

The french (non-)compliance with the european energy policy

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Abstract In the early years of the common European Energy policy, France has been labelled a *black sheep* or a *bad pupil* when it came to applying European and international energy, climate and energy market frameworks. As the country is currently engaged, in its own energy transition process (*la transition énergétique*) the question arises if these attributions are still valid. This article argues that several points of conflict between Paris and Brussels in the field of energy policy can still be identified today, especially in the areas of market liberalisation, the non-ETS sector and the promotion of renewable energy. Following the EU-compliance theory, the reasons for Paris' deviations can be identified as both *intentional* and *unintentional*. On the one hand France is still politically reluctant to fully commit to Brussels energy policy objectives as they clash with the country's view on the energy sector as a public welfare task. On the other hand, France faces systemic constraints due to its strong nuclear fleet, that dominates the country's energy sector and therefore reduces Paris' manoeuvrability within the European Energy framework. Because of this, France should be seen as an *involuntary black sheep* today, when it comes to non-compliance in EU-energy policy. Based on recent policy developments as well as energy production, consumption and GHG-emission data this article describes the current state of French and European energy and climate policies before analysing Paris' performance towards the European framework goals as well as political reasons and structural constraints that inhibit further progress.

Keywords EU Energy Policy · Compliance · Energy transition · EDF · French energy policy

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Die französische (Nicht-)Einhaltung der europäischen Energiepolitik

Zusammenfassung In den Anfangsjahren der gemeinsamen Europäischen Energiepolitik galt Frankreich als das *schwarze Schaf* in Bezug auf die Umsetzung europäischer und internationaler Energie-, Klima- und Energiemarktregeln. Da sich das Land derzeit in einem Energiewendeprozess (*la transition énergétique*) befindet, stellt sich die Frage, ob diese Zuschreibung noch gültig ist. Dieser Artikel argumentiert, dass auch heute noch verschiedene Konfliktpunkte zwischen Paris und Brüssel in Energiefragen identifiziert werden können, insbesondere in den Feldern der Energiemarktliberalisierung, dem Nicht-ETS-Sektor sowie dem Ausbau von Erneuerbaren Energien. In Anlehnung an die EU-Compliance-Theorie lassen sich die Gründe für die Abweichungen von Paris sowohl als *gewollt* als auch *ungewollt* identifizieren. Einerseits ist Frankreich politisch immer noch nicht bereit, sich voll und ganz auf die energiepolitischen Ziele Brüssels einzulassen, da diese mit der Auffassung des Landes über den Energiesektor als Gemeinwohlaufgabe kollidieren. Andererseits sieht sich Frankreich aufgrund seiner starken Nuklearflotte systembedingten Zwängen ausgesetzt, da diese den Energiesektor des Landes dominiert und somit den Handlungsspielraum von Paris innerhalb des europäischen Energierahmens einschränkt. Aus diesem Grund sollte Frankreich heute als *unfreiwilliges schwarzes Schaf* betrachtet werden, wenn es um die Nichteinhaltung der EU-Energiepolitik geht. Auf Basis aktueller politischer Entwicklungen sowie Energieproduktions- und Emissionsdaten, beschreibt dieser Artikel den derzeitigen Stand der französischen und europäischen Energie- und Klimapolitik, bevor er Frankreichs Performance im Hinblick auf die europäischen Rahmenziele in den Blick nimmt. Anschließend werden politische Gründe sowie die strukturellen Zwänge des Atomsektors angeführt, die weitere energiepolitische Fortschritte verhindern.

Schlüsselwörter EU Energiepolitik · Compliance · Energiewende · EDF · Energiepolitik Frankreichs

1 Introduction

France has always been unique in its energy situation. Typically, the country's stance on energy is understood as a form of public welfare policy. Big state-owned energy champions such as *Électricité de France (EDF)* are to guarantee a secure and affordable access to energy for the country (Rüdinger 2014; Andriopoulos and Silvestre 2017, p. 376). This understanding has historical roots: massive energy shortages during and after both World Wars as well as the oil crisis of 1973 gave rise to the desire for greater energy independence of the country.

The French solution to that problem was the launch of a massive nuclear programme that resulted in the construction of 55 of the country's 56 currently operating nuclear reactors in just 13 years (1971–1984) (Buchan 2014, p. 3). Today nuclear power accounts for 40.3% of France's primary energy consumption, followed by oil (29.1%), natural gas (15.2%) and renewables (11.6%). Coal and non-renewable waste play a minor role with only 3% and 0.8%. (MTES 2020a, p. 22;

see Fig. 1). In the power sector the nuclear fleet occupies an even more dominant position, accounting for 67.1% of electricity production in 2020, followed by hydro energy (13%), wind (7.9%), fossil fuels (7.5%), solar power (2.5%) and bioenergy (1.9%) (RTE 2021, p. 23, see Fig. 2). Until today France is the second largest producer of nuclear power after the United States of America (Power-technology 2021).

This layout clashes with the European Energy and Climate policy, which advocates for an integrated Energy Union to reach the goals of supply security, sustainability and a competitive and non-discriminatory internal energy market. In particular, France’s reluctance to liberalise its energy market and to give up regulated prices has been a point of conflict between Brussels and Paris for over more than the last decade and gained the country the reputation of a *black sheep* (Meritet 2007, p. 4768f, 2011, p. 147). Additionally, the French performance in the area of renewable energy expansion has been a point of criticism (Szulecki et al. 2016, p. 556).

