8 France

From renewables laggard to technology-specificity devotee

*Elin Lerum Boasson, Catherine Banet and
Jørgen Wettestad*

Introduction

France has an energy system and a climate policy dominated by centralized, large-scale nuclear energy. Despite the emergence of an anti-nuclear movement in the mid-1970s and repeated bursts of protest, only the United States produces more nuclear electricity than France, and no other country is as reliant on nuclear power (Brouard and Guinaudeau 2017: 126). Early on, the French government chose to put all its energy eggs in the nuclear basket, developing a highly segmented energy sector with one monopolist utility, Électricité de France (EDF). From the late 1950s and for the next decades, the French energy system was increasingly nuclear-dominated.

This chapter tells the story of how and why France came to adopt a renewables support-scheme mix with the potential to transform the world's most monocentric electricity system radically, adding significant amounts of small-scale, decentralized energy. We will also see how and why France ended up with a highly technology-specific renewable energy support mix.

France has great renewable energy resources available, with potentials for a range of associated renewables technologies: hydro, wind, solar and bioenergy. The country exploited much of its potential for large hydro in the first decades after the Second World War, but many years passed before it started to develop a broader array of renewable energy technologies. Precisely because the energy system was so heavily dominated by large centralized nuclear energy, it seems puzzling that the French government should decide to adopt a technology-specific approach, based on a mix of support measures, which could eventually challenge the highly centralized nuclear energy system. France had modelled its feed-in scheme basically on the German scheme. However, when the European Commission (Commission) from 2012 began calling for less technology-specificity and greater exposure to electricity market prices, France was reluctant to adjust its scheme.

The story of France's renewables energy policy has been given moderate attention in the literature on European energy transition. A few scholars have examined French climate and energy policy in general (see e.g. Szarka 2007, 2011; IEA 2010, 2017; Meritier 2011; Whiteside et al. 2010), and certain specific aspects of

French renewables policy have been assessed (see e.g. Nadai 2007; Evrard 2012; Jacobs 2012; Cointe 2015, 2017; Boquillon and Evrard 2017). However, we are not aware of attempts at explaining the development of the French renewables support-scheme mix, or systematically exploring the relative importance of the French organizational field, political steering and EU influence in this respect.

Our multi-field framework rests on the assumption that the European environment will become more influential if one policy measure comes to dominate and Brussels gains stronger formal authority. Chapter 3 (Boasson 2021a, this book) shows that the EU has gradually gained more authority over national renewables support, and that feed-in premiums combined with auctioning became increasingly popular after 2013. Against this backdrop, it would be natural to expect the European environment to influence France more and more over time. But can this explain developments in France? To what extent was France influenced by Brussels and the actions of other EU countries (such as feed-in frontrunner Germany), and to what extent was the French renewables support scheme shaped by domestic factors?

Our general assumption in this book is that organizational fields dominated by a few actors that share a similar institutional logic will have strong policy impact. The highly segmented nature of the French stationary energy field, and the dominance of its centralized nuclear energy technology development logic, would lead us to expect the French organizational field to be very powerful. But it is hard to see how a support-scheme mix that promotes a broad range of decentralized technologies fits with the traditions of the French organizational field of electricity production. Might it be that the liberalization of the 2000s has radically reduced the segmentation of the field, and thus its influence?

Finally, to what extent can French political steering explain why France ended up with a distinctly technology-specific support approach? Has political steering perhaps played an important role, changing the course of development at critical points? According to the multi-field framework, the political field will influence the development of renewables policy most when the national legislature has considerable formal decision-making power and the issue is highly politicized. However, the French Parliament has not been a forceful actor in energy debates, and energy policy has apparently not often been politicized (Brouard 2013; Brouard and Guinaudeau 2017). Hence, we find no compelling reasons to expect the political field to provide key explanations to the development of the country's renewables support-scheme policy.

Technology-specific renewables support mix

By 2016, France had a technology-specific renewables support mix consisting of feed-in premiums ('remuneration complement contracts') for larger projects and fixed feed-in tariffs ('purchase obligation contracts') for small-scale renewables (RES Legal 2017). Certain smaller projects were entitled to feed-in tariffs, and thus a guaranteed price, but only the large-scale projects that successfully navigated the competitive procedure would be awarded feed-in premiums (add-ons

to the electricity price). Feed-in premiums were awarded to projects that won calls for tenders or had been selected as a result of competitive dialogue whereby the government negotiates with bidders about their projects. French renewables support was distributed through a special governmental fund, financed by energy taxes (CJEU 2012a).

Only solar plants of fewer than 100 kW installed on buildings, as well as biogas and hydropower plants of fewer than 500 kW, could get traditional feed-in support (RES Legal 2017). Levels differed between technologies; for solar, the feed-in tariff would be adjusted every quarter. For most technologies, the support levels would be reduced during the lifetime of the plants, but reduction rules differed across technologies. The aim was for feed-in support to be progressively replaced with feed-in premiums, and support financed by the aforementioned governmental fund that compensates the EDF and other distributors for their extra costs (CJEU 2012a).

The French feed-in premium, the remuneration complement, was allocated either through direct guaranteed contracts (*guichet ouvert*), projects that won calls for tenders or competitive dialogue with pre-selected candidates (RES Legal 2017). With the latter, the government negotiates with candidates that fulfil certain criteria, aiming to get the developers to improve their projects. The choice of procedure was to depend primarily on the technology and size of the installation, but the government had a certain leeway here. In practice, tenders have dominated, and they represent the largest volumes of added generation capacity (CEER 2018).

Various factors are to be taken into account in calculating the level of the feed-in premium – such as investment and operation expenses, revenues, the capacity of the facility, actual electricity produced, market integration, reference tariffs (set by the government) and market electricity prices (RES Legal 2017; Norton Rose Fulbright 2018). The weight accorded to various factors differed slightly between renewables technologies, but for all technologies the level of the feed-in premium was to a certain degree influenced by electricity market price developments. Price was to be the main criterion for project selection in tenders or competitive dialogues process, but other criteria, such as contribution to industrial development, were also taken into account (*ibid.*: 15, 26). Because France divided the tenders into many different categories, the support levels varied significantly across technologies: solar photovoltaic, onshore wind, offshore wind and bioenergy. The technologies were divided into multiple sub-categories and each was, as a main rule, awarded support through differing tenders.

A multi-annual investment plan for energy has set out detailed technology-specific investment targets and provides indicative timing for the national bidding procedures (RES Legal 2017). France has sometimes had technology-neutral tenders where different projects applying the same technology competed (as with as diverse solar projects), but not tenders where projects based on different technologies competed against each other (CEER 2018: 37). In addition to the main schemes, France has had several tax exemption rules that favour prosumers.

We can conclude that in 2016, the French support scheme was highly technology-specific. Small-scale projects were not exposed to electricity price development although large-scale projects were, to a certain extent. While eligibility for small-scale support was primarily rights-based, large-scale support would normally result from a competitive procedure. In the following, we trace the history of the French renewables support mix back to the 1970s, showing how differing factors have influenced developments over time.

