better than some fence-sitters. For examples, Member State who has got the most reasoned opinions and court decisions is Belgium regarding the compliance to environmental policies during 1984-1999 (Börzel,2002). How to explain the national differences in terms of domestic changes thus becomes the key point of Europeanization. Intellectual dispute around this question takes place between two versions of institutionalism: rational institutionalism and sociological institutionalism. Two approaches both start with misfits between the domestic arrangement and the EU framework. The incompatibility of processes, policies and institutions between EU and domestic levels thus create adaptational pressures for Member States as the necessary condition for domestic changes. For actual changes to take place, domestic actors should have the capacity to exploit the new opportunities are created by EU policies as the sufficient condition. This is when the facilitating factors (actors or institutions) which respond to the adaptational pressures should be taken into account (Börzel & Risse, 2003). Rational institutionalists believe domestic changes are triggered by resource distribution thus

differential empowerment among domestic actors. Once the new opportunities appear, the facilitating factors in this scenario, veto players and formal institutions, will respond to them. Multiple veto players can resist adaptational pressures by tilting the balance of institutional structure towards one direction. Formal institutions provide actors with material and ideational resources to exploit new opportunities thus changes. For sociological institutionalists, domestic changes are the outcomes of the socialization of European norms, rules and beliefs (Börzel,2003a). Instead of cost-efficiency, the goal of various actors is to fulfill social expectation. The facilitating factors in this model are "change agents" and political culture or other informal institution. Change agents not only pressure policymakers to initiate changes, but also make moral arguments to persuade actors to redefine their interests. Informal institutions like a political culture can also lead to consensus-building and cost-sharing which thus facilitate domestic changes to occur. The socialization can take the form of institutional isomorphism where institutions resemble each other under longtime explosion or an agency-centered form where actors internalize new norms to become members of international society. However, the socialization more likely takes place in a stable, formalized and clear-cut organizational structure with low cognitive misfits (Börzel & Risse, 2000). Resource redistribution and socialization are not mutually exclusive in practise, they can happen simultaneously or sequentially. In the end, there are three possible outcomes of domestic changes : 1)absorption, Member States take EU policies into their domestic structures without substantial modification of the current policies and institutions, 2)accommodation, Member States adapt policies and institutions according to the EU without changing the "essential features and the underlying collective understandings attached to them", and 3)transformation, Member States replace existing policies and institutions with substantially different ones (Börzel & Risse, 2003). Member States with high adaptational pressures and more facilitating factors are expected to able to achieve transformation while low pressures without facilitating factors could lead to inertia.

Other scholars challenge the assumption of the institutionalism about the necessarity of misfits. Knill and Lehmkuhl (1999) point out that different types of policies require different mechanisms of Europeanization. Based on their classification of positive integration, negative integration, and framing integration policy, three mechanisms of top-down Europeanization are identified: 1) positive integration, create adaptation pressures from the prescription of institutional and governance model, 2) negative integration, alter opportunity structures, and 3) framing integration, promote changes in beliefs and expectations of the domestic actors in order to gain supports for EU policies. In the first scenario, market-correcting policies, such as environmental protection or health and safety at work directly prescribe an explicit European model onto the Member States. Policy or institutional misfits thus only are required for this kind of policies. In the second case, the direct institutional impacts are limited since only arrangements which may distort the functioning of the single market will be abolished thus no distinctive institutional model is assigned. Instead, domestic changes are induced by redistribution of power and resources between actors. The third kind of policies is for the purpose of preparing the ground for subsequent policies of negative or positive integration thus bring the weakest influence on national institutions and domestic market structures. Domestic changes take place more on the cognitive level when the social expectation of domestic actors is indirectly influenced by EU policies which echoes with the theory of sociological institutionalists. According to this category of Europeanization, institutions play the main role in the policy fields of positive integration and actors in the negative integration as well as framing integration (Knill & Lehmkuhl, 2002). More specific for the renewable energy policies, Bulmer and Radaelli (2004) identify two ways for domestic changes to take place: 1) marketing-making, RES is provided entrance to the national market (e.g., access to the grid); 2) marketing-correcting, RES is provided favorable competitiveness in the national market (e.g., support schemes). The change of market structure will get backlash from conventional energy sector and electricity generators and therefore brings additional difficulties.

However, potential conflicts may be avoided by the third mechanism where the expectations and beliefs of domestic actors are altered. This is the case of Spain in early 2000s where RES-E bloomed without "any source of opposition from traditional energy producers." (Israel & Fernandez, 2017, p.228). No matter what theoretical models are adopted, the census is that domestic actors play the crucial role in this type of Europeanization not only by receiving the EU policies, but also by their feedback into the process of policy making (Caporaso, 2008, p.30).

The last type of Europeanization occurs between Member States in a horizontal fashion. It refers to "the direct diffusion or transfer of policies from one EU member state to another, within and affected by the institutional, political and discursive context of the EU." (Solorio & Jörgens, 2017, p.22) Since there is no formal delegation of power, this type of Europeanization is based on voluntary and decentralized communication between Member States. Empirical evidence suggests that this form of policy diffusion has similar effects of top-down Europeanization especially in the highly institutionalized contexts like the EU (Busch & Jörgens, 2012, p.81). Horizontal Europeanization can happen with or without top-down Europeanization and take the form of spontaneous convergence of national policies. There are also three mechanisms of policy diffusion: 1) rational learning; 2) norm-based imitation; 3) economic or political competition (Solorio & Jörgens, 2017, p.24). In the first case, policy makers learn from existing practices of other countries and implant them to their national environment after rational calculation: potential benefits will overweigh its costs. The second mechanism, norm-based imitation is used to gain national and international legitimacy. For example, the spread of sustainable development strategies and introduction of constitutional clauses on environmental protection (Busch and Jörgens, 2005). The last mechanism is based on competition to improve international competitiveness, in both economic and political sense. During the economic competition, Member States will try to lower national standards to avoid excessive costs coming with high standards. In political competition, Member States will try to become pioneer in order to set standards first. In this way, they can avoid adaptational costs in the future. In context of EU renewable energy policy, horizontal Europeanization may primarily happen when it comes to support schemes. This is because the more market-oriented strategies that Commission has promoted since the negotiation of the first RES-E Directive almost always are get vetoed. As mentioned in the introduction, the Commission eventually gave up this idea and turned to non-trading flexibility suggested by the UK, Germany and Poland, namely joint support schemes, statistical transfers, and joint development projects. As a result, RED I facilitates horizontal Europeanization. The informative and financial supports provided by the EU can also facilitate policy learning and regional development of RES. During the time period of 2009-2020, there are six EU funding possibilities in the energy sectors including Cohesion Fund, Connecting Europe Facility (for projects of common interests), Horizon 2020 programme, European Regional Development Fund, European Investment Bank and the European Fund for Strategic Investments as well as the Innovation Fund.

Solorio and Jörgens (2020) argue that Europeanization should be understanded in a circular model: EU policy cycle begins with the delegation of authority upwards to the EU (bottom-up), then changes happen under the EU's impact at national level(top-down), but this process is not clean-cut. Instead, a new round of circular Europeanization may start from here. Domestic actors may mobilize either for or against subsequent supranational governance. Therefore, the top-down Europeanization becomes a factor that can either stifle or provoke the contestation of authority by Member States. In the next stage, the authority conflicts will have influence on the future EU policy formulation after the contestation of authorities between Member States. If such conflicts can be well managed, then the next policy cycle can start smoothly. Otherwise, the aftermath of conflicts left by previous policy cycle will alter the original pace of new policy cycle. The reason why the

Commission eventually gave up a harmonized support schemes is a good example of how authority conflicts feedback into new policy cycle and thus change the trajectory of EU energy policy.

Based on the theoretical framework above, this article proposes three hypotheses on why energy transition has been unsuccessful for three cases.

Europeanization begins with misfits and Member States are regarded as rational actors who should try to upload national policies to minimize misfits. However, during the process, other political factors may be prioritized over this efficiency-cost calculation. On the other hand, preference can only be conveyed by sufficient capacity. When a state lack of bargaining power or miscalculate the potential costs thus does not make use of its bargaining power, they are likely to get sub-optimal results of negotiation.

H1: The targets are too high due to unsuccessful uploading where misfits are not minimized. This is because of 1) the preference during the stage of negotiation which heavily influenced by domestic politics, 2) low bargaining power either due to insufficiency or miscalculation.

Adaptational pressure does not lead to domestic changes without facilitating factors. When pressure is too high, it is also possible to end up with strong resistance thus no change at all. Since the time gap between negotiation and effective period of the Directive is relatively long, domestic environments may go through fundamental changes independently.

H2: Adaptational pressure does not convert to real changes. This is because of 1) the lack of facilitating factors, 2) discouragingly high pressure, and 3) deviation of domestic environments from the period of negotiation to the effective period of RES 1.

Cooperation mechanisms are prominent in the horizontal interaction between Member States in context of RES 1 when it is directly embedded in the text of the Directive. The Commission has also promoted cooperation mechanisms as its attempts to harmonize European energy market and take them as one aspect of evaluation. Besides, the EU also provides training, information exchanges, and funds to support national energy transitions. When Member States do not make good use of those resources, they may fail to reach national targets as well.

H3: Member States did not exploit cooperation mechanisms and both informative and financial supports from the EU enough.

Methodology

In order to analyze the impacts of Europeanization on the national energy transition, three models of Europeanization will be used, namely bottom-up, top-down, and horizontal. Since the EU energy policy and national policy both change along with time, it is better to employ the circular model to combine those three models together to trace this process. Although this research focuses on the effective period of RED I, it is important to take the RES-E and RED II into account since outcomes of previous policy serve as the starting condition of the next one. Thus the analysis will cover two time periods: before 2009(negotiation of RED I, effective period of RES-E);2009-2019(Implementation of RED I; negotiation of RED 2). Such two and half policy cycle would be enough for observe the whole loop of forward (bottom-up, top-down plus horizontal) and feedback(contestation) of Europeanization. However, since the negotiation of RED2 took place relatively late, the effects on the implementation of RED1 would be limited. For the purpose of this study, this episode will not be discussed. To trace the energy transition of each case, two quantitative indicators are used: RES shares in the primary energy consumption and in electricity consumption (RES-E) as the mandatory targets designated by RED I. In addition, energy efficiency (energy saving) and biofuel shares will be considered since they are also the focus of RED I.

In the first stage, the position of national government will be analyzed according to the role they play: pace-setter, foot-dragger, or fence-sitter. In this article, pace-setter is represented by the UK, foot-dragger by Poland and fence-sitter by France. The analysis has two aspects: preference and capacity. Preference is measured by the support or not towards national targets and the support of not towards a harmonized support scheme. Capacity includes political and administrative capacity. Political capacity is measured by votes in the Council and the budget contribution while the administrative capacity is measured by the number of institutions and technocrats involving in the scientific assessments. Due to the scope of this study, conclusions from existed studies will be used to assess the capacities. Data used in this section are mainly qualitative and interpretative through text such as records of EU discussions (e.g., in reports of joint meetings), newspaper reports (e.g., the speeches of national ministers and EU officials), advisory committee reports as well as some journal articles (e.g., those who records the contemporary debates in the EU which are hard to access retrospectively). However, quantitative data can be used in a complementary way. For example, by counting the votes against or for a proposal of the Commission, it shows where a country is in the Council.

The next stage is the analysis of the implementation of EU policy. This step is meant to trace the top-down Europeanization and identify whether there are sufficient facilitating factors. The first step is to access the extent to which changes have taken place. Changes can happen in legislation, institutions, markets, and perception in three degrees: high, middle, and low (see table 1). Next step is to identify facilitating factors. To keep a balance between rational and sociological institutionalism, veto players, formal institutions, and change agents will be considered. Veto players include the dominant figures of national industry, e.g., state-controlled energy company, traditional energy industry, farmer associations. Formal institutions mainly refer to national or subnational environmental or energy agency and the financial or informative resources they provide, e.g., National Agency for Territorial Cohesion in France. Change agents includes environmental activist groups, academies, and Green parties. Informal institutions are not included due to the difficulties of measurement and relatively indirect impacts. For this section quantitative data will be used more often for measuring the market configuration (e.g., distribution of shares in the market for traditional energy producers and RES producers, traditional energy source-based electricity generation and RES-E generation). This section will be also analyzed

with qualitative data such as legislative texts, governmental reports as well as NGO reports. The public opinion towards RES is mainly analyzed from secondary sources like Eurobarometer. For horizontal Europeanization, the focus will be on the exploitation of cooperative mechanisms and EU supports. This part of analysis is mainly curried by quantitative means where the number and amounts (Kw/h) of cooperative mechanism (data transfers, joint support schemes, joint projects) and EU supports (training programs and funds) will be evaluated.

Table 1

Categorization of Domestic Changes

	legislation	Institution	Market	Perception
High	completed and on time adoption of RED1 into national legislation	Agency designated to energy transition or RES	large rise (> 30 %)of RES share in total electricity generation and capacity.	High public awareness and support for RES (>50%)
Middle	Partial or slow adoption of RED1 into national legislation	Existing agency includes issues of energy transition or RES, e.g., environment department	Middle rise (30%-10%)	Middle public awareness and support for RES (50%-10%)
low	No adoption	No or very little function added	Low rise (<10%)	Low public awareness and support for RES (<10%)

Since the main focus of this research is to assess the impacts of Europeanization, not every factor that possibly influence national energy transition are considered. For example, the starting condition is essential to the development of renewable energy regardless the position of one country in the EU policy marking process. Another important factor omitted by this research is the ideology shift. For example, whether the emergence of populism has any effects on national energy strategy. The indicator and focus of energy transition is electricity due to its relatively evident development, higher share in energy consumption (after petroleum products and natural gas) and the fact that RES like hydropower, wind power and solar photovoltaic are included in electricity. By Including other aspects of RES like heating and cooling would, a clearer picture of energy transition could be expected. The circular Europeanization model is nevertheless comprehensive because each direction of Europeanization and their interactive effects have been considered. To be clear, this research does not attempt to explore the causal relation between Europeanization and successful or difficult energy transition because the current Europeanization theory is not strong enough to solely explain causality. For example, the external impacts of 2008 economic crisis on the development of RES-E in Spain were determinative as the previous supportive actors in traditional energy section turned against RES-E. This position change of domestic actors thus cannot be explained by top-down Europeanization.

In this research three Member States are selected: France, Poland, and the UK. Since the research question is about the impacts of Europeanization on the energy transition, candidates should be active in each model of Europeanization and face some difficulties in their way to fulfill the mandatory RES-E share targets (so they are

expected to take more actions). On the other hand, the internal pressure and external shocks on energy transition should be relatively small, otherwise the effects of Europeanization may be overshadowed. Therefore, candidates should have an independent energy supply and robust national energy market dominated by non-RES. They should also have a favorable political environment for promotion renewable energy at least in the starting point of EU renewable energy policy. In summary, candidates should be relatively reluctant to spontaneously make energy transition but can carry it on and did so under the influence of the EU policy making process. Based on those criteria, France, Poland, and the UK are chosen. Firstly, the three countries are all behind their national target according to the data from 2019 (France: 17.216% vs. 27%, Poland: 12.164% vs. 15%, the UK: 12.336% vs. 15%). Secondly, they all have reliable energy support and mature energy market. The UK have abundant natural gas reserves and liberalized their energy market in the early 2000s while France mainly relies on nuclear energy with state owned electricity utilities. Poland on the other hand has a long history of strong hard coal industry. As for political environment, the UK was under a Labour Government led by Tony Blair who was a relative EU-friendly figure from late 90s to early 2000s. In France, a favorable political context in the 1990s was ensured by the left-wing coalition with the Green Party as part of it. Polish authorities and domestic actors have never been fans of the RES, but the pressure of accession pushed them to accept the EU policies. Despite the similarity, those three also represent different aspects of Europeanization. The UK is more active as a pace-setter, while France acts as a fence-sitter and Poland as a foot-dragger in the bottom-up process. They also different levels of implementation. UK positively reforms its energy market, encourage the building of new RES capacity, and try new support schemes. In France, the energy monopoly of EDF and the nuclear sector behind its seemly unshakable while other reforms has been confusingly operated. The energy transition in Poland is undoubtedly the most difficult one where politics and economy are interconnected, and market reforms are only superficial. Another important difference between them is preferred support schemes: Poland and France prefer FITs while the UK is a supporter for TGCs. In conclusion, those three countries should be sufficient samples for analyzing the impacts of Europeanization on energy transition.

Case study 1: The United Kingdom

The United Kingdom has a reputation for being an "awkward partner" which refers to its skeptical attitudes towards the European Union. The reluctance could be found in the policy field of energy as early as when British negotiators blocked any proposal that threatened the British control over North Sea oil and gas reserves in the 1970s (Solorio & Fairbrass, 2017). However, the UK gradually became a pace-sitter in the 1990s when the Commission took the British market-oriented approach as a model for its vision of a harmonized European energy market. The implementation of EU renewable energy policy thus the energy transition in the UK, on the other hand, has been insufficient for the last fifteen years. Starting with 1.4% of the RES share in gross final consumption in the reference year of 2005, the UK managed to surpass its indicative interim targets with a small margin through the year of 2011 to 2018 (as reported in its process reports). Even though the RES share in 2019 has reached 12.34%, the 2020 target of 15% seems unlikely to achieve. In this chapter, the reasons for such a rather strange failure will be analyzed within the three aspects of Europeanization. The discussion will begin with the investigation into the preference of the UK and try to understand the decision made by the government during the negotiation based on that. Moving forward, the implementation of the EU policies will be analyzed. Finally, the horizontal aspect of Europeanization will be examined with emphasis on support schemes.

Energy transition status

The development of RES in the UK has been stagnated for a long time. There was only 1.1% share in gross final energy consumption in 2004 and 3.4% of RES-E (Eurostat, 2020). Almost no real progress has been made before the adoption of RED1. In 2009, the overall renewable share in gross final energy consumption is 3.4% with 6.4%of RES-E. Ten years later, the overall share raises to 12.34% and RES-E to 34.8% (Eurostat, 2019). Such improvements are missing when looking into the energy mix; fossil fuels contribute 89% of the energy source (16.4% of solid fossil fuels, 36.4%of oil and petroleum products, and 38.3%of natural gas) in 2009 but this figure remains as high as 80.7% in 2019 (3.3% of solid fossil fuels, 39.5%of oil and petroleum products, and 37%of natural gas). After taking electricity mix into consideration, the situation looks more positive where solid fossils are cut from 27.3% to 2.1% while RES jumps from 7.7% to 37.9%. The predominance of natural gas, however, seems unchallengeable after the surge in 2016 (from 29.9% to 42.5%) when it stills above 40% in 2019 (Eurostat, 2020).

Bottom up

This section will try to analyze what the preference of the UK is and how does it use its capacities to shape the EU policy towards its interests. As a pacesetter, the UK is expected to have a picture of RES in its energy blueprint before the EU actions. During the negotiation, it will support policies close to its vision and reject those apart from it to minimize the transition costs. To be more specific, strengthening EU ETS, promoting flexibility, and more mitigation-oriented policies should be the priority of the UK while increased public spending and potential distortion of the level playing field will be despised. In the British case, political commitment brought by the Labour government should also be considered to understand the decision to embrace an ambitious 20% of RES share target. Notice that the discussion may only apply to England and Wales since the devolved governments (mainly Scotland) have very different views compared to the Westminster. Unlike other countries, the importance of RES in Scotland has been recognized since 2004 with a large amount

of onshore wind potentials. Scottish government (Enterprise and Culture Committee, 2004) not only set a much more higher targets for RES and RES-E (18% and 40% by 2010, compared to 10% and 20% in England and Wales), but also reformed the RO Scotland early in the 2004 (similar changes happened in England and Wales in 2009).