In the literature, the connection between the French and the European energy policy has been the topic of several scientific studies (e.g. Meritet 2007, 2011;

Fig. 1 France’s primary energy consumption in 2019

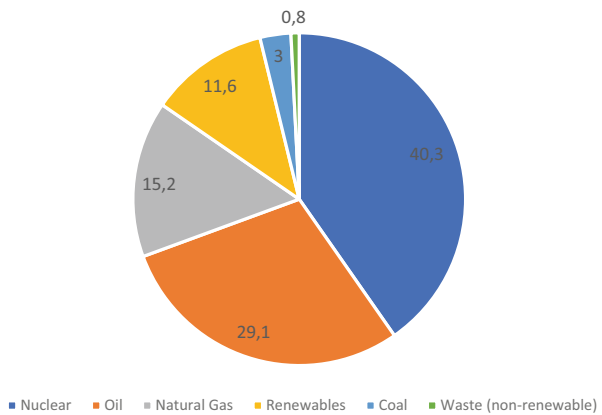
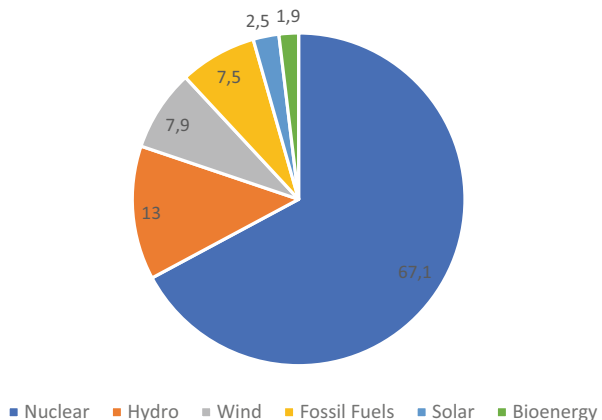


Fig. 2 France’s electricity production per sector (in 2020)



Stüdemann 2014; Szulecki et al. 2016; Engels 2016; Andriosopoulos and Silvestre 2017). However, in light of the rapid developments in these policy areas in the recent years, the question arises if the attribution of a *black sheep* is still valid. Is France still non-compliant in terms of its energy market structure and are there any other areas within the energy sector where the country strays from the guidelines of the EU? Furthermore, if there are any non-compliances, what are the reasons behind Paris' decision to not follow the rules? These questions are particularly more pertinent as France is engaged with its own energy transition process (*la transition énergétique*) since 2015. This article therefore aims to examine areas and reasons of compliance and non-compliances between the French and the EU policy in the fields of energy market and climate. Linking these two policy areas is not without challenges, as both fields are structured differently in terms of governance, regulation and scope. However, as the single market for energy is seen as fundamental in achieving the EU-climate goals and due to the fact that France has faced criticism in both of these areas a combined analysis on compliance seems in order.

To answer the research question, a brief definition of the term *compliance* in relation to the EU-energy and climate policy shall be given first. Then, the research question will be operationalised by utilising the results of that definitory basis. Subsequently, the current energy policies of France and the EU shall be presented. Here, the content of these policies as well as the governance mechanisms will be explored. In the case of France, a special focus will be set on the nuclear power sector as it dominates most of the country's energy system.

In order to identify compliance and non-compliance, France's progress towards the European Energy and Climate targets as well as the countries energy market situation will be evaluated. Based on those findings, the reasons for possible deviations will be analysed. Lastly the conclusion shall synthesise the results and attempt to answer the chosen research question.

2 Compliance: definition and operationalisation

Academic research on EU compliance became a hot topic in the 1990s when many Member States were reluctant to implement the numerous European Single Market directives (Mastenbroek 2005, p. 1104). Since then, the so-called *implementation deficit* or *implementation gap* of EU law on Member State level have been the subject of many empirical and theoretical studies in political as well as legal sciences. Especially the area of environmental policy was often investigated for (non-)compliance issues because it shows “the second highest number of violations of EU law” (Börzel and Buzogány 2019, p. 316).

However, the term *compliance* itself, although widely used, often lacks a clear definition. In the Oxford Handbook of International Environmental Law, compliance is described as the conformity of states to the legal standards of an international agreement (Mitchell 2021, p. 887). Regarding the European level compliance therefore can be defined as the adoption or implementation of EU law by the Member States. Ellen Mastenbroek notes however, that this relatively narrow legal definition of the transposition of EU directives in national law holds no information “about

the timelines and correctness of transposition, let alone about actual application and enforcement.” (Mastenbroek 2005, p. 1104).

Compliance therefore has to be regarded as a term with multiple dimensions. Firstly, there is the formalistic dimension of the implementation or adoption of EU law *on paper*, and the dimension of the *actual realisation* of the law. Reasons for non-conformities in these areas can be either legal, administrative or political, ranging from constitutional concerns to institutional or political opposition against the EU law (Ibid.: 1108). Secondly, both compliance and non-compliance can be *intentional* or *unintentional*. Unintentional compliance means that a state does not have to change its policy to adopt the directive whereas unintentional non-compliance includes legal, technical or financial reasons for defection (Ibid.; Mitchell 2021, p. 887). While hunting for the motives for intentional non-compliance, the area of domestic politics stepped back into the focus of the research in the early 2000s. Although national actors as driving factors to EU (non-)compliance were already recognised in earlier research stages, the analysis of their influence was now combined with a stronger theoretical neo-institutionalist approach (Mastenbroek 2005, p. 1110).

When we ask the question if France is compliant or non-compliant in the areas of EU environmental, climate and energy market policy we have to take into account these observations. Firstly, the analysis in this article has to differentiate between the *on paper* and the *actual* dimension of compliance. A mere adoption of the EU directives (compliance *on paper*) does not necessarily lead to a successful execution of the goals and targets stated in these laws. Therefore, we also have to look at the current progress France has made within the areas of energy, climate and energy market liberalisation within the EU framework. To this end, the target goals within the European directives can serve as useful *comparators* (Mitchell 2021, p. 889f.) for the state’s compliance, as they act as benchmarks for the classification of Paris’ policy efforts. Of course, this applies only to those goals that have a binding character for the EU-Member States (see Chapter 5). Concerning the energy market, we have to examine if the EU liberalisation directives have led to the elimination of monopolistic market structures in France. Indicators for this aspect can be a comparison of the current market shares of historical and alternative energy suppliers, provided by France’s energy regulation agency *CRE*, as well as today’s position of state-owned companies like *EDF* in the country’s energy sector.

Secondly, the distinction between intentional and unintentional non-compliance has to be taken into account as well. If defections can be identified we need to analyse whether these are caused by voluntary political actions by the French government (intentional non-compliance) or whether they were caused by the systemic, legal or administrative situation persisting in the country (unintentional non-compliance).

