

MEXICO'S MID-CENTURY STRATEGY: LESSONS IN PLANNING FOR THE PARIS AGREEMENT

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OVERVIEW

In this case study we describe the process Mexico used to develop its Mid-Century Strategy (MCS), a long-term low-carbon development strategy submitted to the United Nations Framework Convention on Climate Change (UNFCCC).¹ Mexico's climate policy, including the most recent planning instruments, derives from the vision of the Cancún Agreements of 2010 and the General Climate Change Law of 2012, meaning that the MCS was not created from scratch but rather nourished by previous work and complemented by extended technical analyses in adaptation and long-term scenario modeling in mitigation.

This case study begins by presenting the broader context in which the MCS was developed, both nationally and internationally. We explain how Mexico's core climate change vision, including the commitment to sustainable development and long-term targets in adaptation and mitigation across all sectors, was established, refined, and broadly accepted, within the relevant legal and institutional framework, giving the MCS a solid foundation. We then describe the process of elaboration of not only the MCS itself but also the precursor policy instruments in which many of the MCS's core ideas were originally expressed. This leads us to discuss important features of the MCS, including institutional arrangements, sectorial scope, gases covered, analytical techniques, and stakeholder engagement processes.

We continue with some reflections on impacts delivered and lessons learned from the preparation of Mexico's MCS. Much was achieved in terms of institutional recognition of the importance of climate change in national planning, but climate objectives are not on track to being met: establishing clear links between long-term strategic objectives and short-term policy action emerges as a key challenge. In our concluding remarks, we suggest how Mexico could update its core strategic concepts to account for the latest technical, scientific, and political developments, thus maintaining its climate leadership by ensuring that future contributions are more aligned with the Paris Agreement.

CONTEXT FOR LONG-TERM STRATEGY DEVELOPMENT

Mexico's Mid-Century Strategy, presented at 22nd Conference of the Parties (COP22) in Marrakech, is one of the first long-term strategy documents published after the adoption of the Paris Agreement. While Article 4, paragraph 19, of the agreement calls for all Parties to "formulate and communicate long-term low greenhouse gas emission development strategies, mindful of objectives set in its Article 2 of the Agreement," it is worth noting that long-term strategies for in-depth transformation are not typical planning instruments. The planning of long-term and ambitious climate action that brings together mitigation and adaptation is a complex task, different from other development planning processes, as climate action implies the transformation of energy systems and the modification of the ways we organize and conduct economic activities over a 30-year time frame, with far greater reductions in consumption of fossil fuels, lowered emissions of greenhouse gases (GHGs), and better preparedness to withstand the potential impacts of climate change.

The Paris Agreement does not prescribe the process by which a country should formulate a long-term strategy (LTS) or the type of content such a strategy may have. However, the mention of Article 2 indicates the level of global ambition that should guide the strategy, particularly given that the Parties' commitments at COP21, in the form of intended nationally determined contributions (INDCs), do not collectively deliver the necessary changes required according to the best available science to keep the increase of global mean temperature below dangerous levels.

For some countries, an LTS is a new type of policy instrument that may not have an equivalent in their national planning framework. In Mexico, however, the Planning Law and the

General Law on Climate Change (Ley General de Cambio Climático, LGCC) had already defined two aspects of long-term planning applicable to an LTS, stipulating (1) that national development must be planned by the federal government with a view to ensuring sustainability and equity and to advancing the political, social, cultural, environmental, and economic objectives articulated in Mexico's Constitution² and (2) that the National Climate Change Strategy (Estrategia Nacional de Cambio Climático, ENCC) is the policy instrument for medium- and long-term planning to address the impacts of climate change and foster a transition toward competitive, sustainable, and low emissions economic development.³

Therefore, the formulation of any long-term strategy to respond to climate change in Mexico is based on a solid legal mandate. This helps explain how the country was able to submit an LTS less than a year after COP21.

The June 2016 North American Leaders' Summit, held in Ottawa, provided an additional political boost to the development of long-term strategies in Mexico as well as in Canada and the United States.

But how was the MCS prepared? The following sections will further discuss the institutional arrangements and public participation process for the MCS, the technical aspects of its preparation, and the use of the strategy to inform short-term planning and action in the country.

INSTITUTIONAL FRAMEWORK FOR MEXICO'S CLIMATE CHANGE VISION

Many components of Mexico's current climate policy, including its overall vision for change, can be traced back to Mexico's participation in COP15 in Copenhagen in 2009 and to the efforts—and successes—of COP16, held in Cancún, Mexico, in 2010. At the time, long-term planning on climate change was absent from existing regulations. The Office of the Presidency and the Ministry for the Environment nonetheless led domestic discussions on how to address climate change in the long term, as part of the work of the recently established Interministerial Commission on Climate Change.⁴ In preparation for COP15, Mexico commissioned its first study for a low-carbon development program⁵ that assessed the country's mitigation potential and the associated costs of different actions and measures; the study introduced the use of abatement cost curves as input for climate change policy. These technical assessments

were taken to COP16 in Cancún as the basis for Mexico's first submission of voluntary commitments to 2020 under the UNFCCC.

The adoption of the Cancún Agreements helped many in Mexico take its outcomes onboard, including the recognition that deep emissions cuts would be required of both developed and developing countries, and that new institutions and investment routes (such as the Green Climate Fund and the Climate Technology Centre and Network) would help enable these changes at scale. Since then, Mexico has explicitly aimed to reduce national emissions in the long term in a manner consistent with holding the increase in global average temperatures below 2 degrees Celsius (°C) above preindustrial levels, within a paradigm of scaled-up investment, technological development, international cooperation, adaptation, and economic growth.

The enactment of the General Law on Climate Change in 2012 provided the framework for long-term planning on climate change. The law sets out a vision of transitioning to a competitive, sustainable, low-carbon, and climate-resilient economy, guided by the principles of environmental stewardship, shared responsibility between government and society, resource efficiency, sustainability, transparency and accountability, and poverty reduction. It also sets concrete mitigation targets for the medium and long term: to reduce national GHG emissions by 30 percent by 2020 compared to a business-as-usual emissions baseline, and to ensure that 2050 emissions are 50 percent of those in 2000, a level considered consistent with limiting increase in global mean temperature to 2°C, as articulated in the Cancún Agreements.⁶ The law also includes the target of 35 percent of power generation from clean energy sources by 2024. The law does not specify how these targets should be achieved but rather lays out an institutional framework and concrete policy instruments to guide this transition.

