

## Developing 2050 decarbonization strategies in the EU: Insights on good practice from national experiences

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### **LONG-TERM (2050) DECARBONIZATION STRATEGIES ARE VITAL FOR RAISING AMBITION AND FOR EFFECTIVE CLIMATE POLICY IMPLEMENTATION**

There is increasing recognition that achieving deep cuts to GHG emissions requires a close link between long term strategic planning and short term policy action. Long term decarbonization strategies are important at a technical level, because they can help countries to identify concrete and feasible pathways to decarbonization, based on their national particularities, and then to determine their implications for immediate policies and measures. They can also serve an important social and political function, by facilitating a concrete and analytically based discussion between national stakeholders about what long-term decarbonization implies.

### **THE EU'S DRAFT NEW ENERGY UNION GOVERNANCE REGULATION COULD DO MORE TO PROMOTE GOOD PRACTICE AND EFFECTIVE LONG-TERM PLANNING FOR DECARBONIZATION**

Article 4.19 called on Parties to the Paris Agreement to develop long term low emissions development strategies, and decision 1/CP.21 invites Parties to present them ahead of 2020. To implement this requirement across all 28 EU countries, the EU is in the process of agreeing minimum requirements and guidelines under a draft new governance regulation for the EU's Energy Union project. Unfortunately, early drafts of this document contain too little detail on what these strategies should include, or how member states should go about developing them. This is a concern, not only for the quality of climate governance in the EU, but also in terms of the potentially negative signal the EU may send under the Paris process, if many of its member states are incapable of producing robust and credible 2050 decarbonization strategies.

### **DEVELOPERS OF LONG-TERM DECARBONIZATION STRATEGIES SHOULD HEED LESSONS FROM EXISTING EXPERIENCES**

A small number of EU member states have already developed their own 2050 decarbonization strategies and plans. This study—which was jointly undertaken by IDDRI in France and Ecologic in Germany—highlights some important lessons that can be learned from recent experiences with 2050 decarbonization strategies in selected EU countries. It builds on experiences in a small group of EU member states to highlight some examples of good practice when it comes to long term decarbonization strategy development. If the EU and its member states wish to ensure that their climate policy governance is effective and consistent with the aims of the Paris Agreement, they may wish to explore the lessons of these experiences.

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## EXECUTIVE SUMMARY

National climate action strategies that take a 2050 perspective are in vogue. From Article 4.19 of the Paris Agreement on Low Emissions Development Strategies, to Germany's new Climate Action Strategy 2050, to the EU's National Climate and Energy Strategies, there is a renewed focus on long-term strategies for climate policy. This makes sense: the long-lived nature of much of the capital stock in the energy system, the need to develop important industrial breakthrough technologies, and the systemic changes to business models and product markets, means that a dynamic view of the transition to a low-carbon economy is required.

However, while the merits of the idea are becoming increasingly obvious, relatively little has been written about concrete experiences with such strategies. We may therefore ask: What role do such strategies serve in practice? Are they useful or subject to too much uncertainty to be practicable? How should they fit within climate governance frameworks and short-term policy actions? Etc.

This study, pursued jointly by IDDRI and Ecologic, looks at examples of 5 EU Member States that have developed long-term strategies as part of a formal government process and tried to answer these questions. We drew the following conclusions.

**Long-term decarbonization strategies do tend to make short-term policies more coherent with 2050 objectives if done in the right way.** Climate policy in none of the countries studied for this paper is currently completely coherent with its 2050 objectives. 2050 decarbonization strategies are therefore not a panacea. Nevertheless, we found that Member States that had developed detailed long-term strategies, and done so using an intensive stakeholder consultation process, tended to show a higher degree of short- and medium-term

ambition in their policy targets. Their policies also tended to exhibit a higher level of focus on driving necessary sectoral transformations to achieve ambitious 2050 goals.

**Long-term decarbonization strategies tend to serve both technical and social functions that can help to improve national climate policy governance.** At a technical level, they can help Member States to identify coherent pathways to ambitious 2050 climate targets, and to explore robust long-run strategies in a context of uncertainty. Long-term strategies can be useful to identify the kinds of actions that need to be implemented *in the short term* to achieve those 2050 targets. Long-term strategies can also reveal important information about each of the key drivers of emissions on a sector by sector basis, and what transformations need to occur to influence these drivers.

**Long-term decarbonization strategies can help build stakeholder consensus, which is vital for a coherent and consistent climate policy framework.** The stakeholder engagement involved in developing 2050 strategies should not be expected to resolve all conflicts. However, they can add value in a few ways. The process can be used to identify and demonstrate 2050 decarbonization strategies that are consistent with other social or economic objectives, thus removing opposition on these grounds. The process can also help to develop a collective understanding of the facts and alternatives among stakeholders and decision-makers. This can help to make clear the hard choices, but also remove the potential for obfuscation regarding the consequences of long-term objectives. They can thus serve the purpose of revealing and structuring the hard choices that then need to be solved through social dialogue.

**Examples of good existing long-term strategy development exercises in EU Member States seem to have some features in common.** There is no one-size-fits-all formula for 2050 strategy

development. Nevertheless, important ingredients for meaningful 2050 strategy development exercises seem to include: engagement with a wide range of stakeholders during strategy development; a clear role for evidence-based expertise to inform strategy development and monitor implementation; a clear legal and institutional framework to ensure the 2050 strategy's implications are considered seriously when short-term policy is made; quantitative tools that help to communicate the implications of different 2050 strategies; robustness checks of the 2050 strategy, using both bottom-up and top-down analytical tools; close attention to how to make decarbonization goals consistent with other national policy priorities.

Under a recently proposed “Energy Union governance regulation”, the European Commission has outlined requirements for Member States to develop “long-term low emissions strategies” out to mid-century. **We interpret this development as a step in the right direction. However, several of the details of the proposed requirement on Member States are inconsistent with insights from the experiences gleaned in the preparation of this study.**

**On the content of the strategies, insights from national experiences examined here suggest several ways that the EU’s new requirements for national “long-term low emissions strategies” could be improved.** First, to have credible objectives that are relevant to current policy, strategies should focus on 2050, rather than 2070, as proposed in the European Commission’s draft governance regulation. Second, strategies should provide quantitative descriptions of emissions and key drivers of abatement for the major emitting sectors. Third, 2050 strategies should contain an explicit assessment of their implications for short-term strategy development to be consistent with 2050 targets that would be in line with the EU’s -80 to -95% emission reductions goals. Fourth, 2050 strategies should, as appropriate, highlight key risks or challenges to achieving 2050 targets. Fifth, strategies should, as appropriate, highlight important external conditions that would need to be met in order reduce risks to implementation. Sixth, long-term strategies should explicitly consider and place a significant degree of emphasis on

interactions between other national policy priorities (e.g. economic development, energy security, etc.) and decarbonization objectives.

