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Best practices and challenges for effective climate governance frameworks: A case study on the French experience

Andreas Rüdinger (IDDRI)

STEPPING BACK ON THE FRENCH ENERGY TRANSITION PROCESS

The development of robust climate governance frameworks on the national level is a core challenge for the implementation for the Paris climate Agreement. With many countries currently developing or revising their own legal frameworks, this report takes a look at the lessons learned from the French experience. In order to provide an in-depth understanding, this study pursues a twofold-approach, considering both the political process leading up to the adoption of the French Energy Transition Law and the assessment of the substance in terms of targets, policy instruments and governance processes.

INGREDIENTS FOR AN EFFECTIVE CLIMATE FRAMEWORK

Qualified as a "world leader" by the IEA, the French climate governance framework also came first in a recent WWF survey on low-carbon strategies in Europe. Indeed, it integrates all the core ingredients for effective climate policy such as legally binding targets, an economy-wide carbon price signal and strong governance mechanisms to ensure effective planning in line with the long-term ambition.

TARGETING THE PARIS OBJECTIVES

Regarding the compatibility with the Paris Agreement, the French experience offers key insights for other countries. First of all, the 2017 revision of the French long-term target (heading for climate neutrality by 2050) illustrates how the ratchet-effect can be implemented in practice on the national level. Similarly, the French case highlights the importance of going beyond a policy approach focused on the energy sector alone, in order to develop a deep-decarbonization strategy that addresses all economic sectors, including agriculture, waste and forestry.

PENDING ISSUES FOR IMPLEMENTATION

Nevertheless, several lessons can be learned from the challenges France is facing in the actual implementation of its low-carbon strategy over the last years, showing that the devil lies in the details. This is particularly the case with regard to the importance of streamlining monitoring, evaluation and revision processes for the National Low-Carbon Strategy in order to address potential implementation gaps. And the importance of granting a clear policy mandate and resources for independent institutions such as the Expert Committee for the Energy Transition.

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Institut du développement durable
et des relations internationales
27, rue Saint-Guillaume
75337 Paris cedex 07 France

SciencesPo

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For any questions on this publication please contact:
Andreas Rüdinger – andreas.rudinger@iddri.org

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EXECUTIVE SUMMARY

Starting in 2012, France has developed a very ambitious national climate governance framework over the last 5 years. The policy process leading to this began with a comprehensive stakeholder debate in 2012 and 2013, based on an electoral promise by the newly elected President François Hollande: gathering over 120 stakeholders and various experts over 8 months with the aim of defining a collective vision for the energy transition in France. Beyond the preparation of the subsequent Energy Transition Law, the debate also introduced a new way of policymaking in the climate and energy field, building on permanent stakeholder consultations and the inclusion of independent expertise. Based on the outcomes of this debate, the Energy Transition Law was adopted in 2015, including mid- and long-term targets for energy and climate policy (see Table 1), as well as the main governance tools to plan and implement the low-carbon transition until 2050:

- An **economy-wide carbon price signal**, with a pricing trajectory (€44.6 per ton of CO_2 in 2018, reaching €100 by 2030) to enhance credibility and certainty for investors;
- The **implementation of binding national carbon budgets** set in advance for three 5-year periods and revised every 5 years;
- The elaboration of new national planning documents to steer the transition. First and foremost, the "**National Low-Carbon Strategy**", which contains the carbon budgets and provides recommendations for all major economic sectors, in line with the 2050 decarbonization objective. Secondly, the **Multiannual Energy Plan**, which provides a more detailed action plan for the transformation of the energy sector over 10 years, addressing the deployment of renewable energies, energy efficiency, security of supply and market integration.
- The creation of **new dedicated institutions** to govern the low-carbon transition, including the set-up of a permanent stakeholder committee (the National Council for the Ecological Transition) and an independent Expert Committee for the Energy Transition.
- As a major innovation, the French law also contains **new reporting obligations for financial institutions** to integrate the assessment of climate-related risks and the evaluation of the carbon footprint of their assets.

Table 1. Main energy and climate objectives in the French Energy Transition Law

	2020	2030	2050
GHG emission reductions (base 1990)	- 20%	- 40%	- 75%
Reduction of final energy consumption (base 2012)		- 20%	- 50%
Reduction of consumption of fossil fuels (base 2012)		- 30%	
Share of buildings retrofitted to "low energy standard"			100%
Share of RES in final consumption	23%	32%	
Share of RES in electricity consumption	27%	40%	
Share of RES in heating energy		38%	
Increase renewable heat and cold in district networks (base 2012)		x 5	
Share of Nuclear Energy in total electricity generation	50% by 2025		
Electric vehicle charging stations	7 million by 2030		
Carbon price trajectory (euros per ton of CO_2eq)	56	100	

Based on this new comprehensive approach, the International Energy Agency recently stated that France had become a "world leader" in designing an effective national climate governance framework (IEA, 2017). And the WWF put France ahead of all other EU countries in its report on the assessment of EU low-carbon development strategies (WWF, 2017). While more and more countries are in the process of developing or revising their own strategic framework in line with the ambition of the Paris Agreement, the French experience can serve as an inspiration regarding both best practices and the identification of major challenges in the process of establishing and implementing such a framework.

This case study aims to provide additional insights on the establishment of an effective national climate governance framework through an extensive case study of the French experience. In order to provide a full picture and understanding of the lessons learned for other countries, the study addresses three research questions:

1) Understanding the political economy behind the transition: what have been the key political processes and milestones to establish the national framework? How have different groups of stakeholders been engaged in the process? And how have structural conflicts been overcome to achieve a common vision and push ambition further?

2) Assessing the key elements of the governance framework: to what extend does the French case present all the key ingredients for an effective climate governance framework, including targets, dedicated institutions and clear governance processes?

3) What are the specific challenges related to the actual implementation of the legal framework? Even though the legal framework can be perfect on paper, implementation often remains a challenge and shows the need to pay attention to details, when it comes to compliance, establishing effective monitoring and evaluation processes and the set-up of dedicated institutions.

In the following sections, the key insights of the French case study on each of these three research questions are summarized briefly.

The genesis of the climate governance framework: understanding the political economy

Although policy processes are intimately linked to the history, institutions and specific circumstances of each country, several guiding insights can be drawn from the French experience:

Identifying and creating windows of opportunities

The French experience shows how specific windows of opportunities can be seized to establish an ambitious climate policy. In France, what started as a political debate on the future of nuclear energy in the wake of the Fukushima accident (March 2011) eventually became the catalyzer of a comprehensive debate on the establishment of a strategic vision for a low-carbon future, thanks to the political capital invested by key actors and heavy commitment of stakeholders.

Strengthening stakeholder participation through dedicated institutions

Coming from a very centralized and top-down culture of policymaking in the energy and climate field, the French experience illustrates how the progressive integration of stakeholders and independent experts can make a difference when dealing with structural conflicts and building a more transparent and inclusive policy process.

Building on earlier experience such as the 2007 Grenelle Summit for the Environment, the National Debate on the Energy Transition succeeded in installing a new culture for the elaboration of climate and energy policies with significantly higher transparency and commitment through the continuous involvement of stakeholders and independent experts. Based on this success, the 2015 Energy Transition Act has set up new dedicated institutions to ensure a permanent representation of both stakeholders (through the National Council for the Ecological Transition) and independent experts (with the Expert Committee for the Energy Transition) in all phases of the policy process, which is a key driver to increase transparency and compliance by establishing counterpowers.

Fostering commitment through an inclusive political narrative: benefits and equity

Overcoming the structural conflict on nuclear power that threatened to overthrow the policy process from the very start, the French actors managed to progressively build a collective vision on the urgency of an ambitious climate strategy and the need for an ambitious long-term decarbonization target. In this regard, the French debate managed to build a collective understanding and narrative on the economic and social benefits of the low-carbon transition, necessary to bring along key stakeholders and policy makers.

This also highlights the importance of establishing an agenda on the just transition to deal with potential social conflicts arising in the process of transformation. Providing a clear vision on how this process will benefit all actors is essential,

as is the elaboration of transition strategies (and possibly compensation schemes) for economic sectors that could be threatened by the low-carbon transition.

Key design features for an effective climate governance framework

France represents a best-practice example, insofar as all major pillars of the "toolbox" required to fulfill the ambition of the Paris Agreement are addressed in one single legislation, from long-term targets to key policy instruments (such as the economy-wide carbon pricing trajectory until 2030 or the establishment of binding carbon budgets) and the definition of clear governance processes to elaborate, monitor and revise the national low-carbon plan. The following lessons can be drawn from the French 2015 Energy Transition Act:

Establishing a genuinely comprehensive climate framework

A key lesson that can be drawn from the French experience relates to the challenge of building a legal framework that encompasses all major fields of climate policy, with two important pitfalls to avoid. Firstly, escaping the temptation of establishing a strategy that addresses the energy sector alone, without providing a clear decarbonization pathway for the economy as a whole, including key sectors such as agriculture, land-use and forestry. The Law thus includes planning tools that address all sectors and their feasible transformation pathways out to 2050.

Secondly, the importance of going beyond the definition of targets alone: the French Energy Transition Law can undoubtedly be considered a best-practice example in this regard, insofar as it incorporates all the key features for a robust and effective climate governance into a comprehensive legal framework:

- Clear and binding targets for 2020, 2030 and 2050;
- An economy-wide carbon price signal with a clear pricing trajectory until 2030 to provide visibility for investment decisions;
- The definition of clear governance processes to elaborate, monitor and revise the national low-carbon and energy plans, including the participation of stakeholders at all levels. These plans provide important strategic policy orientations to guide policy implementation and enables a focus on enabling conditions for going beyond short and medium-term targets.
- The set-up of dedicated institutions such as a permanent stakeholder committee (the National Council for the Ecological Transition) and a high-level expert commission to increase transparency and provide independent expertise for the policy process.

Nevertheless, the French Energy Transition Act also illustrates the risk of overloading climate legislation. Rather than sticking to the key pillars of the climate governance framework, the French law included a variety of very technical measures which significantly increased its complexity and partly explain the length and difficulty of the legislative adoption process: the French climate law took 2 years from its initial draft to its final adoption, including 5,000 amendments and 150 hours of public debate.

Fixing the right level of ambition: the importance of an adaptive framework

Legally binding long-term targets are a key ingredient to build effective climate governance and implement coherent policy measures in the shorter term. The French target framework could be criticized as not being "Paris-compatible" in the first place (since it only targeted a 75% GHG reduction by 2050). But more importantly, it highlights the importance of establishing a science-based target framework that remains adaptive over time. In this regard, the revision of the French long-term objective to achieve climate neutrality by 2050 illustrates how the "ratchet effect" introduced by the Paris Agreement can effectively be implemented on the national level.

Lessons from implementation challenges: ensuring compliance with the legal framework

The most important lessons that can be learned from the French experience certainly draw on the feedback of the first years of actual implementation of the national climate governance framework. Despite being effective overall, several key challenges can be identified, in particular with regard to ensuring the compliance with the legally binding framework:

Strengthening counterpowers through legal action

To some extent, the French case highlights the difficulties of ensuring legal-bindingness in practice. The fact that the targets and governance processes are enshrined in law provides some status and ensures stability, insofar as they have to be included into all planning documents and related debates.

However, one issue that can be identified relates to the possibility of triggering a judicial review to ensure compliance in the case of serious policy gaps. The Energy Transition Act does not provide any provisions in this regard. This might explain the difficulties of independent organizations (such as environmental NGOs) to effectively go to court in order to act as an effective counterpower. Unlike other countries (mostly Anglo-Saxon countries with Common Law systems), the legal approach has not been used frequently in France, due to constraints in terms of resources and effective results.[1]

Designing clear monitoring, evaluation and revision processes

In the absence of legal sanctions, compliance heavily relies on the quality of monitoring and evaluation processes, i.e. their ability to clearly identify implementation gaps linked to specific policy measures or absence thereof, and the ability to apply political pressure to address these. Several key lessons can be drawn from the French case.

First, with regard to the streamlining of the monitoring and evaluation processes: the French framework includes a multitude of reporting mechanisms, increasing the risks of redundancy and (avoidable) complexity. A more focused approach, including all the key elements for evaluation (compliance with mid- and long-term targets, impact assessment for different policy measures and assessment of potential implementation gaps) appears critical to make this process more efficient and ensure that timely adjustments are put into practice.

Second, with regard to the structure of the process, as can be illustrated by the ongoing first full evaluation and revision of the French strategic plans. Rather than following a chronological approach where monitoring reports allow for a comprehensive evaluation which then informs the revision of the strategic plans, these processes are currently happening in parallel, threatening the overall coherence.

A major risk identified in the case of France (but also affecting other countries) is related to the risk for the government to become both judge and party of the evaluation, highlighting once more the importance of independent expertise in the policy process.