The National Climate Change Strategy is the main policy instrument guiding long-term planning. The first version of the ENCC, formulated and published in 2013, captured the 2020 and 2050 mitigation targets from the General Law on Climate Change and set out a long-term vision based on *thematic axes* of change in adaptation and mitigation as well as six cross-cutting *policy pillars*. For each axis, the document pointed out milestones over 10, 20, and 40 years, highlighting in this manner the key elements of the long-term transformation required by the law. The pillars were derived from the technical studies conducted since 2008.

In addition to the ENCC, the law also established the Special Program on Climate Change (Programa Especial de Cambio Climático, PECC). The PECC, which must be renewed by each incoming administration (i.e., every six years), defines federal government actions over a presidential term that will help advance Mexico's long-term vision. Complementing the PECC are the state-level climate change action plans, which define local actions to help achieve national targets, in line with the ENCC.

In the run-up to COP21, UNFCCC negotiations coalesced around the concept of intended nationally determined contributions as self-defined national targets to collectively prevent dangerous climate change. Mexico published its INDC in March 2015, with economy-wide unconditional and conditional mitigation and adaptation targets from 2020 to 2030. The INDC identified concrete actions within the strategic elements highlighted previously in the ENCC.

By the time the Paris Agreement was adopted at COP21, the main policy instruments required by national law to achieve a 2050 goal consistent with 2°C were already in place,⁷ making it natural for Mexico to prepare the early submission of its Mid-Century Strategy in response to Article 4.

In addition, Mexico, the United States, and Canada adopted a resolution that aimed at significantly reducing methane emissions from the oil and gas sector, increasing the participation of clean energy in the matrix, and harmonizing fuel efficiency standards in the North American region at the 2016 North American Leaders' Summit. As part of the action plan, the three countries decided to prepare and submit their long-term low-carbon development strategies as a sign of commitment to the Paris Agreement.

The main conceptual ideas presented in the MCS in November 2016 had been developed prior to Paris, so the MCS can be seen as an evolution or even as a confirmation of Mexico's ongoing climate change strategic planning, rather than as a dramatic departure from it.

BUILDING MEXICO'S CLIMATE STRATEGY

The work for Mexico's long-term strategy was undertaken in accordance with the policymaking framework stipulated by the LGCC, which defines the policy documents for long-term planning and short- to medium-term execution. The LGCC established four main bodies for policy planning and implementation: (1) the Interministerial Commission on Climate

Change (Comisión Intersecretarial de Cambio Climático, CICC) as the Cabinet-level decision-making body of the federal government; (2) the Climate Change Council as an advisory body to the CICC; (3) the National Institute of Ecology and Climate Change (Instituto Nacional de Ecología y Cambio Climático, INECC) to provide technical analysis and conduct research to inform national policy; and (4) the National Climate Change System, a forum constituted of representatives from federal, state, and municipal government, the Congress, and the Council, within which the executive and legislative branches as well as civil society representatives can interact to make decisions on climate policy. All of these play a role in the formulation, review, and updating of the ENCC. They also provide a framework that facilitates ongoing climate policy discussion and engagement in Mexico.

The Ministry for Environment and Natural Resources (Secretaría de Medio Ambiente y Recursos Naturales, SEMARNAT) coordinated the process of strategy development, through the Underministry for Environmental Policy and Planning and the General Directorate for Climate Change Policies (Dirección General de Políticas de Cambio Climático, DGPCC). However, several other institutions participated in strategy formulation. For instance, INECC provided close support and advice to SEMARNAT on analytical aspects and helped prepare technical information required for long-term planning, including national GHG emissions inventories, emissions projections, mitigation potentials, vulnerability assessments, and modeling, in addition to offering general advice on interpretation of the latest science. The interaction among ministries came through the CICC and its thematic working groups. As the CICC's technical secretariat, the DGPCC convened meetings to discuss topics and progress, as well as to request input, feedback, and approval. In addition, the Climate Change Council advised the CICC during the formulation of the long-term climate change strategy.

To fully reflect the process from which the 2016 MCS emerged, three prior policy instruments, whose content fed directly into the MCS process, were also considered. These were the National Climate Change Strategy (2013), the Special Program on Climate Change (2014), and the intended nationally determined contribution (2015), all of which were developed within the same institutional framework, although with different methodological approaches and considerations that limit their direct comparison.

National Climate Change Strategy:

SEMARNAT started work on the ENCC in early 2013. While the core DGPCC team laid out the document's overall structure, a dedicated INECC team carried out the required analytical work and was active in many of the drafting discussions. ENCC mitigation targets were taken directly from the LGCC, and the overall approach to mitigation also mirrored the law: short-term mitigation was expressed in terms of emissions reductions versus a baseline, while the long-term (2050) target was presented as an absolute, economy-wide emissions maximum. These were a 30 percent reduction by 2020 below the emissions baseline and a 50 percent reduction by 2050 below the 2000 national emissions set in the LGCC.

The analysis used for the ENCC was informed by prior work carried out in 2009–12 as part of Mexico's response to the Cancún Agreements and to the reporting requirements of the UNFCCC.⁸ Specifically, two components provided the background information to the ENCC in 2013:⁹ a TIMES/LEAP¹⁰ modeling exercise and an abatement cost assessment. The modeling developed an estimated emissions baseline for the different energy-consuming sectors, based on assumptions regarding economic growth driving key service demand across sectors, and high-level technology improvement and adoption. Other sectors not related to energy were excluded due to restrictions of the modeling tools.¹¹ A nationwide marginal abatement cost curve analysis was used to estimate the abatement potential of a range of actions and explore the potential costs and savings of portfolios of measures associated with specific emissions reductions with respect to the baseline. The cost abatement analysis updated similar work conducted in 2010¹² in preparation for COP16. Given the close links between energy and climate, the collaboration of SEMARNAT and INECC with the Ministry of Energy (Secretaría de Energía, SENER) was crucial to the work.

The ENCC did not describe specific mitigation actions in detail but rather presented a set of broad measures aligned with five "mitigation axes": (1) clean energy generation; (2) increased energy efficiency; (3) low-carbon sustainable cities; (4) best practices in farming, forestry, and land use; and (5) reducing emissions of black carbon (a short-lived climate pollutant highlighted by Mexico due to its negative health impacts).

The emphasis on black carbon emissions is perhaps the most distinctive element of Mexico's climate policy with regards to scope of pollutants considered, particularly given the uncertainties involved in its estimation. Aside from this

pollutant, measures and plans to mitigate greenhouse gases among the main productive sectors were aligned with emissions inventories guidelines specified by the Intergovernmental Panel on Climate Change (IPCC) for sources and gases, namely, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆).