Furthermore, **on the process of strategy development, the proposals in the new governance regulation also appear inconsistent with the best practice examples that we have observed in preparing this study.** For example: Short-term policy setting and strategies should be set based on insights and guidance from the long-term strategies. *(The current regulation proposal would see the long-term strategies submitted in 2020, while 2030 plans are submitted in 2018.)* Long-term strategies should be developed based on iterative rounds of stakeholder consultation and evidence-based dialogue. *(The current proposal would not require Member States to consult with stakeholders on the development of the long-term strategies during their development.)* Long-term strategies should be embedded in a clear legal and institutional framework at the national level. This should ensure that they are used for the purpose of monitoring and evaluating implementation of climate and energy policy and are explicitly considered for new policy making. Long-term strategies should be based on credible long-term objectives that are relevant to policymaking. *(The current draft calls for strategies that extend out to 2070 rather than the more practically relevant date of 2050.)*

Finally, **doing high quality long-term low emissions strategies under the EU’s new governance regulation will be challenging and calls for targeted support for Member States.** This study finds that administrative capacity constraints, time and cost considerations for effective stakeholder consultation, and limited experience with sectoral strategy development, could all pose challenges for the development of robust and useful long-term strategies by Member States. To ensure that the development of these strategies delivers genuine value, and to simplify the task for Member States, the EU should anticipate and provide necessary support. This could include: a) more detailed guidance on the content and process of long-term strategies, b) technical and financial resources, and c) informal exchanges between Member States on existing 2050 strategy development experiences.

## INTRODUCTION

There is a renewed focus in European climate policy debates on the role of long-term strategy development and strategy development for decarbonization. For instance, the European Council's Decision of 2014 called for the development of a new governance mechanism for EU energy and climate policy that would be based, in part, on new integrated National Climate and Energy Plans, reaching up to 2030, but including a long-term outlook to 2050 (EC, 2015). Internationally, the Paris Agreement has also called on parties to formulate and communicate long-term low emissions development strategies (UNFCCC, 2015 – Article 4.19).

These policy decisions reflect important practical considerations. Deep changes to infrastructure and technology in sectors like electricity production, transport, industry, and buildings, cannot be brought about quickly, but require well-signaled, structured, strategic roll-out over long periods. Strong interdependencies between different decarbonization actions (e.g. reducing carbon intensity of energy vs. reducing energy intensity) and across sectors (e.g. electricity and transport decarbonization), require integrated strategies. Achieving carbon neutrality will also require anticipating the different social, technical, and economic considerations that are relevant to the transition in different Member States (DDPP Network, 2016).

In the European debate, these considerations have led to calls for Member States to develop decarbonization strategies that explore pathways to decarbonization out to 2050 (e.g. IDDRI (2015), Ecologic Institute (2015), Szulecki *et al.* (2015), E3G (2016), WWF *et al.* (2016)). However, relatively little attention has been given to the practical question of how Member States should go about

such an exercise. IDDRI (2015) outlined some of the basic elements that a 2050 strategy module of the EU's new National Climate and Energy Plans could include. However, given emerging lessons from the recent development of such strategies in small number of Member States, this question merits further investigation.

This paper, prepared jointly by IDDRI and Ecologic Institute, therefore presents insights based on the analysis of long-term strategic strategy development exercises in 5 EU Member States. It focuses on experiences in the UK, France, Germany, Poland and Czech Republic. A limited and non-comprehensive number of countries was chosen to allow a deep dive analysis of each. Several of these Member States also have quite well-developed 2050 decarbonization strategies and surrounding institutions compared to the typical European Member State.

Based on these case studies, we attempt to gain more general insights about: What role 2050 strategies play in directing short-term decision-making on policy? What makes for meaningful and effective long-term strategy development, in terms of technical details of the strategy development process, institutional arrangements and stakeholder engagement? What gaps still exist in national and EU frameworks for long-term strategy development?

The rest of this paper is structured as follows. The following section briefly outlines the methodology for collecting insights about national long-term strategy development experiences. Section 2 summarises the findings of the study. It focuses in turn on 5 key topics: the role of long-term strategy development in national climate and energy governance; institutions and capacity; content of the strategies; stakeholder engagement; and relationship of national strategy development to EU strategy development tools. Section 3 concludes.

## 1. METHODOLOGY

The findings presented in this study are based on an examination of a selected group of national examples of 2050 strategy development that was undertaken by IDDRI and Ecologic Institute during the course of 2016. The study is looked principally at 5 main countries: UK, France, Germany, Poland, and Czech Republic. These countries were chosen based on the fact that several of them have recently developed (or are developing) relatively detailed 2050 strategies towards decarbonization. The selection of countries was also based on a desire to reflect a diversity of EU Member States in terms of Member State size, institutions, and degree of long-term strategy development experience.

The focus of the case studies was on official national strategy documents and/or processes that have a clear strategy development dimension out to 2050. A summary of the main processes/documents that focused on is provided in Table 1. These cases form the bulk of the examples studied. In addition to these, (more limited) information was also collected on long-term prospective analysis for climate and energy policy currently being undertaken in Italy<sup>1</sup> and in the German region of North Rhine Westphalia.<sup>2</sup> We also draw some (limited) insights from the now defunct experience of Denmark's Climate Change Act of 2014, which began a process of developing a 100% renewable energy target for Denmark by 2050 and strategy development its implementation.

It is important to define what is meant by a 2050 “strategy” in this study. Of course, it is impossible to accurately anticipate all contingencies out to 2050. Thus, long-term strategies are typically a mix of, on the one hand, more detailed and strict elements that might be properly called “planning” (e.g. 2030 sector targets, projections and concrete policies), and, on the other hand, slightly broader and more adaptive components that set the direction of travel that might be called “strategies” (e.g. broad sectoral strategy and scenario

elaboration beyond 2030). For this reason, neither the word “strategy” on its own, nor the word “planning” on its own, fully captures what is going on in many of the 2050 “strategy development” processes we looked at. However, since our focus is essentially on value added of introducing a longer-term (i.e. 2050) component into the process, we use the terms “long-term strategy” or “2050 strategy” interchangeably to describe the subject of our research.

Moreover, an interesting feature of 2050 strategy development activities in practice is that the process and surrounding institutions are as important of the content of the strategies themselves. Our analysis therefore looks at some of the equally important scenario development and other processes that occur beyond the content of the specific formal government 2050 “strategies” themselves. Thus, in some instances, we may refer to “scenario development” or “strategy pathways” to describe some of the underlying processes that go into informing long-term strategies.

