

# THE FRENCH LOW CARBON 2050 STRATEGY: AN ITERATIVE POLICY PROCESS WITH HIGH STAKEHOLDER ENGAGEMENT

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Suggested Citation: Colombier, Michel. 2018. "The French Low Carbon 2050 Strategy: An Iterative Policy Process with High Stakeholder Engagement" Case Study. Washington, DC: Long Term Strategies Project. Available online at [www.longtermstrategies.org/french-2050-strategy](http://www.longtermstrategies.org/french-2050-strategy).

## CONTEXT SETTING FOR LONG-TERM STRATEGY DEVELOPMENT

After the Rio de Janeiro Earth Summit in 1992, the French government created a task force on the greenhouse effect (Mission effet de serre, MIES) attached to the prime minister's office. The objective of the MIES was twofold: to prepare France's diplomatic engagement in the United Nations Framework Convention on Climate Change (UNFCCC) and to develop a domestic policy package. France is determined to provide leadership, together with Germany and the United Kingdom, in international and European climate discussions. In the first years of its existence, the MIES has had more impact on France's diplomatic position vis-à-vis the G77 and the United States than on domestic climate change policy. But as we will see, it also has led the European Union (and France) to develop global scenario analyses questioning the adequacy of the Rio target (stabilization of emissions for the industrialized countries) to respond to the evolving scientific diagnosis and simultaneously to the development aspirations of most of the world's population. The idea that "eventually, emissions would need to be cut dramatically" started to be openly discussed beyond academics and nongovernmental organizations (NGOs) by experts from the public sector.

Since the early 2000s, the MIES has developed climate mitigation and adaptation strategies at the national level. These strategies, which also take into account France's responsibility and commitments at the European level, had a medium-term focus consistent with the European framework (originally 2020). The climate policy debate, then, is mostly focused on implementation of the Kyoto target, and within Europe on short-term burden-sharing issues. In this context, France sees itself as a "front-runner" country. Indeed, its CO<sub>2</sub> energy emissions are just above five tons per capita, at the lower end of countries in the Organisation for Economic Co-operation and Development (OECD), while other greenhouse gas (GHG) emissions are about average. One reason for this difference is France's power system, which relies largely on nuclear (80%) and hydropower (10%).

The decision during the period 2013–15 to develop a longer-term (2050) low carbon strategy responds to a very specific context, both domestically and internationally:

# CONTENTS

Context Setting for Long-Term Strategy Development .....	1
Institutional Arrangements and Public Participation .....	2
Setting Emissions Reduction Targets in the Long-Term Strategy .....	4
Modeling/Scenario Building .....	5
Sector- and Gas- Specific Pathways .....	7
Key Political Debates Related to Climate Policy in France .....	8
Governance Issues .....	9
Using the Strategy to Inform Short-Term Planning, Implementing the Long-Term Strategy .....	9
Lessons Learned .....	10

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- a. A new *quinquennat*, the five-year presidential term of François Hollande (2012–17) following a campaign in which French nuclear energy strategy was at stake for the first time, in the aftermath of the Fukushima disaster and the German decision to phase out nuclear power.
  - b. A growing domestic tension between the expectations created during the presidency of Nicolas Sarkozy (2007–12) by the “Grenelle” stakeholder consultation process on the environment, which concluded with ambitious announcements that many NGOs and scientists felt were betrayed by its implementation.
  - c. The decision to host the COP21 in Paris.

Beyond its contribution to stabilizing climate change, nuclear power is also considered by many a centerpiece of France’s industrial performance, ensuring both low-cost electricity and a leading global position in the field. Although historically contested by environmental groups, and progressively by a growing number of experts, including the Cour des comptes (the agency that audits French public spending), this position remained unchallenged by the main political parties until Fukushima. During the presidential campaign of 2012, candidate Hollande countered both right-wing competitors (who favored the status quo) and some socialist leaders (who favored a total phaseout of nuclear capacities) by suggesting that France should reduce the nuclear share in its energy mix

from 80 percent to 50 percent and increase proportionally the contribution of renewables.

At the same time, the economic crisis and the unexpected surge of shale gas in the United States fueled growing discontent by major European businesses and a call for more “pragmatic” environmental policies. Meanwhile, environmental NGOs and some (mostly local) political leaders started campaigning in favor of a new mobilization on climate, in reaction to the disappointing outcome of the 2009 UN Climate Summit in Copenhagen and declining ambitions at both the French and European levels. In this context, soon after the election, President Hollande and the Socialist-Green coalition government committed to organizing a yearlong “national debate” on the future of energy (Débat national sur la transition énergétique, DNTE). The aim was to inform the preparation of the new Law on the Energy Transition for Green Growth (Loi relative à la transition énergétique pour la croissance verte, LTECV).

Since the late 1970s, energy planning in France has taken into account both supply and demand, from building efficiency to city planning, urban mobility, long-distance transport, and agriculture and intensive industry developments. Biomass, forestry, or waste management (because of their potential contribution on the supply side), and more recently material recycling, are also included in the scope. Basically, the difference with the current “climate-focused” approach is limited to some “non-CO<sub>2</sub>”-related activities (farming and breeding; hydrofluorocarbons; and land use, land-use change, and forestry, or LULUCF). The “energy transition” aspect of the debate was therefore intimately intertwined with its “climate and green growth” aspect, as well as with the decarbonization objective. Consequently, the LTECV adopted in mid-2015 mandated that the government prepare, publish, and implement a long-term (2050) low carbon strategic document, the National Low-Carbon Strategy (Stratégie nationale bas carbone, SNBC). The first SNBC was adopted just before the Paris COP21 negotiations began. The law also establishes a medium-term energy planning instrument, whose provisions must respect the SNBC objectives.