For a long time, the priority of energy policy in the UK is energy security and competitiveness of the market through liberalization and privatization, even after climate change gaining substantial attentions. Renewables, however, has not been regarded as any serious attempt to serve those proposes. Competitive market has always been pursued which build up the strong attitudes towards a liberalized EU energy market and technology neutrality. One of the consequences is the "dash for gas" which ensured the energy independence of the UK for almost two decades. During late 1990s and early 2000s, the double effects of climate change and growing energy dependence forced the UK to search for new answers. The enthusiasm towards strengthening EU ETS, supports for CCS and energy saving, or more importantly, an ambitious renewables target, seems to be what the UK found and demonstrated at the EU level.

After the discovery of North Sea oil and gas reserves in the 1960s, the coal industry, the traditional energy resource of the UK, has declined by 1980s due to its lost market in gas production (Pearson & Watson, 2012). The unexpected plunge of oil price during 1985 to 1986 made the coal industry which has been shocked by privatization and strike threats from the National Union of Mineworkers (NUM) even weaker. However, the governments kept stress the importance of coal along with nuclear energy considering the possible declining of North Sea oil and gas in the 1990s (Manners, 1994). This preference for nuclear and coal has been manifested in the early stage as Secretary of State for energy David Howell stated that "there must be continuing nuclear power station orders if our long-term energy supplies are to be secured and current industrial uncertainties are to be resolved" in 1979.The commitment to free market was the most prominent during the 1980s and 1990s. A serial of privatization took place in the early 1980s under the leadership of Nigel Lawson, the new Secretary of State for Energy. The conservative government deemed to "set a framework which will ensure that the market operates with a minimum of distortion and energy is produced and consumed efficiently" as Lawson stated this point in his speech to British Institute of Energy Economics Cambridge conference in June 1982. The following election success in 1983 gave the conservative government more time to pursue its free energy market model. The liberalization was completed in 1988 and 1989 along with the Electricity Act with all retail consumers of electricity and gas choosing their own supplier (Pearson & Watson, 2012). Although environmental issues have not been addressed yet, the introduction of the Fossil Fuel Levy (funding of the Non Fossil Fuel Obligation) opened the possibility of supporting renewable energy (Green & Yatchew, 2012). Such scheme, however, was designed to support nuclear industry by helping its cash flow since the privatization did not fit well with its inherent inflexibility and safety concern (Lipp, 2007). The coal industry, on the other hand, faced serious challenges when "dash for gas" was made by major investments in combined cycle gas turbine (CCGT) generation. 31 out of 50 deep mines were scheduled to be closed in 1992 and 30,000 miners lost their jobs consequently (Manners, 1994). As a result, the government stressed again in the 1993 White Paper on the Prospects for Coal that the coal industry "must take its place in a competitive energy market." The domestic coal lost its competitiveness to cheap imported coals nonetheless and depended on the price premiums in the inherited contracts as stated by Mike Parker, the former Director of Economics at British Coal (Pearson & Watson, 2012). The political aspect of the strong attitudes of the Conservative Governments cannot be ignored; to break the power of the unions, including National Union of Mineworkers (Ibid, p.6).

Along with the election of the new Labour government in 1997, the environmental dimension of energy policy has been recognized as the new Energy Minister John Battle MP confirmed the government's

"commitment to tackling our environmental objectives." in his speech given to the Institute for Economic Affairs on 4 June 1997. The independent state of energy partially insured the more intensive approaches taken by the government since the Trade and Industry Fifth Report established the UK as a net oil and net gas exporter (House of Commons Trade and Industry Committee, 1998). Competitive market was still the center of energy policies as Battle, then Secretary of State for Trade and Industry, confirmed on 5 July 1999 the Government's commitment to the promotion of competition in energy markets after the introduction of the Climate Change Levy during the parliamentary debate. In the Fifth Report (ibid, 1998), the Committee confirmed the conclusion of liberalization and privatization of the coal, electricity, gas and "much of the nuclear" and called for regulation reforms. Similar point was also made by 1998 Green Paper "A fair deal for consumers; modernising the framework for utility regulation", as energy industry was classified as a utility industry and the interests of consumers are prioritized (Department of Trade and Industry (DTI), 1998). The liberalization and privitization from 1998 to 1999 in gas and electricity market seemed bring benefits to consumers, according to the 1999 National Audit Office (NAO, 1999) report. The nuclear industry which operated by state owned companies like Nuclear Electric (NE), on the other hand, still faced financial deficits, with profits of only £1.55 billion after receiving £6.6 billion from the Levy by 1995 because of the poorly performed eight Magnox stations and five AGRs (MacKerron, 1996). Renewables, although mentioned in the 1997 Labour manifesto, was not regarded as essential as Stephen Byers, then Secretary of State for Trade and Industry suggested in the debate on 10 March 1999 that improvement of energy efficiency would be the answer to environmental problems (column 413). The situation seemingly changed when Renewable Obligation (RO) was introduced by the Utilities Act of 2000 to replace the Non Fossil Fuel Obligation (NFFO) and Fossil Fuel Levy. Comparing to the nuclear-oriented NFFO (Levy provided £800m to renewables and £7.8bn to nuclear power), RO provides more supports for RES, especially larger projects like onshore wind and biomass plants. The TGCs components of RO also make it more consistent with the liberalized energy market. Due to its complexity, companies with a smaller scale and less mature technologies are discriminated against (Lipp, 2007).

Although climate change has been stressed by previous governments as early as 1995, it connected mainly with international commitment such as Kyoto Protocol and Rio convention. The government seemingly satisfied with its actions against climate change as then Under-Secretary of State for the Environment Sir Paul Beresford argued that "We were the first country to present our national programme under the convention and the first to publish a detailed programme demonstrating how we were aiming to meet those commitments, and we are fully committed to fulfilling our obligations under that convention." in the debate on 17 Feb 1995 (column 1313). The Labour Government did take more actions but restrained itself in 'green' tax to improve energy efficiency. Since the focus of the new government was clearly social welfare reform, environmental issues and energy only got a fraction (3%) of budget during 1999 to 2002 (HM Treasury, 1998). Environmental issues, especially RES, has not been integrated into energy policy until the publication of the report titled "Energy – The Changing Climate "from the Royal Commission on Environmental Pollution (RCEP) in 2000. A start of the gradual shift of attitude towards nuclear can also be found at this point. As the response to the 60% target of the carbon emission reduction by 2050, the Energy Review; A Performance and Innovation Unit Report (Cabinet Office, 2002) emphasized the need to policy reform to reach the reduction targets and more importantly, this review downplayed the energy security risks by suggesting that security threats should be dealt by strengthening international energy markets (e.g., p.68 and p.107). In the 2003 White Paper, climate change was placed as the primary driver of future energy policies (DTI, 2003. p.6). Renewable energy was discussed in detail in this White Paper with the promises made by the government to invest more in R&D for the development of new technologies (Ibid, p. 44). The possible contribution of nuclear power was downplayed as well; "its current economics make it an unattractive option for new, carbon-free generating capacity and

there are also important issues of nuclear waste to be resolved." (e.g., p61) Besides of environmental concerns, the shift of attitudes towards nuclear can also be understood with the near bankruptcy of British Energy in late 2002 (Moss, 2002). Innovative technologies, especially carbon capture and storage (CCS) were considered for the long-term plan (p.90). This preference for CCS tied tight with the fossil fuel power stations given the crucial role of gas in the British energy sector. The UK Emissions Trade Schemes (UK ETS) was also piloted in 2002 and it helped the UK gained experiences in carbon trading which can be traced back when considering the British push for strengthening EU ETS.

Another milestone is the 2005 Stern review where the economics of climate changes was reviewed. This review recognized the economic sense of early climate change action and put the Labour government under greater pressure to reduce carbon emission. Actions should be urgently taken in order to save global economics from 20% of GDP lost if nothing would change (Stern, 2005). A global carbon market and the deployment of RES were explicitly encouraged in this review as well (Ibid, ch.15 and ch.22). The government clearly agreed with those findings as the then Secretary of State for Environment, Food and Rural Affairs, David Miliband stated on 30 October 2006 that the government proposed a 30% greenhouse gas emission reduction by 2020 and at least 60% by 2020 at the EU level. He also argued for a strengthen EU ETS using the same reasoning. Other response taken by the government include the creation of an energy technologies institute which worth £1 billion of R&D funding into low-carbon energy technologies and the proposed Climate Change Bill. Followed by the beginning of the leadership of David Cameron in the Conservative party, climate change became a more political issue (Pearson & Watson, 2012). The government published a draft Climate Change bill in March 2007 in response to the campaign for a new climate change legislation led by the Conservative. Instead of a 60% target recommended by RCEP, this target was risen to 80% of reduction compared to the 1990 baseline by 2050 in the 2008 final act (later amended to 100%). RCEP report and the Stern Review, along with 2002 Kyoto Protocol, raised the importance of the environmental aspect of the British energy policy while the deployment of RES remained low.

Energy security, however, was brought back in the same period around 2006 to 2007 as imports of energy exceeded exports in 2004 for the first time in two decades (net imports in 2003 was -14.13 while 10.55 in 2004) and the rising prices of fossil fuels (Eurostat, 2020). The primary priority of energy security and the continuing commitment to tackle climate change can be found in the 2006 Energy Review. For the former one, energy efficiency was deemed to be main solution while a decline nuclear industry pushed the government to face its dependence on fossil fuels by encouraging CCS. It was addressed in 2007 White Paper "Climate and energy security – A global challenge" as a strategy to ensure energy security as it has been considered multiple times in the past (e.g., 1992 Energy Saving Trust, 1993 Budget, 1994 The Standards of Performance, 1997 White Paper, and 2000 Energy Efficiency Commitment). More specifically, the EU ETS and the Climate Change Levy were recognized as the key instruments to encourage energy saving (DTI, 2007. p.39). As for nuclear, the government admitted its importance and made clear that "any new nuclear power stations would be proposed, developed, constructed and operated by the private sector" at the same time (Ibid, p.17). This shift of attitude was the direct outcome of the state-owned companies' poor financial performance (Pearson & Watson, 2012). Similar situation applies to the coal industry which contributed 33.5% of electricity generation in 2005 but was deemed as unprofitable and unsustainable a long time ago (e.g., the 1993 White Paper). The reliance on coal and fossil fuels in general pushed the government to endorse CCS instead (Ibid, p.18). Beside of R&D projects aimed at it, the government also established a CCS Regulatory Task Force in 2006 as well. As for the concerns of climate change, the importance of renewable energy was formally acknowledged as "not just to give us a secure source of energy but also to meet our obligations to our children to tackle climate change." (DTI, 2006. p.4). The crucial

change in renewables, the RO reforms thus took place in this context. The government realized the underdevelopment of emerging technologies due to its high costs and the oversupply due to its technology neutral nature (Ibid, p.159). In response to those problems, the government introduced "banding" system where the number of Certificates for technologies are differentiated based on their maturity (Ibid, p.16). FITs have been suggested but resisted at this point as Catherine Mitchell (2008) called the analysis backed it "poor in the extreme." The free-market model was pursued as usual with more emphases on the energy market liberalization at the EU level (DTI, 2007) which echoes with the previous opinions expressed by the government (e.g., 2003 Energy White Paper, p. 81). Since the UK became more dependent on international energy market, the enthusiasm for a more liberalized EU energy market and a more strengthened EU ETS can be understood in this sense. Notice that although RES-E was in effect before RED1 (from 2001 to 2009), its indictive target (10% of RES share in electricity generation by 2010) has rarely mentioned by the governments. International commitment (especially Kyoto Protocol) rather than the EU one was more prominent in the British energy policy (e.g., 2003 Energy White Paper, p.8: 2006 Energy Review, p.28).

In conclusion, Energy security remained as the first priority while competitive market was pursuing at the EU level due to the completed liberalization and privitization of the domestic market and the growing dependency on the international energy market of the UK. Climate change incentivized the government to cut more carbon emission and RES gained limited attentions in this process. The decline of nuclear industry pushed the UK to reply more on fossil fuels, especially gas in the context of a weak coal industry. Energy efficiency and mitigation of carbon emission thus became the more reasonable solutions.

The negotiation of the Climate and Energy Package took place after the Commission proposed it in early 2007. This package set the 20-20-20 target for the year 2020; 20% cut in greenhouse gas emissions, 20% of EU energy from renewables, and 20% improvement in energy efficiency. In order to achieve the first target, the third phase (2013-2020) of EU ETS directive (2003/87/EC) was discussed to cover 40% of total EU emissions by ETS and 60% by effort sharing decision. The RES share was enshrined into the RED-1 with national binding targets. Energy Efficiency Directive (2009/125/EC) was offered to encourage energy efficiency. Among those three aspects, carbon emission reduction, instead of deployment of RES, was the center piece of British answers to climate change (e.g., Hilary Benn on 16 July 2008 debate and written contribution to the Council on 28 Feb 2008). This preference could be understood with connection to energy security and competitive market, the priorities of the UK energy policies. Energy security could be solved on the base of a reliable and creditable external market and a sustainable domestic energy structure whose reliance on fossil fuels might be mitigated by energy efficiency and innovative technologies like CCS. Competitiveness, on the other hand, can also be found in this rationale (e.g., written contribution to the Council on 28 Feb and 5 June 2008). This signaling of "the role of the EU as a leader" in carbon emission reduction may be understood when considering the growing dependence on international and European energy markets where competitors from loosely regulated countries may gain advantages. Especially in light of the Copenhagen Climate Change Conference, the UK would prefer a 30% of target if there were an agreement (which was not the case). In contrast, the UK lacks the experiences in renewables and reform the national energy structure around it would be simply unrealistic. As Charles Hendry MP pointed out, wind power would contribute the most to the RES share and an investment level similar to that in oil in the North Sea over recent decades is impossible (debate on 3 June 2008).

As the following analysis will try to demonstrate, the UK led the EU by proactively pursuing ambitious carbon emissions reduction through EU ETS. On RES, it was dragged by the EU when passively accepting the RES targets as part of the package. In this context, EU ETS directive overshadowed other items in the package for the UK as an important tool to build up the EU carbon emission market. The British delegation made clear

that they "cannot accept earmarking of auction revenues. The proposal to earmark auction revenues cuts across an important budgetary principle and does not respect subsidiarity or the division of competences between the EC and Member States" nor "the proposal to reassign 10% auctioning rights between Member States."(Council of the European Union, 2008a). John Bowis MEP, the Conservatives' environmental spokesman in the Parliament stated that it was "disappointing that the ETS has been watered down in key areas, such as the amount of emission allowances to be allocated by auctioning and the complex methodology agreed for allocating free allowances." (BBC, 2008). The strong position of the UK during the negotiation was supported by its relatively strong power in the Council (Thomson, 2008). Besides, Stern Report was referenced in the assessment of RED1. By putting pressure on EU ETS reform, the UK successfully uploaded its preference on market competitivity and energy efficiency to justify the prominent presence of North Sea in its energy mix. The misfits on the other hand were not minimized, especially in the RES sector. The RES targets were rather used to justify some energy policies in the following years as strong statements were not made during the negotiation. Controversies still came from the far-reaching binding targets and support schemes. Even though the national binding RES target of 15% was found challenging or even unachievable as the negotiation going on, the Blair government seemingly made an unreasonable decision and accepted it, nonetheless. The government had a strange confidence as Malcolm Wicks, then Minister of Energy said "it is an achievable target" after two MPs raised concerns about the deployment of onshore wind and microgeneration. It was also proud of its leading development of CCS, as Hilary Been, the secretary of state for environment, food and rural affairs, reported to the Parliament on 16 July 2008 that UK highlighted the importance of CCS. In fact, what the UK welcomed is the binding 20% target for the EU and this decision was made in the 2007 spring Council where all Member States supported such target (Wicks stressed this point multiple times in the Parliamentary debates, e.g., 5 March 2008, 3 June 2008). The distribution of this target among Member States, however, was calculated later according to GDP per capita/flat rate instead of energy potentials. Although the impact assessment (European Commission, 2008) found this approach" is necessarily a more costly approach, but the fairer distribution of the costs of achieving the overall target imply that it is a more feasible approach." Phil Woolas, then minister for Environmental, stated in his letter in April the same year to the Parliament that "we are concerned that setting legally-binding renewable energy targets for each Member State may not be the most efficient and effective way of achieving the necessary emission reductions." Some MPs even found the 15% target was not enough and take Germany and Denmark as good examples. Wicks pointed out that it depended largely on national resources. The energy transition in Germany appears to the minister, and some Labour MPs was the results of large hydro, antinuclear movement since 1980s, and the Green's renewable agenda which was not based on carbon count (e.g., Michael Connarty, column 701). At least according to the government, as Wicks argued, the reason why the UK did not invest in renewables at the earlier stage was the North Sea and the UK continental shelf (column 690).

Discussions around support schemes, namely the current ROs and FITs were heated again in this period as FITs was regarded as a plausible solution to reach the target. Under the framework of RO, electricity suppliers are obligated to present certain numbers of Renewable Obligation Certificates (ROCs). The price of renewable electricity should respond to the supply in form of the price of ROCs. Under FITs, on the other hand, suppliers are paid a tariff by the government thus prices are controlled by the government while quantities are determined by the market (Lipp, 2007). In response to questions on the possible application of such tariffs, Wicks suggested that FITs in the UK would only serve as a complementary mechanism to support microgeneration (column 690). He praised RO as a success for encouraging RES deployment, including in microgeneration. However, the government has admitted that RO discriminated against small scale projects in its 2006 review, as mentioned before. The minister also argued that adding FIT would "involve the scrapping of

the RO" and confuse the consumers (column 691). When MPs take Germany as a good example, he pointed out the "considerable cost" of FITs in Germany and linked this disadvantage to competitive electricity market. This point was also made during the policy debate in the Council on 5 June 2008 as follows; "The binding nature of the 2020 target provides the incentives for Member States to take action in these, or other areas to drive up deployment levels and therefore it is not appropriate for such specific measures (subsidiarity) to be mandated at the EU level."

The paradoxical confidence and uncertainty on RES targets, negative views on FITs, and the disproportional attention upon EU ETS may be explained again by the priority and the cost-efficiency logic of UK energy policy. As Wicks confirmed during the debate on 3 June 2008 that the priority of energy policy was to "tackling climate change by reducing greenhouse gas emissions and ensuring our nation's energy security". In conclusion, the priority of energy policy in the UK has been largely influenced by the energy insecurity and its competitive market approach as the uncertainty grew after oil price shocks in the 1970s and 1980s. The international commitment to carbon emission reduction embedded in the Kyoto Protocol created some potentials for development of RES while the real changes only took place under favorable political conditions, i.e., the Labour government. Fossil fuels, whether in form of coal or gas, still play an important role in the British energy mix facing the decline of nuclear energy. Therefore, comparing to a dedicated RES deployment which would be costly, the UK would rather prefer mitigation of carbon emission through technologies such as CCS. In the sense of minimizing misfits, the bottom-up aspect of Europeanization was not that obvious. When putting in a larger picture, the UK did skew the European agenda into its own interests.

Top-down

Domestic changes

Table 2

Categorization of domestic changes in the UK, Poland, and France

	UK	Poland	France
legislation	High	Low	High
Institution	Middle	Middle	Middle
market	High	High	High
perception	High	Middle	High

The UK has made a great process for its energy transition while the North Sea remains tough to deal with. It took quick step to adopt RED1, raised the RES share in the market with a support scheme reform, and pursued their citizens to take climate problems more serious by giving RES more credits. However, who exactly had the responsibility for RES policy was never clear as the only department dedicated to it was abolished with the government reform.

The UK mainly amended its existing legislation with a few addition to adapt itself to the RED 1, regarding planning procedures and distribution (Art. 22(1)e), support schemes (Art. 22(1)b, c), guarantees of origin (Art.