An innovation of the ENCC was its inclusion of a structured vision for adaptation as a feature of the long-term vision for the country, along with three axes of action: (1) reduced climate change vulnerability in the social sector, particularly among the most vulnerable segments of the population; (2) reduced vulnerability of strategic infrastructure and productive systems; and (3) sustainable ecosystems management. The adaptation section of the ENCC was backed by an extensive territorial analysis, compiled by INECC, of climate risks faced across the country, the hazard posed by climatic events, and vulnerability as a function of social well-being, health conditions, and food security. Nearly one-third of municipalities were classified as at risk of climate-based disasters.

Overall, the ENCC and its mitigation and adaptation components rested on six cross-cutting pillars: (1) multisector coordination on policies and actions; (2) fiscal and economic instruments to drive investment; (3) research, development, and climate-friendly technologies to support action; (4) education and awareness-raising; (5) monitoring, reporting, and verification for mitigation and monitoring and evaluation of adaptation; (6) and international cooperation and leadership. Their inclusion came from national exchanges on possible enabling elements, which were also informed by the UNFCCC negotiations. On this basis, SEMARNAT and INECC jointly developed the text and content of the strategy.

The ENCC draft went to public consultation through workshops, electronic platforms, and sector-specific meetings. The consultation process included multiple workshops organized by SEMARNAT with relevant stakeholders, including subnational governments, civil society, businesses, and academia. Sector-specific meetings took place with chambers and associations from the most energy-intensive industries. The use of an electronic platform allowed the consultation to be widely available to the public and enabled public inputs to be systematized.

In summary, the ENCC published in 2013 sets out a vision of national development by 2050 to be used as a reference in the determination of future policies and programs, while

recognizing that it will take time for this paradigm of sustainable development to become fully accepted by all sectors of society and economic activity. As a consequence, the ENCC does not aim to allocate specific actions, targets (beyond those already stated in the law), or responsibilities. In a similar manner, it does not present detailed emissions pathways to the 2050 goal, either aggregated or by sector or gas.

Special Program on Climate Change:

The first climate policy instrument to be created after the publication of the ENCC was the Special Program on Climate Change for 2014–18. This program is comprised of 199 action items, each with a government agency responsible for its execution, monitoring, and the reporting of its results. The PECC assumed a mitigation target for 2018, measured in absolute reduction below a baseline specifically drafted for the PECC, and based on the mitigation potential of measures to be implemented by the federal government in 2014–18. Given that government agencies can only be held responsible for delivering on actions for which they have a budget and which fall within their sectoral responsibility, the definition of the action items in the PECC was hindered by the difficulty of capturing the long-term vision and the expected results from the ENCC within these constraints. As a result, the ambition of the first six-year federal government program falls short of the ENCC's transformative vision.

The work process was also coordinated by SEMARNAT, as the ministry responsible for its formulation. The ministry team met with each of the 14 ministries that are members of the CICC, as well as other agencies responsible for delivering results on climate change. During the meetings, the parties initially discussed a potential schedule of climate actions for whose delivery they could assume responsibility. They also agreed on concrete actions with defined metrics and target values for success. Although SEMARNAT officials emphasized the role of each sector within the long-term vision of structural change contained in the ENCC, throughout the process, officials in the different agencies were wary of making commitments beyond what they expected could reasonably be included in the agency budget and within their sectoral mandate. There was also apprehension regarding multiyear actions, as the federal budget is approved on a yearly basis. As a result, the link between the long-term goals and the concrete actions presented in the PECC is limited.

One important development related to the PECC was the establishment of a reporting system to keep track of actions and results. The PECC's Cross-Cutting Agenda Information System

(Sistema de Información de la Agenda de Transversalidad, SIAT-PECC), allowed all the different areas responsible for an action item to submit their data or information on progress every six months, together with supporting evidence. The information submitted was later validated by the SEMARNAT team before it was finally released into the system for public use. In its early stage, the SIAT-PECC was Excel-based, but an electronic platform for reporting was developed in 2017 and adopted in 2018. The SIAT-PECC is setting the pace and process for monitoring, reporting, and verification of progress toward national targets. The experience with an electronic reporting system will inform the tracking of Mexico's nationally determined contribution (NDC) and the long-term targets of the ENCC.

Nationally Determined Contribution:

The NDC was a critical policy document influenced by the ENCC. In preparation for COP21, SEMARNAT led the elaboration of Mexico's intended NDC, based on the status of negotiations under the UNFCCC and taking into consideration the country's climate change law.

Technically speaking, it was decided to use a 10-year implementation period in order to favor a long-term planning approach, spanning from 2020 to 2030, on the assumption that the Paris Agreement would be unlikely to enter into force before 2020. The INDC included a mitigation and an adaptation component, reflecting the structure of the ENCC.

In mitigation, the primary thematic pillars previously identified within the ENCC were used to define areas for action. From this, INECC carried out dedicated sectoral analyses, modeling specific emissions-reduction actions identified in a bottom-up, sector-by-sector manner. The then recently updated National Greenhouse Gas Emissions Inventory for 2013 provided more granular activity and emissions data for that year, enabling the detailed quantification of some actions. However, the reliance on emissions from a single year limited comparability with previous national inventories and with historical data. Once again, the paradigm of analysis was to use business-as-usual emissions projections as a baseline and then account for specific actions to reduce emissions with respect to this baseline over the period of analysis. It is worth recalling that the LGCC sets the country mitigation target for 2020 in business-as-usual terms, but the 2050 target is in absolute emissions, so there was no clear guidance from the LGCC on how a 2030 target—that is, between 2020 and 2050—should be defined. However, the INDC was elaborated as an extension of existing policies to facilitate both

communication and implementation of the measures, so the corresponding approach was extended accordingly. Once INDC actions were modeled by INECC, discussions were held with key ministries and stakeholders, evaluating the uncertainties and trade-offs of higher or lower commitments, to determine the actions and resulting emissions reductions submitted as unconditional to the UNFCCC.

There are clear similarities with the elaboration of the PECC. Although the INDC process took its core narratives from the ENCC, specific actions were decided in an incremental, and not transformational, planning paradigm. Expected inventory trends and potential impacts of specific actions made the unconditional INDC path to 2030 granular and credible, but it also prevented them from presenting a trajectory to 2050 consistent with the 2°C target enshrined in the Cancún Agreements.