Understanding the genesis of the French long-term low carbon strategy therefore requires that we examine

1. the consultation leading to the drafting of the LTECV, during which the long-term vision was built through a high-level political process and strong engagement by stakeholders; and
2. the more technical preparation of the SNBC, published in 2015 and communicated to the UNFCCC in 2016, as well as the corresponding Multiyear Energy Investment Planning instrument (Programmation pluriannuelle de l’énergie, PPE).

## INSTITUTIONAL ARRANGEMENTS AND PUBLIC PARTICIPATION

The institutional arrangements adopted for the DNTE consultation built on the Grenelle process organized under the Sarkozy administration. A new consultative process was launched in the fall of 2012, involving all relevant stakeholders at the national level in an ad hoc Council for the Energy Transition (Conseil national de la transition écologique, CNTE). The CNTE included representatives from business (large and small firms in all economic sectors); trade unions; environment, social, and consumer NGOs; members of National Assembly and Senate, as well as subnational (regional and municipal) authorities. This plenary (which included more than 130 representatives) held monthly meetings chaired by the environment minister to discuss views, analyze options, and adopt recommendations. Although the consultation process, and later the preparation of a draft law, was clearly the responsibility of the ministry in charge of energy and the environment, the agriculture and finance ministries were also deeply involved. The plenary was then subdivided into working groups charged with drafting specific reports (on evolution of the energy mix; energy efficiency strategy; issues specific to renewal energy sources, or RESs; finance; the role of local authorities; etc.), each cochaired by a business and an NGO representative.

The plenary and working groups were supported by a group of independent experts (mostly academics), with two lead experts per working group charged with assisting the cochaairs in preparing discussions, providing original analysis and data, and drafting the reports. The first draft reports were submitted to the working group representatives for discussion and amendment. The final version edited by the cochaairs was submitted to the plenary. These reports did not achieve consensus (or compromise) on all issues; disagreements were reported, analyzed, and discussed, recognizing that final policy decisions would be the responsibility of the minister.

The government intention was simultaneously to expand the debate deeper in the society. A dedicated website, reference documents,<sup>1</sup> and communication tools were made available to support initiatives at all levels: more than a thousand debate sessions were autonomously organized by local authorities, businesses, NGOs, and even citizens. This led not only to rich, relevant, and lively discussions (although often confined to a “niche market” of concerned citizens and experts) but also to a rather confusing bottom-up process in which the reporting and synthesis of so much information proved challenging. Nevertheless, this national process has generated new interest and lasting engagement on issues such as energy poverty, protection of agricultural land, shared and circular economy experiences,

and the design of adapted financing tools. This process also has reinforced the legitimacy of local authorities to put forward their own agenda, covering for instance local economic development and jobs, quality of life in cities or rural areas, social cohesion, energy poverty, biodiversity, and citizen participation. This has contributed to greater emphasis on frequently underestimated criteria, and the possible cobenefit of the transition, as opposed to more traditional factors (cost of energy, CO<sub>2</sub> emissions, energy security, etc.).

The whole process (CNTE stakeholder consultation and national debate) was not organized by the ministry: instead, the minister nominated an independent steering committee (five members from business, academia, and civil society, selected after stakeholder consultation to ensure diversity of views) supported by an ad hoc secretariat of about 20 people hired specifically for the project, and a specific budget. In addition, a citizens group was convened to advise on the organization, the hierarchy of issues, as well as the approach and even wording of the public documents.

The report for the minister, including all the individual working group reports, produced not a univocal vision of the long-term strategy but rather a set of possible strategies and respective analyses of benefits, difficulties, and possible controversies among stakeholders. But the process itself, de facto, reinforced some options (including the importance of energy efficiency and in particular the need to invest massively in building retrofit, the rebalancing of the generation mix, and a moratorium on shale gas production) despite the strong opposition of some CNTE representatives.<sup>2</sup>

The production of a draft Energy Transition and Sustainable Development law by the government, and the discussion in the National Assembly and the Senate took another year, with the LETCV finally being adopted in the summer of 2015. The CNTE was maintained and consulted on the successive draft versions of the law. Although consultative, this open process allowed all stakeholders to monitor and transparently influence the translation of the DNTE consultation process and its recommendations into the legal document. As members of the CNTE, deputies and senators could also benefit from the exchanges to better understand the positions and possible disagreements among stakeholders on key issues.

The law defines a series of policy objectives and overarching targets in both the medium (2025–30) and long term (2050), framing the climate and energy transition according to the outcome of the debate (see Section 5 for details). But more important, it establishes new procedures to translate these objectives into actual strategic documents, and then policy action.

As I noted in Section 1, these procedures rely on two strategic documents:

- a. The long-term strategy (SNBC): covering all gases and all sectors, it provides scenario analysis up to 2050, establishes GHG budgets, and defines sectoral and cross-cutting strategic orientations and policy options to deliver the LTCEV 2050 targets. The SNBC budget and policy provisions are structured in five-year periods (the first document issued in 2015 covered 2015–18, 2019–23, and 2024–28) and will be revised and expanded every five years.
- b. The energy planning instrument (PPE): the first document was also issued in 2015, covering 2015–18 and 2019–23. It also will be revised and expanded every five years.