Historical phases: from nuclear monopolism to renewables pluralism

Prior to 1999: becoming a nuclear champion and a major electricity exporter

Unlike the case in many other Western European countries, the oil crises of the 1970s did not lead France to increase its support to renewable energy – mainly because it had embarked on a nuclear path in the previous decade. Over time, France came to produce so much nuclear electricity that an important energy-policy challenge became how to get rid of it all.

The development of the grandiose French nuclear programme resulted from efforts at restoring the economic, political and military status that France had lost during the Second World War (Hadjilambrinos 2000: 1114–1115). Technological prowess, catering to energy-intensive industries and centralized electricity production, was a crucial element in this state-steered reconstruction. As domestic coal and large hydropower resources were limited, the government soon sought alternatives. Due partly to its military implications but also to energy-security concerns, nuclear technology gained important symbolic meaning in France. It was deemed essential to ensure that France could be restored to its former glory and international position.

By the entrance to the 1950s, several organizations dedicated to development of a centralized, large-scale, nuclear-based electrification of the French society were established. The nuclear technology research centre, the Commission for Atomic Energy (CEA), was created already in 1945 (Brouard and Guinaudeau 2017: 127). The public utility EDF was created the same year through nationalization of almost 2000 privately owned companies. It was granted a state monopoly for electricity export, import, generation, transmission and distribution. Initially the EDF primarily produced large hydropower, but the government steered it towards nuclear (Hadjilambrinos 2000: 1114). However, the state also required it to purchase hydropower at a special price, a practice quite similar to what later emerged with renewable energy feed-in tariffs schemes (Rusche 2015: 22).

France started up the world's first commercial nuclear reactor in 1959 (World Nuclear Association 2018). In 1973, the EDF started to implement the government's nuclear ambitions under the slogan 'tout électrique, tout nucléaire' (all-electric, all-nuclear). By the 1970s, the organizational field of electricity production had become very stable, highly centralized and centred on

construction and operation of nuclear reactors; the regulator CEA had superior expertise and authority, the EDF was the sole electric utility, Framatome the single nuclear reactor supplier, and Alstom the only nuclear turbine-generator supplier (David and Rothwell 1994: 296, Krieger et al. 2017: 277–278). The EDF was fully state-owned, but the state also had shares in the two latter companies. EDF was widely held to be powerful, often referred to as ‘l’Etat EDF’ (the state within the state) (van den Hoven and Froschauer 2004: 1083). The company was strongly centralized and hierarchical (Bauby and Varone 2007: 1056; Boquillon and Evrard 2017). Military and civilian nuclear technology development remained closely related until the two activities were split in 1969 (Brouard and Guinaudeau 2017: 128).

A few wind turbines were set up in the 1960s, but by the end of that decade, renewable energy technology was seen as unable to provide the large volumes needed to cover societal needs (Laali and Benard 1999; Hadjilambrinos 2000: 1115). The 1970s oil crisis was widely perceived as a severe threat to French prosperity. Prime Minister Messmer responded promptly by endorsing a nuclear power programme, aimed at constructing 200 nuclear reactors by 2000 (Hadjilambrinos 2000: 1115). The 1974 ‘Messmer Plan’ was adopted without being debated in the parliament. An anti-nuclear movement emerged, calling for decentralization of both energy production and political power (Brouard and Guinaudeau 2017; Hadjilambrinos 2000: 1116). Mobilization against nuclear energy peaked in 1977 with protests against the Superphénix fast-breeder reactor (Brouard and Guinaudeau 2017: 128). The movement had some success locally, but civil disobedience protests were met with increasingly harsh retaliation (Kitschelt 1986: 75).

To understand why the anti-nuclear protesters failed to win through, we need to take the character of the French political field into account. Ever since 1958, France has had two-round elections for the presidency and the parliament and a dual executive system, where the prime minister and the president each have significant formal authority over the government (Cole et al. 2013). The president nominates the members of the government and defines meeting agendas, but only the prime minister has formal authority over the individual members of the government. The French executive has a strong position, especially when the president and the prime minister are from the same party – as was the situation from 1958 to 1986 (Brouard 2013). Only a few interest groups (environmental organizations not among them) had access to influence the French executive (Kitschelt 1986: 65). The French Parliament has rather little political clout, the party system is instable and ‘French parties are famous for their weakness’ (Haegel 2016: 378). Moreover, ‘small parties are systematically underrepresented and large parties systematically overrepresented’ (Blais and Loewen 2009: 352).

In the 1970s, only a marginal Socialist Party was opposed to nuclear; there was hardly any promotion of renewables (Brouard and Guinaudeau 2017: 134). Conservative Gaullist parties and the Communist Party were most in favour of nuclear, while the socialist-oriented parties were internally split (Brouard and Guinaudeau 2017: 136–138, 151). Prior to the 1981 elections, the Socialist presidential candidate François Mitterrand tabled several proposals critical to nuclear,

for instance that national referendum be held (Hadjilambrinos 2000: 1117–1118). But the political resistance at this stage was far from sufficient to reverse the development towards nuclear: after being elected, Mitterrand halted construction of six plants, but eventually the referendum was cancelled and the nuclear roll-out continued. Key electricity industry actors feared that a scale-back would seriously harm them, so new nuclear was constructed even though it was well known that this would lead to more electricity production than the country needed.

Even though renewable energy was a minor issue, governmental bodies with responsibility for renewables were set up. For instance, a solar energy commission was established in 1978; in 1982 it merged with the French Energy Conservation Agency, which in turn merged with other agencies and became the French Environment and Energy Management Agency (ADEME) in 1992 (Décret n°82–404). ADEME supports project developers, citizens and policy-makers with analysis and research and development financial support (IEA 2017: 152). At the ministerial level, the energy portfolio was given to the ministry in charge of economy, finance and industry. A small renewable energy industries association, SER, was established in 1993, but it did not have much political clout (Boquillon and Eyraud 2017: 165). These actors were not much involved in the development of French energy policy: the ensuing five-year energy policy plans were developed and executed by the cohesive nuclear energy policy community (Krieger et al. 2017: 295).

In the 1990s, the EDF became a truly Europeanized utility. By the late 1990s, the EDF was exporting nearly 20% of its electricity production (Hadjilambrinos 2000: 1118; van den Hoven and Froschauer 2004: 1085). In parallel, it was involved in many countries outside France. Indeed, the company ‘transformed itself from a national monopoly responsible for providing public services into a multinational enterprise focusing on its development abroad’ (van den Hoven and Froschauer 2004: 1085–1088). Because of significant overproduction, France promoted the adoption of an EU policy that would open up neighbouring markets for its electricity export. Aiming to secure the EDF access to foreign markets, the French government eventually agreed to an EU policy that would open the French market to new electricity utilities, but the EDF still continued to dominate.

Climate change received only moderate attention in France in the late 1980s (Boquillon and Eyraud 2015, 2017). As France had a much less carbon-intensive economy than most other well-off countries and plenty of cheap non-polluting domestic electricity production, the issue was not regarded as pressing. Carbon taxation was the main climate issue, but climate concerns also contributed to the adoption of the wind-generation programme ‘Eole 2005’ in 1996 (Deroubaix and Lévêque 2006; Laali and Benard 1999). The main aims of this programme were to explore the cost-effectiveness and competitiveness of wind energy and to spur development of a domestic French wind industry. Inspired by the UK non-fossil fuel obligation, Eole 2005 applied tendering (Nadai 2007; Interview 10). The EDF operated the scheme together with the French Ministry for Industry and the governmental agency ADEME. Fifty-five wind projects were selected through tenders, but few were realized – indicating both the criticism of and moderate

priority accorded to this programme by various actors (Szarka 2007: 323; Interview 10).

