

LONG-TERM CLIMATE STRATEGIES: A CASE STUDY OF GERMANY

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CHARACTER AND CONTENT OF THE GERMAN LONG-TERM CLIMATE STRATEGY

Germany's long-term strategy, the Climate Action Plan 2050, is a mitigation strategy, focused on mitigation efforts needed economy-wide and in all relevant sectors to achieve the target of extensive greenhouse gas (GHG) neutrality by 2050. The long-term strategy is limited to mitigation for three reasons: (1) an adaptation strategy was already adopted by the federal government in 2008; (2) federal institutional arrangements give responsibility for implementation of adaptation measures mainly to the Länder (states), while the Bund (central government) has greater authority regarding mitigation, and (3) the strategy needed to take into account Germany's national economic circumstances and long-standing experience with climate change mitigation policy.

The strategy provides a framework for climate action policies for Germany with its federal system, which comprises the federal level as well as the Länder and municipalities. Key elements of the strategy include a long-term mitigation target for 2050 (extensive GHG neutrality) and an overall 2030 target, as well as sectoral targets for 2030. It also features a set of transformative pathways for all sectors by 2050, as well as a first set of measures. Since the long-term strategy focuses solely on national mitigation goals, the thematic complex of common but differentiated responsibilities is not widely elaborated.

The strategy was designed to operate as an iterative learning process enabling a continuous increase in ambition as envisaged by the Paris Agreement. The strategy's cycles for implementation and further development are designed to match the five-year cycles foreseen in the agreement. The learning process also includes the continuous engagement and participation of stakeholders, in addition to providing for the updating of targets and adjustment of measures.

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On November 17, 2016, Germany submitted its strategy to the United Nations Framework Convention on Climate Change (UNFCCC), fulfilling the Paris Agreement’s request that each Party develop and communicate a long-term low GHG emissions development strategy (Article 4, paragraph 19). However, the decision to develop a long-term strategy goes back to 2013, when the parties in the governing coalition, the Christian Democratic Union and Christian Social Union in Bavaria (CDU/CSU) and the Social Democratic Party (SPD), committed to develop a long-term climate and energy strategy as part of a compromise agreement to accommodate the more progressive forces in Germany arguing for a national climate-action law.

CONTEXT SETTING FOR LONG-TERM STRATEGY DEVELOPMENT

The starting point of the decision to develop a long-term strategy was the conviction that the development and establishment of a long-term strategy helps identify robust transformation

pathways for all areas of action, and thus creates certainty for all actors on the direction a country is taking. It can also guide the process of scaling up targets and actions in the short and medium term, and help create the correct conditions for scaling up investments in clean, climate-smart, and resilient infrastructure. Therefore, the Climate Action Plan 2050 can help actors (private and public) by orienting today’s investments and projects. In fact, influencing current decision-making is one of the central aims of the Climate Action Plan 2050.

The Climate Action Plan thus aims to serve as an anchor and guide for current and future efforts to tackle climate change in Germany, beyond legislative periods, and for investment planning. It is also envisioned that the plan will become an integral part of the National Sustainability Strategy, covering all three of the strategy’s dimensions (environmental, economic, and social). The plan also must take into account the Sustainable Development Goals in the United Nations’ 2030 Agenda for Sustainable Development. In addition—as the Climate Action Plan is a mitigation strategy—it will be essential to exploit synergies with the existing German Strategy for Adaptation to Climate Change wherever possible.

A breakdown of Germany’s greenhouse gas emissions in 2015

Germany’s distribution of GHG emissions is typical for a highly developed industrialized country: carbon dioxide (CO₂) was the primary cause of GHG emissions in 2015, with a share of 87.8 percent. Most of these emissions came from stationary and mobile combustion of fossil fuels. Methane (CH₄) emissions, most of which are caused by the raising of livestock, fuel distribution, and landfills, accounted for a 6.2 percent share in 2015. Most emissions of nitrous oxide (N₂O) came from agriculture, industrial processes, and the combustion of fossil fuels, contributing 4.3 percent to GHG emissions. Fluorinated gases (known as F-gases) contributed about 1.7 percent to total emissions; nitrogen trifluoride, NF₃, a greenhouse gas only recently included in the reporting, contributed 0.001 percent.