Exceptionally, the first period was limited to three years and the revision process for both documents started in September 2018. Revised documents are expected in early 2019: the SNBC 2 will be expanded up to 2033 and the PPE up to 2028.

According to French law, these documents are government decrees and prescriptive for the government and its administration. In particular, any new regulation and public action is supposed to be consistent with the SNBC strategy, or must at least show that it has no negative impact. Likewise, the strategy must be taken into account by local authorities in their planning documents, investment decisions, and administrative acts. The strategy is certainly not prescriptive for citizens or private entities, but it does aim to inform them of the government's general long-term intention so they can make decisions accordingly. It reduces policy risk for the private sector, and the risk of lock-in from a public perspective. The PPE serves as a legal basis for the commissioning of new generation, transport, or distribution capacity in the energy sector, and especially for the design and dimensioning of RES support schemes and the organization of calls for bids.

In terms of institutions, the LTECV institutionalizes the consultative CNTE. This now permanent committee has a double consultative mandate:

1. **Develop and revise the SNBC and PPE strategic documents.** The production of these two documents and their revisions every five years is the responsibility of the government (environment ministry and agriculture ministry) and includes a stakeholder consultation process involving the same groups as before. Working groups are invited to discuss assumptions and scenarios and evaluate previous action. The national committee (CNTE) then discusses the government draft. Prior to adoption, a revised version is posted online for public consultation.

2. **Monitor and evaluate the implementation of the law and of the climate and energy strategies.** A monitoring framework has been designed and will be informed by the administration based on national statistical data, and then submitted for consultation. It covers all targets, recommendations, and policy options mentioned in the law and its subsequent documents. Conclusions will be public and inform the successive revisions of the documents. A financial report, assessing the public budget impact of implementation, is also submitted to the National Assembly every year.

The LTECV also establishes an independent committee of experts, Comité d'experts pour la Transition Énergétique (CETE), composed of 10 members nominated by the minister. The committee reports to the minister on the determination of the carbon budgets, evaluates the draft documents produced and revised in the implementation of the law (namely, the SNBC and PPE) and submits an evaluation report on implementation of the low carbon strategy and compliance with carbon budgets at the end of each five-year period, prior to revision. Committee reports are public, available on the ministry website and attached to all documents submitted for public consultation.

## SETTING EMISSIONS REDUCTION TARGETS IN THE LONG-TERM STRATEGY

Key elements of the French climate objective for 2050 have been in place since the early 2000s. In the late 1990s, most domestic effort was still dedicated to defining short-term action, and to negotiating an appropriate European governance framework. But in 2003, President Jacques Chirac mentioned for the first time the objective of a “factor 4” division (F4, or -75%) of GHGs emissions by 2050. In February 2003, at the 20th meeting of the Intergovernmental Panel on Climate Change (IPCC), Prime Minister Jean-Pierre Raffarin expressed the proposition in the following terms: “We know that we need to cut GHG emissions by a factor 2 at the global level. For France, this means a division by 4 to 5; according to the ‘common but differentiated responsibility’ principle, we shall take the lead.”

This long-term target was thus clearly introduced as a “top-down, science-informed” objective, reflecting at the same time France's own assessment of a fair contribution, considering the 450 parts per million compatible global emissions pathways reported by the IPCC at the time and the capacity of industrialized countries to cut emissions. The figure itself (-75%), already popular among French experts, is the translation to France of the -80 percent target then debated (but not yet adopted) at the European level, taking into account the



lower initial level of France's GHG emissions compared to its neighbors'. A couple of nonofficial scenario exercises had already investigated possible avenues to deliver such ambitious transformations at the national level;<sup>3</sup> defining a -75 percent objective was certainly not, at the time, purely wishful thinking.

The F4 objective, covering all domestic GHGs, was later incorporated into the Sustainable Development National Strategy and, in 2005, into the law. In 2008, a public commission was formed to determine the "social value of carbon" that would be compatible with the climate ambition. The Commission Quinet proposed a rising cost trajectory, reaching 100€/ton of carbon in 2030. It was meant as a shadow price of carbon for public investment (transport infrastructure) and a benchmark for the design of public policies (including fiscal policy). Yet for the following decade, the F4 objective remained an aspirational target and failed to effectively influence the country's strategy, let alone its short-term policy design. One major reason lies in the lack of a more short-/medium-term translation of what such a long-term objective would actually imply. The 2013 consultation was launched with a clear statement that the "factor 4" target was a starting point, and this was not openly contested within the CNTE. The shared understanding was that the objective of the process was to operationalize the target, not to reopen the discussion on the appropriateness of the figure. This political consensus was nevertheless fragile. When the discussion became more explicit and quantitative, it became clear that this unanimity was also grounded on misunderstandings about the respective contributions to be expected from the energy sector and from other sectors (especially agriculture and LULUCF activities). Scenario analysis revealed that the "all gases, -75 percent" objective was to be translated into a rather more stringent objective for the energy sector than initially expected, given the difficulty of delivering anything beyond -50 percent in the other sectors.

It is also worth noting, however, that this objective derives from the IPCC third assessment report and subsequent EU scenario analyses prepared to frame the EU domestic and diplomatic climate strategy. It may not align with the most recent scientific assessments and the Paris Agreement objectives set in Articles 2 and 4. After the 2017 presidential election, the new government clearly expressed its will to incorporate a more ambitious "2050 carbon neutral" objective into the current revision process of the SNBC.<sup>4</sup> "Neutrality" is not fully defined yet, but official declarations have already confirmed that it would be "all gases, whole economy," and that only full neutrality (without offsets) in the second half of the century would be compatible with the Paris objective. Still, the use of offsets in the coming decades, the role of carbon capture and sequestration technologies, and the potential for soil sequestration are among the options that the

new SNBC exercise will discuss during 2018.