**Table 1.** Main 2050 strategy development processes explored for this study

Member State	Strategy Development Processes studied	Horizon
Main Case Studies		
UK	<i>Carbon Plan 2011; Climate Change Committee 2050 scenario analysis influencing formal advice on UK Carbon Budgets</i>	2030/2050
France	<i>National Low-Carbon Strategy (2015) Informal 2050 scenarios informing Law for Energy Transition and Green Growth (2015)</i>	2030/2050
Germany	<i>Climate Protection Plan 2050</i>	2030/2050
Poland	<i>Polish Energy Policy to 2050</i>	2030/2050
Czech Republic	<i>Climate Protection Policy (2016) Draft Climate and Energy Plan 2050 (to be finalized early 2017)</i>	2030/2040/2050

\* Cf. Carbone 4 (2015), see bibliography to this document.

Information was collected principally via structured interviews with both governmental and non-government experts in each Member State. Second, desktop research was carried out about the underlying strategies and related policy process that the strategies are intended to influence. Third, information is also drawn from an all-day workshop which was held by IDDRI in Paris on June 2016. At this event, national experts were invited to present their respective national long-term strategy development processes and discuss their strengths, weaknesses and development history with each other. Further insights were also obtained from discussions with officials at the European Environment Agency, which is currently

1. Specific process referred to is the Italian Government Working Group for Scenario Elaboration and Long-term Planning, which is a new initiative driven by the Italian Government focusing on a long-term decarbonization and energy scenarios. This process was still on-going at the time of writing.
2. Specific process referred to is Climate Action Plan of North Rhine Westphalia (2015). NRW's Climate Protection Act (2013) called for a Climate Protection Plan to be drawn up by the NRW government. The Climate Protection Plan was finalised in 2015 based on comprehensive stakeholder participation. The Plan outlines the strategies and measures needed to achieve the Act's GHG emission reduction targets. Further info here: <https://www.klimaschutz.nrw.de/english/>

performing a review of Low-Carbon Development Strategies that have been submitted under the MMR.

The national examples of 2050 strategy development examined for this study revealed a range of quite different long-term strategy development experiences. These were embedded within different kinds of national policy processes, involved different institutions and stakeholders (in different ways), and built on quite different levels of pre-existing national experience with long-term climate and energy strategy development. This heterogeneity means that it is difficult to define one single template that represents “the best practice” for all EU countries. Nevertheless, it is possible to identify a number of clear patterns and insights that emerge across 2050 strategy development experiences that appear to be consistent with good practice.

The following subsections present the main insights and lessons that were gleaned from the national case studies.

## 2. FINDINGS

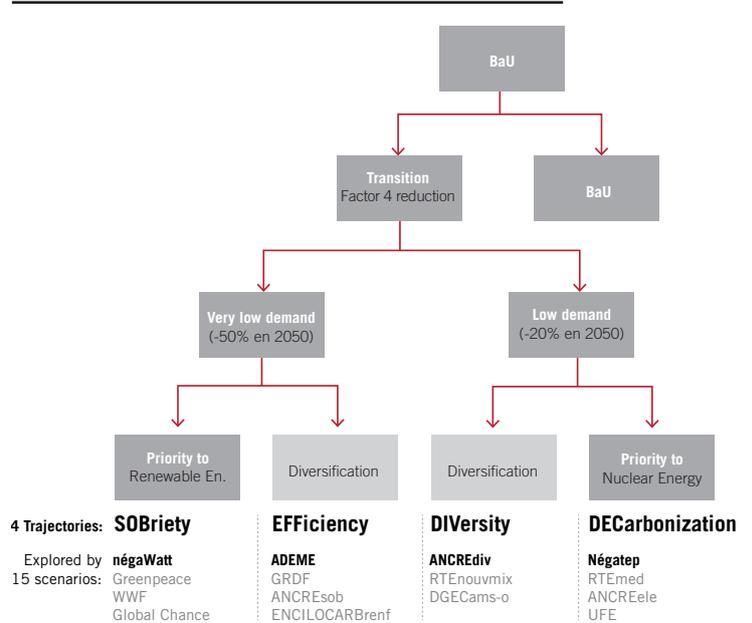
### 2.1. The role of long-term (2050) strategies in national climate and energy governance

Climate policy “strategy development” for 2050 refers to a process that combines long-term scenario analysis, emissions targets for the year 2050, and the exploration of internally coherent strategies to achieve those targets. Examples from the case studies suggest that, when done effectively, long-term climate policy strategy development and strategy development processes (i.e. to 2050) can improve climate governance in several ways.

Firstly, **2050 strategy development tends to improve the overall coherence and ambition of climate policy frameworks.** For instance, in 2012-2013, France held a National Debate on Energy Transition, with a view to developing a major new piece of environmental legislation called the “Law for Energy Transition and Green Growth (2015)”. As part of the “National Debate” process, an expert working group was assembled to examine long-term scenarios towards France’s Factor 4 targets (i.e. to reduce emissions by 75% from 1990 levels by 2050). Based on detailed contributions from, and iterative discussion with, key stakeholder groups (NGOs, trade unions, business community, local authorities and the central administration), the working group assembled and compared four

sets of long-term decarbonization scenarios. Each of which was based on different drivers of abatement (see Figure 1).

**Figure 1.** Overview of 4 families of scenarios explored in the National Debate on Energy Transition in France



Source: P. Criqui CNRS PACTE-EDDEN.

Based on this participatory process, the Efficiency trajectory was identified—by the Ministry of Ecology—as the preferred option to inform the preparation of the Law on Energy Transition for Green Growth, finally adopted in July 2015. The law explicitly mentions six structuring quantitative targets that are consistent with this scenario (i.e. total GHG emissions, final energy consumption, share of nuclear power, share of electricity generation from renewables, share of renewables in total energy, total landfill waste).

A similar phenomenon can also be observed in the UK. The UK’s 5<sup>th</sup> carbon budget set a goal of reducing emissions by 57% below 1990 levels between 2028 and 2032. This is significantly more ambitious than the -40% target in 2030 that the EU has set as a whole. The UK’s independent Climate Change Committee, whose advice the government is obliged to take in setting the budgets, recommended this target, in part, by saying that this was considered necessary to “keep the UK on a cost effective path to [the UK’s] 2050 objective [of -80% emission reductions vs. 1990 levels] (UK CCC, 2015, p.11).

In Germany, the recently published 2050 Climate Protection Plan sets a goal to reduce total emissions by 54-56% below 1990 levels, compared the EU’s -40% target. The higher ambition stems

from the overall approach, which is to focus on what is most likely to be consistent with the country's legally backed 2050 goals of 80-95% reduction by 2050. In the Czech Republic, the 2050 climate strategy sets targets for 2030 that would see emissions reduce by 31% compared to 2005 levels. Once again, this is also likely to be a much steeper reduction than what the Czech Republic would be required to do by 2030 under the EU's 2030 Effort Sharing Regulation or carbon market by that date.

To be clear, in all of these Member States, important inconsistencies or missing details still remain between long-term strategies and *current policies*. However, the balance of the evidence still suggests that 2050 strategy development can still have a significant positive impact on making the overall policy framework.