In view of this limitation, INECC performed an additional scenario analysis to identify a potential path to 2030 that could be consistent with the 2050 target. Although the overall scale of the measures required made it impossible for Mexico to commit to this trajectory in the absence of an international enabling environment geared toward a global transformation to sustainable development, the scale of change was recognized as necessary for the achievement of Mexico's own law. Therefore, it was presented as a conditional GHG mitigation target, subject to “a global agreement addressing important topics including international carbon price, carbon border adjustments, technical cooperation, access to low-cost financial resources and technology transfer, all at a scale commensurate to the challenge of global climate change.”¹³ Although the presentation of conditional versus unconditional reductions led to some confusion, it was an acknowledgement of the strategic limitations of planning a transformation without a global context aligned with its achievement. Once the Paris Agreement entered into force, Mexico's INDC became its first NDC for the 2020–30 period established in the agreement. An update of the NDC is expected by 2020, according to the Parties' decisions under the UNFCCC.

Based on the experience of the SIAT-PECC, Mexico initiated similar work on the development of an electronic platform and related administrative arrangements for the monitoring and reporting of progress under the NDC. The system, known as the SIAT-NDC, is intended to capture what is already uploaded into the SIAT-PECC by federal government agencies, plus a series of measures and actions by other stakeholders, mainly subnational governments, who can significantly contribute to the

achievement of the national targets by 2030. The SIAT-NDC is in an early stage of development, and its initial funding comes from the Capacity Building Initiative for Transparency under the Paris Agreement.¹⁴

Mid-Century Strategy:

Mexico's response to Article 4, paragraph 19, of the Paris Agreement was the formulation of its Mid-Century Strategy. A main driver behind the decision to prepare the MCS was the Leader's Statement on a North American Climate, Clean Energy, and Environment Partnership signed on June 29, 2016, by the presidents of Mexico and the United States and the prime minister of Canada. As part of the statement and as reflected in the action plan, the three countries aimed to jointly advance clean energy, drive down short-lived climate pollutants, promote clean and efficient transportation, and show leadership in addressing climate change. Derived from the statement and with a view to providing a clear signal of commitment to the Paris Agreement, the three countries decided to collaborate in the respective formulation of a long-term strategy based on shared views of low-carbon development. Hence, the respective midcentury strategies were jointly presented by Canada, the United States, and Mexico at COP22 in Marrakech in November 2016.

The formulation of Mexico's MCS, mainly based on the existing ENCC (published in 2013), extended that strategy by incorporating more recent modeling work for the energy sector (generation and use), taking into consideration the recently approved energy reform and its legal framework as well as the scientific findings in the IPCC's Fifth Assessment Report. This additional modeling work was based on the MIT Economic Projection and Policy Analysis integrated assessment model, which was calibrated for Mexico and used to evaluate two policy scenarios: the 22 percent unconditional reduction below baseline by 2030 from the INDC and a more ambitious 36 percent reduction below the baseline that considers regional policies agreed to with Canada and the United States (as contained in the conditional emissions reduction of the INDC). In both cases, the 50 percent reduction target for 2050 was also included as the endpoint. Black carbon emissions and reductions were also modeled in these scenarios.

SEMARNAT led the MCS formulation process with technical support from INECC, in a similar fashion to the arrangement followed for the ENCC. The 14 ministries from the CICC were called for contributions and the Sustainable Development Consultative Councils, representing the environmental work at

the state level, were invited to provide input as well. A workshop with representatives from civil society organizations, the private sector, and academia was organized to further collate input for the modeling.

Regarding climate change adaptation, the MCS incorporated new vulnerability assessments of the potential effects from changes in mean precipitation and temperature, according to a representative concentration pathway 8.5 long-term scenario for 2075–99. The MCS reiterated the adaptation axes from the ENCC and highlighted the municipalities considered most vulnerable to climate change.

One of the main contributions of the MCS came from the potential trajectories to be followed if the country were to achieve its national targets for 2020, 2030, and 2050, including a peaking of emissions starting in 2026, an improvement in emissions intensity, and the integration of 35 percent clean energy sources by 2024. The graphic representation of the trajectories allowed for better communication and improved narrative on the importance of acting now given the magnitude of the climate problem. Figure 1 shows the emissions baseline and two of the emissions trajectories modeled for the MCS that would enable the country to comply with national targets, including climate and clean energy trajectories for 2020, 2024, 2030, and 2050 (shown as milestones or M in the figure). The difference in the trajectories lies in their slopes from 2020 to 2050: a more ambitious trajectory implies early action, whereas delayed action would allow emissions to grow in the coming years before peaking by 2026 and would imply a steep slope (or significant emissions reduction) between 2035 and 2050.