## MODELING/SCENARIO BUILDING

On the basis of a "-75 percent GHGs by 2050" target, the 2012–13 consultation opened with the following question: What possible pathways can be envisaged to meet those objectives, and how can we analyze the benefits, difficulties, and risks attached to each option? The administration did not produce a specific scenario, except the 2030 trend analysis (based on existing policies) that European countries need to inform for reporting purposes. But a number of stakeholders developed their own scenarios to support their views: altogether the process was fed by 11 independent exercises and more than 20 scenarios, with some exercises testing alternative options. The origin of scenarios was very diversified, as they were supplied by NGOs, academia, transmission system operators (TSOs), state agencies, and the private sector. Obviously these scenarios had been developed using extremely different tools (from simple calculators to computable general equilibrium models) and assumptions, at first creating confusion and some distrust. But, with the support of the group of experts, scenario developers were invited to report assumptions and output in a common, transparent, and user-friendly dashboard, making it possible to have an informed discussion of the diverse propositions, but more interestingly of the assumptions. This was extremely useful as it allowed us collectively to better understand where choices were really at stake, as opposed to possible bifurcations due to uncertainty on parameters. On the latter, one has no choice but to gamble: you need a robust strategy, plus an approach that will reveal more information with time. For example, in the adopted strategy, France has decided to reinforce its building renovation policy. The choice was made based on assumptions, backed by project analyses, that it was economically viable and could provide various benefits. The annual number of retrofits assumed in the strategy is simultaneously a policy objective and an uncertain, highly controversial parameter (some stakeholders considering that it is not feasible). Yet supply options depend on that parameter, as it defines the level of final energy in the sector. As a consequence, it needs to be closely monitored, and the strategy updated if necessary.

On this basis, the lead experts conducted a deeper cross-evaluation of these more than 20 scenarios. This meta-analysis demonstrated that structural, political choices and strategies could be organized considering four alternative and consistent pathways (see Figure 1), each characterized by a set of specific options for the government, and leading the energy system to rather different evolutions (all of them capable of meeting the climate objective).<sup>5</sup> This exercise provided the CNTE with the

following:

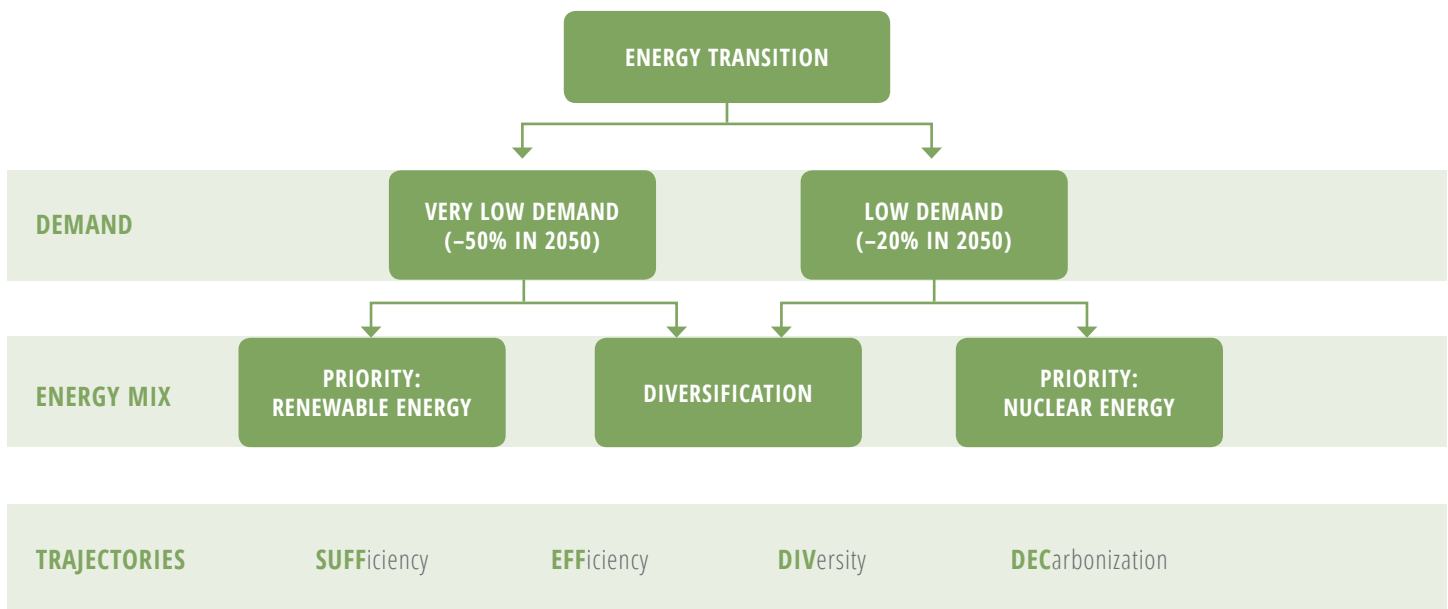
- ◆ A much clearer picture about where important decisions needed to be made, and how these decisions connected with each other to build coherent and robust pathways.
- ◆ The capacity to figure out what type of energy system could be developed, and of the critical time frames attached to each pathway: this facilitated the discussion with engineering experts, on the one hand, and the nonexpert communities, on the other.
- ◆ The capacity to undertake impact analysis on issues such as finance needs, biodiversity benefits or risk, and energy bill impact. In particular, each pathway was quantified in terms of annual investment needs for the different sectors of the economy, and consequences for the country’s balance of payments.
- ◆ The capacity to summarize each pathway with a small number of key indicators on long- and medium-term evolution. The exercise provided milestones for the future law regarding the progressive reduction of fossil fuel consumption and nuclear capacity, the development of renewables, the increasing share of electricity, heat, and decarbonized gas in the final energy balance, and the priority to be given to end-use energy efficiency.