Providing clear mandates and adequate resources for dedicated institutions

While setting-up dedicated institutions is an essential first step, the French experience shows the importance of providing them with specific mandates and dedicated resources, as illustrated by the case of the French Expert Committee for the Energy Transition. Although inspired by the UK Climate Change Committee, the French Expert Committee for the Energy Transition has not been able to fulfil the same role, given that the framework does not endow it with a proper mandate in terms of independency and counterpower (i.e. if and how the government should respond to its reports) and does not provide any financial resources to fulfil its work, which remains a major issue in terms of independency and transparency of the evaluation and revision processes.

Inserting the national level framework into a multi-level governance

Another challenge that becomes apparent from the French case study refers to the complexities of articulating the different levels of climate governance, from the local scale up to the European policy framework. While this is not a weakness specific to the French case, it highlights the importance of ensuring that the different governance tools (in particular for planning) take into account the adjacent policy levels to improve harmonization and coherence. The reform of the EU governance framework will be of crucial importance in this regard, since it must be able to accommodate the different starting points and levels of ambition of the Member States, ensuring that it still creates added value for the most advanced countries (rather than overlapping reporting obligations) and enables the dissemination of best practices on the national scale to raise ambition and effective implementation.

The relative ambition of the French governance architecture also raises questions about what the appropriate role of EU governance is to support French national governance beyond 2020.

The European framework might be of particular importance for stakeholders to put additional pressure on the government in case of weak policy implementation, taking into consideration the aforementioned difficulties of triggering a judicial review. The past experience has shown that having clear commitments from France

1. According to a 2017 Policy Brief by the Grantham Research Institute, climate litigation cases have grown to over 250 in 2017, considering a sample of only 25 jurisdictions (Nachmany, Fankhauser, Setzer, & Averchenkova, 2017). A recent prominent case has been the legal challenge launched by Friends of the Irish Environment to pressure the Irish government to improve its National Mitigation Plan, which acknowledges that the 2020 climate target will be missed (Sargent, 2017). Other cases include South Africa, Austria, the Netherlands, the USA and Pakistan (Khan, 2017).

with respect to the EU (whether legal or political) and related oversight processes at EU level to monitor the achievement of headline targets is an additional source of political pressure that can help ensure robust implementation of the French law's major objectives. The monitoring process associated with the national commitments under the new National Energy and Climate Plans might play an important role in this regard.

However, at the same time, it also seems likely that the nature of the support that France would need from the EU to implement its low-carbon objectives become fundamentally different to simple "oversight" looking forward. Deep transformation of sectors like transport, electricity, industry and agriculture will require more focus on how to create the broader conditions for decarbonization within the context of the EU internal energy market. The proposal for a European Energy Union is obviously already a step in this direction. However, further work in terms of elaborating the governance modalities of how to make the Energy Union concept function in practice would seem to be required.

INTRODUCTION

The strengthened focus on national long-term decarbonization strategies has been one of the major achievements of the 2015 Paris Agreement. Recognizing that the sole definition of targets or single policy measures is not sufficient to drive the structural transformation over long periods of time, this has allowed a new understanding of the elaboration and implementation of climate policies at the international, European and national levels, taking into account the complex interactions across sectors and time horizons.

Nevertheless, despite the growing body of literature on low-carbon strategies, there is still a lack of understanding on how they connect to the broader climate governance challenge, encompassing not only the *outputs* or content of the strategies (pathways, targets and policy measures) but also the *political processes* and *institutions* that are set up to elaborate, implement, monitor and adjust these strategies over time.

In this regard, the following overarching criteria can be highlighted to assess the effectiveness of national climate governance frameworks:

- The ability to plan and implement deep decarbonization strategies on the scale and pace needed to fulfill the Paris Agreement, encompassing the ambition to reach net-zero emissions by mid-century for industrialized countries;
- The need to ensure high levels of transparency, stakeholder involvement and, to secure and maintain public acceptance over time;
- Building an inclusive approach: although the energy sector remains the focal point of climate strategies, case studies illustrate the need to design a strategy that encompasses all relevant sectors, as well as a vision that links the low-carbon strategy to the broader (economic, social and environmental) development targets.

Based on this framing, this study aims to provide additional insights on lessons and challenges related to the establishment of effective national climate governance frameworks, drawing on a comprehensive case study of the elaboration, content and implementation of the French 2015 *Energy Transition Law for Green Growth*.

While the conditions of success obviously differ to some degree based on the specific circumstances and history of each country, this analysis can be extremely helpful to provide food for thought for other countries which are currently in the process of establishing or revising their own climate governance framework, by providing feedback on implementation challenges and successes with regards to four main aspects:

- **Understanding the political economy behind the transition:** what have been the key political processes and milestones to establish the national framework? How have different groups of stakeholders been engaged in the process? And how have structural conflicts been overcome to achieve a common vision and push ambition further?
- **Assessing the specific elements of the governance framework:** what are the key ingredients of the national governance framework in terms of content, processes and institutions? Beyond the legislation itself, what lessons can be drawn with regard to specific implementation challenges?
- **Compatibility with the Paris Agreement:** Is the governance framework compatible with the ambitions of the Paris Agreement? If not, which mechanisms can help to adjust the trajectory in the future, following the approach of a "ratchet mechanism"?
- **Replacing the national strategy in the multi-level governance framework:** To what extent does the national framework provide clear

interactions with climate action plans at the local level? What lessons can be drawn from the French experience regarding the harmonization and connection between the EU and national governance processes?

The analysis is structured around four sections:

1) The first section provides a general understanding of French energy and climate policies by recounting the characteristics and evolutions of the French energy system and policies, up to the National Energy Transition Debate in 2012 which prepared the adoption of the 2015 energy transition law.
2) The second section contains a more detailed description of the Energy Transition Law for Green Growth in 2015, considering its adoption process, structure and key components. It also provides an in-depth look at the two key planning tools structuring the new climate governance framework (the National Low-Carbon Strategy and the Multiannual Energy Plan), considering their structure, content and elaboration processes.
3) The third section provides an analytical assessment of the strengths and weaknesses of the climate governance framework established by the French law, focusing on two overarching questions: How robust is the institutional design of the climate governance framework? And is it effective in driving and implementing the low-carbon transition over time.
4) The final section provides a summary of the main insights and lessons learned from the French experience regarding the implementation of Paris-compatible climate governance frameworks in other countries.

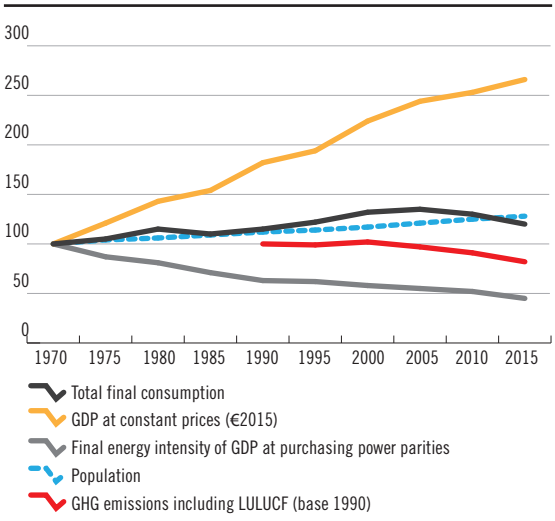
1. THE FRENCH ENERGY AND CLIMATE TRANSITION: MAIN FACTS, POLITICAL ORIGINS AND PROCESSES

In order to contextualize the analysis of the current energy and climate governance framework in France, it seems essential to gain a quick understanding of the main characteristics and political processes that have shaped French energy policies until today.

1.1. The French energy system at a glance

Since 1970, the French GDP has increased by a factor 2,5 while the economy's energy intensity has decreased by more than 50%. Interestingly, the total final energy consumption is decreasing since the early 2000s despite ongoing economic growth, indicating a trend towards the absolute decoupling of economic growth from GHG emissions and energy consumption.

Figure 1. Economic, demographic and main energy indicators for France (1970=100)



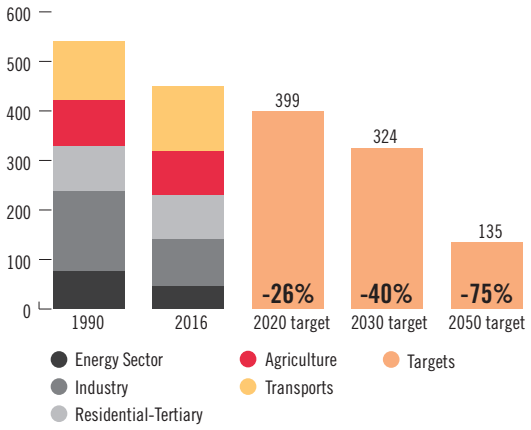
Source: IDDI based on Enerdata data (2017)

Between 1990 and 2016, France has reduced its GHG emissions by 16,6%. These reductions have mainly taken place in the energy and industry sector (-40%), while emissions in other sectors (agriculture, buildings) have stagnated and even increased by 11% in the transport sector.

Sometimes qualified as the country's first "energy transition", the deployment of the world's second largest nuclear power fleet in the wake of the 1970s oil crisis is certainly one of the most distinctive features of the French energy system until today. Launched in 1974, the French nuclear program resulted in the build-up of a total

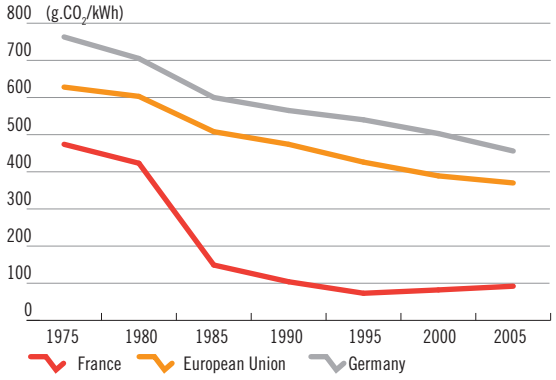
of 58 commercial reactors, with 40 GW (out of a total of 63 GW) of capacities installed in the first 10 years alone (Figure 4). Adding this to the early development of hydro power (and more recently wind and solar), France displays one of the lowest carbon intensities of electricity generation in Europe, 6 times lower than the EU average in 2015 (Figure 3). The rapid expansion of the power sector has also led to a comparatively strong electrification of heating systems: currently about one third of French buildings are equipped with direct electrical heating, raising new challenges in terms of peak electricity demand in winters. Due to the high share of electric heating, the French power system is extremely temperature-sensitive: each degree C° below average temperatures in winter increases peak demand by 2,300 MW, representing more than half of the temperature-sensitivity of the entire European power system (RTE, 2016).

Figure 2. Evolution of GHG emissions in France since 1990 and reduction targets



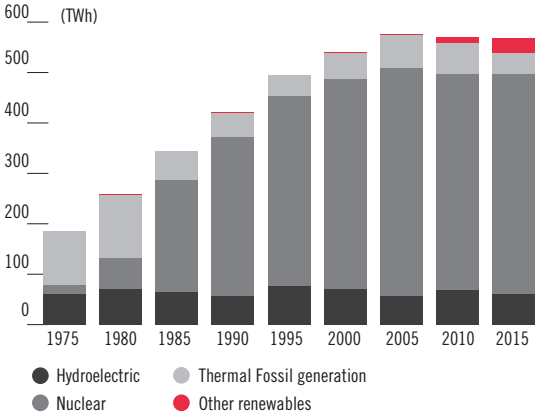
Source: IDDRI, based on CITEPA data (2017).

Figure 3. Carbon intensity of electricity generation ($g.CO_2/kWh$)



Source: IDDRI, based on Enerdata (2017).

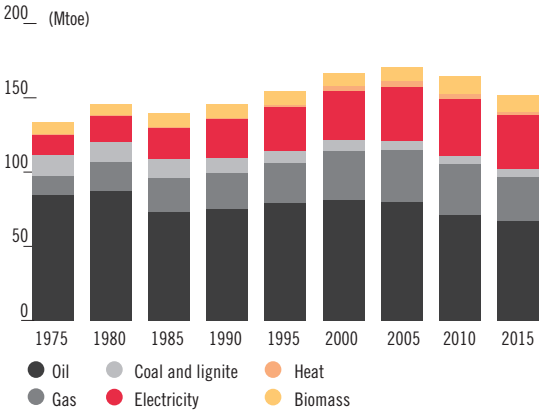
Figure 4. Electricity generation by source in France (TWh)



Source: IDDRI based on Enerdata (2017)

Despite having one of the highest shares of low-carbon electricity generation in the world, the French economy remains highly dependent on fossil fuels, which represent approximately 70% of final energy demand.