A green party with an anti-nuclear agenda had been established in 1984, but failed to gain much national political influence initially (Boy 2002: 64; Brouard and Guinaudeau 2017: 136). Eventually, the Socialists became more critical to nuclear, and prior to the 1997 general elections, they declared their intent to increase renewable energy incentives (Brouard and Guinaudeau 2017: 138). The special two-round French election system makes it attractive for the parties to create pre-election alliances, and the Greens and the Socialists agreed on a government programme that would restrict the development of nuclear energy (Boy 2002; Brouard and Guinaudeau 2017: 128). In the end the Greens won only 5% of the vote, but they still secured a position in the Socialist government. As a result, nuclear expansion was halted somewhat, and a feed-in renewables support scheme was eventually initiated (see the next section).

Thus, by the late 1990s, the organizational field of stationary energy in France was unified around nuclear energy. France adopted a windpower support scheme, but neither climate change nor nuclear energy were really central political issues. Although only a quarter of the reactors originally included in the overly ambitious 1974 Messmer plan had actually been constructed, the country now produced far more electricity than it needed. As the EDF sought to sell its electricity abroad, it was on the verge of becoming a truly European company.

2000–2004: shifting to technology-specific feed-in

Despite producing far more electricity than it needed, France went on to adopt a more encompassing renewables policy in this period. This took place in parallel with a prudent liberalization of French electricity regulation.

Soon after the Eole 2005 programme had been adopted, French energy experts, various environmental movements, the renewables association SER and the environmental agency ADEME began criticizing the programme, seeing the German feed-in scheme as preferable (Boquillon and Evrard 2017: 167; Nadai 2007; Interview 10). Now in government, the Green Party had better access to decision-makers than previously, and prominent Green Party politicians called for a shift to feed-in tariffs, primarily because they wanted to spur the development of a new French renewables industry (Cointe 2017: 487). Even though this was not a headlines-grabbing debate, and only few politicians were actively engaged, it still influenced the law on ‘modernizing the electricity public service’. This law was intended to transpose the EU’s first Electricity Directive, but it also introduced a technology-specific feed-in scheme and a new energy regulator: the Commission for Regulation of Electricity (CRE) (Bauby and Varone 2007: 1057). Thus, the feed-in tariff scheme was introduced even though it had hardly been discussed politically (Cointe 2015: 383). While Eole 2005 had aimed at ensuring cost-efficient renewables development *and* the development of a French renewables industry, the feed-in scheme was aimed primarily at the latter (Jacobs 2012).

A multi-annual investment plan set a range of technology-specific investment targets, and a statutory order detailed the procedures for determining technology-specific feed-in tariffs for various technologies (Jacobs 2012: 58, 106). For two years, the utilities, the ADEME, and industry representatives negotiated how the feed-in level should be calculated (Cointe and Nadaï 2018: 97; Cointe 2017: 485). In the end, it was decided that calculation of the tariff should be based on costs avoided compared to conventional power generation – the calculation method favoured by the EDF (Cointe 2017: 486–487). Hence, the tariff was *not* determined on the basis of actual investment costs. If renewables investments threatened to over-shoot the technology-specific targets in the investment plan, the government could use tenders instead of feed-in (Cointe 2017: 486). Grid operators (primarily the EDF) were obliged to buy renewable electricity at the pre-determined tariffs, compensated by funds raised through a tax paid by electricity consumers (CJEU Case C-262/12:2). The EDF had operated the earlier Eole 2005 scheme, but now it was one of the actors targeted by the new scheme. Despite disliking the new scheme, the EDF increased its windpower investments in France radically from 2004 and onwards (EDF Renewables 2018).

France never reported its new support mix to the Commission as state aid (Rusche 2015: 91). In 2003, the validity of the French feed-in scheme was challenged in the French supreme court for administrative justice, the Conseil d'État. The court did not ask the CJEU to clarify the interpretation of EU state-aid rules. Instead, it ruled that, since the CJEU in 2001 had decided that the German scheme was not state aid, the French scheme was not state aid, either (Boasson 2021b, this book; Rusche 2015: 91). This was surprising, as the French scheme, unlike the German one, relied on a public fund to compensate electricity utilities for additional costs (CJEU Case C-262/12: 2). Later, it became clear that the Commission disagreed with the decision of the Conseil d'État, but many years would pass before the legality of the French support scheme was assessed by the Commission.

In 2001, the EU adopted a Renewables Directive that set the indicative, non-binding target of a 21% renewables electricity share for France in 2010, 5% higher than in 2000 (Boquillon and Evrard 2017: 168; Rusche 2015: 60). Also in 2001, the government initiated several calls for windpower tenders, offshore and onshore (IEA 2010: 95; Banet 2020). After the Conservative Party won the 2002 general elections, attention to renewables decreased. President Jacques Chirac hailed nuclear energy as the key to climate mitigation. A climate plan aimed at radical cuts in French emissions was put forward, but with little attention to renewables (Boquillon and Evrard 2015).

While the modest liberalization of French energy regulation opened the French market for new actors, the EDF remained dominant. However, it did increase its engagement in renewables, 2004 establishing its renewables subsidiary EDF *Energies Nouvelle* (EDF 2005). The same year, the EDF changed from a state-run company to a publicly registered company, but it remained fully state-owned (Bauby and Varone 2007: 1055). From the mid-1990s and onwards, it moved rapidly into liberalized markets in Britain, Germany and Italy (van den Hoven and Froschauer 2004: 10894). The EDF energy production portfolio in France

remained dominated by nuclear, and complemented by some hydropower, but in 2005 the EDF decided to develop new windpower in France and abroad (EDF 2005).

Thus, France radically changed its incentives for renewables development in this period, with the cost-efficiency arguments that had underpinned the Eole 2005 support now replaced by a highly technology-specific feed-in approach (but still with moderate rates). Interestingly, France ignored the EU state-aid rules altogether in this period. Renewable energy was only modestly politicized, and the participation of the Greens in the government was crucial for the shift of support scheme.

2005–2009: aiming to become an international climate champion

Much happened in French renewables policy in the years 2005–2009. For the first time in decades, there were serious discussions on reducing the country's dependence on nuclear power. A substantial ramping up of renewables support also took place, setting off a rapid expansion of solar as well as wind (IEA 2018). Moreover, the international leadership ambitions of President Nicolas Sarkozy led him to commit more strongly to renewables at the EU level, in interaction with the development of renewables support domestically.

By 2005, some nuclear reactors had become so old that they had to be taken out of operation. France now built its first nuclear reactor in 15 years, and an energy law adopted in 2005 ensured that nuclear energy would remain a cornerstone of the French energy system in the future (Brouard and Guinaudeau 2017: 128). Renewables received much more attention than earlier, but had also become far more politically controversial. As Alain Nadai (2007: 2717) has pointed out, 'wind power became a national issue and a genuine controversy', invoking landscape issues and local opposition. Still, electricity price development was a more salient political issue than renewables. A 200% increase in wholesale electricity prices between 2004 and 2008 created a political crisis that eventually led to stricter regulation of electricity price developments (Reverdy 2015).