As I have indicated, the consultation did not explicitly conclude in favor of one pathway in its final report; instead it

acknowledged the ongoing controversies among stakeholders. But the 2015 LTECV certainly did favor a pathway. Most of its targets are aligned with the Efficiency Pathway (EFF), an option that emphasizes reducing final demand, through technology efficiency, infrastructure development, and sufficiency measures (density of cities, circular economy, etc.), and would increase the electrification of final demand from 28 percent today to more than 45 percent in 2050. Indeed, the LTECV mandates that fossil fuel final consumption decrease by 30 percent in 2030, and that final energy demand be cut by half in 2050. It confirms the 50 percent nuclear objective and sets a 40 percent renewable objective by 2030 on the supply side.

The use of scenarios was quite different during the next phase, after the adoption of the law. To prepare the SNBC document, the 2050 vision needed to be translated into more operational, medium-term policy scenarios consistent with the 2030 milestones. Two scenarios were developed under the supervision of the environment ministry and the public French Environment Energy Management Agency (Agence de l’environnement et la maîtrise de l’énergie). The first one (“with existing measures” [avec mesures existantes, AME]) assesses the trends consistent with the policies and measures already in place. The second (“with additional measures” [avec mesures supplémentaires, AMS]) explores pathways consistent with the implementation of the LTECV: under this scenario, policy options were described for the coming 15 years, and the modeling exercise was used

**Figure 1. Four Pathways for the Energy Transition in France**



Source: Translated from DNTE report (2013)

to check that the resulting evolution was aligned with the 2050 LTECV objectives. Detailed demand analysis was built using a sectoral bottom-up model, MED-PRO, and aggregated trajectories using the techno-economic model POLES. But key parameters and, more important, AMS policy options to reach the 2030 milestones were defined in an iterative process with the stakeholder CNTE and ad hoc working groups, thus encompassing most of the conclusions (and some of the controversies) from the previous consultation. In particular, the employment issue had not been properly addressed during the previous cycle, and the decision was made to develop an impact analysis of the 2030 scenario using two different macroeconomic models (Three-ME and NEMESIS). The two models were set to reproduce the chosen scenario and led to generally converging conclusions (a positive and significant net benefit in job creation) although the more detailed output was sometimes less consistent. The AMS scenario is the reference for the 2015 SNBC document and the list of sectoral and cross-cutting recommendations of this strategy. A separate analysis was made for the other gases (and especially for the agriculture sector) and the results aggregated.

## SECTOR- AND GAS-SPECIFIC PATHWAYS

One of the important features of the SNBC document is the definition of carbon budgets: the decree establishes a mandatory, whole economy GHG budget, expressed in CO<sub>2</sub> equivalent, covering three SNBC periods (2015–18, 2018–23, 2023–28). But it also presents a breakdown of the global budget per sector and per gas. These two sets of targets are indicative and important indicators in the evaluation framework. This breakdown was controversial at first, stating explicitly that emission reduction efforts, measured in “percentage per year,” were quite different across sectors. This is in fact normal, the budgets being consistent with the bottom-up, sectoral potentials identified in the AMS scenario, taking into account activity trends, costs, feasibility, and lock-in risks. But a number of stakeholders in the business group had the impression that some sectors were contributing too much while others were protected.

**Table 1. Indicative Breakdown of Carbon Budgets**

AVERAGE ANNUAL EMISSIONS (IN MT CO <sub>2</sub> eq)	1990	2013	1ST CARBON BUDGET, 2015–18	2ND CARBON BUDGET, 2013–23	3RD CARBON BUDGET, 2024–28
Transportation	121	136	127	110	96
Residential services	90	99	76	61	46
Manufacturing industry	148	88	80	75	68
Energy industry	78	57	55	55	55
Agriculture	98	92	86	83	80
Including N <sub>2</sub> O	44	40	37	35	34
Including CH <sub>4</sub>	42	39	38	38	37
Waste treatment	17	20	18	15	13
Including CH <sub>4</sub>	14	17	16	12	11
<b>TOTAL AVERAGE ANNUAL EMISSIONS</b>	<b>552</b>	<b>492</b>	<b>442</b>	<b>399</b>	<b>358</b>

Source: SNBC (2015)

Reducing emissions in the coming decades will certainly be quite difficult in two sectors for France: energy, where the power generation mix is already almost completely decarbonized, and agriculture, where the transition (alternative approaches to fertilizers, soil carbon recovery) will be more progressive. In contrast, the potential in the building sector is high, with technologies available and the challenge really being one of capacity and finance. The strategy includes recommendations for education and training. Options such as targeted loans and guarantee schemes are also identified to mitigate the up-front cost impact, and the development of financial tools constitutes one of the cross-cutting priorities for public intervention. A specific chapter of the strategy is also devoted to research and development (R&D) priorities and programs, supported by public budget and public-private partnership arrangements (in addition to EU R&D initiatives) at national and regional levels. Carbon capture and storage is covered by R&D programs but is not considered at this stage in the implementation of the 2030 strategy.