Figure 5. Final energy demand by source in France (Mtoe)



Source: IDDRI based on Enerdata (2017)

1.2. The historic structure of energy policies in France

The second historic pillar of energy policies in France relies on the general understanding of energy provision as a centralized national public service, a doctrine that emerged shortly after the Second World War and resulted in the creation of state-controlled and vertically integrated industrial champions (*Electricité de France* and *Gaz de France*, now *ENGIE*). Until the unbundling process in the early 2000s, these public utilities controlled the whole value chain (generation, transmission, distribution, supply), while tariffs were (and partly

still are) regulated by the state. The liberalization of the European energy markets has brought some new players in the market, but the incumbents of the historic monopolies still hold significant market shares[2] in France and retain a strong link to government (Reverdy, 2015).[3]

This very specific governance frame has largely influenced political processes until the early 2000s. Particularly for the deployment of nuclear energy, but also for other energy policies, the decision processes has been centralized and concentrated on a small circle of senior-ranking civil servants, political decision-makers and industrial managers at state level, with little involvement from other stakeholders and local or regional authorities (Hecht, 2009). This has gradually changed through two parallel and complementary dynamics. On the one hand, the political decentralization process engaged through different phases since the 1980s and accelerated in recent years enabled the regions and inter-municipal cooperation establishments to take on more competencies in the planning and implementation of local energy policies (Izard, 2016). On the other hand, the gradual emergence of climate change as a political issue and the low-carbon energy transition as a societal response have induced not only a shift in the definition of energy policy objectives (notably, integrating the notion of sustainability), but also an opening towards new political processes with an increasing level of stakeholder involvement.

1.3. The emergence of the energy and climate policy nexus

The 2013 national debate on the energy transition and subsequent 2015 law on the energy transition for green growth are rightly seen as landmark decisions in the French energy policy landscape. From a historical perspective, it is thus important to analyze how this political process has benefited from the progressive build-up of the climate and energy nexus for over 25 years.

The French commitment towards the issue of climate change emerged hesitantly at the end of the 1980s.[4] But it is only after the adoption of the Kyoto protocol in 1997 that it also translated into the national political agenda: following a first parliamentary report in 1999, France ratified the Kyoto protocol in 2000. In 2001, a national law was adopted to recognize the fight against climate change as a "national priority" and create a national observatory on the effects of climate change, focusing on the monitoring of climate impacts and adaptation strategies (Virlouvet, 2015). In 2003, the organization of a first "national debate on energies" illustrated the progressive attempt to open up the political process to the stakeholders and the wider public, despite heavy criticism from stakeholders. Indeed, notwithstanding its initial ambition to elaborate a comprehensive vision for the national energy strategy, environmental NGOs and independent experts accused the debate of being primarily a political attempt to legitimize a predefined strategy of nuclear revival, rather than providing the ground for public consultation to prepare a broader strategy for a sustainable energy system (Global Chance, 2003).

The 2003 debate on energy and 2005 energy policy law

Following this debate and the publication of a white paper on energy policy in November 2003 (Fontaine, 2003), a new framing law on energy policy was adopted in July 2005.[5] This law provides the general orientations for energy policy and includes some innovations that are interesting to analyze in retrospect, since they have structured the main conflict lines of the French energy transition debate until today.

The primary shift in paradigm relates to the adoption of the "efficiency first" principle: for the first time, the conservation of energy is defined as the "first axis of energy policy" (Article 2), followed by the diversification of the energy mix and R&D in the energy sector. Accordingly, the law adopts the objective of improving the final energy intensity of the economy by 2% per year until 2015 and 2,5% afterwards and in parallel introduces a white certificate scheme to encourage energy savings, that is still operational today.[6]

A second major innovation is the adoption of a long-term decarbonization target. Indeed, the 2005 law is the first to introduce the orientation of a "factor 4" division (-75%) of GHG emissions

2. EDF and the local energy companies in place since 1946 still hold a market share of approximately 84% (number of customers, both residential and industrial) in the electricity market, while EDF, GDF and the historic local energy companies hold a market share of approximately 75% (number of customers) in the retail gas market (CRE, 2017).
3. The state directly holds 84% of the capital stock of EDF, while this share has continuously decreased for ENGIE, with currently only 29%.
4. Along with the Netherlands, who hosted the conference, and Norway, France organized the second international climate conference in the Hague in 1989 (Virlouvet, 2015).
5. *Loi de programme fixant les orientations de la politique énergétique* (loi POPE), n° 2005-781, 13th of July 2005.
6. This can be compared to an effective improvement of the final energy intensity of 1,5% between 2004 and 2015.

between 1990 and 2050. However, the legal commitment remains rather vague, as it states that (Article 2) "*France supports the definition of a factor 2 division of global GHG emissions by 2050, which requires, in view of the consumption differences among countries, a factor four to five division of these emissions for the developed countries*".

Thirdly, the law confirms the national choice of reliance on nuclear energy for its power mix and plans the construction of a first 3rd generation reactor (European Pressurized Reactor) by 2015, which has effectively been launched in 2007.[7]

The Grenelle summit for the Environment: 2007-2010

In 2007, the newly elected president Nicolas Sarkozy launched a broad stakeholder consultation process to define the orientations for sustainable development in France, promoted as a "revolution for green growth" that would enable a way out of the economic crisis, promising over €400 billion of investments and the creation of up to 500 000 jobs (Le Parisien, 2008).

The first novelty of this initiative referred to its inclusive approach towards sustainable development. Rather than targeting the energy sector alone, as did the 2003 debate, the Grenelle aimed at covering the issues of climate change and energy, agriculture, biodiversity, health, water management and urbanism.

Beyond the transversal approach towards sustainable development, a significant innovation of this consultation process was related to the institutionalization of the "five stakeholder groups governance process (*"gouvernance à cinq"*), with participation of the state, local authorities, companies, unions and environmental NGOs; an approach that was replicated later on for the national energy transition debate in 2013 (Grimfeld, Jouzel, Le Grand, Notat, & Ernst & Young, 2010). The Grenelle resulted in a total of 268 recommendations and measures, adopted through the two Grenelle laws of 2009 and 2010. In the field of energy and climate policy, the main orientations referred to:

- A more precise adoption of the 2005 factor 4 GHG reduction target by 2050, including an absolute emission volume (under 140 million tons of CO_2eq), as well as an indicative target on the annual decrease of GHG emissions by 3%);
- Translating into national law the French objectives under the EU climate and energy package: 23% share of renewable energy in gross final consumption; -20% GHG emissions; 20% improvement of energy efficiency;
- A more ambitious approach on energy efficiency in buildings, introducing a 38% reduction target for energy consumption in buildings by 2020 (equivalent to at least 400,000 thermal retrofits per year), new funding mechanisms (zero-interest loans and tax credits) and the elaboration of a more ambitious thermal regulation for new buildings;
- Specific measures to increase the share of low-carbon vehicles, notably a bonus-penalty system based on the CO_2 emissions of vehicles and R&D support for very efficient and electric vehicles.

After the early failure of a similar proposal in 2000, the implementation of a new carbon tax was also included as a headline measure in 2009. Nevertheless, the first legislative proposal was censored by the constitutional court, which concluded that the numerous exemptions would undermine its effectiveness and be contrary to the principle of equality in terms of public burdens. While the government initially announced that it would provide a new proposal in 2010, it was eventually withdrawn for political reasons (Rocamora, 2017).

The Grenelle Summit differed from the 2003 energy debate in many aspects.

- First of all, considering its broader scope, integrating various issues related to sustainable development;
- Secondly, in its attempt to establish a more legitimate and continuous stakeholder consultation process, which was considered a success, both in terms of form (organization of specific roundtables on each topic with an independent expert as facilitator) and substance (through the aim of identifying specific and operational policy recommendations);
- And thirdly, by providing an approach focused on operational measures in the short term: while the 2003 debate (and 2005 law) was mainly about defining grand orientations and long-term objectives for future policies, the Grenelle did not provide a new strategic vision but rather attempted to define specific policy measures to achieve existing targets, with a clear focus on 2020.

The lack of a more strategic and long-term vision on energy and climate policy within the Grenelle process can be explained through two factors. The first being the decision to address the different topics at the sectoral level, which facilitated the definition of operational measures at the expense of overall coherency and long-term vision.

7. The European Pressurized Reactor (EPR) project in Flamanville was initially planned to be operational by 2012. Due to multiple delays (and a factor 3 increase in costs), the project is now scheduled for mid-2019.

The second refers to the deliberate choice of excluding nuclear energy from the debate as a reaction to the conflictual 2003 debate. While this certainly prevented the risk of initial blockage, the "elephant in the room" led critics to denounce the restrictive nature of the discussion, which practically prevented any debate on a more comprehensive vision for a low-carbon energy system.

1.4. Towards an energy transition strategy: the 2013 national debate

Prior to the national elections in 2012, the nuclear accident in Fukushima, Japan (March 2011) brought the energy issue back on the political agenda. The changing position of the Socialist Party (PS) was certainly the most noticeable, with leading party members stating that a progressive reduction and even a phase-out of nuclear energy in the coming decades should be implemented.[8] As a compromise between the conservatives' position for a high level of nuclear energy and the Greens' quest for a nuclear phase-out, the socialist program for 2012 thus defended the objective of reducing the share of nuclear from 75 to 50% by 2025. Nuclear energy also became a major topic of discussion for the pre-electoral coalition negotiations between the PS and the Green Party (EELV), leading to an agreement that eventually provided a stronger ground for the objective of reducing the share of nuclear to 50% by 2025, through the commitment to shut down 24 reactors by 2025.

Tackling the weak spot of the Grenelle debate, the presidential candidate François Hollande also committed himself to initiate a new governance process to elaborate a comprehensive strategic vision for the low-carbon strategy until 2050, including the conflictual issue of nuclear energy, based on the new commitment to reduce the share of nuclear power. As a first step to the adoption of a framing law on the energy transition, this process included the organization of a large stakeholder debate which lasted from November 2012 to July 2013 and aimed at identifying clear policy recommendations for the subsequent law.

The institutional structure of the debate

Following on this early commitment, the newly elected president François Hollande organized a first "Environmental conference" in September 2012, aimed at preparing the organization of the national debate on the energy transition (DNTE). As illustrated in Figure 6, this resulted in a very detailed and highly institutionalized organization which necessarily increased complexity and resources, illustrating the political allocated to the debate:

- The principle of a seven-party governance, including the state, members of parliament, local authorities, companies, unions consumer federations and environmental NGOs with a total of 112 representatives forming the "National Council of the energy transition";
- A high-level steering committee regrouping five independent experts and the chair of the debate, Laurence Tubiana, overseeing the whole process;
- A general secretariat, appointed by the environment minister, in charge of the operational organization of the debate;
- An expert committee with 45 members from different backgrounds;
- A liaison committee for decentralized debates, supporting the organization of regional and local debates in parallel of the national one;
- A contact group for companies, and a citizen committee, regrouping 20 randomly chosen French citizens;
- The organization of a "Citizen energy day" in May 2013, based on the World Wide Views approach developed by the Danish board of Technology (MEDDE, 2013).

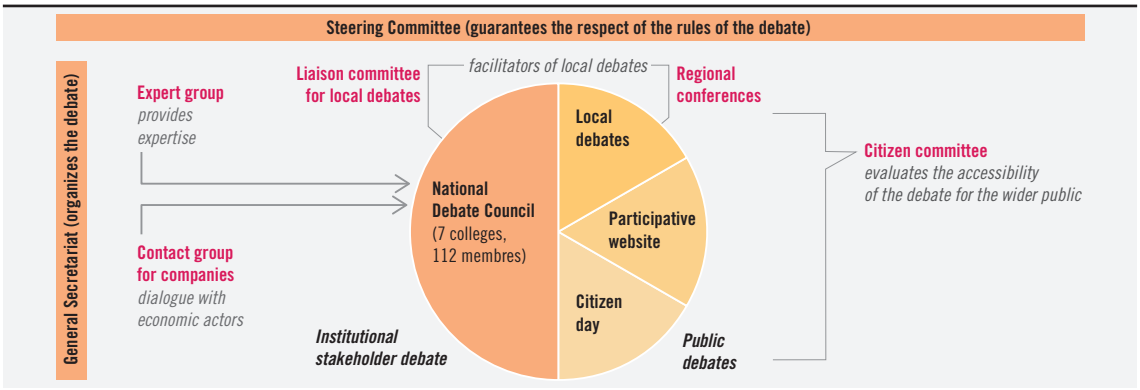
The execution of the debate

The official debate lasted 8 months, from November 2012 to July 2013, deploying considerable resources to push the energy and climate agenda into the public debate and to prepare the subsequent energy transition law. The national council of the debate held a total of 9 plenary sessions, while numerous additional meetings were organized by each of the 8 working groups and the expert group.[9] Multiple hearings of key personalities were organized, including foreign experts (such as the German Environment Minister). About 1,000 local and regional debates labeled within the "energy

8. Ségolène Royal, the socialist candidate for the presidential elections in 2007 and candidate for the socialist primary elections in 2011, pronounced herself in favor of a "nuclear phase-out over 40 years", while the general party line tended more towards a reduction of the share of nuclear rather than a complete phase-out.

9. Based on the key topics (see below), the following 8 working groups were defined, each of them composed with members of the 7 stakeholder groups and additional experts: 1) efficiency and conservation of energy; 2) Energy trajectories and scenarios for 2030 and 2050; 3) Renewable and alternative energies; 4) Costs, benefits and financing of the energy transition; 5) The multi-level governance of the energy transition; 6) Professional transitions: changes for employment, skills and training requirements; 7) The competitiveness of French companies in the energy transition; 8) Distribution of energy and distribution networks.