3 The european energy framework

Energy issues have been a topic for European countries since the beginning of the European integration. With the establishment of the ECSC (1951) and Euratom (1957) the coal and nuclear sector were already at the heart of emerging European

politics. Later, in response to the 1973 oil crisis, the EU launched its first energy efficiency directives (Economidou et al. 2020, p. 5). In the 1990s, coordinated energy policy efforts began with the directives for market liberalisation in the electricity and gas sector, driven by the European Commission. It was not until 2005, however, that a common European Energy Policy framework emerged. This development was born out of crisis. The European Union suffered from the setback of the negative referendums on the European constitution in France and the Netherlands. The then British Prime Minister and head of the European Council, Tony Blair, invited his colleagues to an informal meeting to Hampton Court where the heads of state and government of the Member States discussed possible topics for a reinvigoration of EU-policy (Fischer 2011, p. 88f.). Because of rising fossil energy prices, the demand for security of supply vis-à-vis Russia, expressed by the then new middle and eastern European Member States, as well as the radiance of the Kyoto-Protocol, the idea of a common energy policy was chosen as a new lighthouse project for the European Union (Ibid.).

From 2007 onwards, the EU compiled and enacted numerous programmes and laws that set the framework of Energy and Climate policy¹. All these acts and papers honour three basic goals that were already introduced in the European Commission's Greenbook of 2006: The triangle of a *sustainable, affordable and secure* energy supply of the EU.

3.1 EU energy and climate goals

The sustainability goal unites all the climate and emission targets of the European Energy policy. The first set of rules was known as the *20-20-20 targets*, formulated by the *2020 climate & energy package* that was discussed in 2007 and enacted as law in 2009. The package provided for a 20% cut in GHG-emissions from 1990 levels, a 20% share of renewables in the EU, as well as a 20% improvement in energy efficiency until 2020 (EC 2008, p. 2). To reach the GHG-reduction goal the EU introduced an emission trading system (ETS) to cut emissions in the power sector, in industry as well as aviation.

In preparation of the World Climate Conference (Cop 21) in Paris of December 2015 the 20-20-20 goals were amped up in the EU's 2030 energy and climate framework act. The emission reduction target rose to 40% by 2030; renewables should account for 27% of EU-energy consumption and the energy efficiency goal was also increased to 27%. In 2017 partly under the pressure of the European Parliament the renewables target was increased to 32% and the energy efficiency goal to 32.5% (Bocquillon and Maltby 2020, p. 47). The emission reduction target experienced a revision three years later when it was set to a 55% reduction until 2030 as part of the European Green Deal Package (EC 2020a, see Table 1).

¹ e. G. The EU Energy and Climate Package (2008), the Energy Strategy 2020 (2010), Energy Roadmap 2050 (2011), the Energy and Climate Framework 2020–2030 (2014), the Energy Union (2015), Clean Energy package (2016), European Climate pact (2020).

Table 1 EU Energy and Climate Targets

Target	2020 (in %)	2030 (in %)	2030 (updated) (in %)
Reduction of GHG-emissions (compared to 1990 levels)	20	40	55
Share of renewables (as part of final energy consumption)	20	27	32
Increase in energy efficiency	20	27	32.5

3.2 The internal energy market

In the understanding of the Union, a secure access to energy as well as the fulfilment of the energy and climate goals, can only be achieved through an integrated internal energy market. Even though the common energy market today is seen as one of the major trumps to combat the energy vulnerability of the EU, it is older than the rest of the energy and climate policy. The European Commission began pushing for a more liberalised energy market already in the 1990s as part of the single market programme. At that time, the member states' energy markets were highly diversified and often characterised by a monopolistic structure controlled by publicly owned energy companies. Since then, the Commission has steadily continued to expand the liberalisation of the EU's energy markets. With the third energy package of 2009 the EU introduced new far-reaching rules. To further break up monopolies, energy producing companies were no longer allowed to be grid operators at the same time. They either had to separate the ownership of the production and transmission sector (*ownership unbundling*) or independent system and transmission operators had to be created to establish an effective separation of the business areas (Engels 2016, p. 42f.).² In June 2019 the fourth energy package was introduced in which the rules for the *internal market for electricity* as well as the *EU Agency for the Cooperation of Energy Regulators (ACER)* were revised and specified.³

3.3 Governance of the EU energy and climate policy

Energy policy itself is a shared competence between the EU and its Member States. Since Lisbon, it is part of the European Treaties. Article 194 of the *Treaty of the Functioning of the European Union (TFEU)* covers the areas energy market, energy efficiency, grid interconnection, renewables and energy security. Climate change is part of the EU environmental policy of Article 191 (1) TFEU. Being a shared competence, the sources of authority in terms of policy formulation in these areas vary. While the areas referred to in Article 194 are subject to the ordinary legislative procedure between the European Parliament and the Council, the European Commis-

² The unbundling rules for the electricity market were further updated in the Clean Energy Package of 2020.

³ The fourth energy package consisted of the following directives and regulations: Electricity directive (2019/944/EU), Electricity Regulation (2019/943/EU), Risk-Preparedness Regulation (2019/941 EU) and the ACER Regulation (2019/942/EU).

sion determines the guidelines of the common energy market as part of its internal market competence. In this field she also has the ability to draw the legal option should countries fail to comply to the market rules. Each Member State however solely “determine[s] the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply” (Article 194 (2) TFEU).

The EU energy governance is therefore subjected to “ongoing authority contestation between member states and supranational institutions.” (Bocquillon and Maltby 2020, p. 51). This is particularly visible in comparison of the 2020 and the 2030 energy framework. In the former, the GHG-reduction target as well as the renewables target were binding on the national level for every Member State. In the latter, only the GHG-target is nationally binding⁴ whereas the renewables-goal shall only be achieved on an EU-wide level. This development was driven by several of the EU-Member States namely the *Visegrád-Group* (Poland, Hungary, Slovakia, Czech Republic) as well as the Netherlands and Great Britain that pushed for more flexibility in terms of energy efficiency and the freedom of choice concerning each country’s energy sources (Fischer 2014, p. 2, Engels 2016, p. 30). The European Commission has to be very sensitive towards each country’s energy preferences when formulating common policy proposals. She therefore chose a thematically very broad approach when drafting the Energy Union project of 2015. With that tactic the Commission could, in the end, successfully gather all of the EU-Member States, in spite of diverging interests, under a single programme (Fischer and Geden 2015, p. 2; Buchan and Keay 2015, p. 5).