## KEY POLITICAL DEBATES RELATED TO CLIMATE POLICY IN FRANCE

The economic performance, and more specifically the issue of employment, was obviously a major political concern at the time, in a country hugely impacted by the 2008 crisis and with high levels of unemployment. The issue was indeed much debated both quantitatively (see modeling section) and qualitatively, in terms of professional qualification and training needs, sectoral and territorial impacts of the development (or reduction) of specific activities, and so on. A major emphasis was given to energy industries (nuclear, oil and gas, and renewables) but also to specific issues regarding the building sector (where small and medium enterprises play a major role) and agriculture. The debate began to oppose two visions of the ecological transition: on the one hand, the more traditional fear that a constraint on fossil fuel technologies might increase the cost of energy, hurt economic interests, and jeopardize the population's well-being by requiring unacceptable lifestyle changes; on the other, the conviction that the transition is an opportunity to improve efficiency, reduce production costs and fuel poverty, invest in innovation, and redesign a number of policies to citizens' benefit.

The emphasis on the building sector in the French strategy also responds to a more social challenge: the rise of energy poverty not only in metropolitan areas but also in small towns and rural areas affected by the economic crisis and the downturn in traditional industries. Traditional measures (social tariffs and programs) need to be complemented by more structural ones, including deep renovation of buildings. But the populations in

question are often less educated, with poor access to technical information and financial difficulties. Specific support schemes need to be developed to reach them, but the resulting decrease in their energy bills brings lasting improvement to their financial situation. Similar issues apply for transportation, where the same groups also suffer access restrictions, for both economic and noneconomic reasons (absence of public transport, for example). This led the CNTE to insist on the necessity of developing a more holistic approach to the transition in this sector, as opposed to a simplistic vision where an increase in the carbon tax would mechanically shift demand in favor of electric mobility.

Responding to a stakeholder request, a more systematic approach to cobenefits was also developed with the support of the expert group during the DNTE, listing areas of possible interaction (on social issues, energy security, biodiversity and water, etc.) and starting to inform them. But time was clearly too short to quantitatively inform all indicators. This issue is being further researched and progressively incorporated into the monitoring and evaluation framework.

Adaptation, in contrast, was not explicitly considered at this stage. Since 2009, France has also developed five-year adaptation plans, and although this started as an independent process, the idea now is clearly to make the two exercises progressively converge into a single, integrated country strategy on climate change. But this represents a methodological challenge. It is quite easy to envisage in certain cases, and some were already taken into account in the scenario development (for instance, the impact of climate change on hydroelectricity generation). But it is not yet clear how, for example, the consequences of climate change for the siting of activities, the operation of infrastructure, and local pollution will impact the evolution of transportation solutions (and vice versa). Until now, mitigation and adaptation methodological tools have mostly been developed in parallel.

The European Union Climate and Energy 2020 package objectives were obviously taken into account in the design of the scenarios. But the longer-term framing exercises produced at the European level—namely, the 2050 energy roadmaps—had very little influence on the French process, possibly because these European average visions are quite difficult to connect with current domestic debates. But other countries' experiences were frequently mobilized by stakeholders to support their views. Germany was certainly the most debated and controversial one (nuclear phaseout, renewables development, building renovation programs), but the United Kingdom (carbon budgets, design of economic instruments), Sweden (carbon tax experience, biomass development), and, beyond the European Union, the shale gas



revolution in the United States were also often discussed. CNTE plenary or working group hearings provided the opportunity to directly access high-level international expertise.

Finally, a 2015 report of the Independent Committee of Experts suggests that more emphasis should be given to the international dimension of the strategy. On the one hand, France is not isolated, and, while other countries' experiences were extensively discussed, the collective governance issues—and, quite important, the EU dimension of climate action, as well as France's vision for that action's priorities, design, and development—is almost entirely absent. On the other hand, the connection of the strategy to the Paris Agreement could also be more explicit. This will certainly be addressed in the updated document, where the 2050 objective will be revised according to the Paris global goal, but more elements regarding France's international action (finance, technical assistance, trade, etc.) could be useful.

## GOVERNANCE ISSUES

Although the SNBC is a national document, and France a rather centralized country, the implementation of the strategy raises complex governance issues.

First, France is a member of the European Union, and part of the strategy responds to EU-level decisions, or intends to influence them. This is quite obvious regarding the EU emissions trading schemes (EU ETS), but it also concerns the reform of the power sector regulation, the deregulation of transports, the reform of European agriculture policy, car fuel-economy standards, European Central Bank intervention, and EU-level investment support initiatives (such as the Juncker plan), and so on. If very few orientations of the French strategy are autonomous choices, however, none is completely dependent on EU-level action.

Second, the balance of power is evolving, and local authorities are progressively gaining political leadership and implementation capacity. By law, the National Strategy needs to be taken into account by these authorities, but they are now responsible for developing their own strategic visions, based on regional opportunities, potential, and challenges. This is a new exercise, however, and it is not clear how possible divergences between the sum of regional action and the national strategy will be resolved, if necessary. At the same time, local authorities tend to be more ambitious and more proactive on a number of important issues, such as land planning, renewable development, and mobility.

Third, implementation requires a large mobilization of the private sector. The importance of climate, the determination

of the public sector (national, local) to drive change, and the identification of business opportunities progressively change the approach. In a number of areas, climate change has been identified as a real problem and the question is now how to address it. But in other fields, private decision makers are still poorly aware of the existence of the strategy, or consider that it is a weak document. Regular, high-level political intervention is necessary, as is the translation of the strategy's recommendations into more focused but operational acts.