The structure of German legislation

Under Germany’s Basic Law, which divides legislative authority between the federal government and the Länder, the latter have significant powers, including the authority to enforce most environmental legislation. The Länder were therefore important stakeholders in the development process of the

INSTITUTIONAL ARRANGEMENTS AND PUBLIC PARTICIPATION

Institutional setup

The Climate Action Plan was developed and coordinated by the federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (hereafter, Environment Ministry), which has responsibility for climate change policy within the federal government. As just noted, development of the plan was mandated in the 2013 coalition agreement between the Christian Union and SPD.

The federal Environment Agency (the Umweltbundesamt, which is part of the Environment Ministry) supported the development of the Climate Action Plan, especially its vision and targets, through scientific studies commissioned by the agency. As climate is a cross-cutting, cross-sectoral policy area, a number of ministries were intensely involved in the development of the strategy. Those ministries are also in charge of implementing policies in the sectors most relevant for GHG emissions: the Ministry for Economic Affairs and Energy (energy, industry, and to some extent buildings), the Ministry of Transport (mobility), the Ministry of Agriculture (agriculture, land use, and forestry), and the Environment Ministry itself, which was also responsible for the building sector at that time (2013–18). Further ministries were involved as their responsibilities include further cross-cutting issues and instruments regarding climate policy, including the Ministry of Finance, the Ministry for Economic Cooperation and Development, and the Ministry for Foreign Affairs. Some ministries were supported by subordinated agencies that provided scientific findings and expert advice; one example is the Thünen Institute, under the auspices of the Ministry of Agriculture, which provided guidance regarding land use, forestry, and agriculture.

The collaboration was organized as a coordination process between the ministries on the basis of the Environment Ministry's first draft of the Climate Action Plan. The draft was discussed among ministries for four months on the working level (policy advisors up to heads of department), and during the final stages on the political level (secretaries of state, ministers). At the beginning of September 2016, the Environment Ministry began interministerial coordination of the draft strategy. The final coordinated draft of the strategy was adopted by the federal Cabinet on November 14, 2016. The Cabinet, the chief executive body of the federal government, consists of the chancellor and the federal Cabinet ministers.

long-term strategy. However, the federal government retains decisive influence over environmental legislation and authority to transpose European Union (EU) directives related to the environment (including climate change and energy) into German legislation. Most of Germany's environmental laws are based on EU decisions by way of directives, which Member States must adopt in national legislation, or regulations, with immediate binding legal force.

All 16 German Länder have their own concepts, programs, plans, or legislation relating to climate action. Many local authorities are also setting targets for themselves and developing their own climate-action strategies and measures.

The Climate Action Plan 2050 builds on an existing, well developed, national climate policy and uses a broad mix of instruments. In particular it builds on the experience and success of Germany's Energiewende (energy transition) and on the comprehensive measures put in place from December 2014 onward as a result of the German Climate Action Programme 2020.

The adoption of the Climate Action Program 2020 in 2014 led the German government to approve additional emissions-reduction measures to supplement existing strategies and decisions. The intention was to ensure that Germany met its national GHG reduction target of 40 percent by 2020, since the 2013 Projections Report had indicated that the target would probably not be achieved. Further reductions are now expected as a result of the Action Program. In addition to measures in the energy sector, the Climate Action Program 2020—like the Climate Action Plan 2050—includes more measures to reduce GHG emissions not related to energy.

The task of setting up the strategy stems from the 2013 coalition agreement between the Christian Union (CDU and CSU) and the Social Democrats (SPD), which mandated that the federal government develop a Climate Action Plan during the 2013–17 legislative period. The outcome of the UN climate summit in Paris in 2015 provided crucial support for this task, as it was widely seen as a success that required concrete implementation steps at the national level. In addition, the specific invitation in the Paris Agreement to develop and communicate a long-term low-GHG emissions development strategy impelled creation of the Climate Action Plan, as did the German government's self-set deadline to present its Climate Action Plan 2050 in November 2016 at the 22nd Conference of the Parties in Marrakech (where it became one of the first countries to do so).