Figure 6. Organizational structure of the French energy transition debate



Source: IDDRI

transition debate" initiative took place, totaling 170,000 participants and the public website registered a total of 1,200 written contributions (CNTE, 2013a). Nevertheless, despite these efforts, general awareness within the public opinion remained rather low, with only 20% of interviewees having heard about the debate in January 2013 (Héraud, 2013).

Scientific expertise and the role of prospective analysis

The analysis of quantified energy scenarios within the corresponding working group played a key role in the structuring of the debate. While it was initially planned to produce new modeling exercises based on the propositions and conclusions emerging from the debate, it was eventually decided to limit the analysis to the assessment and comparison of 16 existing scenarios, published by academics, NGOs and companies (DNTE, 2013a). This assessment was performed through a unified "dashboard", which enabled the harmonization and comparison across a range of scenarios, based on common indicators and the subsequent definition of 4 contrasting trajectories and associated long-term visions (Sartor, Donat, Duwe, & Umpfenbach, 2017). This input was in particular useful to provide a more objective and quantified assessment of the three key controversies that structured the debate (Criqui, 2014):

- *What should be the role of energy efficiency and conservation in the low-carbon transition? How far can demand-side reductions go without penalizing our living standard and economy?*
- *What should be the future role of nuclear power in the French electricity and energy mix?*
- *What are the economic consequences of a factor 4 division of French GHG emissions by 2050?*

Indeed, although there was already a general consensus among actors on the importance of energy savings within the low-carbon transition, stakeholders' opinions differed substantially regarding both the level of energy efficiency that would be required to perform this transition and the consequences it might have on the economy. The publication of a technical note by members of the expert group illustrating that only the scenarios aiming for a 50% reduction of final energy demand fully achieved the objective of an economy-wide factor 4 division of GHG emissions[10] played an important role in this regard (Salomon, 2013).

Similarly, the question of nuclear power remained a key controversy all along the debate, polarizing the different stakeholder groups. Without reproducing the mistake of the Grenelle summit by not addressing the issue at all, the DNTE partly preempted the debate by taking the presidential commitment to reduce the share of nuclear power to 50% by 2025 for granted, even though major stakeholders (including employer federations and most unions) heavily opposed any reduction of nuclear power as being a threat to the national economy.

Eventually, the broader question of the energy transition's economic impacts provided ground for intense debates on the potential costs and benefits of an accelerated transition. Without removing all doubts (especially concerning the apprehension of competitiveness issues linked to rising energy costs), the analysis carried out by the working group N°4 and the expert group on energy scenarios laid the ground for a general consensus on two conclusions. Firstly, that the 4 decarbonization trajectories would generate net benefits until 2050, compared to a *business as usual* scenario; and

10. Most energy scenarios focused on energy-related CO_2 emissions, thus neglecting the substantial emissions from other gases than CO_2: 30% of total emissions in France are related to agriculture, industrial processes and waste.

secondly that the implementation of additional funding mechanisms is a key challenge to finance the uptake in investments for low-carbon projects (DNTE, 2013b).

Reflecting these controversies and growing political tensions among stakeholders, the "synthesis" of the debate published in July 2013 left many doubts about the legal value and political impact of the included recommendations (CNTE, 2013b). The initial charter of the debate (2012) set high expectations for the debate, with the aim of defining a clear and consensual vision for the national long-term decarbonization strategy and a clear basis of preparation for the subsequent energy transition law. Nevertheless, many observers (especially among NGOs) criticized the fact that the final output was nothing more than a list of good intentions and principles, without clear orientations nor legal value, partly due to strong pressure from industry and employer federations, threatening to stall the debate right before its closure (Auzanneau, 2013; Kerckhove, 2013; Schneid, 2013).[11]

General assessment of the debate: process and outputs

Even though it is relatively easy to disqualify the specific output of the debate as being rather weak compared to the initial expectations and resources deployed, it is undeniable that the process itself produced a noticeable paradigm shift and provided a clear outlook for the preparation of the draft energy transition law.

Considering the structural embeddedness of different stakeholder opinions, it is eventually not surprising that no consensus could be reached on the most conflict-laden issues (on nuclear *versus* renewable energies, the level of energy demand reductions, etc.). Nevertheless, the established dialogue process and dense production of expertise (on long-term scenarios in particular) managed to structurally transform the nature of the political debate itself, towards a less ideological and more evidence-based dialogue, which also helped avoiding some blockages in the subsequent parliamentary debate.

Furthermore, it is important to notice that the disagreement among stakeholders concerned primarily the preferred means and levers of the low-carbon transition, while a rather strong consensus was achieved on the necessity and value of the long-term decarbonization objective itself, as well as on the governance method, including a permanent (rather than one-shot) stakeholder participation process in the elaboration and monitoring of the National Low-Carbon Strategy.

One lesson that can be learned from the French experience relies on the difficult challenge of defining a clear linkage between the stakeholder and parliamentary debates. Although the national debate was conceived from the beginning as a "preparatory phase" to the adoption of the energy transition law, the government did not specify if and how the identified recommendations would eventually be picked up in the law. While this challenge was resolved later on through the set-up of a stakeholder commission following the drafting process for the law (see section 2.1), the uncertainty on the value of the debate's outputs nonetheless affected its overall credibility.

Another general observation can be drawn from the French experience with regard to the importance of the political framing of the debate and its resulting scope. In France, the catalyst for the debate was the presidential commitment on the future of nuclear energy, rather than the climate agenda *per se*. Thus, despite permanent references to the low-carbon objective, this resulted in a very "energy-centric" framing of the debate (and subsequent energy transition law), neglecting some critical issues for climate policy, such as agriculture and land use. While this can be a deliberate choice (to avoid additional conflicts due to sensitive issues on specific sectors), it comes at the risk of leaving important blind spots in the overall strategic vision for the low-carbon strategy.

2. THE 2015 ENERGY TRANSITION LAW FOR GREEN GROWTH

Originally, the French government had scheduled the adoption of the Energy Transition law for autumn 2013, right after the conclusion of the national debate in July. Nevertheless, the parliamentary process proved to be more difficult than anticipated, including numerous amendments and long debates until the final adoption of the law in July 2015, illustrating the complexity and political challenge related to the endeavor of defining a legally binding decarbonization strategy.

This section is divided into two parts, respectively on the process and substance of the law. The first presents the different phases that led from the elaboration of the draft law to its adoption by the parliament. The second provides a more detailed overview of the contents of the law itself, including headline targets and key measures.

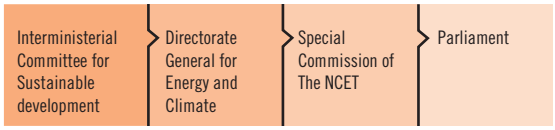
11. Threatening to block the adoption of the final conclusions, the business federations and unions had succeeded in reformulation the synthesis, demanding to change the term of "recommendations" to "stakes and challenges".

2.1. The legislative process

Before even entering the parliamentary arena, the elaboration of the draft law proposal took over a year, mainly because of the complex negotiation process that involved all governmental departments (within the inter-ministerial committee for sustainable development),[12], the Directorate General for Energy and Climate (DGEC)[13] and a stakeholder commission. Following the success of the stakeholder consultation process during the debate and responding to one of its key recommendations, a new permanent representative stakeholder body was created under the name of National Council for the Ecological Transition (NCET) (MEEM, 2017).[14] Under the presidency of the former debate's chairwomen Laurence Tubiana, a specific commission including representatives of the NCET was set up to monitor the elaboration of the draft law by the DGEC, ensuring that the key recommendations of the debate would be included in the final draft. Figure 7 depicts the complex elaboration process of the draft law. Unsurprisingly, the most contentious topics of the debate sparked new conflicts be it among the ministries (for economy and for environment in particular) or the stakeholders. Although time-consuming, this process provided an effective system of checks and balances and all key recommendations of the national debate found their way into the draft law submitted to parliament.

The finalized proposal was presented to the National Assembly in July 2014. Despite the preparatory stakeholder dialogue, the parliamentary process proved to be surprisingly conflictual and lasted for 12 months, including 3 months of negotiations in a special commission, 2 readings in the Senate and 3 readings in the National Assembly.[15] The negotiations on the text proved to be very complex (each chamber being controlled by a different majority), with over 5,000 amendments submitted and 150 hours of public discussion prior to its final adoption on July 22, 2015. The final attempt by the opposition (in both chambers) to rescind the law by seizing the Constitutional Court highlights the importance granted to it by all parties as well as the persisting political divisions.[16]

Figure 7. Elaboration process for the draft law on the energy transition in France



Source: IDDRI

Note: As a first step, the Interministerial Committee for Sustainable Development (ICSD, involving all ministers and presided by the Prime Minister) defines the general outline and strategic pillars of the draft law as a result of the negotiation among ministers. Within the Ministry for Environment, the Directorate General for Energy and Climate (DGEC) is then charged with drafting the detailed articles, under the control of the ICSD. At several stages, the draft text is presented and discussed with stakeholders within the special commission of the National Council for the Ecological Transition. Eventually, the draft law integrates the parliamentary agenda for voting in the National Assembly and Senate.

2.2. The results: the general framework provided by the law

Regarding the content of the energy transition law, a first observation can be made regarding its growth in volume over time. Indeed, the act was initially intended as a "framing law" (*loi de programmation*), focusing on the main pillars of the national low-carbon framework in terms of targets and key governance mechanisms (low-carbon strategy, carbon budgets, monitoring mechanisms). However, after the negotiations and due to pressure from different sides to directly include various implementation mechanisms, it ended up as a mixture of strategic targets (see Table 1), overarching governance mechanisms (national energy and climate plans and sector-specific strategies, see section Erreur : source de la référence non trouvée), key measures (such as the carbon price trajectory or the retrofitting obligation), and a multitude of technical provisions aimed at implementing ancillary measures, some of which were not discussed as such during the national debate.

As a result, the final law included a total of 215 articles on 78 pages. Below is an overview of the structure and main components of the 8 sections of the energy transition law:

12. Created in 2003, the Interministerial Committee for Sustainable Development defines and implements all policies related to sustainability questions. The committee is presided by the Prime Minister or the Minister for Environment and involves all ministers and representatives from the presidency.
13. The DGEC is a department within the Ministry for Environment, responsible for all policies in the field of energy and climate.
14. Created after the national debate to institutionalize the principle of permanent stakeholder consultation on all sustainability matters, the NCET comprises 50 members from 6 stakeholder groups and has the mandate of issuing (consultative) reviews on all major policies (laws, strategies, evaluations) related to sustainability issues.
15. In comparison, the German legislative package related to the *Energiewende* in July 2011 was adopted by all parties, except by the Left Party, which asked for an even quicker nuclear phase-out.
16. In its decision of August 13, 2015, the French Constitutional Court rejected both appeals, but stated that without further precisions on its implementation, the obligation for thermal retrofits by 2030 (article 6) would be unconstitutional.

1) On only 2 pages and 2 articles, the first section resumes the main cornerstones for the French decarbonization pathway, including the overarching principles (sustainability, security of supply, affordability, competitiveness, fight against energy poverty, etc.) and headline targets for 2020 (2025 for the share of nuclear), 2030 and 2050, as well as the carbon price trajectory.

2) The second section (10 pages, 30 articles) presents the sector-specific objectives for the building sector (retrofitting 500,000 dwellings per year and reducing energy poverty by 15% until 2020) and details several measures, such as the publication of a national strategy for the thermal retrofitting of buildings (including an assessment of public policies), a retrofitting obligation for all buildings below a certain performance level before 2025, and the creation of a guarantee fund to facilitate the financing of retrofitting projects through bank loans.

3) The third section (10 pages, 35 articles) focuses on transports, air quality and pollution. It contains the obligation to provide a national clean mobility strategy as well as a series of measures to support clean mobility through public planning and public procurement, the objective of developing 7 million electric vehicle charging stations by 2030, and the right for local authorities to take measures to limit local air pollution due to road transport.

4) Over 8 pages and 35 articles, the fourth section is dedicated to the circular economy and the reduction of waste. It includes the elaboration of a national strategy for the circular economy, including detailed sector-specific objectives to improve recycling and waste treatment, the most visible measures being the phase-out of single-use plastic bags and the legal recognition of "planned obsolescence" for electronic devices.

5) Section 5 (19 pages, 18 articles) addresses the development of renewable energies. As a transposition of the 2014 EU state aid guidelines on energy, it introduces a reform of the support mechanisms, from guaranteed feed-in tariffs towards more competitive and marked-based premium schemes and tenders. It also introduces several provisions to facilitate crowdfunding and local (including public) investment for renewable energy projects, as well as more technical measures on (among others) the attribution of concessions for hydroelectric plans.

6) Section 6 (6 pages, 9 articles) refers to improvements in nuclear safety and transparency, mainly transposing European directives, and contains specific technical provisions without a direct link to the low-carbon transition or energy planning (i.e. it does not mention the 50% nuclear objective for 2025, nor specify any mechanisms in relation with it).

7) Section 7 (11 pages, 40 articles) considers the "simplification and clarification of procedures to improve efficiency and competitiveness" and essentially focuses on the simplification of administrative procedures for onshore wind power, parliamentary oversight over the public costs related to subsidy schemes for renewable electricity, and the regulation of electricity and gas networks, including provisions to support demand-side management.