Fourth, the success of a strategy depends on the degree of citizen mobilization. It is clear that managing climate change alone is not a sufficient motivation and that other incentives may play a much larger role. On the one hand, economic interest needs to be better addressed as a driver at the crossroads of energy cost, available tax rebates or subsidies, and financial solutions (zero-interest loans, third-party investment, etc.). The strategy proposes a set of measures in that direction. But the real challenge is taking advantage of other social demands to popularize climate-smart solutions. Two innovative trends are currently gaining momentum in French society. First, the willingness to become more directly involved, more local, to control the consequences of one's choices: this materializes, for instance, in the development of direct citizen investment schemes in renewables, self-construction initiatives, and comanagement of local public investment. Second, the development of the "share economy," leading to a rapid and dramatic redefinition of the mobility sector, the notion of public transport, of the individual car, and so on. This evolution is a fantastic opportunity for the low carbon strategy, yet its positive impact is not a given, and it is still difficult to understand how public policy approaches are impacted by these changes, and hence how the strategy design itself should be adapted.

## USING THE STRATEGY TO INFORM SHORT-TERM PLANNING, IMPLEMENTING THE LONG-TERM STRATEGY

The 2015 LTECV establishes a clear regulatory and institutional framework to connect long-term vision with short-term public action. As I noted earlier, the law sets a number of milestones from 2025 to 2050. It also creates two processes:

- ◆ SNBC: In addition to the long-term strategy and the carbon budgets, the SNBC comprises 67 cross-cutting (23) and sectoral (44) recommendations, focused on short- and medium-term action. Some recommendations incorporate quantitative, precise targets, such as #RT4, "2l/100km average consumption for new cars in 2030"; or #R2,

“Increase the carbon levy on domestic fossil fuel consumption . . . to 56€/tCO<sub>2</sub> in 2020 and 100€/tCO<sub>2</sub> in 2030.” Many are quantified in the “decision text” and can be monitored. Most of them clearly invite the government to take concrete action and even shape the type of intervention expected, such as #R7, “Develop the use of the carbon footprint and ecological footprint in the financial reporting of institutional investors”; or #RB3, “Remove barriers to investment in the building sector by supporting low-income renovation programs, and by mobilizing the private bank operators to make adapted financial products available.” Each recommendation is monitored, first regarding its translation into actual policies (tracking of regulatory acts, incentive measures, etc.), then in terms of outcomes. This monitoring is presented to the Independent Expert Committee (CETE) and to the stakeholder CNTE.

- ◆ PPE: The PPE defines, in quantitative terms, the desired evolution of the energy system for the coming five-plus-five years. It is prescriptive for the first period and indicative for the second. It defines objectives such as the reduction of consumption in the residential sector, or the new capacity to be installed in solar photovoltaics, or the investment needed to reinforce international interconnectors. The PPE is also a regulatory act (a decree) and serves as a legal basis for the licensing of any new capacity (or the phaseout of old capacity, as with coal) and the use of incentive schemes.

France being a member of the European Union, its individual strategy does not translate directly into its nationally defined contribution (NDC). The NDC is defined at the European level and is the result of collective discussion on the EU long-term strategy and medium-term policy orientations.

## PROCESS TO REVIEW AND REVISE THE LONG-TERM STRATEGY

For both the SNBC and PPE, the law requires a revision every five years. This revision builds on the monitoring and evaluation process, a report to be produced by the committee of experts on the implementation of the carbon budgets, and the production of updated scenarios. The institutional arrangements remain the same (environment ministry in charge, CNTE regular consultations, expert working groups). The first revision started in August 2017 (the first period being, exceptionally, limited to three years) with the presentation of the monitoring report, and the works leading to the production of a new set of 2050 scenarios. It also includes a specific reflection to incorporate the new long-term neutrality objective. The scenario exercises and

the draft revised SNBC, expanding the carbon budget to 2033, were presented to and discussed by the CNTE from January to June 2018. The PPE is being revised and expanded to 2028 simultaneously.

The time frame for the revisions is therefore clearly compatible with the Paris Agreement process, each revision starting a year before the stocktaking exercises. But the issue needs to be envisaged in the framework of the Energy Union governance, and the discussion is still open at that level, European member states still having conflicting views on the draft proposal submitted by the commission.<sup>6</sup>

## LESSONS LEARNED

The production of a long-term strategy certainly depends on the specific situation of each country, but we can at least identify features that, in the French case, have proved essential to creating the necessary momentum:

1. The value of exploring contrasting pathways, acknowledging that the transition is a matter of political choices, even if the options are obviously constrained by technological, economic, and social characteristics.
2. The value of having such pathways proposed by stakeholders, reflecting their knowledge, concerns, motivations, and interests.
3. The need to offer a transparent framework to collectively compare and evaluate the different options.
4. The need to recognize that bottom-up, consensual measures alone will not build a consistent and sufficiently ambitious program, and that strong political leadership is needed to deliver more adequate strategies.
5. The need to complement the normative, long-term vision with a consistent, forward-looking, policy-oriented set of recommendations for public action.
6. The value of presenting explicit, sector-based visions of the transition to feed the discussion of policy options and specifically to identify the needs for new financial approaches, providing adequate investment capacity and risk mitigation to decision makers public and private, large and small.
7. The recognition that the uncertainty about future options, on the one hand, and about the actual delivery of measures, on the other, requires a regular assessment of the strategy and possible adjustments of the policy package.