Public participation

The success of climate action and climate policy depends on public acceptance of the measures. The Environment Ministry, as the lead ministry for the strategy development process, therefore set up an ex-ante dialogue and participation process. This degree of consultation, significantly greater in scope than traditional procedures, was new not only for the participants but also for the German Bundestag and the German government.

The process incorporated various forms of participation. Representatives of the stakeholder groups—the Länder, local authorities, and associations, including trade unions and businesses—met separately. Each group met twice for forum events. During the first set of forum events in September and October 2015, participants compiled proposed measures.

Around 500 randomly selected members of the public met at citizens' conferences held in November 2015 in five different cities and developed around 70 proposed measures. These measures were then discussed in an online dialogue, open to interested members of the public. All of the groups sent delegates to a committee that facilitated communication between the three stakeholder groups and citizens.

The stakeholder groups met jointly in November and December 2015 in five thematic working groups focused on emissions sectors: energy, industry, buildings, transport, and land-use/agriculture.

Scientific institutions tasked with guiding the process streamlined the proposed measures, which were continually refined over the course of the dialogue. The Institute for Applied Ecology conducted impact assessments on the measures.

During the second stakeholder forum events in February 2016, the three groups met separately to evaluate the 97 streamlined measures. To conclude the process, the stakeholders were able to recommend which of the consolidated proposals should be included in the Climate Action Plan 2050. Citizen participants could submit their recommendations online.

In order to keep the other federal ministries involved from the outset, seven ministry information events were held over the course of the process. The goal was to keep other ministries up to date on progress, and to obtain preliminary responses to the proposals generated during the participation events.

One of the main challenges in running the broad dialogue on the Climate Action Plan 2050 was the time frame. In March

2016, barely nine months after the first event in June 2015, the outcome of the dialogue process, the final catalog of 97 proposed measures, was presented to the environment minister. The time frame for the dialogue process was set in line with the coalition agreement: the long-term strategy was to be drafted in light of the UN climate summit in Paris at the end of 2015 and to be adopted by the German Cabinet before the parliamentary elections in 2017.

All parts of the participation process were organized and carried out by organizations specialized in participation and process design. Scientific support was provided by German institutes specialized in applied ecological science.

The dialogue and participation process with stakeholders was evaluated on behalf of the Environment Ministry, using document analysis and interviews with participants. The evaluation revealed that the central goal of the dialogue—namely, achieving broad acceptance for climate measures by involving various groups—was at least partially achieved. The evaluation found that this kind of dialogue offers a new and suitable approach to political discussion and decision-making.

By enabling these target groups to participate in the drafting of the Climate Action Plan 2050, the German government set out in a new, innovative direction to invigorate democracy and give the debate additional impetus. The participation process will be continued throughout the development of the first implementation program (“program of measures 2030”), as well as during the further development of the strategy itself, envisaged for 2019–20.

VISION AND SETTING EMISSIONS AND LONG-TERM REDUCTION TARGETS IN THE LONG-TERM STRATEGY

The development of the vision—the long-term mitigation objective of the Climate Action Plan—was based on a long-term target of the European Union and Germany: an 80–95 percent reduction in GHG emissions by 2050. This long-term target was adopted by the European Union in 2009 (and since then has been recognized in several Council of the European Union conclusions) and by Germany in 2010. Germany has reaffirmed this long-term target several times since. It was the understanding early in the development of the Climate Action Plan that this (scientifically and politically) well-established and confirmed goal would be the crucial basis for any other long-term target or vision.

The long-term target, which the European Union intended to be both a driver and a benchmark for target-setting over the medium term, stems from the fourth assessment report by the Intergovernmental Panel on Climate Change (IPCC) in 2007. The IPCC summarized in the technical report of Working Group 3 the findings of studies that have analyzed the regional emissions allocations or requirements for emissions reductions: for low and medium stabilization levels (450 to 500 ppm), by 2050 developed countries as a group would need to reduce their emissions by 80 to 95 percent below 1990 levels.

As the mandate for the development of the Climate Action Plan clearly stated that the plan had to be developed “in the light of the Paris Agreement,” the task was to translate GHG neutrality in the second half of the century into a long-term target for Germany given the context described above.