Second, **the strategy-making process was seen as a useful means of promoting stakeholder understanding and buy-in into national policy framework that emerges from it.** Long-term strategies were seen as playing an important social and political function, not only a technical function. For instance, one official in Germany reflected on the intensive external stakeholder consultation process (and inter-ministerial process within government) that was involved in developing the country's Climate Protection Plan 2050 by saying that “the outcome is not only the plan itself, but also the public debate—it has shown some success—even if [some stakeholders would have wanted more details]”.

Similarly, in the French Debate on Energy Transition, interviewees noted several ways in which the scenario development process together with stakeholders that informed the law was crucial to moving the national debate on energy policy forward as a whole. For instance, one interviewee noted that a crucial element to getting deep decarbonization scenarios accepted by government officials was by integrating a detailed macroeconomic assessment of impacts with individual transformation scenarios. Experts in Poland also highlighted the importance of integrating any ambitious decarbonization plan with other national policy priorities (e.g. economic development, reducing foreign energy imports, energy security).

Finally, experts also commented that an important role of such national debates can be to place symbolically important or “taboo” topics up for discussion (e.g. the role of nuclear power in the French electricity system, coal phase-out in Germany, implications of decarbonization for meat consumption habits, etc.). If approached intelligently, and based on evidence, such debates can help to move the national discussion forward and beyond popular misconceptions. For instance, the

DNTE in France was instrumental in popularizing the acceptance of a scenario involving a greater role for renewable power in France. The German 2050 consultation process has also led to the establishment of a Commission for industrial transition in Germany, which will further discuss transition options for coal regions.

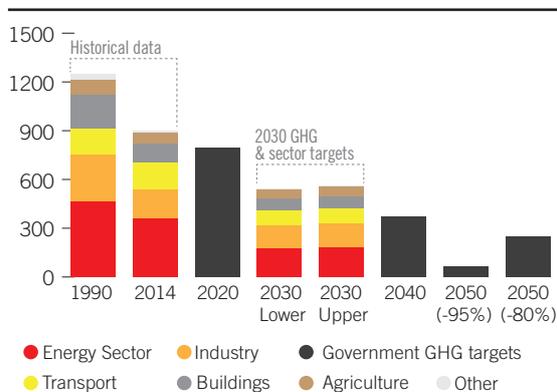
**Thirdly, strategies can reveal important information about the external conditions under which the realisation of long-term decarbonization strategies is feasible.** If done well, long-term strategies should tend to reveal important information about the implications of a specific level of policy ambition, e.g. economically, socially, technologically, etc. Revealing this information can help to overcome misconceptions about the barriers to decarbonization. However, it can also tend to reveal issues that are genuine constraints on action. For instance in Germany, national debate supporting the strategy has revealed that one challenge to coal power phase-out is the concern that it will lead to increased importation of nuclear power from France. In Poland, there is concern about the potential impacts of coal sector phase-out on economic development and political “sell-ability” of an ambitious strategy. In short, although it is not the case today, it seems plausible that revealing this information would be useful for many EU Member States as something that they could use to give content to a European discussion about how to progress the aims of the “Energy Union” including decarbonization goals.

**Fourth, 2050 strategy development can provide necessary guidance on the implications of long-term decarbonization for specific sectoral actions and the role of individual emissions drivers to achieving goals.** One advantage of long-term decarbonization pathways is that they tend to reveal that all major emitting sectors need to contribute to achieve ambitious national goals. This by itself can be an important revelation for many Member States and sectoral stakeholders.

However, strategies can also be more specific in describing the kinds of transformations that need to occur in each individual sector and on what time horizon. For instance, in Germany, the recently published 2050 Climate Protection Plan starts to translate the 2050 target into sector transformation strategies. Thus, targets are set to reduce emissions by 2030 in buildings (-66-67%), energy (-61-62%), industry (-49-51%), transport (-40-42%) and agriculture (-31-34%), all compared to 1990 levels (see Figure 2). Such targets have been adopted because they are considered necessary to coordinate and motivate actions both by individual ministries and other stakeholders. Similarly, the Factor 4 scenarios developed to inform the French

Law for Energy Transition also included a similar kind of sectoral decomposition analysis to that of Germany. In addition, it added another layer which was to identify three key “drivers” of emissions/abatement for representing the transition for energy sectors, namely: end use efficiency, decarbonization of energy carriers (electricity, zero gas, heat), and decarbonization of the primary energy mix.<sup>3</sup> This analysis of “drivers” proved useful in the French debate for clarifying the concrete implications of alternative pathways to decarbonization and to compare scenarios.

**Figure 2.** Germany GHG emissions, total GHG targets and sector GHG goals of 2050 Climate Protection Plan (MtCO<sub>2</sub>eq)



Source: IDDRI, based on data from (BMUB, 2016) Klimaschutzplan 2050; German Federal Environment Agency.

Finally, long-term strategies can help to enable more effective and precise evaluations of progress of policy. Without a clearly elaborated strategy for long-term decarbonization, it is difficult for policy makers to assess whether existing policies are adequate or new policy proposals are correctly calibrated. However, where long-term strategies exist, such factors are more readily addressed, because there is a “benchmark” against which to compare progress.

Thus, in the UK, the Climate Change Committee provides annual progress reports to the Parliament based on a systematic appraisal of indicators that reflect its scenarios for 2050 decarbonization. In France, the Comité d’Experts pour la Transition Énergétique has recently elaborated its opinions on France’s new Multi-year Energy Plan<sup>4</sup> (CETE, 2016) with reference to decarbonisation and energy trajectories, such as those are elaborated in the official French decarbonization strategy, the

Stratégie Nationale Bas Carbone (SNBC). (Indeed, one of its main criticisms was that the PPE was not sufficiently well described with reference to these scenarios.)

To be clear, despite the existence of such monitoring, policies are not always consistent with the 2050 goals in any of the above Member States. This reflects the fact that the existence of long-term strategies cannot necessarily neutralize the role of vested interested on short-term political decision-making. Nonetheless, where monitoring is done based on concrete and detailed long-term strategies, it was nevertheless viewed as providing an important, science-based, counterweight to vested interests or to policy inconsistencies. It was also viewed an important source of pressure on the government to justify actions that might be inconsistent with long-term policy goals.

## 2.2. Content of 2050 strategies

The preceding section suggested ways that 2050 strategy development processes can contribute to effective climate and energy governance. But what criteria did 2050 strategies need to fulfil to make this contribution? This is focus of the next three sections of the paper. This sub-section begins by looking at what technical details and content were viewed by experts as important to the effectiveness of national 2050 strategies.