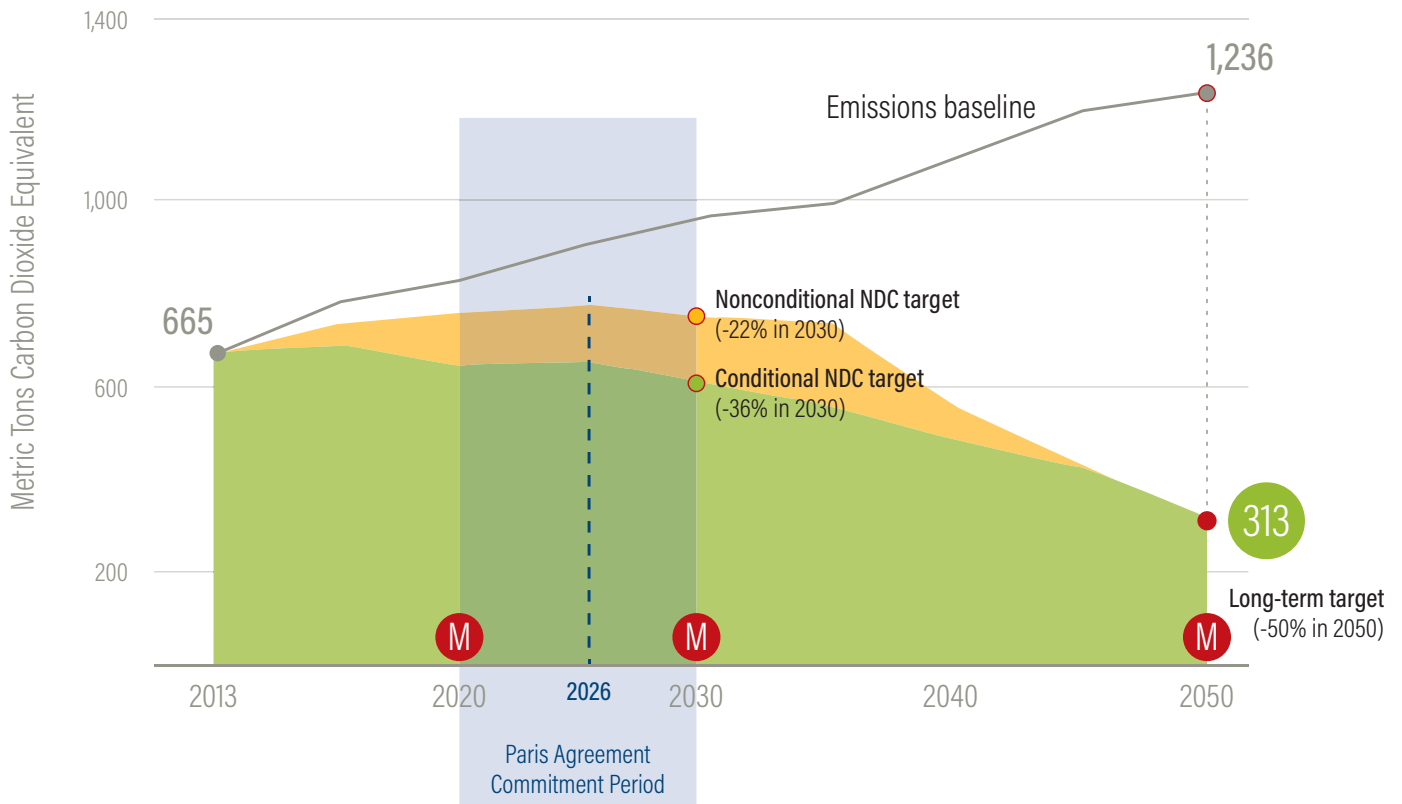
By the time the MCS was being formulated, a new legal framework for the energy sector was adopted. A 2013 amendment (the "energy reform") to Mexico's Constitution opened the energy sector to private investment. The constitutional change led to an overhaul of oil, gas, and electricity regulations in 2013 and 2014. In December 2015 a new energy transition law was enacted, with clean energy targets for the years 2018, 2021, and 2024 as part of the sector contribution to the country's decarbonization. Together with the new clean-energy targets, the new legislation also redefined the roles of the state-owned energy companies and the Ministry for Energy in terms of who was responsible for the sector's planning. New policy instruments were devised, such as the Electricity System Development Program (Programa de Desarrollo del Sistema Eléctrico Nacional, PRODESEN) to be formulated by SENER, replacing the Electricity Sector Public Works Plan

by the Federal Electricity Commission (Comisión Federal de Electricidad, CFE). These changes brought new or different planning assumptions for the electricity sector in terms of new participants, capacity, and technology options, replacing the planning based on the existing infrastructure of the CFE. In response to these changes, the MCS's formulation was launched and new long-term plans and modeling work were prepared for the energy sector.

The MCS therefore included a projection of generation capacity, developed by SENER, which would achieve a 50 percent clean generation target by 2034 and maintain that ratio as a constant to 2050. This detailed projection to 2050 is an important methodological improvement compared to the ENCC and the NDC, which were created without a detailed 2050 forecast of this nature in any sector. However, the decision not to increase the planned share of clean electricity beyond 50 percent,

reaching a plateau after 2035, shows how a well-defined sectoral perspective held sway over the broadly accepted view, present in the literature and implied in the ENCC, that a very large share (over 90 percent) of power should be renewable by 2050. Furthermore, the modeling did not fully incorporate the considerations and options from previous work on deep decarbonization funded by INECC,¹⁵ in which the electrification of end-use was portrayed as necessary for substantial reductions in national emissions. Similarly, the PRODESEN estimates developed by SENER and used in the MCS did not assume a massive electrification of the transport fleet, which again much of the relevant literature sees as necessary to achieve the Paris Agreement goals. In this manner, the MCS presents a power sector forecast that appears incompatible with its stated goals. This highlights some of the difficulties inherent in planning a multisectoral transformation in a piecemeal manner.

Figure 1. Mitigation pathways to 2050 as modeled by MCS



Source: Authors' version, based on SEMARNAT-INECC, Mexico's Climate Change Mid-Century Strategy, 2016.

IMPACTS OF THE STRATEGY

Institutional and policy impacts:

An important achievement of the ENCC was the convergence of different ministries in planning together under a unified climate change agenda. The ministries had to discuss the potential implications of their long-term plans, sometimes without fully understanding how climate change related to their sector. The breadth of topics considered in a long-term strategy on climate change is only comparable to the process followed for the preparation of Mexico's National Development Plan, revised every six years under the coordination of the Office of the Presidency and the Ministry of Finance. The climate change strategy made the environmental sector the convener for the first time of discussions toward a long-term vision pertaining to other sectors, and for the first time those other sectors became involved in discussions about their potential future as seen through the climate change lens.

Another impact of the long-term plan was the role of institutional bodies created by the climate change law, such as the Interministerial Commission on Climate Change. Mexico's planning law defines the need for an interministerial body whenever a topic requires the participation of two or more federal ministries. This leads to a new type of interaction among sectors, one where the environmental sector helps others understand what their new reality could be if the country transitioned toward low-carbon and climate-resilient development. The formulation of the strategy required regular meetings convened by SEMARNAT in which other ministries had to learn about climate change and its potential implications for their sector. The direct involvement of the Office of the Presidency helped facilitate active participation by relevant sectors.

After its publication, the strategy became an important feature of Mexico's climate policy. References to its content—the emissions baseline, the long-term targets, the potential mitigation trajectory, or the actions required to achieve the mitigation and adaptation goals—are now common in other public documents produced by the different ministries and government agencies at the federal and state level. The strategy is now seen as a core document and a necessary reference when identifying the types of actions other sectors may undertake to promote or support national development.

The strategy's enduring bridging potential can also be seen as an important impact. Two examples are the linkages between the 2030 Agenda and the Paris Agreement, and the strategy's

influence in planning of the energy sector. Since climate change is part of the Sustainable Development Goals (SDGs) in the 2030 Agenda, Mexico adopted an agenda for the SDGs similar to the one it had for climate under the guidance of the Office of the Presidency with support from SEMARNAT and INECC. As Mexico embarked on the formulation of a national strategy for the 2030 Agenda, the ENCC became both a reference for long-term planning for a shared time horizon of 2030 and a foundation for technical discussions beyond the six-year presidential term. The linkages between the agendas led to the commissioning of an assessment of cobenefits likely to arise from Mexico's implementation of the 2030 Agenda and the Paris Agreement. This analysis used the ENCC and the MCS as inputs. Similarly, the ENCC and the MCS, including their technical elements, have been incorporated into the new planning instruments created by the energy reform. These include, for instance, PRODESEN itself, and the Strategy for the Promotion of Clean Fuels and Technologies, a new document that established energy efficiency targets for the country. Energy efficiency as addressed in the latter strategy found an important ally in the climate change agenda and remains a topic to be fully incorporated into new modeling and any updated assessment of mitigation actions.