22(1)d), biomass (Art. 22(1)g), and biofuels (Art.22(1) i). Most of the adaptation have been completed during or before the first two periods (2009-2010 and 2011-2012), including Planning Act 2008,2008 Energy Act(introduced Renewable Transport Fuels Obligation (RTFO) and FITs), The Marine and Coastal Access Act 2009, RO reforms 2009, 2010 amended Electricity Regulations, 2011 Localism Act, and 2011 Renewable Heat Incentive (RHI). Therefore, it is fair to say that the UK adopted the Directive comprehensively and on time (by 5 December 2010, as in Art.27(1)).

However, the institutional structure of energy governance is not clear in the UK. Energy responsibilities was transferred from the Department of Trade and Industry (DTI) to the Department of Energy in 1974, under the Edward Heath's government. In 1992, the Department of Energy was merged back to the DTI under John Major's government. The energy responsibilities, however, was once again moved to the new established Department for Business, Enterprise and Regulatory Reform (BERR) in 2007 under Tony Blair's government. At this point climate change policy was charged by the Department for Environment, Food and Rural Affairs (DEFRA). One year later in 2008, a new Department of Energy and Climate Change (DECC) was created by Gordon Brown's government, marking the integration of energy policy and climate change policy. In 2016, energy responsibilities were transferred once again to a new Department for Business, Energy and Industrial Strategy (BEIS). Beside of ministerial departments, there are also institutions like Committee on Climate Change (CCC), Environmental Agency (EA), Office of Gas and Electricity Markets (Ofgem), and Oil and Gas Authority (OGA) act as advisory body, national authority, and executive agency. The only governmental body dedicated to renewables, the Office for Renewable Energy Deployment, was dissolved in 2016 along with the DECC and merged into the DBEIS. Overall, the policy making, implementation, and monitoring of energy policy are scattered and distributed to different departments and agencies. For example, decisions on applications of major infrastructure projects like offshore windfarms and nuclear power stations will be taken by Major Infrastructure Planning Unite (MIPU) in the Planning Inspectorate, but permission must be gained from the EA, which is under DEFRA. The confusing transfer of power between departments raises questions about efficiency and certainty, as David Chaytor MP asked on 9 June 2008, whether "a single Department responsible for power generation, energy efficiency and the response to climate change" since 1997 would be beneficial. On the one hand, the disagreements between departments can be very dangerous, for example the conflicts between Department for Transport's policy on airport expansion and the energy efficiency policy of DEFRA. On the other hand, the budget of "piddling" department like DEFRA is torn in many ways, "when it is struggling on the farming and rural affairs side, the environment side gets squeezed—as, for example, in the cuts to business recycling projects." as Steve Webb MP pointed out. Such a decentralized energy regime has its own merits of accountability and transparency, but in costs of efficiency and consistence.

The expansion of RES on the British energy market seems promising on number. According to the Digest of United Kingdom Energy Statistics (DUKES) 2020 (EBIS, 2020), renewables made up 37.1 % of electricity generation with an increased capacity of 22, 005MW, 28.2% of the total generation capacity by 2019. This marks a progress made in ten years as renewables only accounted for 6.7% of generation and a capacity of 8834MW, 10.1% of the total capacity by 2009 (Eurostat, 2020). Therefore, the RES share increased by 30.4% and 17.9% in generation and capacity. Wind in particular, has grown from 3446 MW to 24095.4MW in capacity and from 9.28 TWh to 64.33 TWh in generation. Another feature is the rapid development of solar PV in the UK. From 2009 to 2019, the capacity of solar PV increased from 23MW to 13346MW with generation went from 0.02 TWh to 12.92 TWh. The later one is the direct result of Feed-in Tariffs since this mechanism supports 857,770 sites of solar PV generation, the 83.8% of total site number, by 2019.

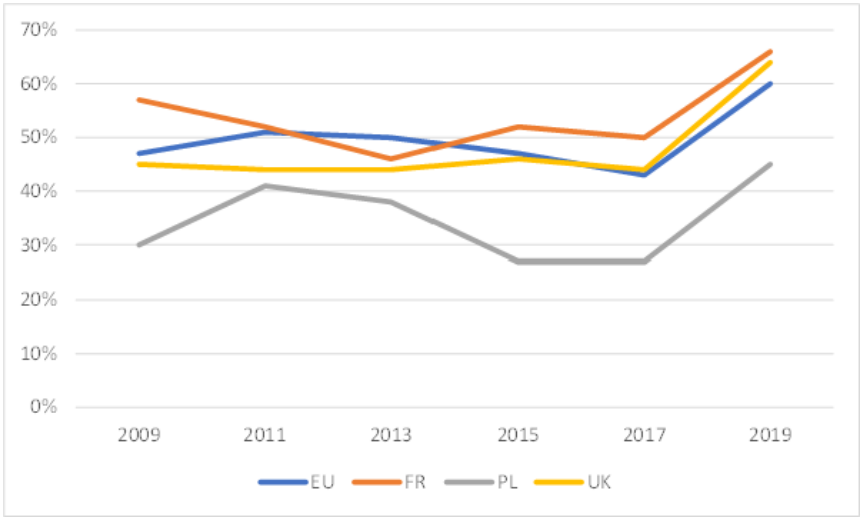

Figure 1 Public perception of the importance of climate changes

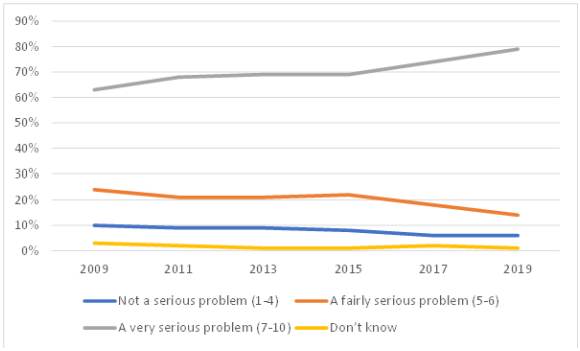

Figure 2 EU average on "How serious is the problem of climate change?"

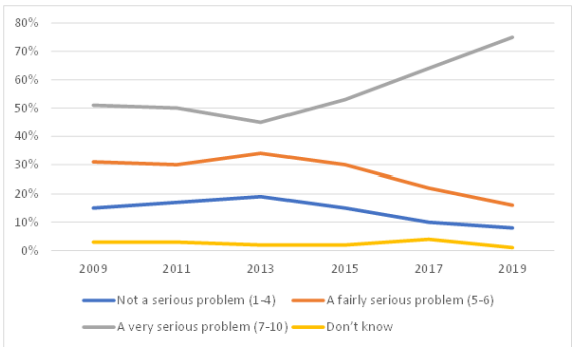

Figure 3 UK on "How serious is the problem of climate change?"

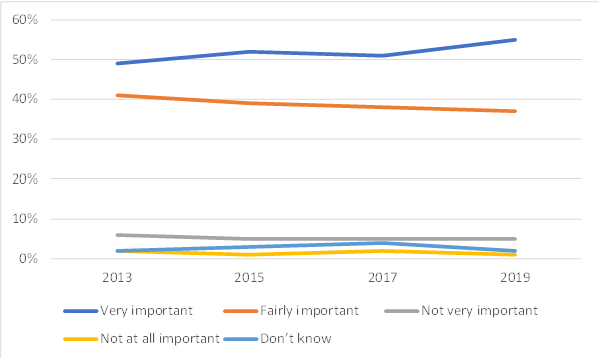

Figure 4 EU average on "How important is for national government to deploy RES?"

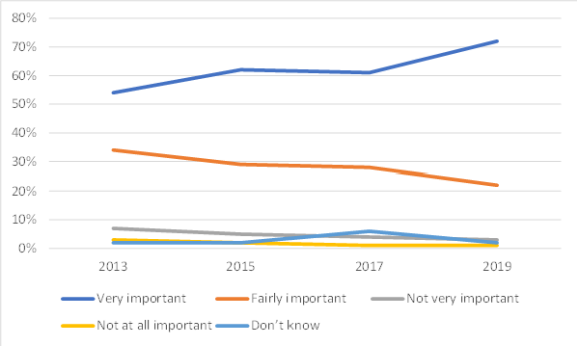

Figure 5 UK on "How important is for national government to deploy RES?"

Source: Eurobarometer Special 332, 409, 435, 459, and 490. QB1, QB2, and QB7.

The public perception of the importance of tackling climate change and the deployment of renewables in the UK increased during the past decades with a lower starting point then the EU average. As shown in figure 1, in 2009, 47% of European respondents found that climate change is the most serious problem in the whole world while 45% of British respondents found so. In 2019, the EU average is 60%, comparing to 64% of the UK. Similar pattern can be found in responses to Q2 whether climate change is a serious problem. Although the average European respondents were more likely to find climate change a serious problem (63% of which found it very serious) than their British counterparts (51%) in 2009, the two figures both raised near 80% (79% and 75%). British respondents have even stronger opinion when asked about the importance of target setting by the national government. 54% of them found it very important, comparing to 49% of EU average in 2009. in 2019, 72% of British respondents found it very important while 55% of European respondents gave the same answers. Overall, the public perception of renewables is positive at a high level. With a high level of recognition of the renewables, British respondents also support stronger government intervention. In a 2012 YouGov survey, 70% of respondents said that they will support the government to introduce legislation to make energy companies reduce use of foreign gas and coal and increase the share of RES. 77% of respondents even accepted a raise of energy bill to impose a levy on energy companies. Such a favorable attitude can also be found in more recent surveys. In a 2018 YouGov survey, 50% of respondents thought that the government is not doing enough and 77% of them found the government should prioritize increasing investment in the supply of energy/power from renewable sources. In 2019, support for renewables and a green economy remained high at an 80% rate (79% for RES, 80% for green jobs, and 82% for green infrastructure). When asked specifically about the renewables, Britons give fairly positive responses. In a 2010 survey conducted by YouGov, 76% of respondents found it favorable for wind farms to produce electricity, comparing to 17% for coal fired power stations, 25% for gas fired power stations and 38% for nuclear power stations.

Facilitating factors

Facilitating factors include change agents, formal institutions, and veto player. In the British context, change agents mainly refer to independent advisory bodies and environmental groups. Formal institutions consist of ministerial bodies and national authorities. Veto players are the North Sea oil and gas industry and trade unions who have a huge present in such industry. On the one hand, formal institutions considered the opinions from change agents and made several favorable changes. On the other hand, the economic and political implications of give up North Sea were unbearable. At the end, RES was left just enough space to fulfill the EU obligation, but nothing more. The top-down aspect of Europeanization in the UK thus can be concluded as a strange

combination of institutional compliance mixing with substantial resistance from the North Sea sponsored by the state. In the following section, different kinds of facilitating factors will be examined to demonstrate why the implementation of RED1 was insufficient.

Among all the change agents, the most influential ones are official advisory bodies like Committee on Climate Change (CCC). CCC have urged the government to cut carbon emission and adapt to climate change multiple times in its annual reports which were responded by the government at least on paper. In 2016, ministers committed to produce an emission reduction plan according to the recommendation of the CCC (Timperley, 2016). This promise was not materialized due to the upcoming Brexit turmoil (The Guardian, 2016c). In 2019, the government took a larger step by announcing a net-zero target by 2050, increased from 80% embedded in the Climate Change Act 2008 in response to the CCC report (British Embassy Beijing, 2019). Such a radical move received several critics by both environmental groups and the Treasury nonetheless (The Guardian, 2019d). Environmental activist groups like Greenpeace and Friends of the earth do not only confront the government for energy issues, but more directly towards the industry figures. Greenpeace has successfully challenged the North Sea oil and gas industry in the past decades. In 2014, it made LEGO drop its partnership with Shell as the way to discredit the latter's rebranding efforts. Greenpeace also pointed out that the industry exaggerated the scale of job loss during the 2014-2015 crisis (The Guardian, 2015b). Friends of the earth took North Yorkshire County council to the court for its fracking project in 2016. Although the high court did not favor its climate change agenda, this move raised the awareness as the Green Party and Liberal Democrats both found the ruling disappointing (The Guardian, 2016e). The influence of change agents on formal institutions during policymaking and implementation are not functional enough to indulge substantial changes, partially due to their lack of legal tools. Essentially, it is the missing of a formal channel which could collect, organize, and materialize appeals to real pressure and incentives, in sequence, real changes that impaired the efforts of change agents.

Formal institutions that should be responsible for the renewable's deployment include national authority Ofgem and ministerial departments (mainly DECC, BEIS, and Defra) while their responsibilities were not clearly delegated, let alone a coherent policy strategy. More emphases are placed on support schemes (Art. 22(1)(b)) and administrative procedures (Art.22(1)e) to comply with RED1 thus reach the national targets. The process of reforms of support schemes in the UK partially reflects the impact of top-down Europeanization, entwined with concerns on cost efficiency. Renewables Obligation (RO) has been the main measure to support renewables since 2002. After two reforms during 2009 to 2010, the scheme closed to new applications in 2017 and will be ended in 2037. To support smaller scale technology (mainly solar PV), Feed in Tariffs (FITs) was introduced in 2010. Both schemes were deemed to be replaced by Contracts for Difference (CfDs) as part of Electricity Market Reform pictured in the Energy Act 2011. Since the introduction of CfDs in 2014, three allocation rounds have been completed in 2015, 2017, and 2019 (BEIS, 2019). As mentioned before, the government has acknowledged the underperformance of RO since 2006 (DTI, 2006). The reasoning behind the reforms of RO however is that an unchanged RO will fail the RES-E targets in 2010 (10%), 2015 (15%), and 2020 (30-35%), argued by Wood and Dow (2011). Through banding of the RO, the government expected that there would be more flexibility to encourage smaller and/or community-based developments. As a result, the UK share of the EU 2020 target and the long-term targets for renewables and carbon reduction may be achieved (DTI, 2007, p14). After the 15% target was assigned to the UK, DECC launched a consultation specifically to meet the 2020 target (DECC, 2009). Consequently, RO was extended pragmatically from 2027 to 2037. The introduction of FITs on the other hand, was in direct need to achieve the target after a long-term neglection. In 2008, FITs were still found unnecessary by BERR in a consultation document considering its small benefits margin, delay and uncertainty, and the

incompatibility with the UK's market-based system (BERR, 2008). Such an attitude shifted after the 15% target of RES share and 30% of RES-E was confirmed as Ofgem "welcome and fully support the introduction of Feed-in tariffs as a simple, easy mechanism through which smaller generators can be rewarded for renewable generation" in its response to the consultation of DECC (Ofgem, 2009). As shown above, the pressure to reach the targets was the major driving force of support mechanism reform. Compared to the experiences of other Member States, the EU regulation may leave larger influence on such reform. Thus, the horizontal effects of Europeanization prevail in this aspect.

Although the RO and FITs have been in place since the earlier stage, the government paradoxically attempted to cut the subsidies for wind for several times. In 2012, the Treasury proposed a major cut in onshore wind subsidies by 25% under the pressure from a group (101 MPs) of Conservative backbenchers (The Guardian, 2012). During 2014 to 2015, the government took a U-turn on its renewable policies as support for onshore wind and large solar has been halted, Climate Change Levy exemption was removed from renewable electricity scheme, 70% of the Green Investment Bank would be sold, the rate of FITs for solar power was cut by 65% (Reuters, 2015). The main concern behind those changes may be the potential higher costs (The Guardian, 2015a). Then Prime Minister David Cameron claimed that the country did not need any more subsidized turbines while defended a relaxed tax regime on fracking (Wintour, 2014). Then secretary of DECC, Amber Rudd explained the government's decisions as to "ensure energy bills for hardworking families and businesses are kept as low as possible whilst ensuring there is a sensible level of support for low carbon technologies that represent value for money"(The Guardian, 2015b). In 2017, the government announced that there would be no new subsidies for clean power projects until 2025 in order to "protect" consumers (The Guardian, 2017). As a result, nearly one third of renewable energy jobs in the UK has been lost between 2014 and 2017, investment in UK renewables fell 56% (The Guardian, 2019c).

As for part of electricity market reform, the governments have taken a series of measures to remove administrative barriers to the development of renewable energy. In association with the transition to CfDs, Power Purchase Agreements (PPAs) and Off-taker of Last Resort (OLR) were introduced especially for smaller and independent generators (BEIS, 2020). The major planning reforms were introduced by the Localism Act 2011. The new planning system set a time limit of nine mouths for onshore wind infrastructure and a "planning guarantee" that it would take no more than months to decide on planning application. For offshore wind, an Offshore Transmission Regime was introduced to grant offshore transmission license (DECC, 2011). Other efforts include electricity transmission price control, "connect and manage" transmission grid access reforms and governmental investments (DECC, 2012,2013). The government contradicted itself in 2018 again by changing the regulation on assessment and design fees which added extra costs to smaller renewable generators (The Guardian, 2018a).

The main veto players in the process of energy transition in the UK would be the North Sea offshore oil and gas industry, including major operators like Shell, BP, and ConocoPhillips. Those big oil firms seemingly "speak double languages" regarding low-carbon transition: on the one hand, they publicly support the climate campaigns to rebrand their images. On the other hand, they constantly lobby at the national and EU levels to block unfavorable energy policies. The dilemma faced by oil and gas industry comes largely from the conflicting priority of energy security, market efficiency, and the needs to tackle climate change. Since the British energy market has been uncoupled, the manufacture, generation and retail supply of energy are independent (sometimes intertwined). The energy generators and suppliers therefore are less influential. Despite the political commitments and public support towards renewables, the importance of oil and gas remains not only in the energy sector but also in the British economy. The economic significance of North Sea oil and gas comes

from jobs it creates and tax revenue it brings. However, the North Sea is also regarded as one of the higher-cost, lower-return regions for investment (BBC, 2015a; Financial Times, 2017). During the 2014-2015 oil price plunge, all the major operators cut jobs to cope with the tough market conditions. According to a 2015 BBC (2015a) report, the sector employed 450,000 across the UK and directly supported other 333,000 jobs, indirectly 207,000 within the supply chain, and 100,000 more in the periphery economic activities. Shell, BP, and Apache all announced a cut of more than 200 jobs. The impact of this crisis lasted until a few years after as trade body Oil & Gas UK (OGUK) found in its annual report that 60,000 direct and indirect jobs were lost in 2016 (BBC, 2017). The sector also contributed 12393 million to the tax revenue during 2008 to 2009, compared to the negative contribution during 2015 to 2017 (HM Revenue & Customs, 2020). Through the downturn, then Chancellor George Osborne announced a cut from 50% to 35% of Petroleum Revenue Tax in order to support the oil and gas sector in the 2015 Budget statement (BBC, 2015b). To remove the current capacities was costly, too. In 2019, the National Audit Office predicted that taxpayers would pay £24 billion for tax relief awarded to oil and gas companies to compensate the potential losts (The Guardian, 2019a). Considering the magnitude of oil and gas industry not only in electricity generation, but more importantly in heating and transportation, along with its economic implications, the reluctant attitude of the industry and the government can be understood. Therefore, the industry found it legitimate to receive governmental subsidy (The Guardian, 2015c) as an important energy and economic factor while publicly promoting a low carbon transition campaign. As OGUK repeatedly claimed, the industry has a "credible plan for the future" to realize net-zero (Loughran, 2019). Beside of actively embracing CCS (Energy Voice, 2018), the industry was also open to other innovative technology and more decommission of current capacities, as the chief executive of OGUK Deirdre Michie stated in reply to Greta Thunberg's contention at the UN climate conference in Poland (BBC, 2019). Contrary to this gesture, the lobbying of big oil firms does not consist with their climate campaign. According to a 2019 report of influenceMap, BP, Total, Shell, Chevron, and ExxonMobil have spent $400 million out of 1 billion on climate since the 2015 Paris climate deal on branding or lobbying (Galey, 2019). Annually, nearly $200 million of lobbying used to delay, control, or block unfavorable climate change policies (The Guardian, 2019b). Moreover, the oil and gas industry allegedly held 110 meetings with senior treasury officials during 2013 to 2016 (Hall, 2017). When questioned, companies often defend themselves with the economic contribution and support for low carbon technology, which only makes up 3% of capital spending in 2019 (Galey, 2019). A typical example of the conflicts between different priorities would be Hydraulic fracturing (informally known as fracking). As trade union GMB claimed in response to Labour's attempt to ban fracking, shale gas reserve will ensure the energy independence of the UK from foreign dictators (The Guardian, 2016d). The government seemingly acknowledge the energy security aspect of fracking and held a positive attitude when lifting moratorium on fracking in December 2012, allowing Cuadrilla to resume operation after two seemingly associated potential earthquakes. In 2014, the UK defeated the EU's proposal to set legally binding environmental regulations for fracking (The Guardian, 2014). The ban on fracking has not been reinforced until November 2019, after the publishing of a report by the Oil and Gas Authority (Financial Times, 2019). Using economic and social implication to justify its operation, the North Sea convinced the government to easy restrictions on fossil fuel exploitation and CCS would be the solution to its environmental impacts. Still, it would not be possible if the North Sea does not share the same interests with the government's energy priority despite all the efforts of lobbying and public image rebranding.