Those tendencies of renationalising European energy policy are on the other hand contrasted by a deepening supranational monitoring mechanism. In 2018 a European law was enacted concerning the *regulation of the Governance of the Energy Union*. This act promotes, “common rules for planning, reporting and monitoring” in the energy sector as well as a synchronisation “with the ambition cycles under the Paris Agreement” (EC 2021). In detail, each EU Member State had to come forth with a *national energy and climate plan (NECP)*, covering the years of 2021–2030. These plans were published and evaluated by the European Commission and will be so again in 2024 when the Member States have to update their NECPs. In addition to that, each country had to develop a long-term strategy paper to ensure strategic consistency between the national policies. Lastly the European Union monitors the Member States progress in climate policies under the *Effort Sharing* and the *LULUCF*⁵ *regulations* as well as the EU-wide progress through the annual *State of the Energy Union report* (Ibid.).

In general, the 2018 regulation has led to a *hardening* of the EUs soft Energy Union governance system (Knodt et al. 2020, p. 792f.). The Commission’s evaluation of the publicly accessible NECPs as well as the obligation of each Member State to

⁴ The GHG-emission reduction target is regulated and monitored by the European Emissions Trading System (ETS) as well as national emission reduction goals, noted in the Efford Sharing Mechanism, for the sectors that are not covered by the ETS (non-ETS sectors).

⁵ Full Name: Regulation on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry.

incorporate the public and important stakeholders in the draft process have increased the potential of *blaming and shaming* in this area (Ibid.).

4 The french energy policy in transition

In the last 15 years there has been a gradual shift in French energy and climate policy. In 2007 the then French President, Nicolas Sarkozy, launched the process of the *Grenelle de l'environnement*. Being a consultative political will-formation event between the state and economic as well as civil society stakeholders, the *Grenelle* marked a departure from classic state centric top-down politics that had characterized French policymaking in the energy, climate and environment sector up to that point (Teräväinen et al. 2011, p. 3436; Engels 2019, p. 133f.). This new phase of participatory policymaking had been triggered by growing domestic and international pressure on French advancement in these areas. In the 1990s and early 2000s France had been slow to implement the negotiated outcomes of international climate conferences like Rio (Lascoumes 2011, p. 281). France also brought up the rear in the area of energy market liberalisation by not implementing the first directives of 1996 and 1998 until 2003, being the last EU state to do so (Engels 2016, p. 104). The same was true for the implementation of European environmental laws which gave France the reputation of being the “mauvais élève” (Zappi 1998) of the European Community.

That mounting international pressure was accompanied by a new political strategy from France's environmental associations. After the disappointment about the feeble performance of the French green party in the cohabitation government between 1997 and 2002, France's environmental NGOs abandoned their traditional social protest attitude, that had relied on public pressure and juridical means, to reach their political goals. Instead, the associations began to offer their own expertise to the state and showed willingness to negotiate directly with members of the administration to influence environmental and climate policies from within the political arena. The presidential election campaign of 2007 served as an ideal window of opportunity to promote the demands of the NGOs (Halpern and Lascoumes 2012, p. 17f.). The then presidential candidate, Nicolas Sarkozy, also used the rising relevance of environmental topics as an electoral tactic. By incorporating sustainable policies in his own electoral programme, he saw the opportunity to renew the political profile of his republican party in order to appeal to new groups of voters (Halpern and Lascoumes 2012, p. 25).

All these elements eventually paved the way for an institutional and substantive opening of the French energy and environment policy (Whiteside et al. 2010, p. 454f.). After three months of consultations, the *Grenelle* process resulted in two laws that formed the basis for France's future sustainable and climate policy. The fight of climate change was named a top priority. The first *Grenelle* law provided for a reduction of French GHG-emissions to a quarter by 2050 (in comparison to 1990 levels), a national incorporation of the European energy efficiency target of 20% by 2020 as well as an increase of renewable energies to 23% of the country's final energy consumption by 2020 (loi n° 2009-967). Detailed targets for the building sector

(–38% energy consumption by 2020), the transport sector (–20% GHG-emissions by 2020) as well as the protection of biodiversity and ecosystems were also included (Ibid.). In the second *Grenelle* act these targets were further operationalised.

The Fukushima reactor disaster of 2011 and the resulting German nuclear phase-out also revived the discussion in France about the future of its own energy system, especially against the backdrop of France's ageing nuclear reactor fleet (Rüdinger 2014, p. 4; Engels 2016, p. 58f). In November 2012 the then French President, François Hollande, turned in one of his electoral promises and launched another extensive consultation process: the *national debate on energy transition (débat national sur la transition énergétique, DNTE)*. That procedure took its roots from the *Grenelle* event a few years earlier and was aimed at finding answers to France's pressing energy, environment and climate matters.

In August 2015 the French parliament passed the country's energy transition act, the *transition énergétique pour la croissance verte*, which incorporated the results of the *DNTE*. The law built upon the targets and focus areas, already provided for in the *Grenelle* acts. Specific goals for 2030 were added and new intermediate as well as long-term targets were formulated. In the end the *DNTE*-law provided for an increase in the share of renewable energy in final energy consumption to 23% by 2020 and 32% by 2030, a 50% reduction in energy consumption by 2050 and a reduction of GHG-emissions of 40% until 2030 and 75% until 2050 (loi n° 2015-992).⁶ Completely new was the inclusion of a nuclear reduction target, a topic that was left out in the *Grenelle* discussions. By 2025, the share of nuclear power France's electricity mix should be reduced from 75 to 50%.

The law also introduced a national low-carbon strategy (*La Stratégie nationale Bas-Carbone, SNBC*). This policy framework serves as the guideline for all of France's emission related policies to reach the country's reduction goals. With the French energy and climate act of 2019 (*loi énergie-climat*) the *SNBC* was also reworked to reach France's new goal of attaining carbon neutrality by 2050, stated in the law. This replaced the 2015 target of 75% reduction by 2050 but not the intermediate target of 40% reduction by 2030.

4.1 The role of nuclear energy in the french power system

In France, the state always played a major role in shaping the country's energy system. The troublesome experiences with an insecure energy supply during both World Wars led to the creation of big national energy corporations like *Électricité de France (EDF)* and *Gaz de France (GDF)* as early as 1946 (Stüdemann 2014, p. 151). Since then, energy policy in France has been regarded as a form of public welfare policy (Meritet 2007, p. 4767; Adriosopoulos & Silvestre 2017, p. 376). After the experiences of the oil crisis in 1973 and the resulting construction of the French nuclear fleet, the civil nuclear sector as well as its military sibling are seen as guarantors of the country's independence (Diechtl and Fischer 2015, p. 4). To

⁶ The base year for the energy consumption target is 2012. The base year for the GHG-target is 1990.

this day, the French state holds a majority stake in the national *energy champions* such as *EDF* or *Orano*⁷.