Germany is the biggest economy and the biggest emitter within the European Union, so it was clear from the beginning of the work on the long-term strategy that the long-term objective in the Climate Action Plan had to be within the range of the 80–95 percent reduction. As an industrialized country and region, Germany and the European Union will have to achieve the goal of GHG neutrality early. Given the Paris Agreement’s goal of reducing GHG emissions to net zero in the second half of the century, the German Climate Action Plan established the guiding principle of becoming largely GHG neutral by 2050, as only one sector has been identified as needing to be at zero emissions by 2050.

An evaluation of the available scenarios and studies in the context of the development of the Climate Action Plan confirmed that the long-term potential for reductions is much greater for energy-related emissions than for nonenergy emissions. It is therefore the understanding of the German Environment Ministry that the energy-related emissions have to be reduced to zero in 2050 to leave room for unavoidable GHG emissions from industrial and agricultural processes.

MODELING/SCENARIO-BUILDING

An evaluation of available climate scenarios and analyses of the transformation needed in the different areas of action helped inform the guiding principles and milestones for 2050 and 2030.

The development of the German Climate Action Plan was based on scenarios and modeling that already existed for different purposes in 2015, when work on the strategy began. These included modeling of 2050 climate change scenarios by Öko-

Institute and Fraunhofer ISI in 2014 and 2015, which included 2050 scenarios with targets of 80 percent and 95 percent mitigation; the scenario “GHG-Neutral Germany 2050,” by the federal Environment Agency in 2013, which assumed a GHG reduction of minus 95 percent by 2050; and a 2014 Prognos study of the development of the energy markets, including the most probable energy developments by 2030 and a trend scenario by 2050. The models in the different studies used different systematic approaches. In general, the modeling was mainly sector-based, and as a general rule no optimizing models or general equilibrium models were used to define pathways toward long-term targets.

At the beginning of the development of the Climate Action Plan, the federal Environment Ministry invited all other ministries involved to propose and/or commission their own scenarios and modeling for the purpose of the strategy development. However, in the end only one major study (on energy markets, mentioned above) was commissioned by another ministry: the Ministry for Economics and Energy. All other studies were commissioned by the Environment Ministry.

The Environment Ministry commissioned an additional study explicitly for the purpose of developing the long-term climate strategy. This so-called overview study systematically compared and assessed existing scenarios and modeling, focusing on the most important scenarios mentioned above. The scenarios were chosen because they fulfilled the following criteria: they covered a time frame up to 2050, they covered all sectors in an economy-wide approach with all relevant emissions sources, they were not older than four years, and they were based on a long-term target of at least minus 80 percent mitigation compared to 1990.

The main finding of this study was that achieving extensive GHG neutrality by 2050—the German interpretation of the Paris Agreement objective—would be a huge challenge for Germany, one only feasible in the context of fundamental structural change. At the same time the study showed that in general the long-term energy- and climate-related objectives—which were finally stipulated in the Climate Action Plan—are generally achievable. The main pathways and guiding principles of the results show that (1) energy efficiency improvements in all sectors are a must, (2) the energy system must be decarbonized, and (3) nonenergy emissions need to be drastically cut.

Economic analysis on behalf of the Environment Ministry found that as long as all measures for achieving extensive GHG neutrality were implemented, then the overall effects for the German national economy would be consistently positive.

The Environment Ministry commissioned an additional study that compared research on all relevant sectors, especially energy, buildings, industry, transport, and agriculture. One result of this study was the creation of robust pathways for the sectors, which underpinned the findings of the overview study.

Thus a number of robust results identified in this overview study (based on the 2050 scenarios analyzed) were taken into account for the Climate Action Plan, in the form of the following guiding principles for almost all sectors for 2050: renewables must be the principal source of energy, the building stock must be virtually climate-neutral, the transport system must evolve so that that it emits virtually no greenhouse gases and is almost fossil-free, and overall energy-related GHG emissions must be reduced to nearly zero, while remaining emissions, given extensive GHG neutrality, will come from industrial processes and agricultural activities.

The corridors identified in the overview study served as the foundation for the sectoral targets for 2030, in turn a central part of the German long-term strategy (see below).