Overall, the implementation of RED1 in the UK was undermined by the unclear distribution of administrative power between ministerial bodies, the lack of an accountable institution, and the resistance from the North Sea. Ultimately however, it was because of the inconsistency of energy policy priorities between the EU and the UK which manifested particularly obviously on RES deployment. The top-down side of Europeanization in the British case penetrated only the surface of the energy industry while the core remained

unchallenged to serve its priorities of market competitivity and energy security.

Horizontal

cooperative mechanisms

With impact of RES cooperation, the expected RES share in 2020 is ranged 16.2% to 16.4% for the UK which surpass its 15% target. Despite the potential benefits of cooperation, it did not appear to be an option as the UK has been confident of its energy potential from the beginning. It is indicated in the National Renewable Energy Action Plan (NREAP) that "The indicative UK trajectory demonstrates that this is possible and does not assume a contribution from the 'flexibility mechanisms' towards meeting the target in 2020." In the sequential years, it holds the similar indifferent attitudes towards cooperative mechanisms with zero gain from or surplus for them. More notably, no legal or administrative procedures have ever been established for cooperative mechanism. However, the UK does not exclude the cooperation with other Member States as an "contingency measure" to achieve its target. This mainly refers to the interconnection of electricity network with the Netherlands (BritNed), France (IFA), Belgium (Nemo Link), and Ireland (Eastwest) has been completed by 2020 while other two interconnectors are currently under construction. Such infrastructure development was not built for cooperation but for the completion of the Trans-European Networks for Energy (TEN-E). In 2013, the UK Government signed a Memorandum of Understanding with Irish Government for energy trade which did seem to be materialized as an intergovernmental agreement in 2014 as promised (with little follow-up). In conclusion, the UK has very limited use of cooperation with other countries to address energy transition. Instead, the UK would prefer importing energy source directly including natural gas and crude oil from Norway, the Netherlands and Belgium; Net Imports of 20.5 Mtoe of oil, 33.31 Mtoe of natural gas and 4.45 of RES with 1.82 electricity (Eurostat, 2020).

EU supports

In general, the UK has gain little from European Regional Development Fund (ERDF) and Cohesion Fund regarding renewable energy while the majority of funded projects concern energy efficiency.

Table 3

Overview of European Funding for the United Kingdom during 2009-2020 in Energy

	Item	Amount (EUR)	Scale
Horizon 2020(R&D)	ISOBIO	5,470,127	
EEPR	ERA-CLIM2	6, 996, 159	
	Ireland/Wales interconnector	110,000,000	500MWh
EEEF	Ore Valley	2,200,000	499t CO_2 emission savings
EEEF	Catfoss CHP plant	25,000,000	
CEF Energy Actions	16 electricity, 4 gas, all studies	93,200,000	

European Investment Bank	93 projects	14,940,694,130
Total		15,183,560,416

Sources: European Commission, European Investment Bank

The projects receiving EU funding are primarily studies and small-scale local projects which aim at improving energy efficiency. Only one plant has been built while another one, Don Valley CCS project, was dropped due to local resistance. Although the total number seems significant, a large amount comes from EIB. Among all the EIB financed projects, nearly all are infrastructure investment such as power network upgrade and offshore transmission network which do not have immediate impacts on energy transition.

In summary, the UK as a pace-setter did not behave entirely like the model predicted. To begin with, the UK did not attempt to minimize particular misfits of RES policies but successfully inserted its general interests into the European energy policy agenda, namely the market approaches and energy efficiency solution. And then, the implementation did not go smoothly due to the unclear distribution of responsibility between ministerial bodies as well as the resistance from the North Sea, demonstrating not only the misfits on the policy, but fundamentally also on the priority level. Last but not least, since energy independence is regarded as one of the energy policy objectives, the UK was not in favor of seeking foreign assistance through cooperation mechanisms. As for successful experiences on support schemes, the government only started to consider them when it was under the pressure of EU regulations. According to the findings from the British case, what matters the most to the UK as a pace-setters is not specific, short-term misfits but general, long-term interests. Thus, the top-down and horizontal aspects of Europeanization are relatively weak which leads to a slow energy transition.

Case study 2: Poland

Since the accession in 2004, Poland has been under the consistent compliance pressure to EU energy policy regime due to its heavy reliance on fossil fuels, especially hard coals. The Polish reluctance can be understood when the historically deep-rooted interdependence of politics and economy is taken into account. The main focus of Polish energy policy seems to be energy independence, namely the protection of its hard coal industry instead of energy transition or sustainability. As a newcomer to both the EU and renewable energy, Poland also suffers from the lack of bargaining power and the capacity to make substantial changes, let alone the political commitment of national authorities. Acting as a foot-dragger in the policy-making stage and a laggard during the implementation, the energy transition of Poland is so underwhelming with a 3.5% raise of RES share from 2009 (8.7%) to 2019 (12.2%) that it is impossible to reach its 2020 target of 15% in such pace. This chapter is an attempt to explain this slow process in the EU policy making context.

Energy transition status

Different from most of the Member States, the largest sector of RES in Poland is Heating and Cooling (11.6% in 2009, 16% in 2019), instead of electricity (5.8%in 2009, 14.4% in 2019). This may be explained by its abundancy of biofuels as it is also evident in the electricity production and electricity mix (largest in 2009, second to wind since 2015). The development of other RES in electricity generation is remarkable as well since wind raises from 100.1ktoe to 1224.5ktoe in 10 years and solar ended up with 61.1ktoe from zero in 7 years. Fossil fuels are nevertheless the main energy source in Poland as they make up 89.4% of the energy mix and 83.7% of electricity mix. Compared to 2009, those two figures, 93% of energy mix and 93.9% of electricity mix, are not improved significantly. Although the dependence on solid fossil fuels seems to drop by a 10% margin, it is still largely compensated by the increasing of consumption of oil and natural gas.

Bottom up

The energy policy regime did not exist in Poland until 1989. Since then, the Polish energy sector seemingly stuck in the centralized model of both production and management. The EU induced liberalization and privitization process in the 1990s did not bring substantial changes but the consolidation of the energy market. However, top-down national control is not the major problem. Due to unaligned priorities, the Polish government and industrial actors hold a rather different view on how to tackle energy and environment related challenges. On the one hand, the European narratives of stability, affordability, and sustainability (Johnson & Boersma, 2013) are not convincing to Poland but received as suspicious or even intrusive, probably manipulated by Germany for economic reasons. On the other hand, the misfits between the European and Polish visions of energy strategy are perceived as largely political from the Polish side; when the EU seeks "mutual dependence" with Russia, Poland "securitizes" its energy policies and attempts to push the anti-Russia agenda on the EU level (Ruth, 2011). Renewable energy, despite its potential contribution to both energy security and environmental protection, is thus merely a secondary issue, let alone the huge transaction costs to adapt the current energy system to it. In this chapter, the strained energy transition in Poland will be analyzed taking consideration of both national institutional difficulties and ideological mismatch.

The energy transition after 1989 was not under favorable conditions. Politically speaking, the rapid changes in legislature (Sejm) and in government bring instability to renewable policy. Institutionally speaking, the problem of the lack of accountability was not solved until 2012 when the Renewable Energy Department

was created. For most of the time, it was unclear who exactly had the competence on renewables and energy topics as a whole. This is especially crucial in the Polish context since ministries have strong connections with conventional industry figures. Under the Communist regime, renewables were not included in the energy discussion except for some large hydropower plants. Nuclear power, however, has been regarded as an option to limit coal dependency since the 1970s (Szulecki, 2020). At the first stage of Polish energy transition in the 1990s, severe environmental pollution (The New York Times, 1990) caused by massive usage of hard coal and lignite (contributed to 99% of electricity generation) was the main driving force. Public and political awareness of "alternative energy sources" have been risen and a serial of mitigation measures has been adopted, including the bill "The assumptions of Poland' s energy-policy until 2010"(Sejm, 1990), the first wind power plant built in 1991, and the first "State Environmental Policy" strategy document published in 1991 (OECD, 2003). Meanwhile, nuclear deployment faced opposition from anti-nuclear movement, e.g., protests against the construction of Zarnowiec plant (WISE, 1989) which resulted in a 15-year moratorium in 1990. In the context of environmental problem mitigation during the 1990s, some favorable changes for renewables happened but not substantially. Feed-in tariff was introduced in 1993 but failed due to low level of tariff and unpredictability, thus closed in 1999 (Szuleck, 2020). In 1994, the European Commission established the EU Baltic Renewable Energy Centre (EU BREC) which supported renewables deployment under Ministry of Agriculture since 1997. This is the first sign of EU influence over renewable policies in Poland through pressure of accession. In 1997, Energy Law (Dz.U. 1997 nr 54 poz. 348) was adopted and connected the development of renewables with national energy security (Art. 3(16)) while establishing the independent Energy Regulatory Office (URE). Notably, biomass and fussel fuel co-firing was also listed as "renewable energy". In 1999, the Ministry of Economy replaced the FITs with a Renewable Purchase Obligation which was not successful either (Paska & Surma, 2014). At that time, it was the Ministry of Environment who oversaw the renewables instead of Ministry of Economy who was responsible for energy issues. The role of coal in the energy sector was still dominant despite a 10% drop from 75% to 65% in both production and electricity generation during 1990 to 1999 (Eurostat, 2020). The closure during the 1990s of coal mines was mainly due to inefficiency. The remained mines were grouped together and merged into coal corporations (Brauers & Oei, 2020).

Although Poland was part of UN Framework Convention on Climate Change (UNFCCC) and later signed the Kyoto Protocol to reduce GHG emission by 6% during 2008 to 2012, the influence of international commitment on Polish energy policy was still limited. Carbon emission problem was considered as " solved" by the structural change towards a less carbon intensive industry (Marcinkiewicz & Tosun, 2015). In the next period during 2000 to 2004, the accession to the EU did not bring substantial changes either. Unlike what the model predicts, Poland has never been fully dedicated to complying with the EU standards. This strange reluctance may be explained by the unique Polish mindset where coal is not only the basis of economy but also the basis of national security. Since the deployment of renewables did not fit in the coal-oriented system, there was little consistence in the Polish renewable policies. Moreover, the EU was unlikely to postpone the accession of Poland as a punishment for non-compliance once the 2004 enlargement was inevitable (Ancygier, 2014). From the very beginning, the top-down Europeanization was deemed to be only superficial. On the one hand, it imposed some duties through legislation, but not the consequences of failing those duties. On the other hand, the large gap of energy strategy between Poland and EU predicated that the cognitive changes would not happen either.

During the new period, renewable energy was integrated into energy policy as its competence was shifted from Ministry of Environment to Ministry of Economy, which was suspicious to its cost-efficiency, nonetheless. In Assumptions of the Energy Policy until 2020 published in February 2000, the priority of Polish energy sector was to increase the share of liquid fuel and reduce the economy's energy absorption (Ministerstwo Gospodarki,

2000). In September 2000, an ordinance "The Strategy of the development of renewable energy" was adopted by the Ministry of Economy to increase the share of RES to 7.5% by 2010 and 14% by 2020 through renewable purchase obligation, which cast upon electricity suppliers announced later the same year (Wohlgemuth & Wojtkowska-Łodej, 2003). However, those targets were not binding but rather "an expression of good will" (Szulecki, 2020). Progress was hindered in 2001 by the new government with key figures having strong ties with the conventional energy sector. To begin with, the newly emerged wind industry was criticized for its reliance on imported infrastructure (from Denmark or Germany) and job loss in the conventional energy sector (Ministerstwo Gospodarki, 2002). Conditions for the deployment for renewables were worsened. First of all, RES was subject to a 22% VAT rate compared to 7% VAT for conventional energy sources. The purchase obligation was not complied by electricity providers very well either. Moreover, the transmission system operator (TSO) PSE blocked all intermittent renewables from the wholesale market (Szulecki, 2020). Last but not least, the instability of support schemes started to unveil. When asked for a new support scheme by the Parliament, green certificate was preferred by the deputy director of the Ministry of Economy as he stated that " We propose market mechanisms, so-called Green Certificates, a renewable energy market" which was rather strange since the liberalization of Polish energy market was not completed yet (Wohlgemuth & Wojtkowska-Łodej, 2003).

Started with such a low point, the situation for Polish renewables was not improved much in the following years. This was not surprising since the priorities of Polish energy policy were still energy independence and economic growth based on the coal industry. Nepotism between the formal institutions and coal industry in an already centralized energy market added more difficulties as well. Meanwhile, Poland started the attempt to insert its energy strategy into the European agenda with a prominent geopolitical implication. In 2003, a new renewables law was drafted in proposed by the Institute for Renewable Energy, the successor of EC BREC, which was part of Ministry of Environment. The Technology-neutral green certificate was regarded as the core support scheme in the draft. Such preference towards TGC can be understood at this point, as Szulecki et al. claim (2016), was to open the door for co-firing, nuclear and "clean coal" to be benefited from support schemes, subsequently safeguard the interests of the conventional energy sector (Szulecki, 2020). The attempt to protect conventional incumbent can also be found in the attempt to give more power to the TSOs in a new draft dated November 2003 submitted by the Department of Instruments for Environmental Protection whose head was a former employee of PSE, the largest TSO. Although in late December another draft was sent out for consultations, renewable energy organizations and environmental groups were not included (Ancygier, 2014). After Poland officially entered the EU, co-firing was classified as renewable energy in 2004, which would become the main contributor of the Renewable deployment in Poland. In the next period, the new adopted certificate scheme reinforced the coal industry while nuclear power went back to the political agenda and Poland started to push its "energy union" idea as an alternative to EU's energy picture. The first factor of change on support mechanisms came with the new government in 2005 when the Renewable Energy Act was finally adopted and transposed the RES-E 2001/77/EC after multiple drafts. TGC was introduced along with the guarantee for all renewable electricity the access to the wholesale market (Szulecki, 2020). The main beneficiaries of the newly adopted TGC were co-firing plants due to its relatively low costs and the technology neutrality of the support scheme (Paska & Surma, 2014). As a result, other RES like wind and solar PV has little development. From 2005 to 2009, cumulative solar and wind capacity increased from 121 MW to 709 MW, or 0.4% to 2.1% of the electricity capacity (Eurostat, 2020). Even worse, the consolidation of the energy market during 2006 to 2007 provided the conventional industry more controls. Polska Grupa Energetyczna (PGE), Tauron, Enea and Energa now officially became the state-controlled oligarchs. The centralization seemed more severe when considering the nepotism between the government and the industry. Szulecki (2018) points out

that it has been a common practice for governmental officials to sit in the board of energy companies to "supervise" their business decision. In the other way around, formal employees seek public position to insert influence on the government energy agenda. Due to such a "government-industry" complex, neither public policy nor business decision was made in their best interests. TGC was proven as a failure mainly due to the oversupply of co-firing. Although in number the deployment of RES (6.6% in energy mix in 2009) and the reduction of GHG emission (87.1% of 1990 level) seemed to go on the right track, the development of a Polish renewable industry and decarbonization of the industry were still in their early stage. Meanwhile, in the Polish Energy Policy by 2025 the need to develop nuclear energy in Poland was brought out for the first time after the massive anti-nuclear movement (Ministerstwo Gospodarki, 2005). Poland also had a very different picture on energy issues, especially towards energy dependence from an early stage. While the EU seek "mutual interdependence" with Russia, Poland rejected the idea of seeing Russia as a reliable supplier of oil and gas (Roth, 2012). During 2004 to 2005, Poland not only contributed to the election of the pro-Western forces in Ukraine, but also advocated the Ukraine membership. "Diversification" thus gained different meaning for the EU and Poland: for the EU, it refers to the diversification of energy sources which RES enjoys a prominent role while in Poland this means firstly finding suppliers of gas other Russia and then developing nuclear power, despite its negative economic implication (Szulecki et al., 2016).

In 2007, the new government led by Donald Tusk presented as more pro-EU and pro-environmental while the basic energy strategy remained intact. Poland's lagging attitude during the negotiation of RED1 can be understood for the following reasons. First of all, the revision of EU Emissions Trading System (ETS) gained much more attention due to its significant costs. In its opinion addressed on 29 September 2008, Polish delegation argued that the introduction of full auctioning will contribute to "a slowdown of economic growth and decrease the EU's energy security". Moreover, Polish delegation also believed that "the reliance on coal will not be significantly decreased even in case of a significant rise of RES share in electricity generation in coal-intensive Member States" (Council of the European Union, 2008b). Poland thus required three amendments of a carbon-price ceiling, free allowances for electricity plants, and more allowance from auctioning revenues (Skjærseth, 2018). Poland had to accept the package in the end, despite its earlier threats to veto it unless being given the favorable ETS revisions. On 12 December 2008, the final compromise was achieved on the EU ETS and RED was accepted just as a part of the package "out there" (Szulecki, 2020). Although Poland held relatively strong power in the Council (Thomason, 2008), this capacity may be undermined by its previous pursuits on the "Energy Union" where Poland did not gain much support from the Commission, the "West", nor other members of the Visegrád group (Roth, 2011). Eventually, Poland got the favorable conditions on ETS by forming coalition with the UK and wielding vetoes from the Visegrád group (Skjærseth, 2018) despite its relatively weak administrative capacity (Ancygier & Szulecki, 2014).

In conclusion, the development of RES in Poland is not possible without EU influence. Neither economically, politically, nor strategically does RES fit into the Polish energy sector despite its great reserves in Poland and potentials to economic growth and contribution to environmental protection. Polish governments regardless of their ideological position regard the conventional energy sector as the basis of the Polish economy and more importantly the guarantee of national independence. Nepotism that deeply rooted in the government-industry relations enforces this kind of state control, resulting in the "securitization" of Polish energy policy. During the negotiation for RED1, Poland as a lagger did not put many efforts on minimizing the relatively large misfits in RES policy but focused on EU ETS. Once again, the model at least partially failed to predict such behavior since it does not take the whole picture of the Polish energy strategy into account. Besides, the indirect effects of the geopolitical disputes slipped under the radar as well, indicating the importance to

consider the current context.

Top-down

Domestic changes

In sum, domestic changes in Poland can be barely classified as at middle level (see table 2). Formal transposition of RED 1 was delayed for five years, yet the Commission did not actually punish Poland for it. Market share of RES may seem high but only in number since it was driven by co-firing where 80% of the fuels are coals, let alone the persistent oligarchy of the four energy groups. The lack of countable institution and only lukewarm public support for RES does not send positive signal either.