Firstly, **effective strategy development requires clear objectives.** This may sound obvious, but there is evidence from the examples we studied—as highlighted in the preceding section—that focusing the policy objectives on 2050 (rather than 2020 or 2030) makes for a substantially different approach to policymaking. To cite another example, the introduction to the UK CCC’s advice on the UK’s 5<sup>th</sup> Carbon Budget justifies its recommendation to reduce emissions more aggressively in earlier years of the transition in the following way (UK CCC, 2015, p11):

*“It is important to signal this direction in advance given the time required to develop new policies, to grow currently nascent markets, for consumer behaviours to adapt and to invest in supporting infrastructure and innovation. A looser budget would fail to send that signal and would involve stop-start investment, storing up higher costs for the future.”*

As noted above, the impact of long-term strategy development tends to be strongest when the process itself is linked to some shorter- or medium-term policy revision process, such as carbon budgets, 2030 targets, policy effectiveness review, etc.

3. To this one could also add process emissions for non-energy emissions in other sectors.

4. Programmation Pluriannuel de l’Énergie (PPE).

However, 2050 strategies also need to be articulated with *other national policy priorities in mind*. In Poland, for example, interviewees consistently reported that a critical objective of national policy makers was economic development. An essential element of long-term strategy development in this context was how to reconcile objectives for a low-carbon economy with economic development objectives. One interviewee suggested that, to have any chance of being credible, the content of national climate strategies would therefore need to explicitly address how proposed actions on climate mitigation interact with national development priorities and challenges (and also energy security concerns).

Apart from defining key objectives, interviewees were remarkably consistent in their comments about the principle content of what long-term strategies should contain. This view was perhaps best summarised by a German participant in the study,<sup>5</sup> who argued that, based on a long history of German experience with developing climate policy, **effective strategy development is best when it provides a robust answer to the “four A questions”, namely:**

1. What (technical) potentials are *available* to achieve the targets?
2. Can these technical potentials be exploited in a way that is *achievable*?
3. Will the transformation pathways be *affordable*? (cost)
4. Will the pathways be *acceptable* to the public?

These questions were seen as particularly helpful because they can help to identify the key issues that need to be resolved in the development of a coherent and feasible national decarbonization strategy. For instance, that all sectors need to contribute (availability); that technical potentials need to be unlocked in a timely and coordinated manner (achievability); that solving distributional issues is key, that dynamic cost efficiency matters, and that thought is needed about how to allocate sufficient financing capacity (affordability); that as the energy sector transforms, interfaces between the energy system and the public will become more noticeable and thus, strategies need to include concrete reflection about how to obtain public backing for key changes and be wary of technical solutions that will be politically unfeasible (acceptability). This broad view was strongly echoed by experts, semi-governmental and ministry officials in France and the UK.

5. Presentation by Felix Matthes at IDDRI Workshop: “Long-term planning for climate and energy policy: Lessons from national experiences”, held in Paris, June 7<sup>th</sup> 2016.

Reliable and useful strategy-making also needs to include a *robust risk assessment* of the proposed strategy for achieving targets, preferably involving the development of more than one possible pathway to the end goal. A common theme that emerged across almost all of the case studies was that there is a tendency for governments to over-rely for policymaking purposes on what might be called a “single trend analysis” in national strategies. The idea here is that excessive analytical weight is placed on one projection, trajectory or pathway to decarbonization. Consequently, there can often be insufficient preparation for real world situations in which a country or sector or technology has deviated from the forecast pathway. This can and does occur for many reasons, e.g. baseline scenarios are almost always wrong in reality, policies under- or over-perform, there are unforeseen technological or economic or political shocks, etc.

The claim that 2050 strategies should explore more than one “pathway” or “scenario” to achieving end goals may seem to give the false impression that 2050 strategies in the Member States studied will create unhelpful complexity or do not provide a clear signal for implementation. However, this does not seem to be a fair assessment, if one examines actual experiences in individual Member States.

Firstly, what tends to happen in the strategic development exercises that we investigated was that running even a few scenarios tended to reveal both common patterns across the scenarios, and also some specific drivers of divergence. This exercise in turn can lead to greater confidence in which specific actions are likely to be “safe” and “no regret” measures regardless of future uncertainties in the short and medium term. It also helps identify those areas where greater account for uncertainty needs to be taken into account (in the longer term). The following quote from the UK’s 2011 Carbon Plan illustrates that this is a reality that 2050 strategy developers face in reality:

*“While our vision for 2050 is clear, there are huge uncertainties when looking 40 years ahead as to exactly how that vision will be achieved. Our approach has been to try to explore a range of plausible scenarios for what the UK might look like in 2050 and to seek to draw lessons from the similarities and differences between those scenarios.” (HMG, 2011)*

The commonalities between different scenarios in practice therefore tend to help the governments (e.g. FR, DE, CZ, UK) to set hard targets in the short-to-medium term for individual sectors with a high degree of confidence. At the same time, the

concrete exploration of uncertainties post-2030 enables the government to develop a sense of the direction of travel for those same sectors, but it is also based on more risk-robust approach, bearing in mind uncertainties. Thus, in practice, there did not appear to be a serious problem for strategy developers to explore more than one pathway to 2050 objectives and also provide clear signals for implementation, investment, etc.

### 2.3. Interaction with stakeholders

As noted above, a clear theme emerging from the national experiences is that, correctly used, 2050 strategy development can be a useful tool for improving stakeholder understanding, consensus and acceptance of policy strategies. Potentially, this may in turn contribute to the credibility and thus the stability of the resulting 2050 strategy and the policy framework accompanying it, although evidence for this latter claim is more limited given a lack of experience with such strategies to date in our examined countries.

Interestingly, stakeholder consultation was done quite differently (and with varying degrees of success) in different Member States, but nevertheless the benefits of a stakeholder-focused process are evident in each case. Some of the main drivers of (or barriers to) effective stakeholder consultation that we identified, were the following:

**A transparent, credible and public-facing process** – The UK climate change committee experience suggests that a combination of evidence-based and expert analysis, high degrees of transparency on the formulation of recommendations, and a “public-facing” process in the development and communication of national strategies (recommendations to government) can be an effective way of promoting acceptance and understanding of policy choices. For instance, one UK interviewee commented that (so far) the committee’s recommendations have tended to be broadly accepted by key stakeholders—even if not by everyone, all of the time—and that has led to governments on both sides of politics more or less accepting the core of the UK CCC’s recommendations on carbon budgets. Conversely, Member States whose strategy development processes lacked these elements tended to say that strategy development was less likely to lead to ambition or even to be adhered to once adopted.

**Iterative rounds of dialogue with stakeholders** – There is evidence that iterative rounds of dialogue have proved effective at promoting stakeholder acceptance, understanding and consensus in 2050 strategy development processes in the UK,

France, Germany and in North Rhine Westphalia. This seems to be useful partly because 2050 strategy development is a complex process and it takes time to address key stakeholder concerns in the discussion and investigate their implications for the strategy development scenarios (notwithstanding the fact that some opposing concerns may remain irreconcilable). However, it also seems to be important because, even independently of their economic interests, stakeholders tend to come to a new process with ready-made positions, dogmas or prejudices about solutions and these must be addressed—at least to some extent—to promote any consensus.