France's public policy approach led to the creation of a political regulated electricity price system in the power sector. Although this was legally abolished in course of the European market liberalisation it is still hard for competitors to challenge the position and the prices of the dominating incumbent *EDF* (see chapter 5.2). To this day French consumers still pay very little for electricity in comparison to other European Member States. In 2020 a French household paid only 0.1958 € per kilowatt-hour (KWh), significantly less than the EU average of 0.2134 €/KWh (Eurostat 2021a).⁸ Energy prices in France are a delicate political topic, in particular since France is a country with a high level of energy poverty (*précarité énergétique*).⁹ A substantial part of the French housing stock has poor energy efficiency as well as outdated heating and hot water systems (RAPPEL 2021). The decades of low energy prices did not create an incentive for energy-efficient renovations. When prices gradually increased around the millennium, the topic of energy poverty became more and more pressing and part of France's political debate since 2004 (European Commission 2012). Until today, France faces a big energy efficiency challenge in the building sector (see chapter 5.1). Moreover, the share of electric heating in the French residential sector accounts for 41%, creating an additional lock-in effect for the need cheap electrical energy (Statista 2018). Therefore, any substantial increase in consumer energy prices can trigger unrest in the French society, as the *jellow vest* protests, that were initially triggered by an announced increase in fuel taxes, have illustrated.

The French nuclear fleet also impacts industrial and labour market policy. Over the decades the nuclear sector became the third largest industry branch—after automotive and aeronautical—with 3,000 companies employing 220,000 people (Elysée 2020). French companies are, for example, world leaders in reactor construction, uranium extraction and the recycling of fuel rods. Both, the jobs and the technological know-how count as assets in French politics as well as in big parts of the society.

4.2 The nuclear power reduction in question

Reducing France's nuclear power share from 75 to 50% was non-surprisingly the most discussed topic of the whole legislation process of the *transition énergétique*. As we have seen, it touches the very foundations of the French energy system and has implications in many other political areas. Atomic energy is the focal point and the determinant factor when it comes to planning and executing a national energy

⁷ EDF is France's biggest power supplier as well as the operator of all nuclear and hydro power plants. Orano (formerly known as Areva) is a global leader in the extraction of uranium and the creation of fuel rods.

⁸ The highest price was paid in Germany with 0.3006 €/KWh, Bulgarian consumers had to pay the lowest price of 0.0982 €/KWh.

⁹ According to the French Ministry of Energy 2.8 million households are in danger of energy poverty (MTES 2021). According to the National energy poverty observation service, 11.9% of all French households are affected (Assemblée Nationale 2021).

transition in France. The question of its future role is highly debated. It is therefore no surprise that François Hollande's successor in office, Emmanuel Macron, postponed the deadline for the reduction to 50% in France's energy mix from 2025 to 2035. Macron takes a positive stance towards nuclear energy stating that “[l]e nucléaire me importe. Le nucléaire, c'est de l'emploi et c'est de l'énergie. Je ne suis pas antinucléaire. Je l'ai toujours dit avec beaucoup de force.”¹⁰ (cited in: Wakim 2020). Since the beginning of his term, the French President pushed for a more ambitious climate policy (*make our planet great again*) and sees nuclear power as central to achieving France's climate goals. In fact, nuclear energy is considered in France as climate-neutral energy source because no CO₂ is emitted during its production.¹¹ Due to the largely decarbonised power sector, the country's per capita emissions are with 6.8 tCO₂eq¹² below the European average of 8.4 tCO₂eq (Eurostat 2021b).

The target delay for the nuclear reduction was then written in the energy and climate act of 2019. But even with this delay it remains still unclear to this day how the reduction shall be achieved and which reactors will have to be shut down in order to do so. The energy transition law of 2015 has set a ceiling for the maximum installed capacity of nuclear power in France to 63.2 gigawatts (GW) which is equivalent to the currently existing reactor fleet. This means that if a new nuclear power plant comes online—such as the EPR¹³ plant currently under construction in Flamanville (northern France)—older reactors would have to be shut down. In France's most recent Multiannual Energy Plan (*programmation pluriannuelle, PPE*), that covers the specific measures for reaching the energy transition in five-year periods, it is just stated that 4 to 6 reactors will be taken off grid by 2028. This already includes the two reactors of the oldest plant at Fessenheim, next to the German border, that were shut down in February and June 2020. To reach the full target of 50% nuclear power by 2035 the *PPE* states that 14 reactors would have to be shut down, but does not deliver further detail (MTES 2020b, p. 5).

5 The french (non-)compliance with the EU energy framework

As the examination of the EU energy and climate governance has shown, only the GHG-reduction target as well as the renewables target remain as useful indicators for analysing France's (non-)compliance as these are the only goals with a legally binding character in the current policy framework (see Table 2). The emissions target can be broken down into two parts: the one that is regulated by the EU emission trading system (ETS) and covers most of the energy sector as well as the major industry emissions. And the so called non-ETS-sector which is not covered by the system and includes, among others, the building and transport sector.

¹⁰ “I care about nuclear power. Nuclear power is employment and energy. I am not anti-nuclear. I have always said so very strongly.” (own translation).

¹¹ Prominent discussions on the disposal of nuclear waste, as they happen in Germany, for example, are rarely held on the other side of the Rhine.

¹² Tonnes of CO₂ equivalent.

¹³ EPR: European pressurized reactor, the third and most recent generation of French nuclear reactors.

Table 2 Comparison of legally binding Energy and Climate Targets

Target	France	EU
Share of renewables in gross final energy consumption	23% by 2020 33% by 2030	20% by 2020 32% by 2030
GHG emissions reduction (non-ETS, non-LULUCF)	-37% by 2030 (compared to 2005)	-37% by 2030 (compared to 2005) ^a

^aThis goal is the binding national target for France as part of the effort sharing regulation (ESR) for non-ETS emissions

Although both parts have national emission reduction targets only the latter will be investigated in this article. As reduction within the ETS sector is achieved by the ever-decreasing maximum number of emission certificates there is little room for national defection.¹⁴ The achievement of the reduction target in the non-ETS sector, however, depends on national measures taken by each Member State. Progress in non-ETS areas like building and transport may determine the degree of France's nonconformity with the EU goals.