The transposition of RED1 into Polish law was not completed until January 2015 when Poland officially noticed the Commission. Prior to that, the Commission has started the infringement procedure in early 2011 by sending a Letter of Formal Notice to Poland. In 2012, this case was referred to the Court of Justice and financial penalty was enforced (European Commission, 2015). Under the pressure of the Commission, the legislation procedure finally started to roll out in December 2011 when the draft renewables law was presented. In July 2012, the first draft was significantly changed to introduce FITs for smaller capacities and reduce support for large hydro and co-firing. A "Small Three-pack", the downgraded version of the expected "Energy Three-Pack" was adopted to set the temporary amendments to the 1997 Energy Law and "more fully implements EU regulations" in the Sejm in July 2013 (Sejm, 2013). Such a slow pace can be explained by unfavorable political conditions and the changes on State Aid rule in 2014. Neither of the government nor the opposition made positive remarks on RES at this point. Tusk stated that "We will not create more ambitious tasks. Within these 15 percent" at the press conference and energy price clearly had more weights for the government as he repeatedly mentioned "the cheapest possible cost for the recipient" (WNP, 2013). The main opposition, PiS, openly hold skepticism against climate change and preferred support towards biomass, waste, and geothermal energy on the basis of strong coal position. It also criticized the new renewable act as the work of wind lobbyists (Szulecki, 2020). Finally, after almost five years, Poland transposed RED1 into the national law by adopting Act on renewable energy sources (Ustawa o odnawialnych źródłach energii) Dz. U. 2015 poz. 478 in February 2015.

Even under the European pressure to support renewables, the Polish government and energy sector still found a way to resist trend. Although support schemes in Poland have never been successful neither in the form of tender nor of FITs before. With the amendments in the Act of Renewable Energy, the development conditions for renewable industry did not improve. Small solar PV became the only beneficiary whose influence on the deployment of RES was little but perceived as a threat by the conventional sector, nonetheless. The conversion factor at 0.75 for wind was not attractive to investment while a 0.70 rate for biomass co-generation was still highly profitable (Ancygier, 2014). The deeply intertwined relation of interest between government and industry should be hold accountable, at least partially.

From the 1990s, energy policy fell under the competence of the Ministry of Economy who was and still is linked to the coal industry. While Ministry of Environment criticized biomass co-firing as "technological and economic nonsense", its competences on renewables were transferred to the Ministry of Economy, which held strong ties with the coal industry (Ancygier, 2014). After the transfer of Marcin Korolec and other former employees of the Ministry of Economy to the Ministry of Environment, the conventional energy sector thus gained more control over renewable policy. This reform and the dispute on whether to spend money on environmental protection led to the resignation of then minister of the Ministry of Environment Maciej Nowicki (PolskieRadio24, 2009). The Renewable Energy Department, was created and then subordinated to the Ministry

of Economy since 2012, was the only institution that dedicated to the development of RES in Poland especially as the only official channel for the emerging renewable industry. According to Ancygier (2014), it was the Department's efforts that the support for co-generation could be reduced in the second draft of the Act. Not only did it convey the interests of the renewable sector, but also became the first formal institution that could be hold accountable for renewable targets and policy implementation. Unfortunately, after the 2015 election, a new Ministry of Energy was formed by the right-wing PiS government. Energy competences thus were deprived from the Ministry of Economy and the Department, who also lost its director (Szulecki, 2020). Besides, the new Ministry did not hold the full control over energy topic since climate change was assigned to Ministry of Environment and the liquidation of the Treasury was also delayed (Forsal, 2015).

Substaintial changes barely happened in the Polish energy market due to the reliance on coal and the oligarchy while numbers look good. As mentioned before, the share of RES in Poland is driven mainly by biomass co-firing where the electricity generation counts as renewable despite its coal element. During the decade between 2009 and 2018, gross electricity generation from renewables increased from 9.28 TWh to 26.17 TWh (so a 182% rise) and a 10% rise in electricity mix (from 6.1% to 16%). The electricity market is dominated by state-owned monopoly as there were only 3 main producers in 2018 whose market share are larger than 5% and generate 33% of the electricity with 20% of the capacity. There were also less retailers in 2018, the number of which decrease from 7 to 4 (Eurostat, 2020).

The public awareness of climate change started in Poland at a relatively low level where 52% of the respondents found it a very serious problem, compared to EU average of 63% and French 72%, but similar to the British 51%. During the decade between 2009 and 2019, the percentage of people who perceive it as a very serious problem rise to 70%, still below the EU average 79% and other two cases (82% for France and 75% for the UK). More notably, the climate skepticism has been seemingly weakened, as 17% of the respondents found it not a serious problem in 2009 but only 5% in 2019, below the EU average of 6%. An uptake in 2011 might be the effect of the adoption of the Climate and Energy package. When asked about whether the government should set targets for RES, the Polish respondents become more reserved. In 2013, only 33% thought it was very important and 55% found it fairly important, slightly below the EU average and other two cases. In 2019, approximately same percentage of people found it very important (35%) and 52% found it fairly important, indicating no obvious changes while in the other two cases there are big jumps in number (14% for France an 18% for the UK). The trend over the six years is relatively stable, might explained by the lack of general trust and confidence towards the national government.

In general, Poles are not interested into RES that much. According to a study (IBRiS, 2020) made by the Institute of Market and Social Research (Instytut Badań Rynkowych i Społecznych, IBRiS), most respondents believe RES is beneficial to Poland (87%) and a modern solution to energy problem (82%), especially the energy security problem (76%) and climate change (69%). However, there were still 51% of the respondents thought RES are expensive and 37% of them found it unreliable. 26% of respondents treated it as an imposed obligation by the EU thus the Westerners. In turn, coal should be the basis of the Polish energy mix (44%). This preference towards coal can also be found in a Pew survey (Pew Research Center, 2020) where 84% of Polish respondents prefer RES over gas and coal when 90% of their French and British counterparts who hold a similar view. Less Poles (63%) support their country to limit GHG mission as part of an international agreement compared to other two cases (86% for France, 78% for the UK) (Pew Research Center, 2015).

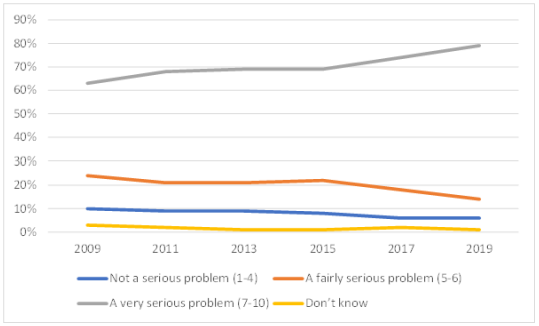

Figure 6 EU average on "How serious is the problem of climate change?"

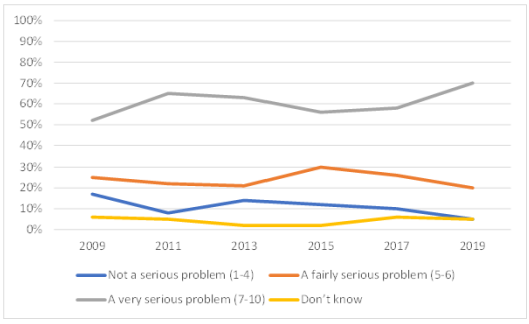

Figure 7 PL on "How serious is the problem of climate change?"

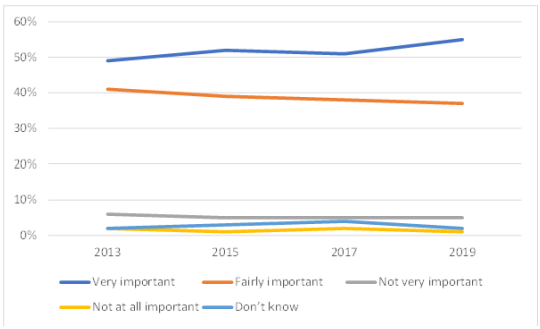

Figure 8 EU average on "How important is for national government to deploy RES?"

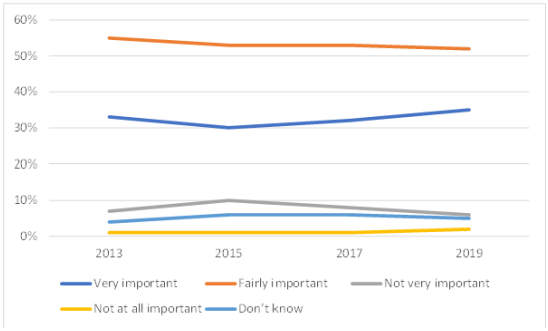

Figure 9 PL on "How important is for national government to deploy RES?"

Source: Eurobarometer Special 332, 409, 435, 459, and 490. QB1, QB2, and QB7.

Facilitating factors

The non-compliance of Polish formal institutions and veto players laid the largest barriers to the deployment of RES. Even though environmental groups actively took legal and civil action to challenge the government and the coal industry, the formal channel to materialize all the helpful critiques and proposals simply did not exist for the most of time. Therefore, neither of the compliance pressure imposed by the EU regulation nor the signals of the domestic RES industry indicating the further development failed to transfer into real progresses for the want of facilitating factors, especially a responsible formal institution. However, this lack of facilitating factors may be traced back to the lack of political commitment.

Change agents

Change agents in Poland mainly consists of environmental NGOs like Greenpeace, ClientEarth and Rozwojtak Tak-Odkrywkinie Nie! (Development YES – Open Pit Mines NO!) and national authority Najwyższa Izba Kontroli (NIK) (Supreme Audit Office). Although their activities including protests, lawsuits, reports, and constant criticizing the government and coal industry, the actual impacts on renewable policy and development are limited. Only certain institutions have access to the policy making process, such as EnergSys. Independent institutions like the Institute of Sustainable Energy and environmental NGOs on the other hand do not have real influence on policymaking (Ancygier & Szulecki, 2014).

Development YES sued Group PZU, a coal company in 2018 regarding the latter's CO_2 emission according to the OECD Guidelines. Two parties eventually made an agreement as PZU promised to stick to its carbon reduction commitment and accept the supervision of Poland National Contact Point (Poland NCP, 2019). Greenpeace also filed a lawsuit against PGE GiEK in 2020 and required the nation's largest coal plant operator

to stop any fossil fuel investments and reach net zero by 2030 (Greenpeace, 2020). ClientEarth filed a similar lawsuit against PGE as well in demand of the latter to reduce the GHG emission of Belchatow power plant. The organization urged PGE to close 11 of 12 coal units at Belchatow ten years earlier than the original deadline of 2040 (ClientEarth, 2019). To raise awareness, Greenpeace organized a protest in 2019 by trying to stop a ship carried with imported coal (Reuters, 2019b).

As the national authority, NIK has more yet not sufficient weights on pushing the government to adjust its policies. For example, the NIK published a report on the delay of the RES development in Poland and criticized the Ministry of Energy for its lack of a coherent, comprehensive concept for the development of this sector in the Energy Policy of Poland until 2030, which has not been updated since 2009 (Teraz Srodowisko, 2018). Although the Ministry published its extract of draft within one week, Energy Policy of Poland will not be published until 2021 and RES policies will not be updated until then. In the past, NIK has also accused relevant ministries on gas and coal policies on their incompetence of implementation and supervision. Instead of accepting those criticisms, Ministries often chose to deny them (Teraz Srodowisko, 2015).

Formal institutions

The formal institutions in Poland are not RES-friendly and the development of support schemes is solely driven by EU obligations while foreign experiences are perceived negatively. As a result, the renewable policies lack consistence. Not only the transposition of RED1 was delayed for five years, but the framework of support schemes was altered multiple times which brought great uncertainty to investors. The deprived status of relatively pro-RES ministries combining with the gradually strengthened ties between the government and coal industry, as well as the low salience of RES issues in the political discourse depict a rather harsh institutional environment for RES development in Poland.

The lack of strategy on RES development can be firstly found in the strategy documents. In 2009, the council of ministers adopted Polityka Energetyczna Polski do 2030 (Energy Policy of Poland until 2030). In this document, renewable energy was listed as one of the priorities with emphasis on biofuels which were deemed to have the highest energy potential. However, (fossil fuel) energy security and diversification through nuclear energy were also presented. The central position of hard coal in terms of energy security was stressed again in the National Renewable Energy Action Plan (NREAP). There was no legal limitation on exploitation of new bituminous and lignite coal mines presented in the NREAP either (Ministerstwo Gospodarki, 2010. P.15). Instead of RES, nuclear energy was regarded as the more efficient tool to both implement the EU climate and energy policy and ensure the energy security, as well as to serve environmental protection purpose, according to the 2014 Program of Polish Nuclear Energy (Ministerstwo Gospodarki, 2014). According to Rosicki (2015), the protection of coal and the promotion of nuclear is on the strategic side of the energy security. In the draft of Polityka Energetyczna Polski do 2040 (Energy Policy of Poland until 2040), the object of diversification shifted from energy resource (previously nuclear) to supply, in line with Poland's external energy policy since 2004 (see last part). Security and independence became the more prominent theme in which domestic coal will play an important role (Ministerstwo Energii, 2018. p.2). The share of coal is reserved at a 60% level in electricity generation and the first nuclear unit will be introduced in 2033 to reduce carbon emission, followed by five more by 2043(Ibid, p.4). The economy competitiveness argument, however, did not hold water since each ton of bituminous coal needs €9 to €10 of subsidy. To close the uncompetitive coal mines, the government even paid PLN 7.58 billion (PAP, 2016). In the long-term landscape, the contribution of RES is suspected according to Polityka Energetyczna Polski do 2050 roku (Energy Policy of Poland until 2050) published in August 2015. It also admitted that the factor stimulating the development of RES in Poland would be to fulfill the EU obligation

(Ministerstwo Gospodarki, 2015. P. 24). Moreovef, the economic efficiency of RES was questioned again, "The development of renewable energy sources and the functioning of their support systems should not disturb the mechanisms of the energy market or cause excessive pressure to increase its prices" and no support will be expected to be granted after 2035 (Ibid. p.14 &P.38). RES was considered rather complementary to natural gas in a balanced energy scenario, if not pursuit nuclear (Ibid. p. 40). In this context, the development of RES and support schemes has been sidelined with no clear priority nor direction. The draft presented in July 2013, the "small three-pack" replaced FITs with TGC in which RES was favored since more certificates per unit was granted (Sejm, 2013). However, a new Minister of Economy brought a new draft in November where nuclear was prioritized while TGC and its technology-specific feature were replaced by auctions. Although a fixed FIT was adopted in 2015 for small installations with capacity below 10kW, overall situations were not improved to RES (Szulecki, 2020).

Since the election of PiS in 2015, Poland fell under the long-term reign of a single party which in turn hindered the progress of energy transition. PiS kept its promise to protect the coal industry and form the group Polska Grupa Górnicza (PGG) in 2016 to save unprofitable mines (Brauers & Oei, 2020). More importantly, a new Ministry of Energy gained the energy competences. The amendment on Renewable Energy Act proposed by PiS in 2016 dimed the future of RES once again. First of all, the ratio between biomass and coal will be changed from 30/70 to 20/80 for co-firing to be considered as renewable. Moreover, a huge amount of additional costs was planned to be casted onto windfarm developers. Not only will they need to renew their license every two years, but two separate permits will also be required to renovate a turbine. Less explicitly, since turbines must be built at least two kilometers away from house or forest, there will be less eligible spots left for new turbines. This move was perceived as an active action taken by the government to prevent the development of wind and to protect coal from competitions by Tobiasz Adamczewski, an energy expert at WWF Poland (The Guardian, 2016a). Additionally, the response by the Ministry of Energy towards the oversupply of Green Certificates was to increase the RES obligations in 2018 and 2019 while keep the price of certificate at the lowest level ever. Although Polish Wind Energy Association pointed out that this move would not solve the oversupply, it was carried out nonetheless (Teraz srodowisko, 2017). In 2018, the FIT/FIP were reintroduced for small installations below 500kW, but both wind and solar PV were not eligible to apply. Instead, biofuels were clearly favored (Ministerstwo Klimatu, 2019). Along with the liquidation of the Ministry, energy competence was moved away from Ministry of Energy once again at the end of 2019 and divided by Ministry of Climate, re-established Ministry of Environment, and Ministry of State Assets. The future for RES in Poland does not seem certain under such circumstances.

Polish politicians also share this indifferent, sometimes hostile attitude towards RES, regardless of their political affiliation. Often regarded as relatively Europhile, Donald Tusk was softer in his rhetoric regarding RES without substantial change on attitudes. On the 2013 COP 19, Tusk recognized climate change as a problem while stressing the economic importance of coal with little mention about RES (Tusk, 2013). The main elements of Polish energy policy were shale gas, coal, and nuclear energy as Tusk claimed (WNP, 2014). The development of RES on the other hand was merely pushed by the EU obligation which has been implicated by Tusk multiple times (S&P Global, 2013; WNP, 2013). On COP24, PiS picked President Andrzej Duda proudly announced that Poland was sitting on 200 years' worth of coal which is the gift from God (The Guardian, 2018b). He also confirmed that "there is no plan today to fully give up on coal" (Reuters, 2018). Marcinkiewicz and Tosun (2015) pointed out that climate change was hardly a salient issue in the Sejm either. Although the votes on environmental issues and climate change increased since the EU accession, energy specific vote only happened twice in 2012 for the Climate and Energy Package. By analyzing the parliamentary speeches, they also could

not find positive stance from any group on climate policy (Marcinkiewicz & Tosun, 2015). Even the opposition was happy to see the veto of the Roadmap 2050 as Ludwik Dorn, the deputy chairman of Solidarna Polska (SP) argued that the Climate and Energy Package would hit the poorest countries first, especially the heavily coal-dependent Poland (Rzeczpospolita, 2013).

Veto players

Unlike their British or French counterparts, the Polish coal industry are not outspoken on their own but manifests its influence through the connection with the government. But more importantly, the enormous protection offered to coal industry is in line with the Polish energy strategy. Veto players in Poland are thus more difficult to challenge and have no obvious reason to compromise. Paradoxically, even though coal industry is regarded as the core of Polish economy, large energy groups are not doing well financially which limits the investment opportunity for RES industry.

First of all, the Polish energy market is highly centralized. Since 2006, the electricity market in Poland has been consolidated and four companies, Polska Grupa Energetyczna (PGE), Tauron, Enea and Energa thus took over the industry (Ancygier, 2014). Those energy companies also established strong tie with the government, especially with the Ministry of the Treasury, their largest shareholder, and the Ministry of Economy, connected with a "revolving door". One example would be Piotr Woźniak, who was the Minister of Economy and Deputy Minister of Environment before PiS came into power when he became the President of PGNiG (Szulecki, 2008).

On the one hand, coal industry has received considerable supports from the government. During the negotiation of the Climate and Energy package, Poland was tough on ETS reforms and eventually got favorable conditions (see previous part). However, most money made by auction of emission allowances and €7.5billion worth of free allowances offered to Poland that were expected by the Commission to invest in clean energy were used to support the coal industry instead. According to the report of Greenpeace, the WWF, and the Climate Action Network, only 1% of planned projects would support RES investment, compared to 82% of the coal projects (Euractiv, 2014a). This is not a surprise since the original goal of the government is to protect the Polish coal industry. Amid the COP19 held in Poland, Maciej Grabowski, who regarded the extraction of shale gas as his priority was appointed as the new Minister of Environment (Bankier, 2013). On the other hand, the connection is not unilateral: when the government protects the conventional energy sector, it also requires companies to take decisions made on the political ground. One example of such state control can be found in the case of PGE, the largest producer in the country. In 2012, the Tusk government appointed Krzysztof Kiljan as the head of PGE to build Poland's first nuclear power station, explore shale gas, and finish the Opole coal plant at the same time (Szulecki, 2018). Although the new president sent letter to Minister of Economy to express his concerns on the nuclear program, the Ministry refused to suspend the preparatory work for the construction, nonetheless. Early in 2012, Kilian suggested that nuclear program and shale gas program were mutually exclusive since either of them could fulfill the energy security priority (Dziennik Polski 24, 2013). Later it was proved that none of those programs are profitable by the poor financial state of PGE. Let alone the fall of its stock price during 2014 to 2018 from PLN 25 to less than PLN 10.6, it had to pay for the rescue of PGG with PLN 0.5 billion despite its own problems. A portfolio mainly consists of fussel fuels is not in line with the decarbonization obligation of the EU thus PGE has to spend on rejuvenating its old facilities and paying for its carbon emission at the same time (Bankier, 2018). The underperformance of large energy groups is not a good news for the renewable sector since they are the main investors of the sector. However, since RES is out of the strategic picture of the government, the falling regulatory conditions since 2016 made even the large energy groups hard to invest in it (Bankier, 2016).