This type of technical interaction between the energy and the environmental sector has become common, and the notion of changing Mexico's emission trajectory has been frequently addressed by both sectors in documents, presentations, and public interventions. Along these lines, the important concept of "acting now" has been grasped by various sectors and levels of government. The anchor given to the strategy by the climate change law is perceived as ensuring its permanence and strategic role in defining a potential future for the country. Despite the progress made, however, a new narrative on "energy self-sufficiency" has emerged from the new government administration in the first months of 2019, one in which climate is rarely mentioned by the energy sector.

Observed and potential climate impacts:

The impacts of this long-term strategy work on the concrete climate goals of adaptation, mitigation, and economic structural change are less clear. The ENCC aimed not to achieve quantifiable goals per se but to inform and guide subsequent policy instruments to ensure that they worked toward the long-term goals. Direct climate impacts are therefore best discussed in the context of the PECC and NDC.

The distributed process through which the PECC was created, with each agency limiting its ambition to existing or expected budgets, generally resulted in small-scale measures, without contemplating transformational change. Therefore, even full compliance with the program would have limited climate impact. Broader measures not part of the federal government's authority were not addressed, further limiting its potential impact on federal budget and action. The extent to which the PECC goals were achieved by 2018 is now available through the SIAT-PECC reporting system. Given the impossibility of using the PECC to drive federal budget ambition at that time, future instances may wish to consider a longer, more interactive dynamic in which agencies estimate which potential actions and budgets could be required in order to achieve impacts in line with long-term goals. While these would not be commitments, they could provide inputs to future policy development and planning.

The climate impact of the NDC cannot yet be directly assessed, as it represents Mexico's implementation commitment for the Paris Agreement over the 2020–30 period. Early signs of progress will come from emissions data for the electricity and transport sector after 2020. However, assuming the NDC is implemented on schedule, it will set an investment and emissions trajectory that can be analyzed in the context of the transformational goals of the agreement itself.

Within the electricity sector, the NDC points to a combined investment in natural gas and renewable generation capacity that will bring significant mitigation versus a baseline by using alternatives to fuel oil or coal. However, any gas-based generation installed during the NDC implementation period will hinder 2050 aims unless its utilization drops to 40 percent by 2035,¹⁶ and lower still afterward. Therefore, such infrastructure risks becoming either stranded assets (running at a utilization below that needed to operate economically) or a force for emissions lock-in (by representing an economic interest against the achievement of Paris Agreement goals). In this light, avoiding such gas investments in the first place, and instead increasing renewable generation and additional transmission (to facilitate grid integration), would be more aligned with the 2050 aims. It is therefore concerning that the federal government's emerging narrative in 2019 seems to favor a larger reliance on fossil fuels, as the tender processes for a high-voltage direct current transmission line for renewable energy and new clean energy generation capacity were halted in the first quarter of 2019.

Similarly for transport, the NDC's focus on reducing black carbon emissions faster compared to carbon dioxide emissions prioritizes reducing consumption of one type of fossil fuel over others, which distracts from the main imperative—required by the best available science—of rapidly phasing out all fossil fuels as quickly as possible (particularly from urban passenger travel), through

vehicle fleet electrification and switching mobility options. The increased demand for decarbonized electricity implied by such electrification presents further arguments in favor of accelerated investment in renewable generation and supporting transmission. Despite the very substantial renewable resources available, Mexico's share of clean energy generation falls below 20 percent, a percentage that already includes large hydroelectricity as the technology that contributes the most. The nexus between transport and electricity should play a greater role in climate planning exercises.

Regarding oil and gas, the NDC focuses on operational improvement in government-managed facilities under the assumption that overall production and export will continue, which is incompatible with the global goal of decarbonization. The significant uncertainties around the global oil industry create large fiscal, budgetary, and labor market risks for Mexico that should be an important part of any future climate policy work. In 2018, nearly one-third of federal revenue originated from oil exports. NDC mitigation actions in industrial sectors other than oil and gas are minor and do not reflect a transformative agenda.

Given these clear instances of emissions lock-in—with investments in natural gas for both power and transportation presented as helpful in the context of a medium-term plan, although they commit the country to future emissions incompatible with the long-term goal—the main climate impact of the NDC in its current form will be to hinder the achievement of the Paris Agreement. This problem is in no way unique to Mexico, and it illustrates how the assessment process to determine technology choices can vary significantly if the planning perspective is mainly incremental, as opposed to directly derived from a long-term goal. In this context, the MCS's inclusion of long-term sectoral scenarios to 2050 is quite helpful. If other policy instruments follow suit, expanding their horizon to 2050 and including climate and energy-related considerations in low-carbon scenarios, then the MCS will surely benefit future planning exercises.

LESSONS LEARNED

This review of the Mexican climate strategy process over several years suggests a number of lessons. The relatively long timeline involved allows discussion of why certain goals have been achieved more than others with the many benefits of hindsight (enhanced by the fact that policy has evolved, international ambition has increased, and the technical literature has advanced). Clearly, the formulation of long-term strategies has been—and still is—a process of learning by doing. Mexico's long track record in this area offers many concrete examples and should allow other countries to learn from its experience.

Find political common ground:

The process followed by Mexico over several years, reaching a high point in the publication of its Mid-Century Strategy, has established a vision that is broadly accepted across the country's many productive sectors and stakeholder groups. Political leadership from the highest levels was instrumental in raising the profile of the climate challenge, and events on the international stage (COP16 first, then COP21 and the North American Leaders' Summit) were fully leveraged by political forces and civil society to generate cross-party consensus on the need for ambitious laws and policies. This has served as an anchor for the national policy-setting process and as a reference for subnational jurisdictions. By recognizing the political benefits of sustainability early on, Mexico has continued to exercise climate leadership, including in the early publication of its midcentury strategy. However, leadership in the past does not guarantee success in the future. Long-term planning inevitably requires detailed actions, concrete monitoring, and increased investment toward the long-term targets. The recent amendments to the climate change law, which incorporated the Paris Agreement goals and principles, including the NDC concept, may help transcend changes in government and in political stances.