The renewables target also requires a word of clarification. As we have seen, only the 2020 target was binding at national level. The 2030 target, on the other hand, is only binding at the EU level. Nevertheless, it is useful to look at both dimensions. Firstly, the deadline of 2020 has just recently expired. This offers the opportunity to investigate if France has been able to reach the 2020 goal and if it hasn't, to identify the reasons behind the shortcomings. Although it lacks the national binding element, the 2030 target is also relevant as it is still obligatory for the EU as a whole. This means that any potential backlog caused by France must be made up by other Member States.

5.1 France's progress towards the EU-sustainability targets

France's path to reach its effort sharing target of 37% by 2030 is unclear. Although the country's newest NECP in general was characterised "as largely compliant and ready to contribute to emissions reduction" (Maris and Flouros 2021, p. 12) doubts of Paris' commitment remain. In the newest EU Climate Action Progress Report of November 2020, the European Commission expects France to miss the target by 14% if the country continues with its existing climate policy (EC 2020a, p. 6). This puts France at the lower end in a European comparison. On average the EU-27 will miss the 2030 target with existing policies by 10% (Ibid.). However, in the current assessment of the French NECP the Commission pointed out that if France were able to follow its more ambitious zero emission trajectory by 2050 as well as to exert a more ambitious carbon budget, it could overachieve the 2030 target by 4% (EC 2020b, p. 8). This would lift France above the European average of 3% overachievement with "planned measures" (EC 2020a, p. 6).

¹⁴ However, it has to be noted that the ETS was and still is the subject of ongoing criticism, primarily focused on the pricing and distribution methods of the allowances (see Hintermayer 2020; Flachsland et al. 2019).

Currently it does not seem as if the latter scenario could become reality. Firstly, the performance of France's national carbon tax, the *budget carbone*, has been sobering so far. In its first period from 2015 to 2018 the budget could only reduce emissions by 1% annually instead of the envisaged 2.2% (MTES 2020c, p. 7). The French energy and environment ministry cites low energy prices as well as meagre emission reduction results in transport, the building sector and agriculture as the reasons for this target discrepancy (Ibid.).

Secondly, emission reduction in the building sector is lagging behind schedule as well. The energy transition law originally provided for 500,000 energetic refurbishments per year. A recent parliamentary status report stated that only 0.2% of the necessary renovations of the French building stock are conducted yearly. To reach the country's emissions and energy efficiency targets in this sector the renovation rate would have to increase to 1% per year after 2020 and 1.9% per year by 2030. For the residential sector this would mean an increase of 70,000 yearly refurbishments over 370,000 (from 2022) to 700,000 households per year from 2030 (Assemblée Nationale 2021, p. 12).

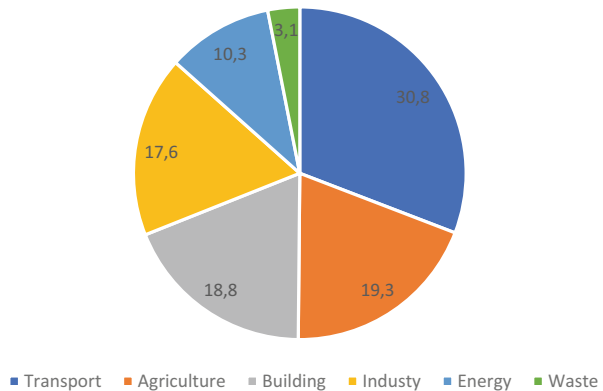
Even less progress can be seen in the transport sector. Although France's total GHG-emissions have decreased by 20% from 1990 to 2019, emissions from the transport sector—mainly CO₂—have risen by 9% in the same period. Since 2009, the country has only been able to stabilise its transport emissions due to less polluting vehicle technologies. (République Française 2021). However, technological progress could not yet reduce emissions further.

Concerning renewable energy there is also a gap between France's ambitious goals and the current share in the country's final energy consumption. The French targets for 2020 and 2030 were with 23% and 33% respectively, higher than the European targets (20% and 32%). However, the newest figures show a share of only 17.2% renewables in France's final energy consumption in 2019, significantly below the country's own, as well as the EU-2020 target (MTES 2020a, p. 61). In 2014, the year of France's big national energy debate (*DNTE*) the share lay at 14.6% (MTES 2016, p. 30). With a resulting annual growth rate of only 0.52% France would still miss its own 2020 target by 2030 reaching only 22.92%.

For the future years there is little sign of major changes in this area, although the French government is trying to raise the numbers: In the current multiannual action plan (*PPE*) the French government aims at increasing the installed production capacity of renewable electricity by 50% until 2023 (in comparison to 2017) which would result in a total amount of 73.5 GW (MTES 2020b, p. 5). The actual development from 2017 to 2023 has so far produced an increase from 48.7 to 55.9 GW in 2020, a plus of 2.46 GW per year (RTE 2018, p. 19, 2021, p. 26). To reach the 73.5 GW in 2023 the annual growth rate would have to be at least 5.86 GW from 2020, but even the highest growing sectors wind and solar only increased by 1.1 and 0.8 GW respectively (RTE 2021, p. 26).

The weak expansion of renewables in France can be explained by the country's energy structure, because "French renewables are competing against some of the cheapest, and the most carbon-free electricity in Europe" (Buchan 2014, p. 12), meaning France's nuclear power. Due to the country's big nuclear fleet the energy sector is already highly decarbonised and accounts for only 10.3% of the French

Fig. 3 French GHG-Emissions per Sector



GHG-Emissions. The main GHG-emitting sectors are transport (30.8%), agriculture (19.3%) and the building sector (18.8%) (MTES 2020c, p. 3, see Fig. 3). Thus, replacing nuclear power with renewables does not decrease France's carbon footprint.