Horizontal

Cooperative mechanisms

The estimated RES share (13.7% to 13.8%) in 2020 with impact of RES cooperation for Poland is still lower than its target of 15%. Even though, Poland has not considered cooperation as an option as it stated in the NREAP and repeated this position in the sequent process reports. The constant deficits in electricity and transport sectors since 2010 do not allow Poland to offer any surplus for other Member States, either. Despite the existence of interconnection capacities with other six countries, the actual transmission carried out by them is much lower and electricity import only counts a fracture of energy net imports. Furthermore, Poland is the only country that established rules on statistical transfer and joint project in its RES act even though neither of them has been utilized.

EU funding

Table 4

Overview of European Funding for Poland during 2009-2020 in Energy

	Item	Amount (EUR)	Scale
EEPR	Polish LNG Terminal	79, 561, 868	
	Czech-Poland Pipeline	14,000,000	
	Poland- Germany Interconnection	14,405,248	
CEF Energy Actions	3 works of gas	410, 800, 000	11 actions
OP-IE	2007-2013	1,693,211,765	
	2014-2020	2,905,383,890	62 funding agreements
Regional operational programme		263, 020, 000	243 agreements
European territorial cooperation programmes (INTERREG)		10, 154, 479	
European Investment Bank		4,070,106,689	34 projects
Total			9,460,643,939

Sources: European Commission, European Investment Bank

As it indicates in the table, Poland does not receive much from the EU funding in the energy sector. Three EEPR projects are infrastructure development with a terminated one due to request from the beneficiary. The most notable funding comes from the Operational Programme Infrastructure and Environment which is

consisted of the Cohesion Fund and ERDF, namely part of EU regional policy. However, the contribution from those regional projects to energy transition is unclear.

In conclusion, the EU is often presented as an anti-force in the Polish energy transition. The gap of energy strategy between the EU and Poland manifested itself since the 2004 accession and keeps further diverging. When uploading its preference, Poland chose the bigger picture over the temporal misfits of RES policy with little incentive to comply anyway. Later in the implementation stage, the supposed top-down pressure did not convey into real changes thanks to the institutional resistance from the state-industry complex. Since independence is the first priority, neither cooperation nor foreign experiences worth considering. Although the performance of Poland corresponds to the behavior pattern predicted by the model, it is through a slightly different mechanism. Once again, it is not the misfits on particular policies but the general interests that member state tends to concern, even if it possesses sufficient bargaining power in the council. The fear of the potential punishment wielded by the Commission is also overweighted by the domestic priorities such as energy security and independence in Poland's case.

Case study 3: France

France is generally classified as a fence-sitter according to its indifferent attitudes towards EU renewable energy policy for most of the time. The advanced development of large hydropower and nuclear power allowed the national authorities to not take energy transition as a political or economic priority. In its path to "catch up" with environmental frontrunners, France has faced with lots of difficulties. The liberalization of European electricity markets brought challenge to the French market which has been dominated by Electricité de France (EdF) since 1946. Let alone the persistence from major actors like EdF and AREVA (now Orano) and labor unions, the implementation of RED1 is also hindered by heavy administrative burdens. In 2019, the RES share of France was 17.22% which is far from its 23% target considering the average 1% per year growth in the past ten years. This chapter try to answer how did France continuously fail to reach its targets with relatively favorable conditions.

Energy transition status

Unlike the previous two cases, France has almost always been lagged its interim targets during 2011 to 2018. This slowness also can be found in the renewable energy share per sector where RES-E raises from 14.4% to 22.4% and RES-H&C from 13.3% to 22.5%. Another feature of the French energy sector is its dependence on nuclear energy. In 2009, nuclear energy makes up 40.5% of energy mix and 76.5% of electricity mix. Ten years later, nuclear energy still holds the biggest share of 40.6% in energy mix and 70% in electricity mix. Along with the stagnated growth of RES, the share of fossil fuels drops from 51.5% to 47.7%. In the electricity sector, the development of wind and solar power is nonetheless prominent as the former increases nearly four times (700.9ktoe to 2791.3ktoe) and the latter almost 100 times (15ktoe to 1051.2ktoe).

Bottom up

The energy transition towards renewables in France is difficult and mainly driven by international commitments and the EU while the actual progresses depend on the position of the incumbent governments. The lack of incentives for change is rooted in the nuclear-oriented energy and industry structure established after the second world war and crystalized since then. Since nuclear energy has been proved as clean, cheap, and reliable according to the French experiences, the priorities of energy independence, energy security, market efficiency, and environmental protection thus come to a seemingly unsolvable conflict. The struggles in both industry and policy regime demonstrate this dilemma vividly. In this section, the formation of the unique French energy profile will be traced with emphasis on the late 1990s and 2000s when renewables went up on the EU agenda. With such analysis, the position of France during the negotiation of RED1 could be understood.

The basis feature of French energy system is its centralization. On the one hand, there is a centralization on single energy source, namely nuclear energy. On the other hand, the operation and management of the French energy market are also centralized by state-controlled monopoly, Électricité de France (EDF). Therefore, it is only natural for the policy makers to incline to be conservative in order to maintain the state control over the energy sector. Efforts for decentralization and regionalization has been made but actual changes are not evident.

The current high reliance on nuclear energy, counting 69% of electricity generation and 42.3 % of total energy supply (Eurostat, 2019), can be traced back to 1945. After the end of the Second World War, the nuclear

technology research center, the Commissariat à l'énergie atomique (CEA), and public utility EDF was created. Although in the initial stage it was large hydro power that was explored, EDF has built its dominance through monopoly for electricity generation, transmission, and distribution (Boasson, Banet, & Wettestad, 2020). Nuclear programs gained its primacy first through military development then in the civil development especially after the 1973 oil shock. During its rapid growth (known as Les Trente Glorieuses), the revived French economy and industry could not bear the potential oil and gas shortage since there was no domestic reserve. In this context, electrification was deemed as the solution thus nuclear electricity became the answer (Millot, Krook-Riekkola, & Maïzi, 2020). The political setting at that time was also favorable to the development of nuclear industry. The Guallist parties and Communist party were all in favor of nuclear. The socialist group was split while the substantial opposition from the Green was not formalized until 1984 when the party was established. The overall support shown towards nuclear may be explained by its national security implication and status of the French nation in a broader sense (Boasson et al., 2020). The plan of constructing 200 nuclear reactors by 2000 in response to the crisis proposed by then Prime minister Messmer was adopted in 1974 without parliamentary scrutiny. At the end, 55 of current 56 operating reactors were built during 1974 to 2000 counting for 63 GW of capacity (Ribera & Rüdinger, 2014). The EDF also followed the government's "tout électrique, tout nucléaire" slogan and started to penetrate the French energy market. In terms of generation, all the nuclear reactors in France are operated by EDF. Although the liberalization of electricity market launched by the EU through Directive 96/92/EC led to the creation of a separated transmission network operator, RTE, it fell under the control of EDF as well. Moreover, the main distributor Enedis which is responsible for the management of 95% of the distribution network are 100% owned by EDF. Not only in the domestic market, the overproduction of electricity also brings the economic benefits for exports, operated by EDF, thus another leverage for the company to defend nuclear generation in the 1980s (Boasson et al., 2020).

Several changes came with the newly emerged International and European energy agenda with underlying environmental concerns and the so-called Green-Red Alliance in the 1990s. Despite the global trend, climate change was not preserved as an urgent problem in France since its energy and industry sector was almost emission-free thanks to nuclear and hydro electricity generation. There were some efforts made by domestic actors to curb nuclear deployment as well, yet fairly weak. In 1981, The Socialist Party (PS) promised to hold a referendum on the construction of new nuclear plants and guarantee the control over nuclear of the citizens and elected officials (Mediapart, 2011). However, they did not keep their promise, considering the fact that out of operational 56 reactors, 38 were built during 1981 to 1995 when PS was in power (Hatch, 1991). Admittedly, progress has been made through the alliance of Green Party and the PS when they reached an agreement to close the Superphénix nuclear reactor (Liberation, 1997). The low-carbon intensity of nuclear generation explained the reason why France was bided with a zero target by Kyoto protocol under the responsibility sharing mechanism of the EU, comparing to the other two cases (reduction target of 13% for UK and 6% for Poland). In fact, during 1990 to 2000, there was a 2% of emission reduction alongside with 19% of GDP growth (Szarka, 2006). Since both priorities of energy security and climate protection were ensured by nuclear electricity generation, the task of emission reduction was shifted to residential and tertiary consumption. Thus, energy efficiency instead of renewables became the second theme of the French energy policy during this period. The lowest electricity price in Europe encouraged households to consume more energy which counted as half of the total emission in France (Ribera & Rüdinger, 2014). Although RES remained unexploited, relevant institutions has been established. The Commissariat à l'énergie solaire (COMES) or Solar Energy Commission was established in 1978 and merged with the L'Agence française pour la maîtrise de l'énergie (AFME), or French Energy Conservation Agency in 1982. Eventually, L'Agence de l'environnement et de la maîtrise de l'énergie (ADEME) was created in 1992 by Decree No. 82-404 and became one of the national

authority responsible and advocative for renewables deployment and energy efficiency. The attempt to develop the French renewable industry through wind generation program "Eole 2005" adopted in 1996 failed eventually. Modelled after the British NFFO (see previous chapter), this tender system faced a similar difficulty as it was skewed towards large companies (Szarka, 2007).

While national incentives for RES were missing and pressure from international commitments was relatively weak, the EU became the major source for energy transition, mainly through legislations and policy learning. However, when designing its support schemes, the government seemed to miss the flexibility part of the German example, indicating the conflicts between RES deployment and the centralization of the French energy market. The development of renewables did not take its first substantial step until 2000 when Law No. 2000-108 was adopted to transpose the Electricity Directive 96/92/EC. Three changes were introduced by the 2000 Electricity law; a technology-specific feed-in scheme designed after the similar scheme in Germany, purchase obligation for EDF, and a new energy regulator, Commission de régulation de l'énergie (CRE). France was also designated a nonbinding target of 21% RES-E in 2010 when the EU adopted RES-E Directive in 2001. In this context, the government started to call for tenders in the wind power industry. However, after the election of Conservative Party in 2002, energy policy was redirected towards nuclear again (Boasson et al., 2020). Meanwhile, EDF established its renewable subsidiary EDF Energies Nouvelle for the newly merged market both in home and abroad, still managed it in a highly centralized way (Poupeau, 2020). Although the German style FITs were considered at the early stage when the "Green" environmental minister Yves Cochet endorsed it as the only effective way to promote solar PV in his 2000 report (Cochet 2000), the introduction of FITs without political consensus did not facilitate the development of RES. Frist of all, FITs only applied to small projects with installed capacity less than 12 MW while larger projects had to go through public tender process. Moreover, the tariffs were criticized as too low (Szarka, 2007). The lower price in the metropolitan area than Corse also shows the secondary place of RES. More importantly, although FITs are inherently unpredictable, EDF and technocrats still prefer to operate this scheme in a centralized way. The costs of French FITs were calculated based on the avoided costs for electricity generation from conventional energy sources, instead of the actual investment cost (Boasson et al., 2020). In this way, the tariffs were disconnected from actual investment costs thus too low to attract investment (Cointe, 2017). Unlike its German counterpart, this scheme was compensated by electricity consumers in form of a levy, Contribution au service public de l'électricité (CSPE). Additionally, when it was first issued in 2001, only hydropower, biogas, co-firing gas, and households waste were eligible for the supports. Despite the supports of ADEME and PV sector, the negotiation took two years for the government to finally add solar PV into the list. However, the tariff was calculated based on the avoided costs as EDF wanted. Additional to the unfavorable policy environment, the public resistance towards onshore wind also posted risks to the industry. The high concentration of wind power in Languedoc-Roussillon and Brittany and the large-scaled grid connection program led to the formation of anti-wind group Vent de colère which challenged the legality of support schemes before Conseil d'état later in 2008(Szarka, 2007). From 2005 onwards, the discussion for reducing the nuclear dependence started to be the center of conflicts in both political scene and industry, but substantial changes were hardly made. Another important law, the 2005 Energy law (No. 2005-781), known as Loi POPE, was adopted. It confirmed the unreplaceable place of nuclear in French energy mix once again (Art.4). A multiyear investment plan (PPI) was published to set the targets for each energy resource. Two of the third-generation reactors EPR were expected by 2012 in the PPI of 2006 (Arrêté du 7 juillet 2006). Development of renewables had gained some momentum with ambitious targets for solar PV and wind, together with the revised FITs which doubled the tariffs for solar PV and included wind for the first time, without the 12 MW limit which was later risen to 30 MW in the same year (Banja & Jégard, 2018). However, the reform on FIT seemed merely symbolic since it was not discussed in the parliament. Instead, it

was probably decided by then Prime Minister Dominique de Villepin (Boasson et al., 2020). Consensus was still missing as both ADEME and CRE were not consulted and critical about this decision (Cointe, 2017). As a result, the rate of tariffs was still too low and not adjusted according to the development of the PV industry but offered as a fixed payment for 20 years (Banja & Jégard, 2018).

The turning point came with Nicolas Sarkozy and the French Presidency in the Council. Sarkozy clearly had a big picture for France on both international and European platforms with environmental protection and energy transition being important parts of it. During the 2007 presidential election period, Sarkozy and the Socialist candidate Ségolène Royal had a debate on EPRs at Flamanville, the future of nuclear industry, and renewables on broadcast. While Sarkozy emphasized the importance of the French nuclear program, Royal proposed a 20% target for RES by 2020 (Actu Environnement, 2007a). In response to the ecologic pact proposed by the popular TV presenter Nicolas Hulot, Sarkozy signed the pact at the end of 2006 and promised to convince other European countries to accept "a reduced rate of VAT of all the energy efficient products and respect the health of the nature" (Le Figaro, 2006). Probably the most explicit demonstration of Sarkozy's ambitious vision can be found in his speech on 10 February 2008 in the eve of the ratification of the Lisbon Treaty when he declared "La France est de retour en Europe" (Le Monde, 2008). Domestic efforts have also been made through the Grenelle Environment Forum where the government, local authorities, trade unions, industry, and environmental groups participated in collaborative consultation process in October 2007. The increasing of renewable share was recommended by the Grenelle working groups and endorsed by Sarkozy (Actu Environnement, 2007b). Although there seemed to be political commitment, France was rather reluctant during the actual negotiation of the energy and climate package. Political ambitions, domestic pressure, and the coordination responsibility restricted France from employing its relatively strong power in the Council (Thomason, 2008) to persist its own preference. Initially, France aligned with the UK and Finland to opposite a biding 20% target of renewable share, in line with its own slow RES deployment. After the UK turned to support it, France compromised in condition of taking nuclear power into account, argued it as a "low carbon emission" energy source and applied the same logic to CCS (Actu Environnement, 2007a). The French position in the council had another change in 2008 under the influence of Grenelle. According to the contribution to the Council dated 4 March 2008, the adoption of RED1 was recognized as a priority for the French Presidency and confirmed its commitment to the 20% target set by the Grenelle Forum. However, energy efficiency and energy independence might be considered more important. As then minister of industry François Loos stated, the real problem for the government was the reduction of CO_2 emission (Actu Environnement, 2007a). The national target for France was set at a rather ambitious level of 23% by 2020 compared to baseline of 10.3% in 2005. This was not the optimal outcome, but the French Presidency was eager to securing an agreement on the Directive by 2008 so that its formal adoption could happened in the first quarter of 2009 (Council of the European Union, 2008c).

In conclusion, France was not an advocate nor an opponent towards renewables. For a long time, clean, safe, and cheap nuclear power left the relatively stationary composition of energy industry, market as well as policy regime out of political and public discourse when other European countries were busy dealing with oil crisis, Chernobyl, and climate changes. The centralized and segmented management of energy sector under the state-controlled monopoly and technocrats reinforced the static energy picture and drove France into a path dependence on nuclear. Under the EU influence, France has some attempts to add RES into its energy structure but only in a complementary way. Overall, the behavior of France as a fence-sitter was predicted by the model. The bottom-up aspect of Europeanization was not manifested as strongly as in the other two cases as France did not insist on its own interests and tended to compromise. In the other end, the disproportional

ambition can only be understood in context of Sarkozy and the French presidency in the Council. Eventually, the misfits were not minimized. A 23% target of RES by 2020 was not in the best interests of the country and surely put much more pressure on a sector facing its aging problems in the next stage of energy transition.

Top-down

Domestic changes

A higher level of changes (see Table 2) has been made in France during the decades while the reform of nuclear electricity industry remains a difficult problem. Grenelle forum builds a solid ground for France to adopt the RED 1 and provides additional incentives for the government to support RES. Although the energy market was still in hand of state-controlled monopoly, RES installations appeared in an impressive pace, especially in the solar PV sector. Through twice changes of government, Ministry of Ecology has kept the competence of energy policy under the supervision of national authorities. Besides, general public became more confident in RES while electricity bill remained as the principal concern.

The transposition of RED1 was relatively quick in France. After the Grenelle environmental Forum, the Grenelle I, or law No. 2009-967 of 3 August 2009 was adopted to formalize the commitments made in the process. To complete Grenelle 1, Grenelle 2, or law No. 2010-788 of 12 July 2010 was adopted. The transposition of RED 1 was finalized with the codification of all the gas and electricity related legislations into the Energy Code by Decree No. 2011-504 of 9 May 2011. Together with the Environment Code, the transposition of RED1 has been finalized within the deadline.

Through the history, governmental agencies dedicated to RES has been established. The most important ones are ADEME and CRE, two national authorities responsible for assessment, financial supports, and R&D. The competence over energy was traditionally assigned to the Ministry of Industry until it was transferred to the Ministry of Ecology in 2007. Along with the government reorganization, energy competence returned to the Ministry of Industry again in November 2010 (Cointe, 2017). later, together with the newly elected Green and Red alliance government under the leadership of François Hollande, climate and energy policy was merged and managed by the Ministry of Ecology, Sustainable Development, and Energy. This move was supposed to pave the road for the new government's ambitious campaign to reduce the nuclear share. Since nuclear power in electricity generation was expected to be reduced to 50% by 2025, renewables should play a more important role in the national energy mix (Brouard & Guinaudeau, 2017; P.138). Since targets and obligations came after Grenelle have been officially enshrined into law, the newly reorganized Ministry established the Direct General of energy and climate to be in charge of the design of energy policies. However, support schemes will still be influenced by the Treasury and the Ministry of Industry.

During the decade between 2009 to 2018, the share of RES in gross electricity generation has increased by a substantial amount from 74.63 TWh to 117.77 TWh (so, a 57.8% rise), considering the little change within the generation, from 535.68 TWh to 570.29 TWh. The percentage of culminative solar and wind capacity has seemingly jumped from 4.0% to 20.0% as well. In the electricity mix, RES count for 11.7% in 2019, increased from 7.5% in 2009. The electricity market is dominated by EDF without doubt as the main producer and the main retailers who generate almost 90% of the electricity with over 80% of the capacity (Eurostat, 2020).

Climate change and renewable has been perceived as an important problem for the French public since 2009 when 72% of respondents found it "very serious". This level was already higher than EU average. After the slight drop in 2013, the awareness seemed rose again and percentage of "very serious" reached 82%, above EU average and other two cases in 2019. French respondents also believe that it is important for the government to set target for renewables. In 2013, 42% of the respondents found targets are "very important" and 47% of "fairly important", slightly below the EU average but higher than the other two cases. In 2019, 56% of the French respondents found it "very important", below the British 72% but above the Polish 35%.
Source: Eurobarometer Special 332, 409, 435, 459, and 490. QB1, QB2, and QB7.