Due to relatively low feed-in tariff levels, complex local planning procedures, lack of grid connections and lawsuits against windpower projects, France was not on track to reach the indicative target in the 2001 EU Renewables Directive (Nadai 2007; Szarka 2007; Rusche 2015: 60; Green Optimistic 2018; Reuters 2018). But after 2007, renewables investments accelerated, thanks to the introduction of more precise and ambitious renewables targets in the second multi-year investment plan, and a doubled feed-in rate for solar photovoltaic (Jacobs 2012: 58). The new feed-in tariff was a symbolic decision at the top level, probably made by Prime Minister Dominique de Villepin; it was not discussed in the Parliament and was against the will of the energy regulator CRE (Cointe 2015: 154, 2017: 487). Moreover, the principle for calculating the tariff for solar was changed, from avoided costs to investment costs. No one expected solar investments to soar because of this change; the intention was rather to spur the development of a new French industry (IEA 2010: 98).

Back in 2005, the French people had rejected the proposed new EU constitution in a referendum, making the relationship to the EU an issue in the 2007 presidential elections (Cole et al. 2013). Climate issues were also on the agenda (Brouard and Guinaudeau 2017: 136; Cointe 2017: 488). While the political platform of Nicolas Sarkozy's centre-right Union for a Popular Movement party emphasized how the French nuclear programme would help to reduce greenhouse gas emissions, the Socialist presidential candidate Ségolène Royal argued that the renewables share of energy consumption should be almost tripled, to 20%, by 2020 (Brouard and Guinaudeau 2017: 136; Royal 2017). Climate issues gained attention after the popular TV presenter and leader of an environmental foundation, Nicolas Hulot, formulated a manifesto calling for a massive reduction of oil, gas and coal consumption, a fourfold decrease of GHG emissions by 2050 and a strengthening of the Ministry of Ecology. Hulot managed to use the manifesto to pressure both candidates to clarify their climate positions; Sarkozy signed Hulot's Pact in January 2007 (Whiteside et al. 2010).

Sarkozy won the presidential elections in May 2007; in the ensuing parliamentary elections, the Conservative Party won an absolute majority (Cole et al. 2013: 6). Sarkozy proved to be more involved in policy developments, including renewables, than most of his predecessors had been (Cole et al. 2013: 5). Standing forth as a leader at the European level was important for Sarkozy; already on election night he declared, 'ce soir, la France est de retour en Europe' (Drake 2013: 218). He was elected just after the EU had decided in March 2007 to adopt binding national 2020 renewables targets (Boasson 2021b, this book). When France assumed the presidency of the Council of the European Union in the second half of 2008, Sarkozy developed a work programme that gave high priority to climate change and renewable energy (Drake 2013: 222). He did not support the Commission's initiative for developing a directive that would leave it to the EU to steer the design of national support schemes, but the French government worked hard to facilitate internal agreement within the EU on a less constraining directive (Boasson and Wettstad 2013: 48, 92; Boquillon and Evrard 2017: 170).

In 2007, energy issues were moved from the Ministry of Industry to the Ministry of Ecology, slightly reducing the dominance of the cohesive nuclear-energy policy community (Cointe 2017: 489). However, the EDF remained the dominant actor, although state ownership was now reduced to 85% (Bauby and Varone 2007: 1052). In addition, new renewable-energy actors were appearing at the generation stage. From 2006 on, membership in the renewable energy industries association SER increased, up to close to 400 entities (Interviews 2 and 3).

Sarkozy also initiated the Grenelle Environment Forum, a three-month collaborative consultation process where governmental organizations, local authorities, trade unions, business and environmental groups participated in 2007. The Grenelle working group on climate and energy recommended increasing the share of renewables in energy consumption by 20% by 2020. In January 2008, Sarkozy announced that this should become an official French target (Renewable Energy World 2008). A more detailed renewable-energy action plan was launched in November 2008, outlining 50 measures for enhancing the development and

deployment of renewable energy in order to reach the Grenelle target – for instance, constructing at least one photovoltaic plant in each region by 2011 (IEA 2010: 95). However, the French target was upped in the final Renewables Directive in 2009: the targeted overall share of renewable-energy consumption in France by 2020 was to be 23% (Directive 2009/28/EC). This increase was related to the French diplomatic offensive aimed at securing agreement on the Directive (Boquillon and Evrard 2017: 169).

The increase in renewables ambitions came at a time when investment costs were falling radically, and photovoltaic investments skyrocketed. However, the government lacked resources to steer these developments and close the gap between investment costs and the feed-in tariff (Cointe 2015, 2017). Few of the windpower projects selected through tendering procedures were realized (Furtey et al. 2015: 37–38). Thus, at the entry to the new decade, the French support-scheme mix over- and underachieved simultaneously.

2010–2016: shifting to feed-in premium and more tendering endorsed by the EU

Unlike many other feed-in countries, France had for many years applied tenders as a method of selecting projects eligible for bioenergy and onshore wind support. In 2010 and 2011, the government issued the first calls for solar and offshore wind tenders (Furtey et al. 2015: 37; Norton Rose Fulbright 2013) – even though many French renewables actors were critical of tendering as a selection method (Furtey et al. 2015: 37–38).

In order to keep up with the rapid reduction in investment costs, the feed-in tariff was reduced twice in 2010, and the government introduced differing support levels for different solar technologies (Cointe 2015, 2017: 489–490). However, the feed-support was still criticized for contributing to the rising electricity prices and for profiting Chinese industry. To avoid a speculation bubble, the government introduced a three-month photovoltaics moratorium in December 2010, and a public consultation process was initiated. This process was messy, with a wide range of actors including various equipment producers, large utilities, farmers, environmental groups and several new solar-energy interest organizations in addition to SER. According to Beatrice Cointe (2015: 156–158) these actors had very different, sometimes irreconcilable, interests and objectives, and the process did not result in any consensus on reform of the support scheme. Against the wishes of most solar energy actors, the government finally decided to reduce the feed-in tariffs for small-scale projects, and a combination of feed-in premium and technology-specific tenders for larger projects was introduced. The feed-in premium was calculated on the basis of a complex equation.

In the midst of the support-scheme debate, the Fukushima nuclear accident in Japan in March 2011 spurred greater public debate over the future of nuclear as well as renewables. The French government and President Sarkozy responded by increasing spending on nuclear safety and promising greater investments in renewables (The Guardian 2011; Krieger et al. 2017: 289). They also argued:

‘renewable energy doesn’t allow for an abandonment of nuclear energy involving anything but an increased reliance on fossil fuels. A hurried abandonment of nuclear energy cannot be financially and environmentally neutral, so it can only be irresponsible’ (French Embassy in London 2011).

Public support for nuclear actually increased after Fukushima, probably resulting from the pro-nuclear campaigning performed in relation to the presidential and general elections in 2012 (Brouard and Guinaudeau 2017: 142). While the Gaullist party stood by nuclear even though the costly replacement of old reactors was immanent, the Socialist challenger for the presidency, François Hollande, campaigned on reducing the nuclear share to around 50% (Brouard and Guinaudeau 2017: 138). This would necessitate more renewables support, but renewables as such received less explicit attention than in 2007, due partly to how the financial crisis had affected France (Interview 11).