Strengthen links between long- and short-term policy goals within the strategy planning process:

The development of the ENCC along thematic axes, cross-cutting pillars, and clear temporal stages (10, 20, and 40 years) contains the essence of a transformation plan. However, a review of the PECC and NDC development processes reveals that the strategy's lack of direct guidelines regarding these short- and medium-term plans hindered its ability to ensure their consistency with the transformational vision. Sectoral policymakers and decision-makers, who developed plans and targets for a 5–10 year delivery time frame, have projected, budgeted, and planned ahead in good spirit but with a traditional, incremental mindset, given some institutional or legal constraints. While there is a recognition of the importance of the strategic vision in their narratives, it is absent from their actions: both the PECC and NDC are characterized by incremental, achievable targets that do not require deep structural change. Thus their concrete actions do not necessarily contribute—and may on occasion hinder—the transformation required by the Paris Agreement. In order to achieve the changes required by the ambitious goals of the Paris Agreement, modifications of the typical policy development process will be required.

The development of any future long-term strategy may wish to include additional processes and guidelines to explicitly require that short-term policy instruments drive transformational change. Since sectoral leaders will not be in a position to identify these unilaterally, the overall strategy-setting process must both present the core elements of such a transformation and

establish mechanisms to refine and improve them over time in a multidisciplinary manner. Direct governance and review of the link between the short and long term will be needed to ensure that the right emphasis is maintained over time.

Monitor ambition across all sectors and gases:

Given the economy-wide emissions targets driving Mexico's climate policy, the planning processes have included all sectors and gases for over a decade. However, one of the greatest challenges in whole-economy decarbonization planning is the allocation of targets and actions to the different sectors, sources, and gases. While Mexico's LGCC allocated minimum requirements to some sectors, the overall profile of Mexico's 2050 emissions was not given detailed consideration in the national policy process prior to the MCS. The close collaboration between the Energy and Environment Ministries during the MCS process, coupled with the sophisticated planning and forecasting tools in the power sector and conservative targets for electrical generation established in the LGCC enabled a technically convincing electricity sector forecast to be adopted as the core of the MCS. Unfortunately, this took up too many emissions to allow other sectors a reasonable 2050 allocation. This difficulty was recognized explicitly in the MCS document.

Sectoral planners are naturally cautious about their own reduction commitments, hoping to see greater ambition from other sectors. This suggests not only that future climate strategy planning efforts must be whole-economy and all-gases in scope but also that a continuous tally of the total must be maintained, even if the scale, sophistication, or maturity of plans differs across sectors. By definition, this is a task not for the sector planners themselves but for the coordinating entity responsible for producing a balanced strategy as a whole. The handbook developed by the 2050 Pathways Platform, as well as its Horizon to Horizon planning guide, can be helpful in this respect.¹⁷

Coordinate policy actions into “packages” to achieve ambitious goals:

Mexico's climate actions to date include a broad range of measures, including, among many others, vehicle fleet efficiency standards, renewable targets in power generation, and fuel taxes based on carbon content. Some of these have not been fully implemented. However, many of the changes described in the technical literature require that multiple incentives and levers act on the economy at the same time in order to drive transformational change. Costa Rica's recent decarbonization plan is an example of this.¹⁸

Recognize the challenge and identify enablers for the transition:

In the Paris Agreement, Parties recognize the scale of the climate challenge as described by the IPCC and commit to act accordingly. The message of in-depth structural transformation,

however, is sometimes difficult to accept for people who do not fully appreciate the latest climate science. Typical reactions to suggestions that fiscal reform, enhanced infrastructure investment, and legislative review will be required to achieve a “merely” environmental objective such as avoiding the harmful effects of climate change can produce an incredulous “tail wagging the dog” reaction. However, this scale of change is precisely what the Parties have signed up for. Full-blown economic transformation toward sustainable development is the only effective climate agenda available. Long-term strategies must start from this, in order to accelerate familiarity with this paradigm, and they must present the development and sustainability advantages of this model, leading to broader acceptance over time. In order for LTSs to credibly paint this picture, they must lay out the enablers that must be present, both internally and in the international community, for such changes to take place.

CONCLUDING REMARKS

Taking stock of the process followed by Mexico since COP15 to develop its long-term climate strategy, it is clear that the 2013 ENCC is the current long-term plan guiding national policy on climate change. While its content was updated to inform the MCS (submitted to the UNFCCC in 2016, in response to Article 4, paragraph 19), the MCS itself has not been adopted as an internal policy instrument, either as a complement to or replacement for the ENCC. Hence, an update of the ENCC, in light of recent improvements in modeling, the newest climate science, and new targets under the NDC, is advisable.

The LGCC sets out conditions under which the ENCC should be updated. The adoption of the Paris Agreement, in particular with its increased ambition, the results of the IPCC’s Special Report on Global Warming by 1.5°C, the need to deliver a next round of NDCs by 2020, and the recent evaluations of national climate change policy within Mexico, collectively make a compelling case for a full update of the ENCC. This would present a natural opportunity to take into consideration the technical progress made in the MCS, with a view to producing a renewed ENCC that can be adopted by 2020 and become the reference for the 2020–30 phase of Paris Agreement implementation, as well as for the 2050 target already adopted in Mexico’s climate change law.

Given this opportunity to update its climate strategy over the coming months, Mexico should consider using the latest available scientific knowledge and long-term climate policymaking developments. The Special Report on 1.5°C has emphasized, more than ever before, the need for transformational change, bringing new urgency to the time frame for cultural and structural shifts originally envisioned in the ENCC. Recent years have seen more countries publishing decarbonization plans and long-term

strategies, from which new best practices in transformation planning are beginning to emerge (complemented by additional technical literature). An updated long-term strategy must present with greater clarity what a successful 2050 Mexico looks like, without shying away from serious market, fiscal, and labor reforms, together with significant investment. Costa Rica’s recent decarbonization plan starts to directly address some of these challenges and opportunities. In other words, leadership shown in the past must be maintained and should lead to the imagining of a different country by 2050.

A future ENCC document should offer specific guidelines on the short- and medium-term actions required to achieve long-term goals, and articulate a whole-economy approach to target development at every stage, to avoid skewing the sectoral balance. Sectoral and temporal targets and trajectories should derive directly from a transformation pathway toward a carbon-neutral economy by 2050. Actions required to enable change should be implemented as soon as possible, with a cohesive view of “policy packages” (sets of coordinated measures) that align to drive the desired change (including specific mention of main lock-in risks to avoid, by sector), as opposed to different measures from different sectors potentially sending contradictory signals. This requires a level of policymaking coordination that is not typical, and achieving it will have to be prioritized.