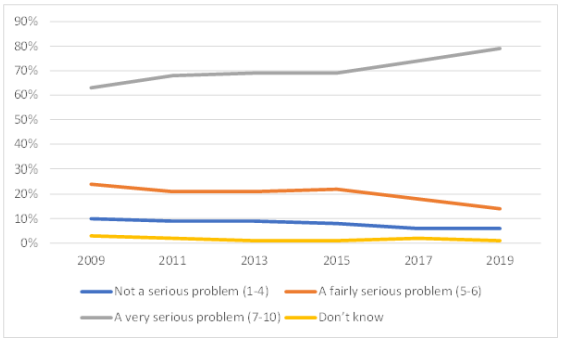

Figure 10 EU average on "How serious is the problem of climate change?"

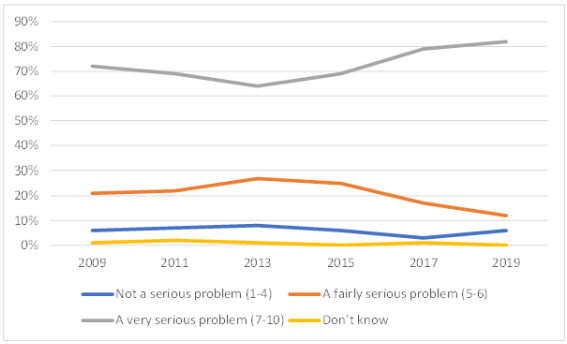

Figure 11 FR on "How serious is the problem of climate change?"

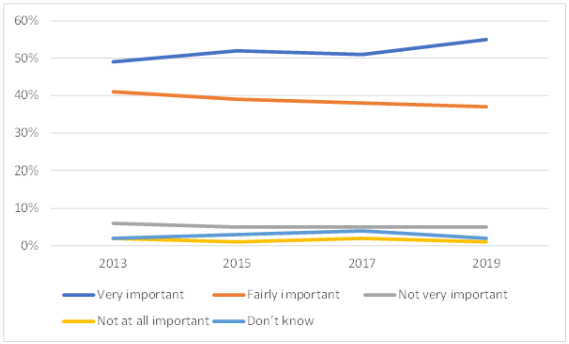

Figure 12 EU average on "How important is for national government to deploy RES?"

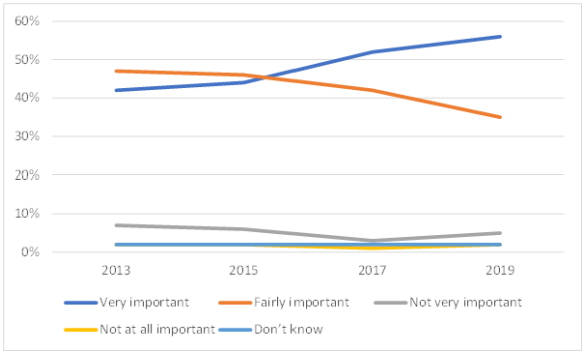

Figure 13 FR on "How important is for national government to deploy RES?"

In general, the French public has a fairly good impression of renewable energy. According to a series of Ifop survey, over 90% of the respondents thought it is respectful to the environment and almost 90% found it is favorable to energy independence during 2011 to 2014. In 2013, 67% of the respondents thought the public authority has not done enough to promote renewable energy and 90% (69% of "totally") found it the right solution for electricity production and heating, compared to 80% for natural gas (only 24% gave their total support) and 54% for nuclear energy. In the 2014 survey, 90% (47% "totally") of respondents thought that Renewable energy should also be encouraged to produce electricity and heating as well, compared to the support rate of 66% (14% "totally") for natural gas and 45% for nuclear energy. However, those higher number maybe deceive once take the costs into consideration. In a Ifop 2014 survey, only 31% of respondents were prepared to bare a higher cost for RES deployment, compared to 33% of "certainly no". 48% of respondents could not accept any rise on costs of energy while no one could accept a rise of 10%. In a 2017 survey conducted

by Ifop for the thinktank Synopia, 58% of respondents refused to accept any rise in electricity bill for its renewable source. Among those two were willing to, most of them could only take up to a rise of 10% (30% out of 42%). But they seemed open to change their consuming habits to adapt to local production from wind or solar (87%).

Facilitating factors

There are lots of facilitating factors for RES deployment in France, but they are not in great harmony. Change agents are highly active and should take credits for the rise of public awareness. Although they have challenged the formal institutions and veto players in many ways, the formal channel for activists to participate in the policy making process is still missing. The unstable state of RES in the agenda of the formal institution can be contributed not only to the economic and political significance of the conventional energy sector, but also to the loss of touch on reality: technocrats are used to design policies in their own bubble which is not applicable to RES policy. The major veto player EDF is open to RES, but just not in France.

Change agents

Change agents in France includes environmental groups, trade unions, and associations. The French Green party however does not have much influence. The most prominent domestic player is Vent de Colère. This network of several associations was established since the beginning of the wind industry and held a radically hostile position towards wind. According to the association, wind is "neither in interests of economy, nor of energy, nor of ecology, nor of social advantage" (Vent de Colère, n.a.). The fight against wind deployment did not stop after the triumph in the Court of Justice in 2014. In total, the association brought national and local governments to the court for 179 times since its establishment. International environmental NGOs like Greenpeace and WWF France are also active in the energy discourse. Based on its strong opposition towards nuclear energy, Greenpeace has published multiple studies trying to justify a French energy sector without nuclear, e.g., 2012 and 2015 Energy [R] Evolution, to criticize the management of EDF, e.g., 2016 EDF asphyxiée par le nucléaire, to point out the risks of nuclear wastes, e.g., 2010 Déchets nucléaires: un héritage mortel. It also published the ranking of electricity suppliers for the consumers in 2018 where energy giants like TOTAL and EDF both got the "really bad" score in terms of their RES share, carbon emission, and nuclear share (Greenpeace, 2019). Towards renewables, Greenpeace holds a positive attitude. During 2014 to 2015 amid the COP20 in Paris and the G7 summit, the organization endorsed the 100% Renewable report by ADEME and advocated the same goal as well. However, the enthusiasm of Greenpeace is often perceived as too aggressive to be treated seriously by the political sphere and even perceived as dangerous by the industry figures. Early in 2011, Greenpeace pointed out that most of the members identified as "qualified personnel" in the Energie 2050 commission were "notoriously pro-nuclear", such as the member of the ethic committee of Areva. Along with other NGOs, Greenpeace refused to participate in Energie 2050 in the end (Actu Environnement, 2011). In 2013, Greenpeace organized a break-in into the Tricastin nuclear center and hanged several banners to protest the lack of action from the government despite the hollow promises. This move however was criticized by Jean-Vincent Placé, the chef of the environmental senators as a "terrorist risk". The operator of the nuclear center EDF also regarded it as a criminal offense (Libération, 2013). The construction of the new generation of reactors in Flamanville was not appreciated either. It was rather perceived as a symbol of the complete fiasco of the nuclear industry (L'Express, 2016). Towards another ambitious legislation presented by the new government in 2019, Greenpeace kept its skepticism and disappointment towards the Macron government, as expressed by its energy campaigner Alix Mazounie, "This government systematically makes vague and very long-term commitments, but never any concrete, short-term policies that would be implemented during this president's

term" (Reuters, 2019a). Despite radical actions and fierce criticisms taken by the change agents, their opinions have hardly been channeled into the actual policy-making process due to the lack of political endorsement and the missing of a designated formal institution, resonating the findings in the other two cases. What complicates the French case may be the more militant style of operation of the change agents which creates a sense of confrontation, instead of cooperation.

Formal institution

The European influence was not manifested on the formal institution to a great extent other than the redesign of support schemes closely followed the 2014 State Aid rule reform. Rather than being purposely resisted like in Poland or sidelined like in the UK, RES deployment in France was often disoriented by the low efficiency of the bureaucracy, either due to insufficient skills and information, or the unclear political agenda changing with each government in a nuanced way. Since 2007 when the Ministry of Ecology gained the control over renewable policies, the design and reform of the support schemes have been executed by a small team of civil servants with limited resources and information, partially due to the lobbying of the conventional sector and large labor unions (Szarka, 2006). After the governmental reorganization in November 2010 and the crisis of an overflown solar PV industry, cost-efficiency overrode the environmental concerns as energy competency was returned to the Ministry of Economy. The government set ambitious targets through PPE and several major legislations (Grenelle 1&2, 2015 Energy transition Act, and 2019 Climate and Environment Act) but seemed not so eager to achieve it.

Traditionally, the Treasury and the Ministry of Economy are not advocates for RES while Ministry of Environment, ADEME, and CRE should be supportive. The Ministry of Ecology regained its influence on energy topic when Ségolène Royal entered the office in 2014. Back in 2007, she was known by its opposite position on nuclear against Sarkozy during the presidential election (Le Monde, 2014). This time she came back under the leadership of Hollande with the proposal for a new energy law in 2014 (Le Point, 2014). Heated debates started in the National Assembly and the Senate where compromise had to be made between the Left, as the Green who wanted to phase out nuclear, and the Right. Eventually, the deadline for 75% to 50% of reduction on nuclear generation by 2025 was made with a cap on total nuclear capacity of 63.2 MW which implied that old capacity has to be closed to make place for the new ones. This was exactly the case for Fessenheim, the oldest nuclear center in France and Flamanville where the latest generation of rector, the EPR, was scheduled to go online in 2017 (Le Monde, 2015). In the interview with L'Usine Nouvelle, then Ecology Minister Ségolène Royal confirmed that "nuclear energy is an asset" and "it permits us to realize energy transition because it guarantees the energy security". When asked about the slow development of RES in France, she pointed out that the poor situation can be traced back to the lack of investment in the 1970s when nuclear was chosen. However, the Minister was confident in the French enterprises to strengthen the nuclear industry (L'Usine Nouvelle, 2015). Despite all the endorsements and promises made by the government, the closure of Fessemheim and the construction of Flamanville were not on track. At the first, the deadline to close Fessemheim was the end of 2016 as declared by Hollande. Later it was delayed to 2018 when Flamanville was expected to be built after 4 delays already (Le Figaro, 2015). In 2016, a report by the Court of Audit (La Cour des comptes) suggested the serious financial problems of EDF and urged the Ministry of Ecology to "make things clear" when technical problems occurred while the construction was halted by ASN (L'Express, 2016). Although the new government led by Emmanuel Macron was under the newly added pressure from Paris Climate Agreement, protective attitudes towards nuclear has barely changed. Then Ecology Minister Nicolas Hulot, the influential figure in the French energy transition, presented a "Plan Climate" in 2017 to lower the emission level to 40% by 2030 and reach carbon neutrality by 2050 (Libération, 2017). Oil and natural gas drilling was also banned in order to deliver such

ambitious targets despite the fact that 99% of the fossil fuels were imported (Reuters, 2017). The central place of nuclear did not seem to be threatened as Economy Minister Bruno Le Maire said, "Nuclear will rest essential in the long term to guarantee the security of supply in our country, the competitivity of our country, and the energy independence of the French nation." at the World Nuclear Exhibition in 2018. He also suggested that there should not be an opposition between renewable energies and nuclear energy. Instead, an "equilibrium" should be kept (Novethic, 2018). This was a rather strange statement since the development of those two were clearly not balanced as by 2018 there was no offshore wind farm in France. The efforts of Hulot were not respected either. When he was dismissed in August 2018 (Le Parisien, 2018a) and Ministry of Economy held an audition participated by a limited group including a former director of Areva to recommend the construction of six new EPR around the same time (Le Parisien, 2018b). Meanwhile, the oil and gas ban led to a series of protests, the so called "Gilles Jaunes" movement. As a result, the Law No. 2019-1147 dated 8 November 2019 on energy and climate ended up much less ambitious. Instead of the closure of coal power stations as promised, a CO_2 emission cap was introduced. More importantly, the 50% reduction of nuclear by 2025 was delayed to 2035 (Reuters, 2019a). In theory, the decommission of 14 reactors and a rapid development of wind and solar PV would be required to reach those targets (Le Monde, 2019). However, the closure of Fessenheim and the commission of EPRs in Flamanville were still not realized at that time. Therefore, the extension of lifetime for certain reactors for another ten years became reality in 2020, proved by ASN (Le Monde, 2020).

Two of the most influential national authorities, ADEME and CRE hold opposing opinions on RES, especially on the economy ground. While ADEME has always been a strong supporter for RES, CRE is critical towards its prices. Early in the 1990s, ADEME has been into conflicts with EDF over the choice between Germany inspired FITs and tenders (Boasson et al., 2020). According to ADEME, FITs have not only been proved effective in German and Denmark, but also could better support the RES industry in its infancy by bearing the external costs. It was also the ADEME's efforts that BIPV could get a €0.25/kWh FIP. However, the more economical way was clearly a tariff based on avoided costs compared to conventional generation according to EDF (Cointe, 2017). During the decade between 2009 to 2020, ADEME becomes the main advocate for denuclearization and RES deployment. During the 2015 turmoil of the Energy Transition Act, ADEME took the side with the RES sector and published a study titled "Un mix électrique 100% renouvelable? Analyses et optimizations" to argue that it is both technically and economically viable to achieve 100% RES-E by 2050. Not only the lost electricity generation can be compensated by RES, the lost jobs in the nuclear sector also can be compensated from services, construction, and production of RES (ADEME, 2015). This strong position echoed with the ambitious targets set in the Energy Transition Act to increase the RES share to 32% in the final energy consumption and 40% in electricity production. A few years later, the target to reduce the nuclear share in electricity generation to 50% to 75% by 2025 was found impossible. ADEME had to accept this unavoidable delay of the timeline while held its position nonetheless by publishing another study in 2018 "Pour une ambition renouvelée en faveur de la transition énergétique" in light of the upcoming 2019-2023 PPE. As the new president Arnaud Leroy claimed, "The deadline of 2025 was set back by realism and pragmatism, but the 50% ambition has not changed. We are stick to this scenario." Although ADEME was not confident on 100% RES, it did not stop put pressures on the nuclear sector (L'Obs, 2018). Another national authority, CRE has been critical towards RES mainly over cost issues since its establishment. Amid the 2006 FITs reform, CRE warned about the potential additional costs for consumers of between €1 and 2.5 billion (CRE, 2006). Towards wind, CRE also gave an unfavorable opinion in 2001 in which it argued that the tariffs were too high for the metropolitan area, creating additional costs of 3% for households and 15% for firms. Besides, it would not contribute much to the emission reduction either (CRE, 2001). In 2014, CRE published a report and pointed out that the tariffs of FITs should be adjusted to the real production costs regularly due to the "excessive profits" made by the RES industry (CRE,

2014). This concern over prices is relevant as the support schemes are paid by the public at the end. In 2019, CRE predicted that there would be a 1.75% increase of costs in 2020 compared to 2019, or 7,916 €Million in total, and 65% of which would be contributed by the support towards renewables (CRE, 2019).

The conflicted interests between formal institutions do not necessarily lead to a policy failure, but the closed circle of policy-making process directed by bureaucrats is more likely to. The most notable problems in the designing and the delivery of support schemes are poorly organized consultations and the lack of adjustment. A typical example of the ineffective operating of support schemes can be found in solar PV. As mentioned before, the French FITs have a technology-specific background. Since the tariffs for solar PV was doubled in 2016 to a generous level of 300 €/MWh and a bonus of 250 €/MWh for BIPV in the form of premium, the industry has been incentivized and rapidly expanded. The problem was that the price has not adjust to this development in a decreasing fashion. This "degression" element was included on paper as in its German Renewable Energy Sources Act of 2000 (known as EEG) model, but the French authorities failed to do so in practise. A bubble thus was created and pushed the tariff to 600 €/MWh in 2009, the most attractive in Europe which French officials were seemingly very proud of (Cointe, 2015). An increasing number of requests to connect to the grid and the rising costs eventually led to a crisis. Not only EDF warned that it was hard to handle the grid connection requests, but local government were also buried by the huge amount of paperwork (Actu Environnement, 2010). According to Banja and Jégard (2018), the main contributor to the high cost of the support scheme was BIPV, which received bonus in the form of FIP, instead of the conventional building attached PV systems (BAPV). The consequences of such an excessive level of support eventually manifested on the electricity bill. However, electricity price was a sensitive topic in France thus a layer of political implication was added onto the problem and complicated the situation even further. Since the system was overwhelmed, a moratorium was issued in December 2010 by the government to stop the supports for new applications for three months. The following consultation did not go well either. Too many actors with too different interests were invited and led to a chaos, as one organizer described " there were insults, death threats, people trying to commit suicide. . ." (Cointe, 2015). Later, any capacity over 100kW was required to go through public tender process and a 500MW capacity annul cap on new capacity was announced in addition. After this shock, the French solar PV industry has never recovered from its defeats, despite the amount of supports and a electricity price rise by 33% for household (Banja & Jégard, 2018). Substantial changes on support schemes did not happen until the 2014 State Aid rule reform on the EU level. This was understandable since the government has been sued by activist group Vent de Colère on this exact issue. Eventually, CJEU ruled the purchase obligation (FITs) is a form of state intervention thus violated Art. 107(1) of TFEU (CJEU, 2013). Since 2014, the "Guidelines on State Aid for Environmental Protection and Energy 2014-2020" gave more space to support RES for Member States. Modified accordingly, an open desk procedure (guichets ouverts) was opened to small installations and the tender procedure was required for the application for either FITs or FIPs (Actu Environnement, 2015).

The development for wind, however, are mainly hindered by the over-complicated administrative procedure, another frequently cited reason for slow deployment. Although the support for wind started way earlier than other RES in the form of a tender, Eole 2005, it was proved to be a failure just like its model, the British NFFO (Szarka, 2007). After the 2000 reform introduced by 2000 Electricity Act, wind was not benefited immediately from it either. In 2004, the Government started to call for tenders for wind, both onshore and offshore (Ministère de l'Économie, 2004). In the end, cumulative capacity of 278.35 MW onshore were accepted with a tariff of 75 €/MWh, much lower than the 500 MW target (Le Monde, 2005). Despite the pressure brought by the 23% target of RES-E and the avoided concentration problem, there was no "wind rush" in France ever since. The first explanation is the low tariff (Feurtey et al., 2016). The main obstacle however, as identified by

Szarka (2007) and Nadaï and Labussière (2009), was the complex planning procedure. Operators had to not only obtain the agreement from the municipality, but also the planning permission from the department based on 27 clearances from different authorities. Besides, the 12 MW cap forced the operators to divide the large capacity into smaller unity and apply for FITs, planning permission and grid connection separately.

The simplification of procedures began in 2012 when small installation with capacity below 12 MW was automatically authorized. In 2013, major changes came with Law No 2013-312 as the power threshold, the wind development zones, and the "five mast" rule were abolished. In 2015, several changes were introduced by the Energy Transition Act (Law No.2015-992). Most notably, Feed in Premium (FIP) replaced FITs along with its funding CSPE and became the main support scheme. Moreover, almost all supports will only be granted through a competition process unless the technology specific contact is granted on demand (Thomson Reuters Practical Law, 2020). Later an Ordinance No. 2016-1059 removed the 12 MW cap on capacity for FIT and FIP applicants in 2016. In the same year, the decree 2016-687 removed the administrative procedure for applying to the Prefect for a purchase obligation certificate (CODOA) and raised the threshold for authorization for the most of RES to 50 MW (Actu Environnement, 2016). Another favorable change came in 2017 when the energy competence finally returned to the Ministry of Ecology (has been renamed as Ministère de l'Écologie et du Développement durable during 2012 to 2017) and Single Environmental Authorization replaced several authorizations, e.g., ICPE and IOTA (Ministère de l'Écologie et du Développement durable, 2017). Other measures have been taken such as the national wind power working group gathering took place between 2017 and early 2008 (Ministère de la Transition écologique et solidaire, 2019).