Hollande won the presidential elections in the spring of 2012; one month later, the left-wing parties scored a historic win of the majority in both chambers of the Parliament (Brouard et al. 2013: 36). The new government, a coalition between the Socialist Party and the Green Party, swiftly took three important decisions with implications for the energy transition process, formally committing to: reduce the share of nuclear power in electricity generation to 50% by 2025; shut down the country’s oldest nuclear station; and merge the climate and energy policy portfolios in one ministry in charge of ecology, sustainable development and energy.

A new round of debate and consultations on energy policy started in the autumn of 2012: the ‘National Energy Debate’. Key issues included the place of renewable energy sources in the national energy mix and the design of the support schemes. At this stage, the general public was becoming more positive towards renewables and more negative towards continued reliance on nuclear (EWEA 2014). Moreover, the media reported that one of France’s two main labour unions (the CFDT) was, for the first time, now calling for more renewables (Energy Transition 2013; Interview 10). It also became clear that the support regime for photovoltaic introduced in 2011 had led to a severe crisis in the industry. In an attempt to remedy the situation, annual targets were increased and support levels were changed accordingly (Cointe 2017: 494).

In July 2012, an opinion issued by the Advocate-General of the CJEU concluded that the French renewables support scheme fell under the definition of ‘state aid’ as per the EU Treaty (CJEU 2012a). This view was confirmed in the judgement of the Court in December of the same year (CJEU 2012b). This implied that the French government would have to notify the Commission of its support schemes. The CJEU rulings created profound legal uncertainty concerning whether the Commission would dismiss any of the French state-aid practices as unlawful and thus decide that recipients would have to repay some or all of the support they had been granted. This uncertainty was amplified by the Commission’s then-ongoing revision of the relevant state-aid guidelines (Premier Ministre 2014). France engaged in dialogue with the Commission already in January 2013, but it took several years for the Commission to endorse all French support schemes (Norton Rose Fulbright 2013; Commission

2016; Commission 2017c). In 2013, it became clear that DG Competition aimed to introduce new state-aid guidelines that were inspired by some of the changes that France had already introduced, but also was pushing for renewables to be even more exposed to electricity market prices and greater technology-neutrality (Boasson 2021b, this book). France protested, calling for greater leeway (Premier Ministre 2014).

In the autumn of 2013, the French government launched a public consultation on the future of the French renewables support schemes. This consultation attracted massive interest in the sector (Interviews 2 and 3). For instance, the Commission for Energy Regulation (CRE) recommended several changes to the support schemes, basically wanting them to become more aligned to the EU guidelines (CRE 2014). The EDF warned against favouring renewables investments too heavily as compared with other energy sources (EDF 2014).

By now, several large European electricity utilities had entered the French electricity market, such as Vattenfall, Enel and E.ON (AFIEG 2012). A broad range of new actors had moved into solar energy and offshore wind development, giving rise to several new industrial consortiums between windpower developers and equipment producers and French electricity actors (Banet 2017; Cointe 2015; Norton Rose Fulbright 2013). Moreover, the EDF had become a significant renewables investor in France, in wind as well as in solar (Cointe 2015: 156; EDF Renewables 2018).

A few months after the EU had adopted new state-aid guidelines in April 2014, the French Minister of Ecology, Sustainable Development and Energy, Ségolène Royal proposed a new energy law that included a new multi-annual investment programme with technology-specific targets and a new support-scheme mix, introducing new equations for calculating feed-in premiums, increasing the use of competitive tendering and reserving the use of fixed feed-in for smaller renewables projects (Brouard and Guinaudeau 2017: 2–7; Energy Transition 2014). The Parliament started to debate the proposal in October 2014, but the future of nuclear and the overall direction and speed of the energy transition attracted more attention than the design of the renewables support-scheme mix (Interviews 10 and 11). The Greens advocated a radical phase-out of nuclear, but due to meagre support from the socialist parties, no agreement was reached on this (Brouard and Guinaudeau 2017: 7). A final law was adopted in July 2015 (Energy Transition 2015b, 2015c).

France started formal notification of its scheme to the Commission in late 2014, but it took three years before deliberations with the Commission were concluded (Commission 2017a; Commission 2017b). The French government invested considerable resources in these negotiations with the Commission (US Press Agency 2016). While the law from 2015 was largely in line with EU state-aid guidelines, many details needed to be sorted out. The French authorities were particularly negative to the Commission's calls for less technology-specificity. In December 2016, DG Competition finally announced that it had accepted the French support schemes for geothermal deposits, biogas, small hydropower, and wind farms that had applied for aid during 2016 (Commission 2016). Another

six months would pass before the DG Competition endorsed the French support schemes for large-scale renewables and the Commission agreed to the continuation of technology-specific tenders (Commission 2017c). Large-scale solar energy had shifted to feed-in premium and tendering already in 2011; similar procedures were now developed for almost all large-scale renewables projects.

There have been no major changes in the support-scheme mix after Emmanuel Macron was elected president in 2016, and his new centrist party 'La République En Marche!' won a majority in the parliament. However, the leadership did aim to accelerate the development of windpower projects and continued support to solar (ENDS Report 2018; Reuters 2018).

Discussions and conclusions

This chronological account shows that the French support-scheme mix has emerged as the result of complex and often slow-moving developments. Different fields have played differing roles and had varying importance over time. By 2016, France had a highly technology-specific renewables support mix, where large-scale projects were partially exposed to fluctuating electricity prices, and support was awarded primarily through some sort of competitive bidding. The feed-in premium was not a mere add-on to the electricity price; the price of electricity was calculated by applying technology-specific equations that gave varying weight to factors such as operating expenses, revenues, the capacity of the facility in question, actual electricity produced, market integration, reference tariffs (set by the government) and market electricity prices. In addition, tendering based on price competition usually determined which projects were granted support. However, most small-scale projects were still awarded fixed feed-in support. All support schemes were technology-specific.

To what extent was this specific support-scheme mix a result of varying facets of the European environment? That is, to what extent was the French renewables support scheme shaped by EU steering and inspiration from other EU countries? The French renewables support story started in the mid-1990s, when France, inspired by the British tendering scheme, adopted a tendering system for windpower. A few years later the German scheme was hailed as superior, and France adopted a feed-in scheme. The tendering scheme was not abandoned, however. From the early 2000s, tendering and feed-in were combined for windpower, and gradually more and more technologies were granted feed-in after having won the tendering procedures. In order to understand the unusual combination of approaches in France, it is important to bear in mind the inspiration from two neighbouring countries, the UK and Germany, with very different approaches to renewables support.

For a long time, EU-level developments hardly influenced France. For instance, major political conflicts in Brussels concerning how and to what extent the 2001 Renewables Directive should influence national support schemes did not influence French debates and decisions. That France did not reach its indicative target in the 2001 Directive indicates how little attention France initially paid to the EU.

Furthermore, by not notifying the EU of its support schemes, France was able to avoid DG Competition and CJEU influence over these. This was in part thanks to the 2001 CJEU ruling that the German support scheme did not fall under the EU definition of ‘state aid’.