A number of institutes and members of the analytical community in Germany working on climate scenarios and modeling were involved in the studies analyzed to develop the Climate Action Plan. Some of them were commissioned to undertake these analyses. No institute or organization was excluded from the discussion. However, the scenario and modeling work was expert-based and not part of the stakeholder participation process. It was not questioned by stakeholders during this process but accepted as a scientific foundation for the development of the strategy.

SECTOR- AND GAS-SPECIFIC MILESTONES AND PATHWAYS

At the heart of the German long-term strategy are sector-specific targets for 2030. These were agreed for the first time as part of the Climate Action Plan. The sectoral targets are based on the overall target for 2030 of at least a 55 percent reduction in GHGs compared to 1990. The overall target for 2030 stems from the Energy Concept (2010) and was not revisited in the context of the development of the Climate Action Plan. The sectoral targets define the reduction needed in the main areas of action in order to achieve the overall 2030 target. Furthermore, the targets describe the pathway up to 2030. The sectors with targets for 2030 are those that are most relevant in terms of GHG emissions in Germany: energy, buildings, transport,

industry, and agriculture (see Figure 1). In 2015 carbon dioxide was the primary cause of GHG emissions, with a share of 87.8 percent. Most of these emissions came from stationary and mobile combustion of fossil fuels. An evaluation of the available scenarios and studies shows that the long-term potential for reductions is greater for energy-related emissions than it is for nonenergy emissions, which come primarily from agriculture. As accounting for emissions from land use and forestry is subject to considerable methodological difficulties, this sector has not been included so far in the national climate targets.

The sector-specific targets provide guidance for investments and—by defining a clear framework—promote research and innovation.

Regarding achievement of the long-term target of extensive GHG neutrality in Germany by 2050, the overall 2030 sectoral targets, as well as the underlying ones, provide the appropriate milestones for getting on the transformative pathway to 2050. At the same time, the German 2030 target is roughly in line with the EU climate framework for 2030 (which includes the EU nationally determined contribution submitted to the UNFCCC in March 2015) and the contribution required from Germany.

A comprehensive impact assessment is under way in 2018, with assumptions and possible pathways toward the sectoral targets for 2030. The findings of the impact assessment will be used to inform the work on the first implementation program with measures for achieving the 2030 targets.

The sectoral targets can be modified if necessary (i.e., in the case of severe negative impacts on economic or social development), but it is also clear that the overall 2030 target for Germany is fixed and will not be adjusted. This means that GHG mitigation that will not be delivered in one sector has to be delivered in another sector.

The sectoral targets provide for a technology neutral and innovation-friendly approach and ensure at the same time that actions will be taken in all relevant sectors.

Since the adoption of the Climate Action Plan, the sectoral approach has inspired fruitful discussions within sectors like energy and agriculture. The sectoral targets provided a clear signal and trigger to intensify discussions within a sector by sectoral stakeholders. The emissions reduction targets for each sector have been recognized by nonstate actors—including industry, business, and civil society—as a framework for their considerations on future action.

ADDITIONAL ELEMENTS

While the Climate Action Plan provides a vision and framework, the specific measures for reaching the respective targets and interim targets are developed within subsequent “programs of measures,” which are not included in the Climate Action Plan. For the 2030 objectives—the 55 percent GHG reduction economy-wide and sector-specific goals—the first program of measures will be developed in 2018 and adopted in 2019. The sector-competent ministries will prepare the specific measures, for which an ex-ante impact assessment is obligatory. In addition to estimating measure-specific GHG-reduction effects, these impact assessments will consider social and economic consequences—such as possible increases in electricity prices and rents, as well as employment and redistributive effects.

In this way, the program of measures aims to prevent trade-offs between climate and social policy, and to utilize existing cobenefits.

While sustainable finance and climate-consistent finance flows are not defined as an individual sector within the Climate Action Plan (instead they are discussed in the chapter “Overarching Goals and Measures”), the government will develop specific measures within the program of measures aiming to direct finance flows consistently with the Climate Action Plan’s pathways and the Paris Agreement. Most finance regulations concerning Germany fall under the competence of EU law and therefore will primarily be determined on the EU level, where Germany supports the EU Commission’s recent initiatives on sustainable finance.

Figure 1.