A good example of this was the French National Debate on Energy Transition, where stakeholders reported that taboos about the role of nuclear, the role of energy sobriety, and the role of renewables threatened to almost derail the debate before it began. These taboos were ultimately tackled quite successfully, but they required an iterative process of listening, quantitative testing by independent experts, and confrontation with the evidence, to move the discussion forward. The need for an iterative and public-facing process implies that a robust 2050 strategy development process tends to take time, money and the expenditure of political capital. Typically 18 months to 2 years can be needed to do the process thoroughly.

**A focus on achieving consensus (to the extent possible)** – Successful stakeholder consultations tended to aim to promote consensus during the process itself, rather than to “tick a box” of stakeholder consultation. For instance, in Germany, a very detailed—albeit quick—stakeholder process was engaged in the development of the Climate Strategy 2050. One government official noted that delegates to the consultation processes were encouraged to aim for consensus, since in doing so they would make it harder for the government to ignore their recommendations. Consensus building was also promoted *via* pre-meetings and the use of professional mediation experts to run some of the meetings. This was broadly viewed as successful at improving consensus. The time allocated was too short for some actors to consult with their respective constituents, which may have had a negative impact on overall buy-in—but this time pressure also facilitated reaching consensus in the group.

Denmark also reflects an interesting example in this regard, since a recent change of government has led to a significant watering down of some of the more ambitious elements of its climate policy, such as the scrapping of a coal phase-out strategy and a reduction in 2020 ambition. However, interestingly, the Climate Change Act itself, which

resulted from a broad public consensus, has stayed. This may be further evidence that consensus helps to maintain some degree of policy stability, despite significant changes of government.

On the contrary, in countries where public consensus was not sought with the same level of effort during the strategy development stage, such as Poland, national 2050 strategies appear to have more difficulty in surviving changes in government.

**A role for independent experts** – Typically, experts tended to say that the arrival at a higher degree of stakeholder consensus was due in part to the role of credible independent experts in the process. This seemed to be important to both the ability to resolve conflicts of opinion by appealing to evidence, as well as lending the process credibility beyond the political cycle. Indeed a commenter in one Member State which does not include technical experts in its strategy development process argued that his country had “policy-based evidence, rather than evidence-based policy”. Of course, the role of independent expertise does not necessarily outweigh powerful vested interests in all situations, but it appears to be an important element of good practice nonetheless.

**Integration of key non-climate policy objectives for stakeholders in the discussion and the strategic scenarios** – A common theme across all Member States was that for 2050 climate mitigation strategies to be credible and likely to get any traction with policymakers across successive governments, they need to explore ways to be consistent with other vital national policy priorities. For example, experts in Poland noted that energy and climate plans have historically been weakened by the belief that deep reductions in coal production and consumption are inconsistent with economic development and energy security goals.

**It is important to embed the strategy into a broader institutional and policy framework to tackle unresolved issues** – Although it can be very helpful for promoting consensus, the strategy development process on its own cannot resolve all stakeholder conflicts. There will inevitably need to be accompanying processes that try to resolve the most difficult conflicts, e.g. in those cases where large economic interests are at stake. The national experiences we looked at suggest that it can be necessary to make trade-offs between how much can be resolved by a strategy, and what issues need to be left as unfinished business. This, in turn, means it is important to embed the strategy development process within broader legislative and institutional processes in order to be able to follow up on these issues within a well-structured process.

For instance, in the case of the recent German Climate Protection Plan 2050, while a number of important targets and orientations were set, some challenging issues (such as a coal phase-out strategy) were left unresolved. However, officials and stakeholders that we interviewed still tended to say that this criticism tended to overlook the important progress that the strategy has delivered. Firstly, the process had led to the creation of new, more targeted activities, such as a Commission for Industry Transition, and a call for regional transition strategies to be developed as a further step to revisiting the coal phase-out issue. Furthermore, the German strategy will be accompanied by a new formal monitoring process of independent experts and has a built-in revision mechanism every five years, which should in principle allow for remaining inconsistencies to be brought to light. Finally, the strategy is embedded within a set of legally binding targets, such as the 2050 target. This should also be a source of impetus for policymakers to continue to improve the strategy.

## 2.4. 2050 strategy development tools, institutions and “capacity”

### National capacity to develop long-term decarbonization strategies

A strong result emerging from the national examples studied was that developing robust 2050 climate strategies requires a significant investment of resources. For example, doing extensive and iterative rounds of stakeholder consultation requires time and money; developing a detailed and carefully considered strategy requires willingness by government to invest the time and to employ the man-power to follow the process; and more than one ministry will typically need to be involved.

But there is much more to strategy development capacity than pure governmental or ministry man-power and experience. Both Germany and France provide interesting examples here. Both country have a fairly long history of detailed climate policy (and related scenario) development going back to the late 1980s (in Germany) and 1990s in France. These various processes have cumulatively contributed to common knowledge base and sense of what is technically possible that is broadly accepted by experts and different political colours.

National experts who have followed these processes argue that this experience has created significant analytical and political capital, which has helped to enable the formulation of strategies both analytically and politically. This suggests a role for scenario development by non-state actors

(civil society groups, academics, think tanks, regional governments, etc.) may be important in improving the overall conditions for official 2050 strategy-making and related policymaking.

### Legal form of the 2050 Strategy and surrounding process

**In general, the most convincing long-term decarbonization strategies tended to be a combination of legal and non-legal elements.**

Typically, the strategies themselves were not legally binding, so that they could be adjusted and improved over time. However, to give them institutional credibility and promote a positive dialogue between the strategies and actual short-term policy, the strategies were sometimes embedded within a legal framework to some extent.

For instance key legal elements guiding the strategies and process in UK, FR, and Germany were:

a. A binding 2050 target for total economy-wide GHG emissions (e.g. FR, DE, DK).

b. A link from the strategy development process to the setting of similar binding target(s) for medium-term emissions or sector goals (FR, UK, DE, and CZ).

c. A link to national climate act of some sort that mandates the role the strategies or advice coming from the strategies should play for government policymaking.

One can speculate that the role of a legally binding 2050 target could be to give a clear focal point for the strategy developed in the national strategy, and also give the 2050 strategy institutional credibility stemming from the target. The binding carbon budgets or medium-term targets appear to be necessary to provide a clear motivation for immediate action on the set of policies as a whole. While the sectoral targets appear to be important to set clear and actionable objectives in the short term.