Veto player

Defenders of the conventional energy sector mainly consist of trade unions and the EDF group. Renewables are not explicitly resisted but find itself hard to fit in the current system. Due to economic, political, and to some extent the social significance of nuclear energy and the energy system built around it, RES has gained little actual support from veto players, even though they never truly rejected it.

In the defense of EDF, the concentration on nuclear energy can be firstly justified in many economic senses. Although the rate of electricity demand and consumption has been declined since 2010, the total consumption per capita in France is still at the top of the EU (Berghmans, 2017). Besides, because of the large share of nuclear, electricity price has been kept relatively low for a long time. As in 2020, French households pay $0.22/kWh, compared to $0.36/kWh in Germany and $0.33/kWh in Denmark (Global Petrol Price, 2020). The inevitable rise on electricity bill brought by large deployment of RES thus would be too controversial. Moreover, the oversea investment also provides another economic rationale for EDF. For example, the projects of Hinkley Point C and Sizewell C in the UK were considered as an important step for EDF to become more "international", let along the £12.5bn worth of property. Renewables, in this context, plays a rather insignificant and complementary role. Admittedly, the EDF group has made some efforts on this supposedly profitable section of business by establishing its renewable subsidiary EDF Energie Nouvelle (EDF EN) in 2004. Yet, the moves on renewables seemed to be more align with its "internationalize" agenda instead of the actual development of RES. In 2015, EDF presented a "CAP 2030" plan to double its renewable energy capacity from 28 GW to 50 GW worldwide, mainly outside of France. As the CEO of EDF EN Antoine Cahuzac said, "We have a very, very strong will to internationalize us." In contrast, EDF only had a "5 to 6 GW" plan in the next 15 years domestically. The promised 1 GW of wind capacity in Lorraine and in Franche-Comté has been gradually developed but the offshore wind parks were not. Faced with the potential legal challenge of the Commission on competition concern, Cahuzac found it is "unthinkable for the European Commission to prohibit EDF from competing" (Actu Environnement,

2015). In 2018, EDF EN got a new identity as EDF Renouvelables which "translate the ambitions of EDF group to double its renewable capacities in France and in the world, between 2015 to 2030" with no substantial changes taking place (Actu Environnement, 2018).

The stagnated process of liberalization, especially in the transmission and distribution systems which would otherwise lead to decentralization if went smoothly can also be understood economically speaking. Both transmission system operator (TSO) RTE and distributor Enedis are controlled by EDF. The former owns all the infrastructures, leaving no room for competition while the latter only faces challenges by some local distributors. Despite the legal obligation, le Schéma Régional de Raccordement au Réseau des Énergies Renouvelables (S3REnR) introduced by Grenelle 2 early in 2010, the negotiations between producers, operators, and local governments did not went well. This was mainly due to the overprice of grid access which made up to 30% of the final price of the project, as claimed by Jérôme Billerey, the president of directory of Aérowatt. In some cases, the TSO increased the quota to be eligible for tariff reduction by 70% (Actu Environnement, 2013). As a result, the Schémas régionaux climat, air, énergie (SRCAE) in many regions have not been approved until 2019 after multiple consultations and the decision made by CRE to raise the capacity bar from 100 kVA to 250 kVA in January (CRE, 2019). From the perspective of EDF, the profitability of Enedis means that drive private actors out of the network would be the best option (Poupeau, 2020).

The social implication of nuclear energy on the other hand, can be found through the attitudes of trade unions. Trade union like CGT and CFDT, the two biggest in France, are active in the energy discourse because of their large constituency in the conventional energy sector. Although they dissent from each other on the role of nuclear and the monopoly of EDF at the early stage, when it comes to job loss, both choose to side with the status quo. After the energy debate initiated by Hollande in 2012, CGT was strongly supportive towards a centralized energy system centered around nuclear based on its involvement in EDF while CFDT preferred the decentralization and the replacement of nuclear by RES (Poupeau, 2020).

Facing multiple delays of construction and the lack of funding, CGT supported EDF nonetheless to finish Hinkley Point C in the UK in fear of more job losses in France. More prudently, the CFDT also supported EDF by urging the British court to speed up the legal process (The Guardian, 2016b). The proposed reform of EDF was criticized by CGT as the most profitable part, namely the renewable part of the business will be privatized. According to CGT, this move was to "privatize the profits and socialize the risks" (RTL, 2021). CFDT, along with other big associations including FO and CFE-CGC joined CGT and denounced this move as "finance who split EDF for make the pretty part into the competition at the price of dividing the production and commercialization" (Le Figaro, 2019). The risk of job loss was also used to justify the first delay of the closure of Fessenheim by EDF in 2013. As then CEO of the company Henri Proglio argued, the delay of four years to close Fessenheim was "socially responsible" considering 700 directly involved jobs and 200 others indirectly involved (Le Monde, 2013).

The governments, regardless of their political position, are in favor of nuclear energy and showed a lot of mercy to EDF. After Fukushima, then Environment Minister Ségolène Royal stressed again that " France has made the choice at the nuclear" and it will rest as " the basis of our energy mix" (Euractiv, 2014b). The rise of the right-wing figures, such as Marine Le Pen, and their arguments centered around energy independence complicated the political discourse on nuclear energy. According to Le Pen, "the state has to engage in the great refit" to increase the lifetime of French nuclear centers. Unsurprisingly, she also attacked the "appalling and costly" wind (BFMTV, 2017). The economic arguments used by the government to bailout EDF for Hinkley Point C, Areva amid competitions with other European manufacturers, and to support Flamanville did not hold water

since the rescue for Areva costed €10 billion (Reuters, 2017). The incumbent Macron administration even considered renationalizing EDF in 2019, at least for its nuclear activities. Although this will cost €37 billion, "the President considers that nuclear power is a sovereign activity which should not be subjected to the turmoil of the stock market or the markets.", affirmed by a close figure to this plan (Le Parisien, 2019).

Horizontal

Cooperative mechanisms

Similar to the previous two cases, France planned to reach the target without the deployment of cooperation mechanisms. The Mediterranean Solar Plan suggested in the NREAP as a project which France can be benefited from did not make many progresses even with the Project Preparation Initiative approved by the Commission and the EIB. The interconnection capacities with Spain, Italy and Belgium have been improved and the cooperation between Transmission System Operators (TSOs) has been intensified through the establishment of Coreso, the first regional technical coordination center for electricity. Since France has no intention to use any of cooperation mechanisms, it does not put any procedure in place.

EU funding

Table 5

Overview of European Funding for France during 2009-2020 in Energy

	Item	Amount (EUR)	Scale
NER 300 Programme	GEOSTRAS	16,800,000	241,000 MWh electricity production 810, 000 MWh thermal production
	WINd Vertimed	34, 300, 000	82 GWh/y
Horizon 2020(R&D)	EUROSUNMED	5, 261, 726	PV, CSP, GI
EEPR	Reinforcement of gas network on Africa-Spain-France axis	175,765,000	Projects of Common Interest (PCI)
	France-Belgium Interconnection	174,864,500	
	France-Spain Interconnection	225,000,000	1400 MW capacity
EEEF	CHP Plant in the city of Orléans	5,100,000	17,266 CO_2 emission savings 7.5 MW electricity capacity 17 MW thermal capacity

	CHP Plant in the city of Rennes	7,300,000	12,695 CO_2 emission savings 10.4MW electricity capacity 22 Mw thermal capacity
	Bolloré (company)	30,000,000	
	Société Publique Locale d'Efficacité Énergétique	5,000,000	
CEF Energy Actions	10 electricity works, 11 studies	376,000,000	12 CEF actions, 8 PCIs

Table 5 (Continued)

European Investment Bank	94 projects	11,677,316,940	
Total			12,732,708,166

Sources: European Commission, European Investment Bank

France has received funding from the EU for diverse projects cover studies, infrastructure, and small local construction. Compared to the UK and Poland, France seemly carried out some more "important" works. Not only does it have eight PCIs which contribute an integrated EU energy market, but most of funded projects also have immediate outputs: electricity and thermal capacity. Therefore, there is no obvious insufficiency of EU financial supports to France.

In conclusion, the Europeanization of energy policy in France is visible yet not transformative. Unlike the other two cases, energy transition has been on the French energy agenda for a long time. EU policy could have been an opportunity but brought limited influence at the end. On the one hand, the simplification of administrative procedures, reforms of support schemes and the ambitious nuclear reduction targets are incentivized and driven by the EU policy regime. On the other hand, the EU does not persuade France to abandon its reliable energy structure with neither sufficient evidence nor substitutes of nuclear energy. Domestic difficulties including the centralized bureaucracy and the path dependence on nuclear electricity further hindered the implementation of RED1 which in turn resulted in a slow energy transition towards renewables. The bottom-up aspect of Europeanization was so skewed by the presidency of France and political ambition of Nicolas Sarkozy that the French interests were hardly defended during the negotiation of the Climate and Energy package. Consequently, policy misfits brought challenges to the rigid national energy system entirely designed for nuclear electricity. Although German experiences on support schemes were appreciated, its essence of flexibility was not fully understood which ended up causing damages to the newly emerged solar PV industry and discouraging the authorities to offer favorable conditions in the future. While the incumbent Macron government has taken some actions to reduce the use of fossil fuels, its strong confidence in nuclear energy makes the future of renewables unclear in France.

Conclusion and discussion

In this thesis, the energy transition in the three EU member states, the UK, Poland, and France during the effective period of RED 1 from 2009 to 2020 has been traced in detail with a Europeanization perspective. Through the study, it becomes clearer that although all three countries have great RES potentials and sufficient political and administrative capacity to comply with the EU energy policy, resistance and friction coming from their domestic politics, industry and civil society complicate the process of energy transition. In the theory section, three hypotheses are made to explain why and how the energy transition fails.

> *H1*: The targets are too high due to unsuccessful uploading where misfits are not minimized. This is because of 1) the preference during the stage of negotiation which heavily influenced by domestic politics, 2) low bargaining power either due to insufficiency or miscalculation.

In all three cases, H1 is proven to be true to different extents. In the British case, the EU target of a RES share of 20% by 2020 which coincided with the international energy leadership vision of the UK was willingly accepted. The national target or more precisely its calculation however was not part of the plan. Although the misfits were acknowledged from the very beginning, since RES did not have an important role in neither emission reduction, energy independence, nor competitive market, the pressure to fulfill the targets mainly came to the EU. Moreover, the unique situation of the devolution added another layer of difficulty on decision of RES. In the French case, the personal influence of Nicolas Sarkozy and the Presidency in the Council skewed its position during the negotiation. Admittedly, France was facing the internal pressure for energy transition, but the central role of nuclear energy was not substantially contested. Miscalculation of its nuclear decommission process and coordination obligation of the Presidency led to a challenging national target. Contrary to the conventional wisdom, Poland as newcomer possessed quite a negotiating power in the Council. It successful converted its disadvantages such as unfamiliarity to EU laws and the coal dependent energy sector into bargaining chips and got favorable conditions including derogation and free allowance under EU ETS. In this sense, Poland did upload its preference, just not for RES but EU ETS. Since the failure to fulfill the obligations of RES-E as part of the conditions for accession did not bring much consequence, another target that unlikely to reach did not seem to be a big problem either. Fundamentally, Poland did not share a similar view with the EU on sustainability and diversification of energy.

> *H2*: Adaptational pressure does not convert to real changes. This is because of 1) the lack of facilitating factors, 2) discouragingly high pressure, and 3) deviation of domestic environments from the period of negotiation to the effective period of RES 1.

H2 also applies to all three cases, especially for the first reason. While little evidence suggests that high pressure discouraged RES deployment, effects of a new government were evidently observed in the UK and Poland. In all cases, the formal institution dedicated to RES deployment was missing. Such institution should have the competence of renewable policies, especially support schemes, act as the channel for the interests of change agents and the RES sector, and more importantly, be hold accountable when it comes to policy failure. In the UK and Poland, a Department of Renewable Energy did exist for a short period of time but eventually lost its competence of renewable policies. In France, although Ministry of Ecology holds the competence of energy policy for the most of time, it fails to use it to its full potential, especially on organizing effective and transparent consultation. The inter-ministrative coordination, however, was severally deficient in the absence of a single integrated body in all three cases. Due to the expensive nature of support schemes, the Treasury and Ministry

of Economy/Industry will hold a less favorable attitude towards RES development while Ministry of Environment/Ecology endorses it on the ground of environmental protection. However, imbalance between ministries is observed in all cases where Ministry of Economy/Industry often prevail. The disadvantaged position of Ministry of Environment is mainly caused by the frequent reform or reshuffle of the government and/or the insignificant role of RES in the long-term political agenda. The former situation applies to the UK as even the PMs lost track on who exactly oversees RES policies, the latter situation more applies to France and Poland as their environmental ministers openly support the conventional sector. Three cases also differ on the influence of incumbent's ideology on the energy agenda which connects to the third point. Ideological difference was more obvious in the UK as the Labour government led by Tony Blair was clearly more enthusiastic to RES than the successive Conservative governments. However, the priority of the UK energy policy did not change substantially along with the government. In both French and Polish case, ideology is not so relevant. In France, even supporters for nuclear decommission changed attitudes once enter the government, e.g., Ségolène Royal, while in Poland even the opposition is hostile towards RES. In conclusion, the EU obligation is regarded as a "problem" rather than opportunity by national governments. When making RES policies, the fulfillment of EU target is the principal concern, instead of the development of a domestic RES industry. Essentially, RES is not the optimal answer to their national energy problems, if any problem is recognized. In this context, the missing of the crucial facilitating factor, i.e., a competent and accountable formal institution can be understood. Disconnection between interests of RES industry and policymaking emerged as a result and led to larger lags of energy policy and development of RES behind the EU vision.

H3: Member States did not exploit cooperation mechanisms and both informative and financial supports from the EU enough.

Although the Commission sees cooperation mechanisms as an important tool to reach the 20-20-20 target, only a few member states has considered it feasible, let alone utilized it. None of the cases believe that it will need external supports to fulfill the obligation, at least not through cooperation mechanisms. The EU funded projects are predominately R&D projects (UK and Poland) or construction project with little direct effects on domestic RES development (France). The horizontal dimension of Europeanization can be found in the design and reform of support schemes instead. In the UK, Renewable Obligation was reformed twice in 2009 to become technology specific and thus more effective for reach the target. The relatively late introduction in 2010 of FITs for small installations however can only be understood as a complementary tool reluctantly imported from the continent. Since FITs were deemed as exogenous to the British energy market, Contract for Difference was introduced to replace this mechanism just five years after the introduction. France and Poland tried to copy other member states but failed to copy it in the right way. Although French authorities noticed the degression element of the German FITs, it was overlooked during the implementation. As a result, tariffs were either too low, as for wind, or too high, as for solar PV. Such disconnection with the market ended up with a bubble and the permanent damages to the solar PV industry. In the Polish case, since the government was suspicious towards European and German agenda, trials for German FITs and British TGC were terminated prematurely with no obvious success. The 2014 State Aid reform seemingly left significant influence on support scheme design since both of France and Poland switched accordingly to auction afterwards. Eventually, the horizontal Europeanization did not leave many marks on energy policies in all cases. This phenomenon is primarily linked to the reserved states of energy policy as a "domestic issue" whose national security implication cannot be ignored, especially in Poland. When member states opt for policy learning, the essences of other's success seem difficult to copy and adapt to their unique conditions. Unfortunately, the funding and platforms provided by the Commission fail to serve as the bridge between policy and practise gaps among member states.

In conclusion, a similar pattern can be observed from the not-so-good experiences of the UK, Poland, and France on energy transition. At first, they did not get the optimal outcomes according to the cost-efficiency calculation after the negotiation, i.e., minimized policy misfits. This is not because of the insufficiency of bargaining power, but the unaligned national interests. Compromises has been made under other circumstances such as the presidency of France and the significance of EU ETS for Poland. During the implementation, the division of duty between institutions was not clear. Therefore, the interests and opinions of change agents and RES sector left unrepresented and undelivered. As a result, the design and implementation of RES policies did not follow the actual states of RES development closely. This mismatch with reality not only caused confusion and uncertainty, but also brought out financial burdens onto the taxpayers, which may discredit RES in the political sphere and the civil society. Meanwhile, successful examples were not understood thoroughly and adapted to the domestic environment properly. The financial and informative supports offered by the EU were not utilized in the most efficient way, either.

However, the ultimate explanation would be the difference between the energy vision of the EU and that of member states. When the EU chooses RES and in a longer-term, hydrogen as the answer to sustainability, competitivity, and affordability, member states have their own answers based on their unique domestic conditions. For the UK, North Sea with CCS, and some nuclear plants are sufficient, cheap, and safe. Therefore, even the UK actively participated in the negotiation, it did not comply to the EU standards actively afterwards unlike what is expected from a pacesetter. For France the fence sitter, there is no adequate reason to replace the reliable, clean, and cheap nuclear plants (renewed with new generation of reactors) with unpredictable and expensive RES for politicians nor industry actors. For Poland, since the highest priority is the independence from Russia, energy policies should be designed to serve this purpose instead.

The most pressing problem of established theories of Europeanization is that it hardly grasps the importance of the "grand picture" for certain member state in given policy area nor the contextual aspect of the bottom-up process which results in the misprediction of behaviors. Admittedly, according to the intergovernmentalism and rational institutionalism, national governments are rational actors who always make cost-efficient decision. This is not to say that constructionism is right by explaining Europeanization mainly through cognitive process since the priorities of national energy policy are preserved through different governments regardless their ideology. Contexts and the basic orientation of energy strategy are also crucial when assessing the bargaining power of each member state in the Council. However, existing measurement of political power is based on voting records combined with social-economic conditions and budget contribution which may predict the behaviors of a particular member state in the long term, but not for a specific event like the Climate and Energy package. As for the administrative power, there is no systematic way to do the calculation. Researchers who share no connection with the EU bureaucrats will be blind when trying to investigate the "inner work" of the EU policymaking. For top-down aspect of Europeanization, the model provides a relatively comprehensive "check-list" for facilitating factors, but the European influence is not visible when examining those factors. This weak linkage may be specific to selected cases where the link is missing due to the exact insufficiency of facilitating factors. The most underdeveloped part of this study and established theory might be the horizontal aspect of Europeanization. When tracing the policy-making process of support schemes where the influence of other member states should be the most visible, it is not easy to identify the causal relations between policy design in two member states. For example, whether to adopt FITs in the UK has been heatedly debated in the Parliament priori to the negotiation of Climate and Energy package. When asked about the successes of such mechanism in Germany, the government found it unsuitable and even counterproductive to the British energy market. However, FITs were eventually introduced in 2010 specifically

to reach the national targets. In this instance, top-down pressure from the EU overrode the horizontal policy learning. Besides, there is no tool to assess whether the assistance provided by the EU is properly exploited and benefited the RES deployment in member states.

Based on the results of above discussions, future study on Europeanization and its theory could be improved in the following aspects. In the bottom-up process, the more accurate way is to identify the immediate and contextual factors first, including the position of incumbent government and domestic situations, and then establish the national interests by tracing back the history. In the top-down process, future study could strengthen the connection between European influence and domestic change through facilitating factor when investigating "better" cases like Denmark and Germany. In the horizontal process, studies on EU funding and programs should be integrated into the Europeanization theory as well. Since the causality between experiences of one member state and another is hard to be determined, correlation in its subtle form should be considered instead. Overall, the distinction of the three aspects is rather theoretical than substantial as they are often intertwined with each other, e.g., the reform of RO in the UK. Such dynamic should be noticed with examining certain policies.

As RED1 came to an end in 2020, it is fair to claim that the EU programs on climate change and energy transition is on track to fulfill its ambitious targets. However, member states still face challenges in their own course to sustainability and affordability. In such a context, this study tries to explain what the causes could be and what the role of the EU is in this process. Hopefully in the next decade, the implementation of RED2 will further facilitating the achievement of carbon neutrality by 2050 and a brighter future of the environmental and economic conditions in the EU.

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