TOWARD A GREENHOUSE-GAS NEUTRAL GERMANY

Sectoral targets in reducing CO₂ emissions until 2030 (vs. 1990)



-61%

Energy Sector



-66%

Buildings



-40%

Transport



-49%

Industry



-31%

Agriculture

-55% in total

Source: Klimaschutzplan 2050 der Bundesregierung (Climate Action Plan 2050 of the Federal Government).

CAPACITY, FINANCING, ENABLING ENVIRONMENT, AND RESOURCES TO IMPLEMENT LOW-GHG EMISSIONS DEVELOPMENT STRATEGIES

Another aspect described in the Climate Action Plan 2050 and included in the 2013 coalition agreement is the creation of a commission on structural change. The commission's primary concern will be developing a socially acceptable coal phase-out plan. Results are expected by the end of 2018. The German coal power plants are mainly concentrated in two regions, so a phase-out plan will extensively consider regional opportunities and challenges.

As we have noted, the Climate Action Plan is a mitigation strategy. Adaptation is addressed in detail in the separate German Strategy for Adaptation to Climate Change. Synergies and links between the Climate Action Plan and the Strategy for Adaptation to Climate Change will be elaborated and utilized where practical.

To promote the transformation needed in emerging and developing countries toward climate-friendly and climate-resilient development, Germany is one of the world's leading providers of development funding. Germany's budget for international climate finance amounted to €3.5 billion in 2016, which was an increase of 25 percent compared to the preceding year.

Germany harmonizes its activities with the guiding resolutions of the international community. In 2015, the international community created a political framework for this transformation by adopting the 2030 Agenda for Sustainable Development and the Paris Agreement. The vast majority of the financial resources for Germany's climate-related development aid come from the budget of the Ministry for Economic Cooperation and Development. In 2016, these resources represented 83 percent of overall climate finance.

The Environment Ministry also contributes to these international activities with its International Climate Initiative, founded in 2008. Through this initiative, Germany provides additional support for cooperation with developing countries and emerging economies in the areas of climate change mitigation and biodiversity protection. In 2017 the financial resources provided amounted to €356 million.

In 2017, the total budget of the federal Ministry for the Environment, Nature Conservation, and Nuclear Safety was €5.621 billion. The ministry's budget for climate action amounted to €477.978 million. Additionally, the other ministries have climate-related line items in their budgets. Unfortunately, precise information on the comprehensive budget for climate-related issues, across all ministries, has not yet been generated.

Specific financial resources dedicated to implementation of the Climate Action Plan 2050 itself would contradict its rationale. The objective of the Climate Action Plan is to mobilize all actors and all ministries to engage and exercise their responsibility for reaching their sectoral target. This also applies to the "program of measures" for reaching the 2030 targets, since sector-responsible ministries must both develop measures and supply the financial resources needed to implement them.

Probably the most important achievement with respect to nonfinancial capacities and regulations within the Climate Action Plan has been the development and definition of specific targets for the five major sectors of the German economy (energy, buildings, transportation, industry, and agriculture) until 2030 and 2050. The establishment of specific sectoral targets requires each sector to contribute to the overall reduction goals. The new government committed to adopt a climate protection law in 2019. This law is expected to declare the 2030 target (defined in the Climate Action Plan 2050) and the principle of sectoral targets to be legally binding. Therefore the enabling environment to reach targets and implement the long-term strategy will gain further strength in the upcoming legislative period. The establishment of legally binding reduction goals will be a central legislative act to facilitate climate protection on a national level.

An important mechanism to support climate action on a national level is the National Climate Initiative (NKI), launched by the Environment Ministry in 2008. The NKI includes funding programs for target groups such as local authorities, educational institutions, companies, and consumers, as well as strategic projects to provide information, advice, and support to those groups and help them build capacity. As of 2017 more than 25,000 projects had been supported, with an overall promotional volume of €790 million, initiating investments amounting to more than €2.5 billion.

The German government prepares climate action reports every year so that it can regularly monitor the implementation and fulfilment of goals, and it will continue to do this after 2020 so that any necessary adjustments can be made. The climate action reports follow the existing format to show progress in implementing measures under the current program of measures and current emissions trends in the various areas of action, as well as an estimate of the reductions expected from upcoming steps.