8) Covering 30 pages and 43 articles, the final section is key with regard to the implementation of the new climate governance framework:

- It provides the legal definitions for the carbon budgets and the National Low-Carbon Strategy (article 173) as well as the Multiannual Energy Plan (article 176) and specifies the conditions of their elaboration, monitoring and revision (see section 2.3 for a detailed description);
- It extends the energy and climate planning obligations at the regional and local levels;
- It contains new regulation to oblige investment funds to include the assessment of climate-related risks in their financial reporting;
- It creates the expert committee for the energy transition.

Box 1. Innovation made in France: Climate-related reporting for financial institutions

Beyond the introduction of the National Low-Carbon Strategy and carbon budgets, Article 173 of the French Energy Transition Act also created new climate change-related reporting obligations for financial institutions, which are the first of their kind internationally and were designated a "groundbreaking measure for the investment community" by the European Sustainable Investment Forum (Eurosif, 2016). The obligations extend beyond the classical Environmental, Social and Governance (ESG) reporting to focus on both physical risks related to climate change effects on assets and an assessment of financial risk exposure in relation with the transition towards a low-carbon economy.[17] The regulation applies to publicly traded companies, banks and credit providers, asset managers and institutional investors, with varying obligations depending on their asset volume.

Even though the obligation was only implemented recently (the first reports were issued in 2017) and includes a 2-year learning phase (with an evaluation planned for the end of 2018), it is nonetheless expected to become a game changer in the way climate risks are approached by the financial community, in France and more broadly.

17. This includes the assessment of the carbon footprint of their assets and specific policies and measures to maximize investments in the low-carbon economy as well as reducing the exposure related to high-carbon assets.

Table 1 gives an overview of the main quantitative objectives included in the first section of the law, all of which are binding for the French government.

Table 1. Main energy and climate objectives in the French Energy Transition Law

	2020	2030	2050
GHG emission reductions (base 1990)	- 20%	- 40%	- 75%
Reduction of final energy consumption (base 2012)		- 20%	- 50%
Reduction of consumption of fossil fuels (base 2012)		- 30%	
Share of buildings retrofitted to "low energy standard"			100%
Share of RES in final consumption	23%	32%	
Share of RES in electricity consumption	27%	40%	
Share of RES in heating energy		38%	
Increase renewable heat and cold in district networks (base 2012)		x 5	
Share of Nuclear Energy in total electricity generation	50% by 2025		
Electric vehicle charging stations	7 million by 2030		
Carbon price trajectory (euros per ton of CO_2eq)	56	100	

Excluding the assessment of the level of ambition of each target, the following conclusions can be drawn from this initial overview of the law's main contents and headline targets with regard to the lessons learned:

- The French Energy Transition law contains most of the key elements required for a sound climate governance framework, including legally binding long-term targets for 2030 and 2050 and three complementary strategic planning tools to provide visibility on the pathway and implementation of the low-carbon transition: the National Low-Carbon Strategy, the definition of binding carbon budgets for 3 subsequent periods of 5 years and a detailed Multiannual Energy Plan (over two 5-year periods), providing clear orientations for the transformation of the energy sector.
- However, the French energy transition law also provides a striking example of a "catch-it-all": the above mentioned key ingredients for the strategic framework only represent a minor share of the law (5 articles out of 215), while the rest of the law contains a bundle of mostly very technical implementation measures which should not necessarily be included in a framing law on climate policy. The resulting density negatively affects its visibility and is one of the main factors that explains the length and complexity of the political negotiation process leading to its adoption. A more focused approach limited to the main pillars of the climate governance framework could both be easier to pass through the political process and still provide a sound basis for legal implementation afterwards.
- Even though this can be understandable since the French ETL was adopted before the Paris Agreement of December 2015, the headline GHG reduction objective for 2050 (-75% compared to 1990) is not sufficient to reach the ambition of the Paris Agreement. The French government has announced in July 2017 that it will introduce a new long-term target to achieve climate neutrality by 2050, but it remains to be seen how this objective will be anchored in the existing legal framework (see section 3).
- Another striking observation relates to the very energy-centric focus of the French legal framework, which was carried over from the national debate to the law. Indeed, most headline targets focus on the energy sector, while other key sectors for climate policy are neglected or addressed insufficiently. However, non-energy sectors (agriculture, industrial processes and waste) are responsible for more than 30% of France total GHG emissions and are virtually not addressed in the Energy Transition Law (apart of the waste sector). This is most visible for the agricultural sector, which is not mentioned despite representing 17 % of GHG emissions.
- Similarly, the transport sector does not emerge as a clear priority across the headline targets, although it represents 27% of GHG emissions and 32% of energy consumption, and is one of the only sectors that saw its emissions increase since 1990. Even though the law contains several specific[18] and transversal measures,[19] the transport sector appears to be insufficiently treated with regard to its strategic priority for the low-carbon transition, a weakness that can be observed in many national strategies.
- In terms of providing a vision for the long term, it can be noted that the objective of reducing the final energy consumption by 50% and the factor 4 on GHG emissions by 2050 are the only long-term objectives reaching beyond the 2030 timeframe. While these two objectives already provide strong guidelines for the strategic vision, they might not be sufficient to provide full visibility on the decarbonization pathway.

18. Such as new requirements for clean transport plans for companies and local authorities, subsidies for low-carbon vehicles and a quota for public procurement of low-carbon vehicles and a kilometric allowance for bicycle use.
19. For example the climate and energy contribution (carbon tax).

- Eventually, the time horizons of the different headline objectives are not homogeneous and do not provide a clear declination of all headline objectives for identical terms, thus leaving major uncertainties on the trajectory of the long-term roadmap beyond 2030. The power sector provides the most striking example: while the objective for the reduction of nuclear energy is set for 2025, the complementing objectives for the share or renewable electricity are defined for 2020 and 2030, leaving room for uncertainty and potential incoherence between the two, a weakness that has since then been confirmed by the recent announcement to delay the objective on nuclear until 2030 (see section 3.1) (Rüdinger, Colombier, Berghmans, Criqui, & Menanteau, 2017).

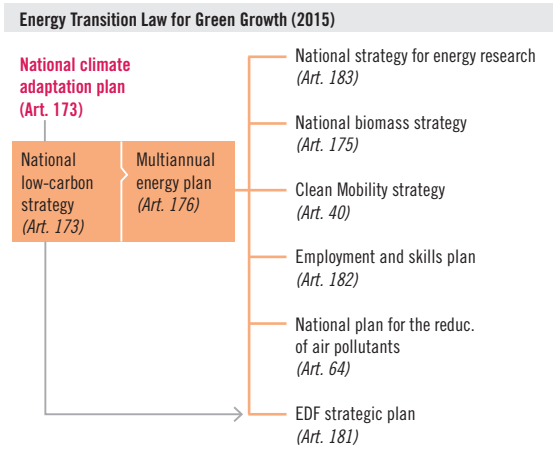
2.3. The new French climate and energy planning tools

Providing a coherent and inclusive vision for the deep decarbonization pathway is a fundamental part towards the implementation of ambitious climate policies over the short and long terms. This section will provide an overview of the general planning framework introduced by the French Energy Transition act, as well as a deeper analysis of the main planning instruments introduced by the French Energy Transition act (the National Low-Carbon Strategy and the Multiannual Energy Plan), considering their structure, content and elaboration processes.

Consistent with its strong legacy of state interventionism and centralized policy planning since the Second World War, France has a long history in elaborating and implementing national energy plans, best illustrated by the massive roll-out of hydro and later nuclear capacities under the national public service for energy (Boutaud, 2016; Finon, 1996). The overall governance framework of energy policies has largely evolved since then, becoming much more transversal (i.e. including both energy supply and demand sectors), open to stakeholder engagement and integrating a complex multi-level governance. Nevertheless, the elaboration of national strategies and plans remains a core element of French energy and climate policies. As a matter of fact, the 2015 Energy Transition Act introduced or reformed a total of 9 national planning documents and integrates major changes for the main regional and local energy and climate plans (Cerema, 2016; MEEM, 2016).

Figure 8 represents the main strategic plans on the national level, as well as their articulation:

Figure 8. Energy and climate planning tools introduced by the French Energy Transition Act



Source: IDDRI based on MEEM (2016)

As becomes apparent from this scheme, the National Low-Carbon Strategy (NLCS) and the Multiannual Energy Plan are the two key strategic plans concerning the mitigation of climate change and the planning of energy policy on both the supply and demand side:

- Based on a funnel approach, the National Low-Carbon Strategy provides the strategic roadmap for energy and climate policy. It sets out the targets, defines the legally binding carbon budgets and provides overarching policy recommendations, which are then detailed and implemented through the Multiannual Energy Plan and sectoral strategies.
- Based on the definition of carbon budgets over three 5-year-periods, the Multiannual Energy Plan defines more detailed measures to achieve the targets in the energy sector on the short and mid terms, covering a total of 10 years.
- A total of 6 additional plans provide detailed guidance on key challenges, such as research & development, sustainable use of biomass, clean mobility, the evolution of jobs and skills in line with the low-carbon transition, the reduction of local air pollution and the elaboration of a strategic plan by the main utility EDF, which has been introduced as a legal requirement to improve visibility on the transformation of the power sector, regarding in particular the implementation of the 50% nuclear objective by 2025.

The following two sections will present the National Low-Carbon Strategy and the Multiannual Energy Plan in more detail.

2.4. The National Low-Carbon Strategy

General overview

First introduced by the 2015 energy transition act, the NLCS is the centerpiece of the current French climate governance framework. Inspired by the UK Climate Change Act (2008) and carbon budget approach, the NLCS defines a pathway to achieve the long-term (2050) decarbonization target and defines milestones for the short and mid terms through the definition of legally binding national carbon budgets[20] for three subsequent 5-year periods.[21]

In order to provide visibility on the decarbonization pathway over 15 years, the revision of the carbon budgets occurring every 5 years includes:

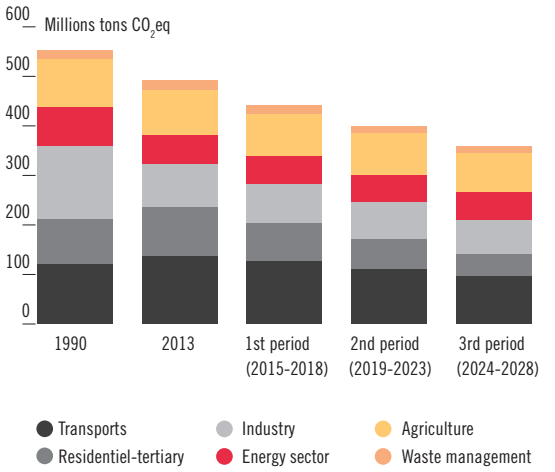
- The evaluation of the carbon budget ending this given year (i.e. have the targets been achieved? Which sectors have exceeded or performed better than their respective carbon budget allocation?);
- Where appropriate, the revision of the two upcoming carbon budgets (which have already been defined previously);
- The definition of an additional 5-year period (thus covering 15 years in total).

In terms of methodology, the elaboration of the low-carbon strategy combines quantitative and qualitative approaches. Firstly, the strategy builds on an integrated prospective modeling exercise used to provide a detailed representation of both a b*usiness-as-usual* and a target scenario until 2035 (DGEC, 2015). The target pathway is then used to define the carbon budgets, as well as their allocation among sectors. The comparison of both the BAU and target scenarios then provides information on the implementation gap (i.e. what is needed beyond current policies to achieve the targets), in order to define additional policy recommendations which are discussed in expert and stakeholder workshops. Building on this approach, the first NLCS defines a total of 23 transversal and 44 sector-specific policy recommendations, ranging from very broad recommendations ("Encourage initiatives that implement CO_2 pricing on the majority of GHG emissions in the world") to more detailed policy measures ("Support the replacement of old heating systems emitting more than 300 g. of CO_2/kWh").

As stated in the strategy itself, most policy recommendations are not specific enough to define an operational "action plan", but rather provide general guidelines to ensure consistency with the long-term decarbonization target. Thus, the NLCS relies on other planning tools (see Figure) to specify policy measures in the short term, such as the multiannual energy planning framework.

The National Low-Carbon Strategy is legally *prescriptive*, meaning that all related planning documents (on the national, regional and local level) have to be taken into account and be compatible with the orientations of the NLCS.

Figure 9. Indicative distribution of carbon budgets across sectors for the first 3 periods



Source: IDDRI based on (MEDDE, 2015a)

This representation of the decarbonization trajectory shows that past GHG emission reductions have been primarily driven by the decline of industrial production (and efficiency gains), accounting for a total of 60 million tons of CO_2eq (equaling the total emission reductions between 1990 and 2013). On the contrary, future emission reductions are expected to mainly focus on buildings in the residential and tertiary sectors (-54% between 2013 and 2028) and the transport sector (-29% between 2013 and 2028).