As the pathway to a sustainable, low carbon economy becomes clearer, certain enablers to unblock change will gain greater visibility. Recognizing them, and their importance, will provide not only Mexico but also future UNFCCC negotiations with concrete proposals for internal processes, as well as attract international investment to this new development model. Efforts should be made to highlight these enablers, while recognizing the ongoing learning inherent in this process by ensuring an iterative cycle of improvement. Otherwise, Mexico risks locking in technologies and development choices that may derail any effort to achieve climate neutrality by 2050.

Mexico’s climate leadership to date derives directly from its visionary response to the Cancún Agreements, and the actions following from the climate change law of 2012. As we approach the 10th anniversary of COP16, it is time to reinforce this leadership with a new strategic vision that uses the latest technical and policymaking knowledge to guide implementation toward the goals of the Paris Agreement.

ENDNOTES

- 1 SEMARNAT-INECC (Ministry of Environment and Natural Resources and National Institute of Ecology and Climate Change), Mexico's Climate Change Mid-Century Strategy (Mexico City: SEMARNAT-INECC, 2016), https://unfccc.int/files/focus/long-term_strategies/application/pdf/mexico_mcs_final_cop22nov16_red.pdf.
- 2 Ley de Planeación, Artículo 2, http://www.diputados.gob.mx/LeyesBiblio/pdf/59_160218.pdf.
- 3 Ley General de Cambio Climático, Artículo 60, http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCC_130718.pdf.
- 4 The first Interministerial Commission on Climate Change was created by presidential decree in 2005; Secretaría de Gobernación, Diario Oficial de la Federación, April 25, 2005, http://dof.gob.mx/nota_to_imagen_fs.php?codnota=2034062&fecha=25/04/2005&cod_diario=149805.
- 5 International Bank for Reconstruction and Development and World Bank, Low-Carbon Development for Mexico, conference edition, 2009, https://siteresources.worldbank.org/INTLAC/Resources/Medec_final_Oct15_2009_Eng.pdf.
- 6 UNFCCC, Decision 1/CP.16, "The Cancun Agreements: Outcome of the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention," in Report of the Conference of the Parties on Its Sixteenth Session, Held in Cancun from 29 November to 10 December 2010, addendum, part 2, "Action Taken by the Conference of the Parties at Its Sixteenth Session," <https://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf>.
- 7 The policy instruments derived from the LGCC are the National Climate Change Strategy, the Special Program on Climate Change, and the state-level action plans for climate change.
- 8 Mexico submitted its Fifth National Communication to the UNFCCC on December 6, 2012. In accordance with national communication guidelines for Non-Annex I countries, Mexico had updated its national GHG emissions inventory for the period 1990–2010. México: Quinta comunicación nacional ante la Convención marco de las Naciones Unidas sobre el cambio climático (Mexico City: Secretaría de Medio Ambiente y Recursos Naturales, 2012), <https://unfccc.int/documents/125276>.
- 9 Instituto Nacional de Ecología y Cambio Climático, "Anexo Metodológico del Diagnóstico de Mitigación," December 16, 2015, <https://www.gob.mx/inecc/documentos/anexo-metodologico-del-diagnostico-de-mitigacion>.
- 10 TIMES stands for The Integrated MARKAL-EFOM (Market Allocation–Energy Flow Optimization Model) System; LEAP stands for Long-Range Energy Alternatives Planning System. For information on the LEAP model and the software, see C.G. Heaps, introduction to Long-Range Energy Alternatives Planning (LEAP) System, software version 2018.1.24 (Somerville, MA: Stockholm Environment Institute, 2016), <https://www.energycommunity.org/default.asp?action=introduction>.
- 11 The resulting emissions baseline was later compared with results from a similar modeling exercise conducted with POLES, as part of a collaboration with the Danish Energy Agency facilitated by the Mexico-Denmark Cooperation Programme on Energy and Climate Change. The comparison improved the transparency of the initial modeling work by estimating and discussing assumptions and uncertainties and by identifying the factors that led to divergence in the results. For information on the model and the software, see Enerdata Intelligence + Consulting, "POLES: Prospective Outlook on Long-Term Energy Systems," <https://www.enerdata.net/solutions/poles-model.html>.
- 12 For the cost abatement analysis from 2010, see SEMARNAT and Instituto Nacional de Ecología, Potencial de mitigación de gases de efecto invernadero en México al 2020 en el contexto de la cooperación internacional, October 28, 2010, http://www2.inecc.gob.mx/descargas/climatico/Potencial_mitigacion_GEI_Mexico_2020_COP.pdf.
- 13 México, Gobierno de la República, "Intended Nationally Determined Contribution," <https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/Mexico/1/MEXICO%20INDC%2003.30.2015.pdf>.
- 14 For the project summary, documentation, and approval timeline, see GEF (Global Environment Facility), "Transparency under the Paris Agreement: National and Subnational Contribution and Tracking towards Mexico's NDC," 2019, <https://www.thegef.org/project/transparency-under-paris-agreement-national-and-subnational-contribution-and-tracking>.
- 15 The Deep Decarbonization Pathways Project prepared a country report for Mexico with the results of its modeling. Jordi Tovilla et al., Pathways to Deep Decarbonization in Mexico (Paris: SDSN-IDDRI, 2015), http://deepdecarbonization.org/wp-content/uploads/2015/09/DDPP_MEX.pdf.
- 16 See Mexico section in IDDRI, "MILES (Modelling and Informing Low Emission Strategies)," September 2017, https://www.iddri.org/sites/default/files/import/publications/miles_2017_7-factsheets.pdf.
- 17 See 2050 Pathways Platform, 2050 Pathways: A Handbook, July 2017, <https://www.2050pathways.org/wp-content/uploads/2017/09/2050Pathways-Handbook-1.pdf>. See also 2050 Pathways Platform, Horizon to Horizon, August 2018, <https://www.2050pathways.org/resources/horizontohorizon/>.
- 18 Gobierno de Costa Rica, "Plan Nacional de Descarbonización, 2018–2050," 2019, <https://cambioclimatico.go.cr/wp-content/uploads/2019/02/PLAN.pdf>.

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ABOUT THE LONG-TERM STRATEGIES PROJECT

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