Installing more renewable capacity without a nuclear reduction is also not an easy option. Nuclear plants operate on high baseloads that create a relatively stable amount of energy. Renewables on the other hand are more volatile energy sources as they depend on external factors like wind or sunshine to produce electricity. Linking the two forms can be a challenge because they demand different setups of energy grids and systems (Buchan 2014, p. 7). Additionally, there has to be a demand for higher power generation in the first place if renewables shall not be replacing the nuclear reactors (Szulecki et al. 2016, p. 556).

5.2 (Non-)compliance in the single energy market

Since the beginning of the internal energy market in the 1990s the topic has been a point of conflict between Paris and Brussels. The French upheld their vision of energy policy as welfare policy, supplied by vertically integrated state-owned companies. The European Commission, on the other hand, promoted a liberalised energy market as part of the single market programme as well as for reasons of security of supply. Because of these conflicting conceptions, France has, similarly to the international climate acts, always been reluctant to implement European liberalisation acts (Andriosopoulos and Silvestre 2017, p. 378). It was the last Member State to implement the internal energy market directives of 1996 and 1998 only in 2003. The second energy market package of 2003 was also delayed by three years, which led the EC to launch an infringement procedure in April 2006 (Stüdemann 2014, p. 272–75).

While the French gas market is mostly liberalised since 2007, tensions between Paris and Brussels in the electricity sector remained. To avoid legal punishment, the French parliament passed the *NOME* law (*loi portant la nouvelle organisation du marché de l'électricité*) in 2010. This law obligates the state company *EDF* as the only operator of nuclear energy to sell 100 TWh of nuclear power production, around a quarter of the nuclear generation at that time, to alternative supplier companies for

a regulated price of 40 €/MWh. After the Fukushima accident the price was raised to 42 €/MWh to account for the higher reactor security measures that had to be taken by *EDF*. The effectiveness of this so called *ARENH*¹⁵ instrument depends on the market prices for electricity. From 2010 to 2014 it was profitable for alternative energy suppliers to use *ARENH* because it was cheaper than buying electricity for market prices. This changed in the period of 2015 and 2016 where electricity was relatively cheap therefore making “this framework unattractive” (Andriosopoulos and Silvestre 2017, p. 378). Rising prices from 2017 onwards made the mechanism profitable again. In the last years (2019–2021) the demand even exceeded the supply of the 100 TWh (CRE 2021). Therefore, the French energy and climate law of 2019 raised maximal *ARENH* volume to 150 TWh which now accounts for around 45% of the state’s nuclear production in 2020 (RTE 2021, p. 23).

5.2.1 French unbundling: historic versus alternative suppliers

Another point of conflict between Paris and Brussels is the question of unbundling the state-owned historic energy suppliers. This is especially a hot topic in the electricity sector where the French State fully owns the energy giant *EDF*. Under the European liberalisation pressure France separated its power transmission network operator *RTE* (*Gestionnaire du Réseau de transport d’Électricité*) from *EDF* in 2000 and turned it into an *Independent Transmission Operator* (*ITO*) in line with the European regulation rules. However, this system allows the parent company (*EDF* in this case) to maintain ownership of network operator even though the business units are legally separated. The same is true for France’s primary distribution network operator, unbundled in 2008, and then known as *ERDF* (*Électricité Réseau Distribution France*) (Andriosopoulos and Silvestre 2017, p. 378; Engels 2016, p. 55).

The proximity of both companies by Name (*EDF* and *ERDF*) as well as their public appearance—both companies shared the same logo, except for a change in colour—led to confusion among customers and satisfied neither the European Commission nor France’s national energy regulation authority, the *CRE* (*Commission de Régulation de l’Énergie*) (Bezat 2015). The criticism first only resulted in a change of the *ERDF* logo in 2015 before the company was completely renamed to *Enedis* a year later “in order to stand out as its parent company” (Andriosopoulos and Silvestre 2017, p. 378).

Despite France’s hesitant implementation of the European liberalisation rules, progress in France’s energy market opening can be seen. In 2020 alternative power suppliers had a market share in total power consumption of 24.1% in the residential sector and of 47.7% in the non-residential sector (CRE 2020, p. 8). In comparison, alternative suppliers in 2015 only had a share of 8.3% (residential) and 22.1% (non-residential) respectively (CRE 2015, p. 6). Simultaneously, the number of alternative electricity suppliers has also increased to 44 in 2020, compared to 18 in 2015. (CRE 2020, p. 13ff.). The discontinuation of the last remaining regulated electricity tariffs

¹⁵ *ARENH* stands for: *Accès régulé à l’électricité nucléaire historique* // regulated access to historical nuclear energy.

in January 2016 and 2021 may have favoured this development and will probably continue to do so in the future.

Nevertheless, the historical suppliers like *EDF* still occupy a dominant position in the French power system as they still supply the majority of electricity to residential as well as non-residential customers. Furthermore, *EDF* continues to hold an enormous technological advantage because the company is the owner of the entire nuclear fleet in France (Buchan 2014, p. 13). The French State has a strong interest to maintain this situation not only to keep electricity prices low for its people but also to guard the countries technological leadership as well as the jobs in the industry. In the past, the French State has shown that cementing France's strong position in the nuclear sector is a political priority. In 2015 the government reorganised its two nuclear giants *EDF* and *AREVA* to avert financial difficulties that had arisen for the latter due to delays in the construction of the new third generation EPRs. *EDF* took over the reactor construction branch which now operates under its historic name of *Framatom*. *AREVA* was recapitalised with 2.5 billion Euro and was given the new name of *Orano* in 2017.

5.2.2 Electricity transition as a "herculean" task

The restructuring stunt did not however solve the problem of the French power sector. By adding the struggling reactor construction sector to *EDF*, France's energy champion is itself approaching a difficult financial situation that could be too much to bear. The French government came forth with a new restructuring idea initially baptized *Hercules*, now known as *Grand EDF*. The state would like to split the company up in three separate entities one for the nuclear sector (*EDF* blue), one for its hydropower business (*EDF* azure) and one for the renewable energy, distribution and retail sector (*EDF* green) (Euractiv 2021). The clashing point with Brussels is the idea that all three companies, although legally separated shall remain under a common corporative *umbrella* that would allow for a transfer of personnel and capital. The Commission regards this structure as non-sufficient in terms of market liberalisation and sees the danger of possibilities for hidden state aid (Oest-France 2021). Furthermore, the French government advocates a higher regulated electricity price in the *ARENH* system in order to combat the dept problem of *EDF*, which have risen to 41 billion € (Hernandez and Leali 2021).