After Sarkozy became president, the role of the EU increased, primarily because his European leadership ambitions led France to develop more ambitious renewables policies. France held the EU Presidency in the crucial autumn of 2008 when the climate and energy package was finalized, and an even more ambitious EU RES target was accepted than previously adopted domestically. As the EU target was binding, this contributed to increase the willingness of French governments to improve existing support schemes, but there were repeated difficulties in setting feed-in support levels that could spur investments without leading to overcompensation. In order to perform better, France developed a type of feed-in premium relying on highly complex technology-specific equations for calculating support levels, and it stepped up its use of technology-specific tenders. Hence, France’s key role in the negotiations over the second Renewables Directive in 2008 indirectly helped to make the French renewables support mix even more technology-specific.

The CJEU ruling in 2012, that French renewables support did indeed fall under the definition of ‘state aid’, gave rise to profound insecurity among French renewables actors – but DG Competition subsequently launched new and more constraining state-aid guidelines that proved to not require a shift to schemes radically different from the support mix France already had. Eventually, these guidelines led to the introduction of more competitive elements in the French support mix, but DG Competition did not succeed in persuading France to adopt technology-neutral tenders. Moreover, the liberalization of the French energy sector, driven by the EU, contributed to reduce the power of the EDF and probably also influenced the development of the French renewables support portfolio.

Initially, we had expected the *European environment* to influence France increasingly over time, since the EU gradually gained more authority, and feed-in has come to prevail as the most common support scheme for small-scale projects – and feed-in premium combined with tenders has become the dominant approach for large-scale projects. But this is not what we find in the case of France. France was early on influenced by the UK even though very few other countries copied its scheme, and it emulated the German scheme long before feed-in had become the most common support-scheme design in the EU. Moreover, France had introduced widespread use of feed-in premium combined with tendering for large-scale projects even before the DG decided to favour this support-scheme mix. Hence, the effect of greater EU authority in this issue-area after 2014 is less than it may appear at first sight. In any event, influence from the European environment cannot account for all aspects of French renewables policies.

Further, we had expected the French *organizational field* to have influenced the country’s support schemes most when the field was the most segmented; when one institutional logic dominated, and authority as well as information were concentrated. But, as it was difficult to see how a support-scheme mix that promoted a

broad range of decentralized technologies could fit with the traditions of the dominance of centralized nuclear energy in the French organizational field, we focused on whether it in fact was the EU-induced liberalization in the 2000s that slightly reduced the segmentation of the field, making possible the introduction of technology-specific renewables support.

The impact of the organizational field emerges as being more complex than we had expected. Initially it was highly segmented, with authority and information controlled by a few players, with the EDF at the centre. In addition, the field was dominated by a technology-development logic, geared towards refining and improving only one technology: nuclear. From the 1950s and until the early 1990s, segmentation hindered development of any renewables support. Moreover, the overly ambitious nuclear plan from the 1970s undermined the need for any more domestic energy production for decades to come. Only when the nuclear installations became so old that they needed to be replaced did renewables support development really become more of a priority issue.

Windpower is the renewables technology that offers the most centralized power production, so it is hardly surprising that this should be the first technology to attract some kind of governmental support in France. The EDF accepted the introduction of tendering schemes for windpower, partly because this support method rewarded the least costly projects. In contrast, the adoption of the feed-in scheme in 2000 clearly took place despite resistance from the organizational field. True, the EDF was initially able to ensure feed-in tariffs too low to lead to much investment, but eventually the old 'centralized nuclear technology logic' gave way to an alternative 'decentralized technology development logic', where it was assumed that the state should ensure development of a broad range of new French industries rather than only protecting the old and established nuclear industry (Cointe 2015: 482).

In 2010, the industry development aspects of French renewables policy had become strong and a broad range of new renewables industry actors had emerged. At this point, the legitimacy of the French feed-in was deteriorating. Despite lack of coherence and considerable internal conflicts, the new actors managed to underpin continuation and gradual refinement of the French support-scheme mix. Over time, the ministry and agency for environment gained more formal authority over renewable energy; a new energy regulator was also established. Civil servants seem to have played key roles in the gradual changes in the support mix that occurred after 2010, and the dominance of the old nuclear policy community was clearly weakened. In particular, the EDF's influence lessened, not least because the company struggled to develop clear priorities with regard to renewables support developments. It proved difficult to unite market thinking, centralized (nuclear) technology development logic and a decentralized technology logic; significant internal conflicts and uncertainties ensued.

We conclude that the EDF played a key role in the launch of the tendering practice in France, but feed-in was adopted more in spite of than because of the French organizational field. Eventually, the de-segmentation of the French organizational field and the emergence of a new decentralized technology development logic underpinned the adjustments and refinement of the support-scheme mix

from 2010 and onwards. Hence – contrary to our original expectations – it seems that the field actually becomes more important for the development of the support scheme when the degree of segmentation is somewhat reduced.

Research needs to include developments within the French *political field* in order to explain the French renewables story more fully. According to the multi-field framework, the political field will influence renewable support developments most when the legislative assembly has the formal powers to make decisions, and when renewables are subject to political competition. But since the French Parliament is known to be weak, we had not expected to find that political steering played much of a role in the French case. Is that also what we found?

No, not quite. True, the political field played a very marginal role up until 2000. It is not all clear what sparked the adoption of Eole 2005, but it seems to have happened without any strong prior political involvement. At two later points in time, central politicians heavily influenced the development of renewables policy, despite the lack of intense political competition. Around 2000 the Greens were instrumental in ensuring that France introduced a feed-in scheme, and in 2008 Nicolas Sarkozy ensured that EU renewables policy development contributed to strengthen the French feed-in scheme. In both cases, the political involvement was driven primarily by other concerns besides strong views on specific support-scheme designs: the first was related to nuclear phase-out, and the second concerned strong EU leadership ambitions on the part of France. The French Parliament did endorse the introduction of feed-in, but the details of the scheme were later determined without parliamentary involvement. Sarkozy's commitment to more ambitious French renewables targets was not endorsed by the Parliament until long after it had been included in the EU Renewables Directive.

After 2010, we see that the election victories of the French socialists, with their new stance on nuclear downscaling, underpinned the process of refining the French support mix in the years to come. Still, there does not seem to have been strong political involvement in the actual adjustments made to the overall scheme after 2010. Here we see that political involvement has been important also when the issue is not subject to political competition and the Parliament is not strongly involved. Simply put, the political field has been important in differing ways from those predicted by the multi-field framework.

We conclude that the French support-scheme mix is the result of intricate interplay between the European environment and developments in the domestic political and organizational fields. The organizational field has gradually increased its impact and importance, but political steering has been vital at a few crucial points. Furthermore, while models in the European environment initially served as a crucial source of inspiration, other parts of this environment later acted to constrain the processes of adjusting and improving the French support mix.