## ENDNOTES

1. See, for instance, the “Stakeholder Book,” to which all stakeholders were invited to present their views; Secrétariat général du débat national sur la transition énergétique, *Les cahiers d’acteurs*, February 2013, [http://www.side.developpement-durable.gouv.fr/EXPLOITATION/DEFAULT/doc/IFD/IFD\\_REFDOC\\_0515734/le-dossier-du-debat-national-sur-la-transition-energetique-les-cahiers-d-acteurs](http://www.side.developpement-durable.gouv.fr/EXPLOITATION/DEFAULT/doc/IFD/IFD_REFDOC_0515734/le-dossier-du-debat-national-sur-la-transition-energetique-les-cahiers-d-acteurs). This document was available on the website and in the public meetings, along with a document presenting the objective of the debate, some basic factual information about energy and climate change, and FAQs.
2. See Actu-environment.com, “Transition énergétique: La méthodologie incertaine du débat réactive les dissensions,” June 21, 2013, <https://www.actu-environnement.com/ae/news/debat-transition-energetique-methode-dissensions-18834.php4>; and Guillaume Malaurie, “Transition énergétique: Pierre Gataz, merci !,” *L’Obs*, July 18, 2013, <https://www.nouvelobs.com/planete/20130718.OBS0185/transition-energetique-pierre-gataz-merci.html>.
3. See, for instance, on the academic side, the ENCILOCARB scenarios by the International Center for Environmental and Development Research: Centre international de recherche sur l’environnement et le développement (CIRED), “Scénarios de réduction d’émissions de gaz à effet de serre pour la France,” February 2010, [http://www2.centre-cired.fr/IMG/pdf/20100226-Encilowcarb-Rapport\\_Scenarios\\_existants.pdf](http://www2.centre-cired.fr/IMG/pdf/20100226-Encilowcarb-Rapport_Scenarios_existants.pdf); or the Iddri-EPE 2050 scenarios: CIRED, Enerdata, and LEPII: “Etude ‘Sous contrainte carbone’: FONDDRI, Fondation pour le développement durable et les relations internationales, rapport complet,” December 2008, <https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Rapport/Rapport-complet-FONDDRI-Etude-Scenarios-sous-contrainte-Carbone.pdf>. On the NGO side, a group of experts produced in 2011 a deep decarbonization scenario exercise under the name “négaWATT” (Association négaWATT, “Scénario négaWATT, 2010–2050,” September 29, 2011, <https://negawatt.org/Scenario-negaWatt-2011>) and published an updated version in 2017 with a detailed agriculture and LULUCF analysis.
4. Partners for Sustainability, “France Pledges to Become Carbon Neutral by 2050,” July 10, 2017, <https://partnersforsustainability.ch/france-pledges-to-become-carbon-neutral-by-2050/>; Aline Robert, “France Raises Its Environmental Game with Ambitious New Climate Package,” *Euractiv.fr*, July 7, 2017, <https://www.euractiv.com/section/climate-environment/news/france-raises-its-environmental-game-with-ambitious-new-climate-package/>.
5. See “The Deep Carbonization Pathways Project: Insights and Emerging Issues,” ed. Chris Bataille and Henri Waisman, special issue of *Climate Policy* 16 (2016); and Michel Colombier, Sandrine Mathy, Henri Waisman, Chris Bataille, Amandine Denis, Meg Argyriou, David Sawyer, “The Impact of the Deep Decarbonization Pathways Project (DDPP) on Domestic Decision-Making Processes: Lessons from Three Countries, 2016,” IDDRI, November 2016, <https://www.iddri.org/en/publications-and-events/decryptage/impact-deep-decarbonization-pathways-project-ddpp-domestic>. See also the final report of the CNTE on its official website: Ministère de l’Ecologie/CNTE, *Débat national sur la transition énergétique: Rapports des groupes de travail du Conseil national du débat*, 2013, <http://temis.documentation.developpement-durable.gouv.fr/document.html?id=Temis-0078782>.
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## ACKNOWLEDGMENTS

The author would like to thank Jean-Charles Hourcade for reviewing and providing input on the draft case study.

The case study series was developed by Kelly Levin, Taryn Fransen, Cynthia Elliott and Katie Ross.

We would like to thank Carni, Klirs, Romain Warnault, Julie Moretti and Billie Kanfer for their assistance with publication design, graphics and layout. Emily Matthews and Alex Martin provided editorial support. Beth Elliott helped with messaging and outreach, and Pauline Hill provided administrative support.

We are pleased to acknowledge our institutional strategic partners, who provide core funding to WRI: Netherlands Ministry of Foreign Affairs; Royal Danish Ministry of Foreign Affairs; and Swedish International Development Cooperation.

Funding from Germany's Federal Ministry of Economic Cooperation and Development (BMZ) made this project possible.



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This vision and direction of the project is guided by the project's advisory committee: Monica Araya, Richard Baron, Ron Benioff, Pankaj Bhatia (co-chair), Yamil Bonduki, Rob Bradley, Carter Brandon, Hakima El Haite, Claudio Forner, Stephen Gold (co-chair), Emmanuel Guerin, Ingrid-Gabriela Hoven, Dr. Martin Kipping, Carlos Nobre, Siddharth Pathak, Samantha Smith, Marta Torres Gunfaus, Laurence Tubiana, and Pablo Vieira.

For more information about the project, and to view the expanding set of resources, visit [www.longtermstrategies.org](http://www.longtermstrategies.org).