Another potentially important legal component to developing long-term strategies can be the legal requirements that are placed on governments on when and how to use them when determining their shorter-term climate and energy goals and policies. One of the apparent strengths of the UK's Climate Change Act is that it requires the government to take into account several criteria in setting its carbon budgets, including dynamic cost effectiveness to achieve 2050 goals. This (combined with the institutionalization, also *via* legal mandate, of an authority to provide independent advice on how to ensure this long-term cost-effectiveness criteria is satisfied) means that a long-term perspective is fairly well integrated in the process of policy development itself.

There were also some important non-legal elements of robust long-term strategies. For instance, since 2050 strategies did not set specific targets for individual sectors beyond 2030, it was important that they signal the “direction of travel” to stakeholders and policymakers nonetheless. Thus, scenarios developed in the 2050 strategy documents often involved a description of overall strategy for a given sector out to 2050, for instance by discussing *benchmark ranges* of emissions or a breakdown of sectoral emissions drivers beyond 2030 (see discussion on “dashboards” below).

Another important non-legal element of long-term strategies is that they tended to provide a description of the kinds of measures or technologies that would be necessary to deploy to meet 2050 goals in individual sectors (e.g. DE, FR). This also appears to be a way of providing clarity on the direction of travel—both for stakeholders and for governments themselves on what they need to prepare—without necessarily overcommitting to very specific details. One challenge with this approach, however, is to provide guidance while avoiding “shopping lists” that provide little commitment from government, nor great certainty to stakeholders.

### Specific strategy development and communication tools

One important issue that arose during the study was the role of computer modelling tools, such as integrated energy and economy system models, for developing long-term strategy scenarios. In general, experts tended to argue that such tools were useful. One of its key advantages is the ability to represent energy and economic system interactions and thus to reassure key stakeholders and policymakers that the costs of even ambitious strategies are manageable. This has proved very important, for instance, in the scenarios that the French ADEME provided to the ministry to inform France's National Low-Carbon Strategy development. Actors in Poland, the UK, Czech Republic and Germany tended to confirm this view.

However, experts *also* tended to claim that such models are over-used and that there is a need to combine them more with detailed **bottom-up analysis at the sectoral level**. This preference appeared to reflect the greater transparency of the bottom up approaches, the fact that “real world” feasibility issues could be more easily integrated into the analysis, and therefore lend themselves more easily to the kind of multi-criteria and risk assessment analysis that is needed to develop robust strategies.

For instance, the UK's 2011 Carbon Plan states (HMG, 2011):

*“Carbon budgets have to be set with a view to meeting the 2050 target. It is important to consider the appropriate pathway that minimises costs over time of reaching this target[...]The modelling evidence base is limited, and not sufficiently granular or tailored to answer the question ‘what is the optimal level of effort over 2023-7 consistent with the 2050 target?’. Instead consideration needs to be given to views on technical feasibility, key technologies for the UK’s pathway to 2050 and implications for investment and action over the 2020s given risks of lock in, considerations of supporting supply chains, incentivising innovation and the benefits of this, and feasible rates of uptake given consumer preferences and behaviour change.”*

Interestingly, in different Member States, an issue that was important at the stakeholder consultation stage of the strategy development process was the ability to communicate the content of long-term strategies and their implications to both policymakers and stakeholders in a simple and clear way.

An interesting tool that was explored in the French National Energy Transition Debate (DNTE) was the use of energy system “dashboards”. This tool is essentially based on a simple Kaya decomposition of all of the key drivers of emissions in each major energy consuming sector. It also divides the energy system into three basic parts: end-use demand (e.g. in buildings, industry, transport etc); energy carriers (electricity, heat); and primary production. The tool is relatively simple but also allows for a very comprehensive and systematic overview of the decarbonization pathway. The dashboards were developed by experts during the DNTE in response to the need to be able to make different strategy scenarios comparable and transparent. This approach has been further exploited by think tanks under the Deep Decarbonization Pathways Project (IDDRI-SDSN, 2015). Its capacity to provide a standardised representation of the energy (low-carbon) transition means that it may also be well-suited as a basis for developing comparable strategies for EU Member States.

Another 2050 strategy development tool that was cited by one interviewee as being potentially important is the use of “Dynamic Marginal Abatement Cost (DMAC) Curves”. To be sure, *static* MAC curves can give a misleading picture of actions to prioritise because they do not account for dynamic learning effects on energy systems and technologies. However, the expert noted that they can be adapted to give a dynamic picture of long-term

marginal abatement costs. They can also be useful ways of communicating to policymakers an overall picture of the potentials that exist and the cost-optimal timeframe to ramp them up.

### Independent expert institutions

The case studies showed different kinds of institutional arrangements around the 2050 strategy development and implementation process. These ranged from the very formalised example of the independent expert UK Climate Change Committee in the UK, which has a very strong and visible role in national policymaking, as required under the country's Climate Act, to a country like Poland where most strategic strategy development is done “in-house” by the Energy Ministry, albeit with some linkages to the Parliament (e.g. for 2030 strategy development).

It is difficult to robustly assess the value of specific institutional arrangements, given the small sample size and limited experience with the institutions. Nevertheless, it can be seen that at least in the case of the UK, the existence of a more or less independent, well-funded, and visible independent expert institution can fulfil very useful functions that do improve the quality of national policy. Specifically, they can be an important way of:

- Institutionalising “evidence-based” debates about policymaking.
- Increasing transparency of decision-making for stakeholders.
- Improving stability of policy beyond the election cycle.
- Monitoring the implementation of the 2050 strategy as a whole and bringing contradictions to light for public debate.

For these reasons, approaches involving independent expert committees have been pursued in Denmark, France and Germany. The examples suggest that such committees are not necessarily immune to political interference, and that not all governments in the EU are likely to be willing to accept the degree of independence and visibility granted to the UK's Committee. However, once they exist, they do nevertheless seem to make it harder for governments to pursue un-scientific-ly-founded policies.

## 2.5. Interaction with EU institutions

### The value added of EU action

Discussions with experts in the different Member States strongly suggested that, **in general, EU requirements can be important to encouraging policymakers to allocate the necessary**

**capacity and tools to develop detailed strategies** (cf. Ecologic and IDDRI, 2016b). Moreover, there is evidence that this can help improve the national governance culture. For instance, the Czech Government developed its Draft 2050 Plan in part due to the requirement of the MMR to develop low-carbon development strategies.

Similarly, experts in Poland noted that while national governments do not have a strong culture of long-term strategy-based policymaking, the requirements to develop and frequently reporting on strategies under the EU's 2020 climate and energy package has led to a change in culture in the relevant ministries. They also noted that rules that require putting specific numbers on paper and to report on them to the EU generally help to increase transparency and thus the capacity of stakeholders to hold decision-makers accountable.