Another innovation in the approach of the NLCS relates to the fact that it considers not only the domestic GHG emissions, but also integrates the "carbon footprint" of the French economy, i.e. imported emissions that are produced elsewhere but linked to the consumption of products and services in France, as well as the risk of carbon leakage. The

20. While the French legislation explicitly mentions "carbon budgets", it would be more appropriate to refer to "GHG emission budgets" since the strategy covers all major greenhouse gases rather than CO_2 only.

21. The first period of the NLCS covers only 4 years (2015-2018), in order to align the revision process with the electoral cycle, so that the revision of the strategic plan takes place in the first year after national elections. The emission budget for each period represents average annual emissions within this period.

inclusion of the carbon footprint concept remains rather secondary in the current strategy, since the associated policy measures (encouraging life-cyle assessments and providing more information on the carbon footprint of products to customers) remain rather vague and so far non-binding. Nevertheless, this approach is very complementary to the traditional view relying on domestic emissions and might receive greater attention in the future since it responds to the growing need to improve the integration of international factors into climate policy (trade, risks of carbon leakage in industry, international transports, harmonization of climate policies across borders). And it is also a relevant indicator to raise attention: in 2012 the French per capita carbon footprint was over 40% higher than the corresponding domestic emissions (MEDDE, 2015a, p. 27).

Content and structure

The NLCS is structured around 7 chapters and over 200 pages, structured as follows (MEDDE, 2015a):

- The introductory chapter provides an overview of the policy context and presentation of the long-term targets;
- The second chapter gives information on the prospective scenarios used to define the carbon budgets and policy recommendations;
- The core section of the strategy presents the policy recommendations, based on the assessment of cross-cutting challenges (such as the inclusion of the carbon footprint approach, the carbon price signal, research and innovation policy, financing and local implementation) and sector-specific analysis (transports, buildings, agriculture, forestry, industry, energy and waste). The first NLCS adopted in 2015 defines a total of 67 recommendations. It is worth noticing that the low-carbon strategy reaches beyond the energy-centric focus of the Energy Transition law and does include specific recommendations for non-energy sectors, in particular agriculture and forestry;[22]
- The fourth chapter details the strategy's monitoring process through the definition of the carbon budgets for the three 5-year periods,their (indicative) allocation on a sector-by-sector approach and additional indicators to monitor implementation;;
- The following three appendices provide more information on the compatibility between the national carbon budgets and the French commitments and targets on the national, European and international levels,a short impact assessment and more detailed information on the methodology of the quantitative modelling underlying the strategy and additional information on land-use and land-use change and forestry, which has not been integrated in the main section of the first NLCS.

Stakeholder participation and input from independent experts

Based on the principles established through the national debate, stakeholders have been involved at the level of the prospective modeling (through a dedicated "Information and Orientation Committee") and for the elaboration of the strategy itself, through multiple workshops. Eventually, the National Council for the Ecological Transition (gathering the six stakeholder groups from the national debate) has published a review on the proposed strategy, followed by an independent review from the Expert Committee for the Energy Transition established by the Energy Transition law, and a public consultation has been opened on the draft document between August and September 2015, receiving a total of 46 responses (MEDDE, 2015b).

Overall, the participation of stakeholders in the elaboration of the low-carbon strategy has been perceived as being well organized and successful. Nevertheless, the role of the Expert Committee in the process remains rather weak, since its mandate has not been fully specified: the Government has no obligation to follow (or even to respond to) the recommendations made by the experts.

2.5. The Multiannual Energy Plan

General overview

The Multiannual Energy Plan[23] (MEP, *planification pluriannuelle de l'énergie* in French) is the second pillar of the national strategic framework. Following the strategic guidelines of the NLCS, the plan provides detailed measures over two periods of 5 years to advance the transition in the energy sector.[24] In comparison to the "multiannual investment plan" existing before the 2015 energy transition law, the MEP aims at providing detailed assessments and measures for the transition in the energy sector, taking into account both the

22. A detailed assessment of emission sinks (land use and forestry) was not required for the first NLCS but should be included in the first revision in 2018.

23. An English summary of the Multiannual Energy Plan is available here: http://www.ecologique-solidaire.gouv.fr/sites/default/files/Synth%C3%A8se_EN_PPE.pdf.

24. Since the first Multiannual Energy Plan was adopted in 2016, the initial period covers only 3 years so that the revision coincides with the electoral cycle and the revision of the NLCS.

historic scope on energy supply (gas, power and heating sector) and new items on demand (energy efficiency) and infrastructure (smart networks, storage, power system flexibility and security of supply) as well as a comprehensive economic and environmental impact assessment. The MEP is legally binding through the adoption of a corresponding decree, which includes quantitative targets for the end of each period (respectively 2018 and 2023 for the first MEP). These targets cover for example the deployment of renewable energy capacities (power, gas and heating sectors), demand response capacities, and intermediary milestones related to the energy efficiency targets.

Content and structure

The wide scope and level of detail directly affect the length of the MEP: including the economic and environmental evaluations, the total document is 600-page long. Furthermore, the main MEP only covers the metropolitan area, with an additional 7 MEPs being developed for each of the overseas territories. Within the main document, the heterogeneous treatment of the different subsectors has been subject to criticism from both stakeholders and experts (the Expert Committee and the Environmental Authority), regarding in particular the imbalance between supply and demand items. Indeed, despite its importance for the national energy transition, the section on energy demand covers only 13 pages (of which only 4 focus on policy measures), compared to 85 pages for the supply section, 56 pages for security of supply and infrastructures and 108 pages for the clean mobility strategy (ECET, 2016; NCET, 2016).

Stakeholder participation

According to the legal framework established by the French Energy Transition Act, the draft version of the MEP has to be submitted for review to various institutional bodies (the National Council for the Ecological Transition [NCET], the Expert Committee on the Energy Transition, the Advisory Energy Council and the Environmental Authority) before its formal adoption. Nevertheless, the legal framework does not specify if and how the Government has to address or respond to specific requests highlighted in these assessments.

Furthermore, even though this process has not been specified in the law itself, the elaboration of the MEP has been subject to an extensive stakeholder participation accompanying the process over 18 months (from March 2015 to September 2016). A total of 22 workshops with 800 participants have been organized with stakeholders to define the main assumptions (for the prospective modelling exercise) and measures included for the different sectors. Furthermore, a monitoring committee including representatives from the main stakeholder bodies has followed the different steps of the process. Participation from the broader public has been included through on open consultation process, gathering a total of 5,000 written contributions, 4 times more than the contributions registered during the national debate in 2013 (MEEM, 2016).

3. ASSESSMENT OF THE FRENCH CLIMATE GOVERNANCE FRAMEWORK: GOOD PRACTICES AND CHALLENGES

Following the general description of the French Energy transition law and the main governance tools, this section aims at providing a more detailed assessment of the design and effectiveness of the French climate governance framework, identifying good practices that might serve as potential inspirations for other countries as well as lessons learned from key challenges and potential weaknesses. Building on the analytical guiding questions and framework established by IDDRI (Sartor *et al.*, 2017) and Ecologic (Ecologic, 2017),[25] this analysis is structured around two dimensions:

The first targets the robustness of the institutional design of the governance framework and its ability to steer the transition over the long term. This includes factors such as:

- the level of political commitment from political decision-makers and the participation and "buy-in" of stakeholders;
- the legal bindingness of the framework and targets;
- the adaptability of the framework over time, i.e. its capacity to adjust to exogenous and endogenous changes and challenges;
- the institutional set-up of the governance framework, including the role of independent expertise and consultative bodies.

The second criterion refers to the effectiveness of the governance framework in driving and implementing the structural transformations necessary for the low-carbon transition. Indeed, even though a specific governance framework can be "perfect" on paper, it still might fail in producing the stimulus needed to implement strong policies. Factors included under this item include:

- the quality of the mid and long-term ambitions, i.e. the level of ambition of and coherence between targets;

25. A similar but slightly different evaluation matrix can be found in (WWF, 2017, p. 23).

- the policy impact: are strategic planning tools used to merely describe an "ideal" pathway to the low-carbon future or do they provide detailed and feasible policy orientations and mechanisms to ensure the achievement of the targets?
- monitoring, evaluation, accountability and implementation stringency: does the framework include regular reporting processes, aiming at evaluating policy progress? Does it provide adjustment and enforcement mechanisms to solve implementation and ambition gaps?
- the multi-level governance: to what extent is the national framework articulated with regional and local strategies? What are the specific provisions to enhance coherence between the different levels of policy implementation?

Table 2 outlines the different items included in the assessment of the governance framework:

Table 2. Evaluation criteria for the design of the climate governance framework

Criteria	Influencing factor	Design feature
Robustness and institutional design	Political commitment	Support within the political system; Stakeholder participation and buy-in
	Legal bindingness	Legal status of the framework and of individual elements
	Adaptability	Review of the strategy and of the governance framework itself
	Institutional set-up	Dedicated institutions and processes
Effectiveness in driving the low-carbon transition	Quality of long-term objectives	Level of ambition, credibility and coherence
	Policy impact	Operational policy measures
	Implementation stringency	Monitoring, evaluation and revision processes
	Multi-level governance	Articulation between national, regional and local strategies and policy action

Source: IDDRI based on Ecologic, 2017.

3.1. The robustness and institutional design of the governance framework

The ability of a climate governance framework to provide stability through a sufficient level of political commitment, credible long-term orientations and the ability to adjust over time is a key feature for a robust climate governance framework. With regard to the French governance framework, this analysis is particularly relevant as it shows how specific details can affect the overall robustness of the framework, despite including all the relevant main design features.

Political commitment

As highlighted in sections 1.8 and 2.1 , the political process that led to the adoption of the French energy transition law successfully generated a new culture of policy debate and stakeholder participation on the low-carbon transition agenda, giving ample opportunities for involvement of stakeholders, experts and political decision-makers and creating or strengthening consultative bodies such as the National Council for the Ecological Transition. Even though the debate and subsequent parliamentary process did not overcome the preexisting major divide on the role of nuclear and renewable energies in the low-carbon transition, it nonetheless produced an overarching consensus on the urgency of the low-carbon transition and the associated level of ambition.

And the fact that the energy transition law not only includes a long-term (2050) decarbonization target, but also managed to adopt ambitious objectives on the core drivers of the transition (energy efficiency, renewables, diversification of energy supply) despite strong opposition can be seen as a success of this deliberative process, through the ability of overcoming major political conflicts.

Observing that the climate governance framework has not been affected in its form (governance processes) or substance (revision of targets or main instruments) by the political change after the 2017 national election provides another illustration of this robustness and the general level of support.

The continued involvement of all stakeholder groups in the elaboration and revision processes of the strategic plans (low carbon strategy and Multiannual Energy Plan) shows that this new "participative culture" has been carried over from the experience of the national debate. Furthermore, the National Public Debate Commission[26] has announced its willingness to organize a larger citizen debate on the revision of the Multiannual Energy Plan in 2018, enhancing direct participation from the public.

However, one potential weakness is related to the fact that the Parliament has no direct voice in the elaboration or adoption of both the National Low-Carbon Strategy and the Multiannual Energy Plan. Indeed, the parliament is only informed of the adoption or revision of the strategic plans, without having a direct influence on the process.

26. The *Commission Nationale du Débat Public* is an independent administrative body that organizes public debates on major political projects and decisions. These public debates can either be a legal requirement (for example for large infrastructure projects) or be initiated on behalf of the government, if it considers that a particular question requires a public debate.

This might negatively affect the commitment on policy implementation in the future, taking into account that the Parliament repeatedly requested a stronger role in the process.[27]

Legal bindingness

Having a legally binding climate framework is generally considered very important to foster stability and to implement stringent accountability mechanisms for policymakers (Ecologic, 2017). This does not only apply to quantitative mid and long-term targets, the credibility of which is much improved if written in law, but also to the set-up of institutional procedures and dedicated bodies, such as the role of independent expert committees and the legal provisions that govern the elaboration and ensure the quality of the national plans.

As highlighted in sections 2.2 and 2.3, the French governance framework is extensively codified through the 2015 Energy Transition Act for Green Growth, which successfully created a legally binding governance framework, that:

- defines the binding mid- and long-term targets for the decarbonization pathway and transformation of the energy sector;
- gives clear provisions for the elaboration, monitoring and revision of the main national plans (low-carbon strategy and Multiannual Energy Plan) and specifies the carbon price trajectory until 2030;
- created the Expert Committee for the Energy Transition to provide for independent expertise on the elaboration and implementation of the national strategy.

Box 2. Assessing the legally-binding character of the French framework

Touching on the complex debate of whether legally binding target frameworks are more effective in the field of climate policy, the implementation of the French case has some interesting insights to offer. Indeed, the fact that all major elements of the climate governance framework are enshrined into a single law grants a legal value to all long-term objectives. Nevertheless, it remains yet to be seen if this legal constraint will induce additional policy pressure in practice.