Interviewees

- 1 Electricity industry representative, Statkraft, 28 August 2017, telephone
- 2 Renewable industry representative, Syndicate of Renewable Energies, 8 November 2017, Paris

- 3 Renewable industry representative, Syndicate of Renewable Energies, 8 November 2017, Paris
- 4 Independent energy law expert, 8 November 2017, Paris
- 5 Electricity industry representative, EDF, 23 January 2018, Paris
- 6 Electricity industry representative, EDF, 23 January 2018, Paris
- 7 Electricity industry representative, EDF, 23 January 2018, Paris
- 8 Civil servant, Ministry of Ecology, 23 January 2018, Paris
- 9 Civil servant, Ministry of Ecology, 23 January 2018, Paris
- 10 Energy policy researcher, CIRED, 23 January 2018, Paris
- 11 Energy policy researcher, University of East Anglia, 21 February 2018, telephone interview

References

- AFIEG (2012) 'Press release', 8 March. Retrieved from www.afieg.fr/the-french-independent-association-of-electricity-and-gas-afieg-is-created-with-the-aim-of-promoting-open-energy-markets-in-france/?lang=en, 22 January 2019.
- Banet, C. (2017) 'Legal framework to develop offshore wind in France', in A. Ming-Zhi Gao & C. Te Fan (eds), *The Development of a Comprehensive Legal Framework for the Promotion of Offshore Wind: The Lessons from Europe and Pacific Asia*. The Hague: Wolters Kluwer.
- Banet, C. (2020) 'Energy law in France', in *International Encyclopedia of Law*. Alphen an den Rijn, Netherlands: Kluwer Law International.
- Bauby, P. & F. Varone (2007) 'Europeanization of the French electricity policy: Four paradoxes', *Journal of European Public Policy* 14(7): 1048–1060.
- Blais, A. & P.J. Loewen (2009) 'The French electoral system and its effects', *West European Politics* 32(2): 345–359.
- Boasson, E.L. (2021a) 'A dynamic multi-field approach', pp. 32–57 in E.L. Boasson, M.D. Leiren & J. Wettestad (eds) (this book), *Comparing Renewables Policy: The Role of Political, Organizational and European Fields*. London: Routledge.
- Boasson, E.L. (2021b) 'Europeanization of renewables support', pp. 58–72 in E.L. Boasson, M.D. Leiren & J. Wettestad (eds), (this book) *Comparing Renewables Policy: The Role of Political, Organizational and European Fields*. London: Routledge.
- Boasson, E.L. & J. Wettestad (2013) *EU Climate Policy: Industry, Policy Interaction and the External Environment*. Farnham: Ashgate.
- Boquillon, P. & A. Evrard (2015) 'French climate policy: Diplomacy in the service of symbolic leadership?' pp. 98–113 in R.K.W. Wurzel, J. Connelly & D. Lieffering (eds), *The European Union in International Climate Change Politics: Still Taking a Lead?* New York: Routledge.
- Boquillon, P. & A. Evrard (2017) 'Complying with; resisting or using Europe? Explaining the uneven and diffuse Europeanization of French renewable and electricity and biofuels policy', pp. 162–183 in I. Solorio & H. Jörgens (eds), *A Guide to EU Renewable Energy Policy: Comparing Europeanization and Domestic Policy Change in EU Member States*. Cheltenham: Edward Elgar.
- Boy, D. (2002) 'France', pp. 63–77 in F. Müller-Rommel & T. Poguntke (eds), *Green Parties in National Governments*. Abingdon: Routledge.
- Brouard, S., O. Costa & R. Kerrouche (2013) 'The "New" French parliament: Changes and continuities', pp. 35–52 in A.S. Cole, S. Meunier & V. Tiberj (eds), *Developments in French Politics*. Houndmills: Palgrave Macmillan.

- Brouard, S. & I. Guinaudeau (2017) 'Nuclear politics in France' pp. 125–156 in W.C. Müller & P.W. Thurner (eds), *The Politics of Nuclear Energy in Western Europe*. Oxford University Press.
- CEER (2018) *Tendering Procedures for RES in Europe: State of Play and First Lessons Learnt*. Council of European Energy Regulators. C17-SD-60-03. Brussels: CEER.
- CJEU (2012a) *Case – 262/12. Opinion of Advocate General Jääskinen*, 11 July 2013. Luxembourg: Court of Justice of the EU.
- CJEU (2012b) *Case – 262/12. Judgement of the Court (second chamber)*, 19 December 2013. Luxembourg: Court of Justice of the EU.
- Cointe, B. (2015) 'From a promise to a problem: The political economy of solar photovoltaics', *Energy Research & Social Science* 8: 151–161.
- Cointe, B. (2017) 'Managing political market *agencements*: Solar photovoltaic policy', *Environmental Politics* 26(3): 480–501.
- Cointe, B. & A. Nadaï (2018) *Feed-in Tariffs in the European Union: Renewable Energy Policy, the Internal Electricity Market and Economic Expertise*. Cham, Switzerland: Palgrave Macmillan.
- Cole, A., S. Meunier & V. Tiberj (2013) 'From Sarkozy to Hollande: The new normal?' pp. 1–18 in A.S. Cole, S. Meunier & V. Tiberj (eds), *Developments in French Politics*. Houndmills: Palgrave Macmillan.
- Commission (2016) 'Press release: State aid: Commission approves four support measures for renewable energy in France', 12 December, Brussels, European Commission Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/IP_16_4355, 14 April 2018.
- Commission (2017a) *Aide d'État SA.40349 (2015/NN) – France Aide sous la forme de tarifs d'achat pour le développement d'installations photovoltaïques. C (2017) 1093 final*, 2 December. Brussels: European Commission.
- Commission (2017b) *Aide d'État SA.41528 (2015/NN) – France Soutien par appels d'offres au développement des installations utilisant l'énergie radiative du soleil: appels d'offres du 8 juillet 2011, 30 juillet 2011, 9 mars 2013 et 22 mars 2013. C (2017) 1090 final*, 2 December. Brussels: European Commission.
- Commission (2017c) *Objet: Aide d'État SA.47205 (2016/N) – France Complément de rémunération pour l'éolien terrestre à partir de 2017. C (2017) 3127*, 5 May. Brussels: European Commission.
- CRE (2014) 'Coûts et rentabilité des énergies renouvelables en France métropolitaine – Eolien terrestre, biomasse, solaire photovoltaïque', April.
- David, P.A. & G.S. Rothwell (1994) 'Measuring standardization: An application to the American and French nuclear power industries', *Journal of Political Economy* 12: 291–308.
- Deroubaix, J.F. & F. Lévêque (2006) 'The rise and fall of French ecological tax reform: Social acceptability versus political feasibility in the energy tax implementation process', *Energy Policy* 34(8): 940–949.
- Drake, H. (2013) 'France and the European Union', pp. 218–232 in A.S. Cole, S. Meunier & V. Tiberj (eds), *Developments in French Politics*. Houndmills, Basingstoke: Palgrave Macmillan.
- EDF (2005) 'Annual Report on Sustainable Development', EDF Group.
- EDF (2014) *Answer to a Consultation as a Registered Organization. Consultation on Guidelines on State Aid for Energy and Environmental Protection*. An EDF Response. DAE/FGZ/2014/02/13/9. Paris: EDF.
- EDF Renewables (2018) 'Projects map', Retrieved from www.edf-renouvelables.com/en/edf-renewables/projects-map/?project_type=&project_country=21&project_year=65, 19 February 2018.