USING THE STRATEGY TO INFORM SHORT-TERM PLANNING

The development and establishment of a long-term strategy helps identify robust transformation pathways for all areas of action, thus increasing investment certainty for all actors.

The 2013 coalition agreement reflects the considerable political influence of the Climate Action Plan 2050. It included three central political initiatives. First, the already mentioned upcoming climate protection law will mainly be oriented toward the 2030 and 2050 targets, which were developed and formulated within the Climate Action Plan. The adoption of a climate protection law will increase the political and legislative relevance of the sectoral objectives and the Climate Action Plan. Second, the coalition agreement provides for the creation of a commission on structural change—an idea originally formulated in the Climate Action Plan. The commission is expected to focus on developing a socially acceptable plan to phase out the use of coal, a plan that will be presented by the end of 2018. Third, the program of measures (the major tool for implementing the long-term strategy and achieving the

2030 objectives) is currently being developed by the sector-responsible ministries and should be adopted in 2019. This process will therefore aim to align the medium-term policies with the established targets defined in the Climate Action Plan.

In more general terms, the Climate Action Plan provides a valuable point of reference for both policymakers and civil society, enabling the latter to hold policymakers accountable, and thereby facilitates the political and public debate on national climate action.

The Climate Action Plan will be reviewed and updated in accordance with the Paris Agreement's calendar for nationally determined contributions (NDCs), which are to be revised every five years. The first update will take place when the Parties to the agreement submit new or updated NDCs, which they must do by late 2019 or early 2020 at the latest.

IMPLEMENTING THE LONG-TERM STRATEGY

The implementation of the Climate Action Plan ultimately relies on the sector-responsible ministries and the programs of measures. To ensure that the overall and sectoral 2030 targets are achieved, in 2019 the Climate Action Plan 2050 will be underpinned by a first program of measures having quantifiable effects on reductions.

The environmental, social, and economic impacts of the measures envisaged and the comprehensive program of measures will be assessed ex-ante. It is foreseen that there will be additional programs of measures in the future, especially after the update of the Climate Action Plan itself, which will take place every five years.

Future programs of measures will underpin each upcoming reduction step and milestone with specific measures, where possible quantified in terms of their impact on emissions reduction. The programs of measures will be developed by the respective ministries in consultation with the Bundestag (the lower house of parliament). The Climate Action Plan's five key sectors (energy, buildings, transport, industry, and agriculture) all must undertake significant measures and deliver specific GHG reductions.

We should emphasize that the Climate Action Plan does not define how the sectoral or overall GHG reduction targets are to be reached and therefore does not identify first steps or prioritize policies. This reflects the conviction that the 2030 and 2050 targets will not be achieved by defining the sequence of political measures or prioritized policies but by the commitment of all actors to transform our society and achieve extensive greenhouse gas neutrality by 2050. Therefore, the Climate Action Plan aims to provide a vision and framework that will orient all actors. How the measures will be developed and implemented and in what sequence, as well as which technologies will be used, are choices to be made by the responsible actors. The underlying implementation mechanism will be significantly strengthened by the upcoming climate protection law, whose passage is expected in 2019.

PROCESS TO REVIEW AND REVISE THE LONG-TERM LOW STRATEGY

As we have noted, the German government prepares climate action reports on the progress of measures of the Climate Action Program 2020 every year so that it can regularly monitor the implementation of measures and the fulfilment of their goals. As the Climate Action Program only covers the period up to 2020, the German government will use the format of the monitoring reports as a basis for future reporting on the Climate Action Plan. The climate action reports show progress in implementing measures under the current program of measures, illustrate current trends for emissions in the various areas of action, and estimate the reductions expected from upcoming steps.

In future updates of the Climate Action Plan (the first being due by late 2019 or early 2020 at the latest, when Parties to the Paris Agreement must submit new or revised NDCs), the intermediate targets and milestones, the relevant transformation pathways, and the associated measures will be continuously reviewed as part of a learning process to ensure that they are consistent with achieving the targets. This process will cover all emitting sectors.