Indeed, unlike a growing number of countries (mostly Anglo-Saxon with legal systems based on Common Law), legal action is rarely used by French stakeholders (such as environmental NGOs) to ensure that the State complies with its objectives. This can be explained through the specificities of the French Civil Law legal system (making it difficult to directly assign liability to the State in terms of obligation of result or means), significant resource requirements and the fact that preceding attempts have not been successful. Nevertheless, a new initiative by civil society is currently trying to build a case against the French State to pressure it to stronger climate action in the name of climate justice and historic responsibility.[28] The outcome of this initiative will be of significant importance, since it might set a precedent in terms of acknowledging the State's obligation of means and of results with regard to climate policy, making it also relevant to pressure the government on failure to comply with existing national objectives (see below).

The challenge of assessing the practical bindingness of the French legal framework can be illustrated with regard to Environment Minister Hulot's statement in November 2017, who announced unilaterally that the objective of reducing the share of nuclear energy in power generation to 50% by 2025 will be postponed (Parr, 2017). The fact that the minister made this declaration without prior consultation with the stakeholders and without awaiting the strategic revision process planned for 2018 is problematic, insofar as it negatively affects the credibility of the legal framework and value of the national targets in general.[29] Indeed, observers could now wonder whether the government will distance itself from other strategic objectives in the future, on the sole ground that their achievement is deemed difficult. Furthermore, this announcement could become a legal conundrum for the 2018 revision of the strategic plans. From a strictly legal perspective, as long as the 2015 Energy Transition Act has not been amended, the 2025 nuclear objective remains binding for the elaboration of the national strategy. Thus, if the new Multiannual Energy Plan deliberately choses to not include this objective, it would become legally challengeable by other actors (Gossement, 2017).

Adaptability

The adaptability refers to the inclusion of specific procedures that enable the timely revision of the climate governance framework itself, considering in particular the ability to increase the ambition of long-term targets in line with scientific evidence. Adaptability can be distinguished from the "monitoring, evaluation and revision" criterion (see section 3.2): the former refers to the capacity of adjusting the strategic framework itself (including

27. According to the Energy Transition Act, the government has to present the new strategy to Parliament, which it is not directly involved in its elaboration or revision, apart from the 8 MPs of the National Council on the Ecological Transition. The parliamentary reports N°3952 (July 2016) and N°4157 (October 2016) explicitly requested a formal adoption of the national strategies by the legislative branch.

28. See : notreaffaireatous.org.

29. For a more extensive analysis on the Minister's annoucement, see (Berghmans, Rüdinger, & Colombier, 2017).

the revision of targets, institutions and processes); the latter focuses on the policy implementation, that is to say the capacity to assess the effectiveness of policy measures and to strengthen or adjust them when needed.

The French governance framework displays highly relevant design features to ensure adaptability, insofar as the whole governance framework is set-up as an iterative process, with the possibility to adjust strategic milestones over time with a clear focus on ensuring the alignment with the 2050 climate target, similar to the legal framework established in the UK.

First and foremost, the 2015 energy transition act explicitly mentions the possibility to adjust long-term targets, based on the governmental review of policy implementation that precedes the revision of the Multiannual Energy Plan (every five years).

However, two important limitations must be mentioned. On the one hand, unlike the "ratchet mechanism" included in the Paris Agreement, the French law does not stipulate that targets could only be revised upwards, which represents a possible threat to the level of ambition. On the other hand, it does not specify the conditions under which targets could or should be revised, which might leave too much flexibility. If a new government simply considers that the climate agenda is no longer a priority or that the achievement of the objectives is too costly, would this be sufficient to decrease or even eliminate the target? This risk is however mitigated by the necessity of adopting a legal reform undergoing the full legislative process, given the generally high support on the urgency of the fight against climate change across all political parties.

And beyond the theoretical possibility of weakening the targets, the current policy process rather tends towards the strengthening of climate ambition: following the Paris Agreement, the 2017 French climate Plan presented by Environment Minister Hulot introduced "climate neutrality" as the new 2050 target and foresees that the 2018 revised low-carbon strategy will take into account this new objective. However, it is not clear so far whether the climate neutrality target will also be introduced in the legal framework in order to replace the legally binding objective of reducing emissions by 75% until 2050.

Secondly, the implementation of carbon budgets inspired by the UK Climate Change Act provides another mechanism to adjust the decarbonization trajectory in the short and mid terms without changing the long-term ambition. In the French case, the low-carbon strategy defines economy-wide carbon budgets for two five-year periods. The budget for the first period is mandatory to provide stability in the short term. The budget for the second period can be adjusted during the revision of the strategy (at the end of the first period), thus providing flexibility to take into account potential over- or underachievement during the initial period. Furthermore, this iterative process should enable to improve the (indicative) allocation of the carbon budgets among sectors, to reflect policy progress and external factors.

Institutional set-up

The institutional set-up of the governance framework is of key importance since it structures all the processes from the definition of targets to the elaboration and implementation of strategies, not forgetting their monitoring, evaluation and revision. The following questions can lead the assessment of the institutional set-up:

- **Diversity of structures and functions:** are all the relevant "functions" (e.g. coordination and implementation of the transition; stakeholder participation; independent monitoring and evaluation) covered within the framework? Is there a "balance of power" between institutions that allows for transparency and accountability or are all powers concentrated in the government?
- **Mandate and responsibilities:** do the different institutions and bodies have clear (and ideally legal) mandates within the governance framework, ensuring that they can influence the policy process?
- **Resources:** do the different institutions have the (mostly human and financial) resources to fulfill their function?

With regard to the French case, several key points can be highlighted. The first one concerns the increasing level of institutionalization of the climate governance framework starting with the national debate in 2012, which clearly provides a blueprint and inspiration for other countries, including the implementation of a more participative policy process through the creation of a dedicated and permanent stakeholder group (the National Council for the Ecological Transition) and the set-up of the Expert Committee responsible for providing independent expertise and monitoring.

While the French governance framework certainly checks all the boxes on paper, the devil might however be in the details. Regarding the consultation of stakeholders, the French model could be considered overly complex, with three stakeholder bodies involved in the elaboration of the national strategy and legal framework, including the National Council for the Ecologic Transition (NCET), the Economic, Social and Environmental Council, and the High Advisory Council

on Energy, the main stakeholder groups[30] being represented in each of the three. Following the maxim of "quantity rather than quality", this poses the risk of generating additional complexity and of eventually weakening the actual importance of stakeholder participation, since all three bodies have merely a consultative function.

With respect to the independent Expert Committee on the Energy Transition (ECET), the French approach seems to leave much room for improvement. It is inspired by the UK Climate Change Committee (CCC): a high-level group of experts covering different fields, in charge of providing independent opinions on all strategic documents and of elaborating regular assessments on the implementation and progress of the transition.

Nevertheless, the French Committee has neither the mandate, nor the resources of its British counterpart. While the CCC has been set up as an "executive non-departmental public body sponsored by the Department for Business, Energy and Industrial Strategy", the French ECET has no legal existence or status outside of the Energy Transition Act.[31] More problematic, in terms of mandate, the French law foresees several major monitoring and reporting responsibilities for the Expert Committee,[32] but does not specify if and how the government has to take its advice into account by any means. Last but not least, the CCC benefits of an annual resources totaling £3,5 million and a staff of 13 employees (not including the Committee members) against zero financial support for the French Committee, all experts working as volunteers on their own time (CCC, 2017). The combination of lack of a clear mandate (in terms of direct impact on the policy process) and absence of resources thus greatly weakens the importance of an institution that would otherwise have a great importance and potential in enhancing the effectiveness of the French climate governance framework.

30. Unions and industry federations, civil society (environmental NGOs, consumer associations), political representatives.

31. The French Expert Committee does *de facto* not exist as a formal institution: it has no legal person, no physical address, no specific budget. The only formality pertains to the fact that its members are designed by a decree.

32. The ECET is responsible for providing an expert review on: the drafts of the National Low-Carbon Strategy and Multiannual Energy Plan (every five years); a review assessing the implementation and achievement of the national carbon budgets (every five years); a review of the implementation of the Multiannual Energy Plan s (for Metropolitan France and all oversea territories); a synthesis of the regional energy and climate strategies (every five years).

3.2. Effectiveness in driving the process of long-term decarbonization

Quality of long-term objectives

The French governance framework stands out as a good practice example insofar as it presents a good level of ambition, legal bindingness and relevant milestones and supporting targets. The French headline objective of dividing greenhouse gas emissions by a "factor 4" until 2050 has been legally binding since 2005 and is supported by the 2020 and 2030 milestones and the implementation of binding carbon budgets. In terms of ambition, the governmental pledge to achieve climate neutrality by 2050 in accordance with the Paris Agreement is an encouraging sign, even though it still requires clarification (in terms of scope, integration of sinks and offsets) and a legal basis for implementation. In this regard, it will be interesting to see whether the inclusion of the climate neutrality objective in the upcoming revision of the National Low-Carbon Strategy will trigger a debate on adjusting the trajectory and strengthening the milestones (notably for 2030).

Aiming to achieve a wider low-carbon energy transition, the French framework includes multiple supporting objectives focusing on the reduction of energy demand and diversification of energy supply (see Erreur : source de la référence non trouvée). As noted previously, these objectives are crucial to improve credibility and establish a detailed decarbonization trajectory to measure policy progress over time.

Nevertheless, as stated in section 2.2, two weaknesses of the French target framework can be highlighted. The first refers to the very energy-centric focus of the Energy Transition Act, which fails to address other key sectors for climate policy, such as agriculture. While this could be deemed a minor omission at first sight, addressing all economic sectors will be essential to reach climate neutrality by 2050. The second challenge refers to the lack of visibility on the drivers for decarbonization beyond 2030, given that the only supporting objective informing the trajectory beyond that horizon is the reduction target for final energy consumption (-50% by 2050).

Policy impact

As stated in the recent Ecologic report on climate governance, "*Any long-term objective is ultimately only a declaration of intent, unless backed with measures to create implementation action*" (Ecologic, 2017). The French case provides some valuable lessons in this regard. Indeed, beyond the definition of targets, the French Energy Transition Act

also specifies some of the key policy tools to implement the transition:

- The first one refers to the implementation of an economy-wide carbon tax as a central policy instrument, including the legal definition of a clear pricing trajectory until 2030.[33]
- The second refers to the regular elaboration of policy action plans (the National Low-Carbon Strategy and the Multiannual Energy Plan) in line with the targets, including regular reviewing and evaluation (see section 2.3).

Considering that the first strategic plans have only been published at the end of 2015 (for the NLCS) and 2016 (the MEP), it remains difficult to assess their concrete impact in terms of policy implementation. Nevertheless, the reviews of the 2016 Multiannual Energy Plan provided by the Expert Committee and the National Council for the Ecological Transition have both identified the same structural weaknesses (ECET, 2016; NCET, 2016):

- While the division into sector-specific chapters (energy supply, demand, mobility, infrastructure, etc.) is useful to provide additional detail, the different items appear to be disconnected from each other and do not provide a comprehensive strategic vision of the trajectory for the energy system as a whole.[34] This point appears to be critical, since the whole idea behind the elaboration of the MEP was to provide a holistic vision of the transition towards a low-carbon energy system.
- Even though the MEP contains both an overview of all relevant targets (2020 and 2030) and an inventory of existing policy measures, it does not connect the dots. Indeed, the first version of the strategic plan does not provide an assessment of the potential "implementation gap", i.e. identifying whether the impact of existing policy instruments is sufficient to meet the targets or if additional instruments are needed. This weakness is particularly apparent for the achievement of the nuclear power target for 2025 (for which no policy measures have been identified) and for the objectives and measures focusing on energy efficiency, for which the identification of measures appears as a simple catalogue, without further evaluation of their implementation and potential impacts.

While the latter point can be partly resolved through the upcoming evaluation and revision process (see next section), the former represents a more structural challenge for the elaboration of the strategic plans and highlights the importance of combining different modelling tools (elaboration of a comprehensive prospective pathway and assessment of potential impacts and implementation challenges regarding key policy instruments) to provide a clear and coherent action plan.

Implementation stringency: "Mind the gap"

Because of uncertainties linked to its extensive time horizon and the complexity of the low-carbon transition, the implementation of a national climate governance framework must be considered as an iterative learning process. Hence, the monitoring and revision process is a core element of the French governance framework, which foresees a comprehensive procedure for the monitoring and revision of the low-carbon strategy and the Multiannual Energy Plan every five years.

However, several key challenges can be identified with regard to the actual implementation of the monitoring processes. The first one is related to the complexity deriving from the multiplication of various and often overlapping monitoring processes in France, as illustrated in Table 3.

Even though the multiplication of procedures can be an advantage to establish a "permanent" monitoring process, it bears the risk of increasing general confusion and diminishing the overall quality (due to the massive workload) and attention granted to their publication.

As becomes apparent from this listing, a second issue is related to the fact that the National Low-Carbon Strategy and Multiannual Energy Plan are monitored in separate processes, even though they are largely overlapping with regard to the transition in the energy sector. A more streamlined general monitoring framework integrating the main indicators for both strategic plans might provide a clearer and more coherent approach.

A third important question is related to the evaluation method itself, as can be illustrated through the first evaluation published by the French government on the National Low-Carbon Strategy.[35]

33. Even though the Energy Transition Act defines a price trajectory with a 2020 and 2030 value, it has to be pointed out that the actual level of the carbon tax must be confirmed annually through the budget law, thus leaving some uncertainty on policy implementation.