- ENDS Report (2018) 'France gives green light to 103 solar projects', 14 august.
- Energy Transition (2013) 'France labor unions call for energy transition', 9 July. Retrieved from <https://energytransition.org/?s=france+labor+unions&submit=Search>, 19 February 2018.
- Energy Transition (2014) 'New French energy policy to limit nuclear', 18 June.
- Energy Transition (2015a) 'French energy transition bill adopted', 23 July.
- Energy Transition (2015b) 'So far, so good? The French energy transition law in the starting blocks', 29 July. Retrieved from <https://energytransition.org/2015/07/french-energy-transition-law/>, 20 February 2018.
- Evrard, A. (2012) 'Political parties and policy change: Explaining the impact of French and German Greens on energy policy', *Journal of Comparative Policy Analysis Research and Practice* 14(4): 275–291.
- EWEA (2014) 'France: Wind energy solution in energy transition', Retrieved from www.ewea.org/blog/2014/04/france-wind-energy-solution-energy-transition/, 19 March 2019.
- Feurtay, E., A. Ilinca, A. Sakout & C. Saucier (2015) 'Lessons learned in France and Quebec regarding financial and legal mechanisms to develop renewable energy: A hybrid model as an acceptable solution for onshore wind?' *Renewable and Sustainable Energy Reviews* 47: 34–45.
- French Embassy in London (2011) 'François Fillon on nuclear energy and safety', Retrieved from <https://uk.ambafrance.org/Francois-Fillon-on-nuclear-energy>, 8 January 2019.
- The Green Optimistic (2018) 'France intends to speed up wind power projects', Retrieved from www.greenoptimistic.com/france-speed-up-wind-power-projects-20180123/#.W5ktfPZuJ2s, 24 January 2019.
- The Guardian (2011) 'Nicolas Sarkozy makes €1bn commitment to nuclear power', 27 June. Retrieved from www.theguardian.com/world/2011/jun/27/nicolas-sarkozy-france-nuclear-power, 18 December 2018.
- Hadjilambrinos, C. (2000) 'Understanding technology choice in electricity industries: A comparative study of France and Denmark', *Energy Policy* 28: 1111–1126.
- Haegel, F. (2016) 'Parties and party systems: Making the French sociocultural approach matter', pp. 373–393 in R. Elgie, E. Grossman & A.G. Mazur (eds), *The Oxford Handbook of French Politics*. Oxford: Oxford University Press.
- IEA (2010) *Energy Policies of IEA Countries – France, 2009 Review*. Paris: IEA.
- IEA (2017) *Energy Policies of IEA Countries – France, 2016 Review*. Paris: IEA.
- IEA (2018) 'Statistic data browser', Retrieved from www.iea.org/statistics/?country=FRA&NCE&year=2016&category=Renewables&indicator=RenewGenBySource&mode=chart&dataTable=RENEWABLES, 19 January 2019.
- Jacobs, D. (2012) *Renewable Energy Policy Convergence in the EU: The Evolution of Feed-In Tariffs in Germany, Spain and France*. Farnham: Ashgate.
- Kitschelt, H.P. (1986) 'Political opportunity structures and political protest: Anti-nuclear movements in four democracies', *British Journal of Political Science* 16(1): 57–85.
- Krieger, K., O. Renn, M.B. Rogers & R. Löfstedt (2017) 'Nuclear accidents and policy responses in Europe: Comparing the cases of France and Germany', pp. 269–304 in E.J. Balleisen, L.S. Bennar, K.D. Krawiec & J.B. Wiener (eds), *Policy Shock: Recalibrating Risk and Regulation after Oil Spills, Nuclear Accidents and Financial Crises*. Cambridge: Cambridge University Press.
- Laali, A.R. & M. Benard (1999) 'French wind power generation programme EOLE 2005: Results of the first call for tenders', *Renewable Energy* 16: 805–810.
- Meritier, S. (2011) 'French energy policy within the EU Framework: From Black sheep to model?' pp. 145–169 in V.L. Birchfield & J.S. Duffield (eds), *Toward A Common European Union Energy Policy*. New York: Palgrave.

- Nadai, A. (2007) 'Planning, siting and the local acceptance of wind power: Some lessons from the French case', *Energy Policy* 35(5): 2715–2726.
- Norton Rose Fulbright (2013) 'European renewable energy incentive guide – France', Retrieved from www.nortonrosefulbright.com/knowledge/publications/66831/european-renewable-energy-incentive-guide-france, 21 December 2018.
- Norton Rose Fulbright (2018) 'Blue skies over the photovoltaic sector in France', Retrieved from www.nortonrosefulbright.com/knowledge/publications/165584/blue-skies-over-the-photovoltaic-sector-in-france, 21 December 2018.
- Premier Ministre (2014) 'HT.359 – Réponse des autorités françaises à la consultation de la Commission sur le projet de lignes directrices concernant les aides dans le domaine de l'environnement et de l'énergie. Letter to the Commission', 26 February 2014. Premier Ministre.
- Renewable Energy World (2008) 'France sets ambitious renewable energy targets', 1 February. Retrieved from www.renewableenergyworld.com/2008/01/02/france-sets-ambitious-renewable-energy-targets-50971/, 19 February 2018.
- RES Legal (2017) 'Promotion in France', Retrieved from www.res-legal.eu/search-by-country/france/tools-list/c/france/s/res-e/t/promotion/sum/132/lpid/131/, 21 December 2018.
- Reuters (2018) 'France plans to accelerate wind power projects', 17 January. Retrieved from www.reuters.com/article/us-france-windpower-idUSKBN1F60TE, 19 December 2018.
- Reverdy, T. (2015) *Managing Uncertain Reform Through 'Flexible Institutions': Electricity Sector Liberalization in France*. Paper presented at the SASE Conference: Inequality in the 21st Century, July 2015, London.
- Royal, S. (2017) 'Le pacte présidentiel', Retrieved from https://fcampalans.cat/images/noticias/SR_pacte_presidentiel.pdf, 21 January 2019.
- Rusche, T.M. (2015) *EU Renewable Electricity Law and Policy*. Cambridge University Press.
- Szarka, J. (2007) 'Why is there no wind rush in France?' *European Environment* 17: 321–333.
- Szarka, J. (2011) 'France's troubled bids to climate leadership', pp. 112–128 in R.K.W. Wurzel & J. Connely (eds), *The Europe Union as a Leader in International Climate Change Politics*. London: Routledge.
- US Press Agency (2016) 'Segolene Royal celebrates the European Commission validation at the anniversary', 15 December. Retrieved from www.uspa24.com/bericht-10276/segolene-royal-celebrates-the-european-commission-validation-at-the-anniversary.html, 18 January 2019.
- Van den Hoven, A. & F. Froschauer (2004) 'Limiting regional electricity sector integration and market reform: The cases of France in the EU and Canada', *Comparative Political Studies* 37(9): 1079–1103.
- Whiteside, K.H., D. Boy & D. Bourg (2010) 'France's "Grenelle de l'environnement": Openings and closures in ecological democracy', *Environmental Politics* 19(3): 449–467.
- World Nuclear Association (2018) 'Outline history of nuclear energy', Retrieved from www.world-nuclear.org/information-library/current-and-future-generation/outline-history-of-nuclear-energy.aspx, 20 December 2018.