In principle the targets will be adapted in response to technical developments and societal, political, and economic trends and changes, as well as the latest scientific findings. Although the revision is institutionalized in the Climate Action Plan, the specific process and outcome is currently under development. While the development of the program of measures will focus on specific measures to achieve the 2030 targets, the updated Climate Action Plan itself presumably will generally be centered on either long-term or cross-cutting issues. The specific format is a work in progress, as the further development of the Climate Action Plan itself will build on lessons learned from the development and implementation of the program of measures. The review and revision of the Climate Action Plan will be as participative as the process of its development, including especially civil society and citizens but also—like the development of the program of measures—the other ministries, the Länder, and the Bundestag.

LESSONS LEARNED

Since the Climate Action Plan 2050 was only developed recently and the program of measures, its implementing mechanism, is currently in the making, identifying lessons learned is only partially possible. Those we can point to mainly concern the process of developing the Climate Action Plan itself.

A central aspiration in the development of the Climate Action Plan 2050 was to ensure broad participation of various relevant stakeholders. This process began in June 2015. Stakeholder groups including the Länder, local authorities, associations, and the general public were asked to propose strategic measures that could be taken to reduce emissions between 2020 and 2030. The process incorporated various forms of participation and actors ranging from representatives of the stakeholder groups to randomly selected citizens, thematic working groups on the five identified sectors, and scientific institutions. In order to keep federal ministries beyond the Environment Ministry involved from the outset, seven ministry information events were held over the course of the process to keep other ministries up to date on progress and to obtain preliminary responses to the proposals generated during the events. While the participation process

was perceived as highly important within our working group, the time requirements were daunting, largely a result of the short time frame, which had been set for political reasons. This tight schedule both challenged the work within our working group and was criticized by stakeholders because it did not allow for in-depth discussion and revision of the proposed measures.

Another major weakness of the process was that a detailed written account, to show how dialogue results were incorporated into the Climate Action Plan and how these were changed in the interministerial coordination, could not be completed. The participation process thus did not result in a traceable outcome reflected in the Climate Action Plan, which prevented some stakeholders from understanding the meaningfulness of the process.

We can derive the following lessons learned regarding the participation process:

- ◆ The intended outcome of the participation process has to be well defined and communicated. This is also fundamentally important to manage the expectations of all stakeholders and might additionally channel the discussion in a more expedient direction.
- ◆ The definition of clear roles for all stakeholders in the process, which might vary according to their background, is key and must be repeatedly communicated and explained.
- ◆ Clearly defining the role and expectations of the working group is also essential, as became clear in our case, since the amount of work and time required to conduct the participation process was not fully foreseen. The need for clearly articulated responsibilities regarding participation and for increased resources will therefore be considered in the upcoming review and revision process.
- ◆ Additionally, wherever possible, a written account indicating which results of future participation processes were incorporated into the Climate Action Plan should be published to prevent dissatisfaction and increase commitment to the results.

Apart from the participation process, the most important methodological element of the Climate Action Plan is the establishment of sector-specific targets for the five key sectors (energy, buildings, transport, industry, and agriculture). These goals provide each sector (the respective ministries as well as nonstate actors) with a specific responsibility that must be delivered. The sector-specific goals result from scenarios, modeling, and scientific input as well as a negotiation process with ministries and stakeholders and therefore are both feasible and widely accepted within the sectors. The central benefit of this approach is that it is easier for actors to know what is expected of them, so by extension it is easier for them to be held accountable if they fail to achieve emissions reductions. One result was that during the last two years stakeholders and players in specific sectors, like the Federation of German Industries and the German National Farmers Association, commissioned studies or developed their own climate strategies to assess what must be done to achieve their sector targets. This triggered additional debates in their communities on how to respond to the challenge of achieving the targets.

Within the set targets, the Climate Action Plan is characterized by openness regarding technological options and approaches to achieving the targets and aimed at providing guidance for actors and researchers on the technological innovations that need to be developed. Its nonprescriptive character is a key element facilitating both technological research and acceptance of the Climate Action Plan.

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ABOUT THE LONG-TERM STRATEGIES PROJECT

World Resources Institute and the United Nations Development Programme, working closely with UN Climate Change, are developing a set of resources to help policymakers integrate long-term climate strategies into national policy making.



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For more information about the project, and to view the expanding set of resources, visit www.longtermstrategies.org.