34. As an example, within the Multiannual Energy Plan two scenarios are used to represent the impact of energy efficiency measures on future energy demand (one of which is compatible with the national objectives). However, the transformation of the energy supply (and in particular power generation) is based on different assumptions in terms of energy demand (which are not in line with energy efficiency targets), thus creating further incoherencies.

35. The first evaluation report has been published in January 2018 : https://www.ecologique-solidaire.gouv.fr/suivi-strategie-nationale-bas-carbone

Although containing over 120 result indicators, the evaluation of the policy measures is limited to assessing if (yes or no) specific policy measures have been implemented for a given recommendation included in the strategy, without providing information on the actual impact of these measures, thus greatly reducing its scope in terms of identifying potential implementation gaps.

Table 3. Inventory of main monitoring reports on climate policy in France

Monitoring Report	Frequency	Author	Comments
Progress report on the fight against climate change	Annual	Government	Annex to the annual budget law
Progress review of the MEP based on quantitative indicators	Annual	Government	Presented to the NCET
Synthesis progress report on NLCS	2 years	Government	Submitted to NCET, ECET, Advisory Energy Council
Synthesis progress report on MEP	2 years	Government	Submitted to NCET, ECET, Advisory Energy Council
Complete evaluation report with indicators and policy assessment – NLCS	5 years	Government	Basis for revision of the NLCS
Complete evaluation report with indicators and policy assessment – MEP	5 years	Government	Submitted to Parliament
Assessment on implementation of carbon budgets and current NLCS	5 years	Expert Committee	
Review of the NLCS evaluation report produced by the government	5 years	Expert Committee	
Review of the MEP evaluation report produced by the government	5 years	Expert Committee	Not clear if independent from government evaluation or as an "opinion" building on official report
Synthesis report on regional climate strategies	5 years	Expert Committee	As part of evaluation of the MEP
Review on the revision draft of the MEP and the NLCS	5 years	Expert Committee	Before final adoption of the new MEP / NLCS

Source: IDDRI

Furthermore, the French case highlights the challenges of structuring and streamlining the different components (monitoring, evaluation, revision) within the process. Indeed, an effective workflow would require a chronological sequence where the monitoring process results in a progress report and detailed assessment of implementation gaps that feeds the discussion on possible adjustments for the revision of the strategy and policy measures. In this regard, the fact that both the evaluation and revision processes have been started simultaneously by the French administration raises some doubts in terms of interaction and effectiveness of the process, further adding to the complexity outlined above.

Last but not least, despite its importance for improving transparency and accountability, the effectiveness of the role of the Expert Committee in the monitoring process remains uncertain. Unlike the UK, where the Committee for Climate Change is clearly in charge of producing the monitoring reports and providing a "call for action" for the government, the mandate is less clear in the French case. Indeed, the public administration remains the main responsible for all reporting activities, with the Expert Committee either producing its own report in parallel or submitting a "review" of the official report. Taking into account the resource constraints of the French Expert Committee (see section 3.1), this clearly diminishes the potential role of independent expertise in the process, in the absence of clear rules detailing how the government has to take into account the recommendations outlined by the Expert Committee.

The 2018 revision of the strategic plans will be the first of their kind, which means that this is still a learning process on its own. While this might be considered overly complex, it thus appears crucial to include an assessment of the monitoring and revision process itself, in order to evaluate its effectiveness with regard to policy compliance. Beyond the case of France, this appears as one of the key structural challenges of designing an effective national climate governance framework

Multi-level governance of the transition

Despite its historically centralized governance structures, the French institutional system has devolved new competences on energy and climate to regional and local authorities (Izard, 2016). Indeed, all of the 13 regions in continental France (and all municipalities above 50,000 inhabitants) have to elaborate their own climate and energy strategies, including specific objectives and measures on GHG emissions, energy efficiency and the deployment of renewables. Furthermore, many regions and local entities are taking ownership of this transition through the implementation of local policies and projects (Energy Cities, 2017). While this certainly provides a stimulus for the effective

implementation of the low-carbon transition, it also generates new challenges regarding the articulation between different governance levels.

This is particularly obvious with regard to the elaboration of the different climate strategies, which are currently missing clear coordination mechanisms. On the one hand, the national framework (NLCS and MEP) does not explicitly address the challenge of regional and local implementation of the low-carbon transition, despite its importance for improving national policies based on local feedback on implementation. On the other hand, even though the regional strategies have to be "compatible" with the national strategy, there is no explicit mechanism for coordination or effort sharing, be it with the national process or among the regions themselves. One illustration of this lack of coordination can be drawn from the observation that the sum of the regional targets for the deployment of renewable energy capacities (wind and solar) until 2020 equals almost the double of the national objective, while the aggregation of energy efficiency targets and efforts could well fall short of the ambitious national objectives.

While the issue of multi-level climate governance is generally addressed through the national-global nexus, the French case shows that the coordination between national and local strategies and policy implementation will become increasingly important in the future, in order to fully take advantage of the uptake of climate initiatives at the local level.

A second major challenge, which is not specific to France but relevant for the European Union as a whole, touches upon the interactions between the national low-carbon strategies and the European governance framework, which is currently undergoing reform.

A significant risk in this regard is related to the scope of the "National Energy and Climate Plans" (NECP) the Member States will have to transmit to the European Commission. Indeed, the perimeter of the NCEP might present two major risks with regard to establishing a comprehensive low-carbon strategy in line with the Paris Agreement.

First, one could identify the issue of temporality: the EU requirements (as currently discussed) set a time-horizon of 10 years (2030) for the future NECPs, omitting the importance of defining ambitious targets for 2050 in order to design a coherent decarbonization pathway. A similar case can be made with regard to the existing reporting requirements under the EU Effort Sharing Regulation, which requires the development of 10-15 year projections with different packages of measures. While obviously both discussions—on short to mid-term measures and on the broader enabling conditions for deep decarbonization until 2050—are essential, the challenge will be about striking the right balance. The EU process can certainly be helpful to ensure effective implementation in the short to mid terms (2020 and 2030), but it should do so while encouraging countries to maintain coherency with their long-term decarbonization targets, especially in the case of countries which already have ambitious 2050 plans. Thus, a more mixed focus between short (2030) and long-term (2050) targets in EU approaches to planning and reporting on policies, measures and projections could be helpful in this regard.

Secondly, in terms of substance. The NECPs will be structured around the five pillars of the Energy Union,[36] bearing the risk of not providing a comprehensive economy-wide decarbonization strategy covering all items and sectors. Looking again at compatibility issues with the Paris Agreement and the ambition of reaching net-zero emissions by 2050, this approach might bear the risk of restraining the scope to the energy sector alone, leaving behind other key sectors for deep decarbonization such as agriculture and waste.

This does not mean that the EU climate and energy policy does not have any added value for France or other ambitious Member States. On the contrary, the EU energy and climate package has been a catalyzer of policy evolution in France by the past, both in terms of target-setting and policy implementation, be it on renewable energies, energy efficiency or the elaboration of national energy plans. Nevertheless, the issues outlined above demonstrate the need to integrate the evolution of the national frameworks into the EU governance approach to ensure that it provides real added value for the Member States and equally, to prepare a European approach that includes a vision for deep decarbonization up to 2050.

4. CONCLUSION: LESSONS FROM THE FRENCH CASE STUDY

Based on the 2015 Energy Transition Law for Green Growth, France has become a "world leader" in designing an effective national climate governance framework, as stated by the International Energy Agency (IEA, 2017), a judgement that has later been confirmed by the WWF, placing France ahead of all other EU countries in its report on the assessment of EU low-carbon development strategies (WWF, 2017).

36. Security of supply, integration of the internal energy market, energy efficiency, emission reductions, research and innovation.

Beyond the description of the French climate framework, this study attempted to provide a more comprehensive evaluation of the French climate governance framework through the addition of two key research questions. Firstly, by taking into account the political context factors in order to understand how the evolution of the policy debate enabled and shaped the adoption of the new legal framework. And secondly, through a first attempt to "look behind the curtains" in order to identify key implementation and design challenges within the climate governance framework which are not necessarily apparent when assessing the strategic framework on paper.

While the results are obviously strongly linked to the specific circumstances and national context, various key insights can be drawn from the French experience, with regard to the policy process and the design of a robust and effective climate governance framework:

Identifying and creating windows of opportunity
Even though the climate agenda had received relatively small attention until then, France managed to develop an extensive climate governance framework quickly. This clearly illustrates the importance of recognizing or creating political windows of opportunity. In the French case, what started as a political debate on the future of nuclear energy in the wake of the Fukushima accident eventually became the catalyzer of a comprehensive debate on the establishment of a strategic vision for a low-carbon future, thanks to the political capital and commitment invested by stakeholders and policymakers.

Another key insight of the French debate which might relate to a lot of countries reposes on the treatment of core conflicts, that threaten to overthrow the whole process. Even though the debate itself did not manage to solve this conflict (on nuclear in the French case), it helped to objectivize it through the integration of independent expertise and most importantly, managed to build a common vision on the long-term climate objective despite this dissent, thus illustrating that a long-term vision can both foster ambition and remain sufficiently flexible to accommodate such conflicts.

Strengthening stakeholder participation through dedicated institutions
If one key element stands out as a factor of success in the French case, it certainly is the organization of the 2013 national energy transition debate, which provided the foundation of a new way of elaborating climate and energy policies with significantly higher transparency and commitment resulting from the continuous involvement of stakeholders and independent experts through dedicated institutions.

Building on this experience, the set-up of new dedicated institutions such as the National Council for the Ecological Transition and the Expert Committee for the Energy Transition represented a key step to ensure that stakeholder participation and independent expertise would be associated at all levels (adoption of the laws, elaboration and revision of the strategies) on a permanent basis.

Foster commitment through an integrated political narrative: benefits and equity
Even though this was not obvious from the start, the French debate managed to build a collective understanding and narrative on the economic and social benefits of the low-carbon transition, indispensable to bring along key stakeholders and policymakers. In the French case, the transparent dialogue on energy scenarios and the use of integrated modelling tools to assess economic and social benefits were key in this regard.

This also highlights the importance of establishing an agenda on the just transition to deal with potential social conflicts arising in the process of transformation. Providing a clear vision on how this process will benefit all actors is key in this regard, as is the elaboration of transition strategies (and possibly compensation schemes) for economic sectors that are threatened by the low-carbon transition.

The need for an overarching climate framework
A key lesson that can be drawn from the French experience relates to the challenge of building a genuinely complete climate framework, with two important caveats: firstly, the need to establish a strategy that addresses not only the energy sector, but provides a clear decarbonization pathway for the economy as a whole. And secondly, the importance of going beyond the definition of targets alone: the French Energy Transition Law can undoubtedly be considered a best-practice example in this regard, insofar as it addresses all the key features for a robust and effective climate governance into a comprehensive legal framework, including not only the targets but also the governance processes required to elaborate, implement and adjust the low-carbon strategy over time.

Ensuring the right level of ambition
Legally binding long-term targets are a key ingredient to build effective climate governance and implement coherent policy measures in the shorter term. In this regard, the French experience shows the importance of establishing a science-based target framework that remains adaptive over time.

In this regard, the revision of the French long-term objective (initially a 75% reduction of GHG emissions) to achieve climate neutrality by 2050 illustrates how the "ratchet effect" introduced by the Paris Agreement can effectively be implemented on the national level.

Ensuring compliance: addressing the implementation gap

Albeit being essential to avoid ending up with paper tigers, clear compliance mechanisms often represent a weakness of climate governance frameworks. In the absence of sanctions, compliance relies heavily on two key components: the *quality* of monitoring and evaluation reports (i.e. their ability to clearly identify implementation gaps linked to specific policy measures or absence thereof) and the transparency of the process (i.e. involvement of stakeholders and independent experts) which increases accountability for the government.

Independent expert committees: the importance of mandates and resources

While setting-up dedicated institutions is an essential first step, the French experience illustrates the importance of providing them with specific mandates and dedicated resources, as illustrated with the case of the French Expert Committee for the Energy Transition. Despite being inspired by the UK Climate Change Committee, the French committee has not been able to fulfil the same role, given that the framework does not endow it with a proper mandate in terms of independency and counter-power (i.e. if and how the government has to respond to its reports) and does not provide any financial resources to fulfil its work.

Reduce complexity to streamline the policy process

Although being very complete and detailed, the French governance framework might be considered excessively complex on some aspects, such as the number of (partly overlapping) stakeholder bodies involved in all processes and the multiplication of monitoring reports. This highlights the importance of conceiving streamlined governance processes, particularly to allow for a comprehensive and yet transparent monitoring activities.

While this is true for France on the national level, the importance of this challenge increases when also taking into account the European governance framework. In this regard, it will be essential to ensure that the EU governance regulations avoid duplication of strategic plans and rather provide a platform of progressive harmonization between national climate and energy plans, in order to disseminate best practices and enhance transparency on monitoring and evaluation.

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