To this point it is unclear if Paris and Brussels are able to come to an understanding. In July 2021 the French President Emmanuel Macron postponed the reform project of *EDF* until after the presidential elections in France in April 2022, fearing negative political consequences for his own campaign (Hernandez and Leali 2021). In the same month, French Finance and Economy Minister Bruno Le Maire stated that the Commission's position on a reorganization of *EDF* would mean a de facto dismantling of the organization and would therefore be not acceptable to the French government (De Beaupuy 2021).

6 Discussion: France's systemic trap

As the analysis above has shown, France's performance in energy and climate policy is strongly influenced by the structure of the country's energy system. Cheap and stable nuclear energy makes efforts in energy efficiency and the installation of renewables less attractive than in other EU Member States, as a diversification away from nuclear power could result in increasing prices, a more unstable security of supply or a massive loss in jobs and industrial leadership. This situation also has major implications on the European level, as "the political difficulty of the nuclear question frames what is possible to discuss [...]" (Szulecki et al. 2016, p. 556) in terms of national and European energy policies. That France's stance towards the EU energy and climate framework is "fundamentally determined by its domestic energy objectives, as well as political and economic challenges" (Szulecki et al. 2016, p. 555). This is very clearly illustrated by the example of the negotiations on the future of *EDF*. Here, the opposing views on energy and a common market structure collide. The dominant nuclear sector leaves France currently little choice when identifying its energy and climate priorities and is still "at the core of all debates" (Meritet 2007, p. 4768).

This systemic perspective generates the question if France is willing and able to alter its policy course or if the country is caught in a *systemic trap*. Any change in the current French energetic infrastructure will create political, social and economic backlashes due to the high degree of interlinkage of the nuclear sector in all of these areas (e.g. energy prices and the problem of energy poverty, the industrial and labour dimension). But a change could occur if the cost of maintaining the nuclear fleet would surpass the cost of installing and operating renewable energy. There have been signs indicating in that direction in the past. Multiple reports by the French Court of Audits, stated that the security maintenance of the old reactors as well as dismantling costs continue to become more expensive. Additionally, the construction costs and time periods of the new *EPR* generation continue to rise to unimagined heights (CDC 2020a, b; Wakim and Mouterde 2020; Mortinet 2021). The actual discussion about the future of *EDF* is also the result of these symptoms. At the present time, however, these signs are not yet able to dissolve the persisting forces in the French energy sector and research on the subject has been limited (see Buchan 2014).

The recent European discussion to label nuclear energy as a *sustainable energy source* is most likely going to strengthen France's course on maintaining a high amount of nuclear energy in the country's own energy mix. The positive voting result for including gas and nuclear in the EU's sustainable finance taxonomy by the European Parliament was welcomed by *EDF* officials. A few hours after the EP vote, the French government also announced that the French State "would take over the entire company of *EDF* beyond the 84% stake it already owns" (Euractiv 2022). In February 2022 the energy giant was already given a €3.16 billion additional capital of which the French State provided €2.7 billion, to fight the company's financial difficulties (Ibid.). The money will also be needed to shoulder the construction costs of future nuclear reactors, which the French president Emmanuel Macron had already

announced in November 2021 “to guarantee France’s energy independence [...] and achieve our objectives, in particular carbon neutrality in 2050.” (Reuters 2021).

7 Conclusion

This article aimed at analysing the compliance or non-compliance of the French energy transition project within the European Energy framework to explore if the attribution of a *black sheep* in terms of energy and climate policy as well as market liberalisation is still valid today. The findings have shown mixed results. France has developed ambitious energy and climate targets that, in some areas, even surpass the European goals. Additionally, the country now has adopted all of the necessary European directives concerning the climate sector and the energy market. The country’s NECP is mostly in line with the EU-targets and alternative energy suppliers continue to penetrate the French electricity market. However, this compliance *on paper* did not eliminate France’s *actual* defections in those policy areas. Firstly, the country struggles in achieving the binding EU climate targets, most observable in the effort sharing sector—mainly transport and building—as well as in the promotion of renewables. Additionally, there are points of conflict concerning the market liberalisation as France still defends its public welfare policy approach. Hence, the European-French relationship in energy questions fits the description of an “ongoing authority contestation” (Bocquillon and Maltby 2020, p. 51). Elements of this stance can still be seen today in the recent discussion with the EU about the future of the state-owned energy champion *EDF*, where no solution is still in sight.

The reasons for Paris non-compliance can be categorised as both, *intentional* and *unintentional*. On the one hand the country sticks to its energy policy as public welfare task due to political and economical reasons. On the other hand, France’s ability to formulate and exercise energy policy is limited by the structure of its own energy system. The massive, historically grown, proportion of nuclear power with all its implications on other policy areas is unique in Europe and therefore strongly influences the country’s views on the energy sector. The numerous reconstructions of the State’s energy companies have not been able to solve that problem as they were mostly cosmical reactions to the European liberalisation pressure.

All in all, it can be noted that the attribution of France as the *black sheep* or *mauvaise élève* in energy, climate and internal market areas is still applicable. Although there has been considerable progress both *on paper* and in *actual* adoption of EU energy and climate laws, the fundamental points of conflict between Paris and Brussels remain. Due to the systemic constraints France is facing, labelling the country as an *involuntary black sheep* might be more accurate, as the structure of France’s energy system limits “the ability of the country to determine a coherent vision of domestic energy goals” (Szulecki et al. 2016, p. 556) thus, making some of the non-compliances politically hard to dissolve.

In the light of these findings, one could finally argue that the current European Energy framework does not sufficiently reflect the national energy situations of its Member States. While a joint approach on climate targets is imperative, the EU could be more flexible in the ways of how to reach the target limits. In the case

of France this would mean that a specific goal for renewable energies would not necessarily have to be on the agenda regarding the country's current difficulties in marrying renewables and nuclear power. As an increase in renewables in France does not per se result in lower GHG-emissions, a political framework that focusses more on the building and transport sector would be more suitable for the country.

Future research should therefore focus on the questions if and under which conditions a major change of the French energy system can occur to be more in line with EU legislation, or if the Union has to be more considerate of the needs of its member states in tackling the joint energy and climate challenges.

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