#### Existing EU tools are not sufficient

**However, an analysis of current (and expected future) EU long-term strategy development requirements shows important gaps when it comes to 2050 strategy development.** The EU's 2050 Roadmap to a Low-Carbon Economy of 2011 is seen by Member States as having had some positive impacts. It helped policymakers in Germany to argue that the biggest country in the EU should also have one. There is also evidence that some Member States, such as Slovenia, also started to develop one when the EU developed its own, only to abandon the process after the EU 2050 Roadmap failed to be adopted by Council.

However, it is also seen as having important limitations. In general, experts were very skeptical of the capacity of an aggregate EU level roadmap to illicit buy-in from national stakeholders, since the process can find it difficult to respond to the particular concerns of individual Member States in direct dialogue with them. Furthermore, EU Roadmaps and similar modelling exercises are sometimes seen with distrust by national actors in some Member States.

The current Monitoring Mechanism Regulation (MMR) requirement for Member States to produce low-carbon development strategies is a more nationally specific measure. However, the requirement lacks any detailed guidance to Member States about content or process of strategy development—or a time by which it should be produced. Indeed, such Strategies do not even need to reflect a 2050 time horizon. With the exception of the Czech Republic, where the requirement partially helped to motivate the creation of a 2050 strategy, no Member State expert thought that the current requirements for LCDS under the

MMR in its current form was adequate to ensure high quality long-term strategies.

#### The new Energy Union Governance Regulation proposal is inadequate as currently formulated

Under a recently proposed “Energy Union Governance Regulation”, the European Commission has outlined requirements for Member States to develop “long-term low emissions strategies” out to mid-century (Cf. Chapter 3 of the proposed regulation).<sup>6</sup> The proposal is framed in terms of the requirements on the EU to fulfil its obligations under Article 4.19 of the Paris Agreement. This article requires Parties to formulate and communicate long-term low greenhouse gas emission development strategies.

In contrast to existing EU long-term strategy development tools, these requirements would appear to offer the potential to develop nationally driven strategies that are explicitly linked to the EU's goals of reducing emissions by 80-95% by 2050. However, as it is currently formulated, this text may not necessarily lead to strategies that are consistent with the lessons we draw from national experiences in this study.

Firstly, and most strikingly, the chapter of the regulation describing the requirements for developing these strategies *lacks basic details* about the necessary content of the strategies and process for formulating them. This paper has highlighted a number of important pieces of content that are important for national strategies to include if they are to add genuine value to national climate and energy governance. These include basic elements that are not presently required by the language of the governance regulation, such as:

- Quantitative descriptions of emissions pathways and key drivers of emissions/abatement in each sector out to 2050 (e.g. based on a Kaya decomposition for each sector).
- An explicit consideration of the implications and options for ensuring consistency between national policy priorities (e.g. economic development, energy security, etc.) and 2050 decarbonization strategies.
- An explicit assessment of their implications for short- and medium-term policymaking, including a risk assessment of the implications of different options for achieving 2050 goals.
- A description of external conditions that would need to be met in order to reduce risks to implementation.

6. European Commission (Nov 30, 2016). “Proposal for a regulation on the Governance of the Energy Union”, European Commission, Brussels.

At present, however, none of these elements are explicitly expressed in the requirements outlining what Member States shall include in their long-term low emissions development strategies. This stands in stark contrast, also, with the level of detail that is required of Member States in preparing their National Climate and Energy Plans to 2030.

Moreover, the proposals in the governance regulation also contain very little information on what the processes should be engaged in the development and implementation of the long-term low emissions strategies. Once again, a number of the best practice examples that we have observed in preparing this study are missing. For example:

- Short-term policy setting and strategies should be set based on insights and guidance from the long-term strategies. (*The current regulation proposal would see the long-term strategies submitted in 2020, while 2030 plans are submitted in 2018.*)
- Long-term strategies should be developed based on iterative rounds of stakeholder consultation and evidence-based dialogue. (*The current proposal would not require Member States to consult with stakeholders on the development of the long-term strategies during their development.*)
- Long-term strategies should be embedded in a clear legal and institutional framework at the national level. This should ensure that they are used for the purpose of monitoring and evaluating implementation of climate and energy policy and are explicitly considered for new policymaking.
- Long-term strategies should be based on credible long-term objectives that are relevant to policymaking. (*The current draft calls for strategies that extend out to 2070 rather than the more practically relevant date of 2050.*)

Doing high quality long-term low emissions strategies under the new Energy Union Governance Regulation will also be challenging for Member States and calls for targeted support. Observations collected from this study suggest that administrative capacity constraints, time and cost considerations for effective stakeholder consultation, and limited experience with sectoral strategy development, could all pose challenges for the development of robust and useful long-term strategies by Member States. To ensure that the development of these strategies delivers genuine value and to simplify the task for Member States, the EU may be wise to anticipate these challenges and provide appropriate support. This could take a few forms, and include:

- Guidance on the content and process of long-term strategies.
- Technical and financial resources.
- Informal exchanges between Member States on existing 2050 strategy development experiences.

As the Commission will be developing its own 2050 Roadmap during this time, opportunities to exploit interactions between the EU and national long-term strategic strategy development exercises should be explored.

### 3. CONCLUSIONS

This paper has presented insights of national examples of formal 2050 decarbonization strategy development exercises in 5 EU Member States. The sample size is admittedly relatively small, and the level of experience and sophistication of these strategies varies across the examples studied. Nevertheless, there is still a fair amount of evidence that national long-term strategies, if pursued in line with certain basic principles, can be valuable climate policy governance tools.

In particular, we find that long-term strategies can serve both technical and social functions. At a technical level, they can help Member States to:

- Construct a detailed and coherent pathway to ambitious 2050 climate targets.
- Identify the kinds of actions that need to be implemented to achieve those 2050 targets.
- Select specific short-term actions needed to avoid closing off pathways to ambitious 2050 targets.
- Determine robust strategies in a context of uncertainty.
- Identify ways to pursue ambitious 2050 decarbonization strategies that are consistent with other social or economic objectives.

In addition to these technical functions, for which there is actual evidence to date, we can speculate that long-term strategies may be a way to identify potential trade-offs that could inform negotiations between Member States on future targets and measures.

Furthermore, 2050 strategy development exercises also appear to have an important social and political component. They can help to build understanding and consensus among stakeholders about the national strategy and specific policy approaches. While they cannot resolve all conflicts between stakeholders, they can also serve as a basis for identifying those areas where

further negotiation, dialogue and policymaker attention is needed.

To their credit, both the European Commission and the authors of the Paris Agreement appear to have recognized the importance of long-term strategies to climate policy governance. Nevertheless, present proposals under the new Energy Union Governance Regulation, as currently

formulated, appear unlikely to deliver many of the potential benefits of long-term strategies. The insights gleaned from national experiences with long-term strategy development that are presented in this paper suggest some simple ways that the long-term strategy development requirements could be strengthened in this new regulation. ■

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## Developing 2050 decarbonization strategies in the EU: Insights on good practice from national experiences

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