



GOOD GOVERNANCE FOR LONG-TERM LOW-EMISSIONS DEVELOPMENT STRATEGIES

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EXECUTIVE SUMMARY

Highlights

- Undertaking integrated long-term planning for climate and development requires tailored governance and institutional arrangements.
- This paper explores country experiences with long-term climate and development planning and provides an overview of their governance approaches and institutional arrangements. The paper reveals that there are both common and diverse governance and institutional arrangements for their development and implementation.
- This paper concludes with a checklist of key questions to ask when developing long-term low-greenhouse gas (GHG) emissions development strategies or *long-term strategies* (LTSs) as encouraged by the Paris Agreement. The questions are designed to help readers focus on governance issues that may influence the effectiveness of an LTS. The questions can be used to identify crucial gaps and challenges, as well as opportunities to strengthen governance and institutional arrangements for long-term climate and development planning.

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Background and Objective

The current level of climate effort is insufficient to limit warming to well below 2°C and pursue efforts to limit warming to 1.5°C (UNEP 2018), and decisions being made today can significantly affect whether this goal can realistically be met.

Decisions that do not consider longer-term climate implications risk locking in an unsustainable, emissions-intensive future leading to stranded assets, stranded communities, and stranded workers and diminish opportunities for economic prosperity (New Climate Economy 2018). For these reasons, countries are invited to develop and communicate mid-century LTSs by 2020, mindful of Article 2 of the Paris Agreement and taking into account their “common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.”

Longer-term planning allows for better decision-making in the present by acknowledging the long-term implications of alternatives (Tubiana 2018). Taking a farsighted approach to integrated climate and development can open up national discourse on difficult topics and guide countries on a path to meeting the temperature goal of the Paris Agreement and ensure that near-term climate efforts support strong, sustainable, and equitable growth. LTSs could help drive accelerated, ambitious climate action toward a green economy with the opportunity to reap as much as US\$26 trillion in economic benefits between now and 2030 (New Climate Economy 2018).

By exploring different experiences, this paper aims to reveal insight into the governance and institutional arrangements surrounding the development and implementation of LTSs. The analysis and subsequent checklist of key questions are intended to be helpful to a diverse audience but, in particular, are aimed at supporting policymakers leading the development of a national LTS. This paper is not prescriptive and does not attempt to judge or evaluate to what extent a given governance arrangement influences or has an impact on national decision-making. Instead, this paper draws on governance literature to understand the broad scope of good governance considerations that might be relevant to LTSs and then reviews how these considerations are applied in practice. Through this analysis, we examine and identify trends in the governance experiences and approaches of 25 long-term planning efforts, and propose a series of key questions that

may be considered when undertaking LTSs. While LTSs may include both mitigation and adaptation, the majority of cases in this paper focus on mitigation. However, governance arrangements for LTSs may, in some cases, be the same for both mitigation and adaptation.

Governance Considerations

Effective governance of national climate planning must address many different needs. It should be developed through processes that generate the broadest possible ownership by stakeholders; address the differentiated impacts on affected groups to promote equity; effectively coordinate key actors; and incentivize mainstreaming of climate change through institutional arrangements, laws, policies, or regulations across government entities. Additionally, it should have sufficient political salience, which may emerge through the efforts of multi-issue coalitions that are enabled in part by government actors with the decision-making space, information, and opportunity to link the LTS to their sustainable development priorities and are empowered to participate in its development and implementation. LTS developers should also consider where monitoring and oversight roles should be situated and whether a new institutional mechanism, such as an ombudsperson or independent committee is needed and how parliamentary actors can contribute. In certain respects, integrated long-term climate and development planning requires governance capabilities that are similar to any national planning effort: coordination and cooperation, capacity to conduct relevant analysis, and inclusive processes and policies to minimize inequity and discrimination. However, the specific details, methods, and approaches when taking a farsighted approach are unique and merit examination. In this paper, we take common governance lessons from other planning processes and consider their application in the context of LTSs.

Throughout this paper, governance considerations of LTSs are organized into four themes: *building a foundation*, including initiation of the process, political leadership, and technical capacity; *institutional arrangements*, including organizational structure, legal frameworks, and public engagement; *communication and review*, including communication and review procedures; and *international cooperation*, covering the role of intergovernmental cooperation and shared learning.

Building a Foundation

Several enabling factors trigger the initiation of long-term planning processes. In many cases, the backstory to the initiation of a long-term planning process involves a combination of existing circumstances and conditions, influential factors, or chain of events that drive the early stages of development. Legislative, environmental, and international factors often shape the overall governance arrangements surrounding LTSs. In all of the official LTS cases explored, encouragement in the Paris Agreement to develop an LTS was an important factor. High-level, visible political leadership is also critical to building the necessary foundation for long-term planning as this can mobilize government actors, unlock resources, establish technical and coordination bodies, and raise public awareness. Technical capacity to undertake complex modeling and build scenarios is also an important foundation for an LTS.

Institutional Arrangements

Developing and implementing an LTS requires clear roles and responsibilities, structures and incentives to coordinate, capacity and procedures to manage and share information, and processes to encourage inclusive stakeholder engagement. In development of an LTS, some countries enacted new laws and/or established new bodies or processes while others adapted existing arrangements, often from processes to enact legislation or plans. What matters most is that these arrangements have clear structure with the political and budgetary support to be credible and taken seriously by those involved. In many cases these arrangements are formed during the development of the strategy and can carry over into implementation. In addition to supportive legal arrangements, public engagement is an important element as governments can strengthen ownership of the plan by sharing information on the transformation that will be required in the coming decades, the scale and range of risks, and expected impacts on communities. It is critical to engage a wide variety of stakeholders that will be most affected by the LTS in their design, including the private sector as well as other actors that play a role in implementation, such as subnational entities, nongovernmental organizations (NGOs), and experts. Once the strategy is out, it is important to engage the public at large. Planning out a long-term vision can help identify potential trade-offs, and the public will need to be aware and involved from the outset to ensure that difficult choices are made visible and equitably managed.

Communication and Review

Communication of the LTS to both domestic and international audiences is a critical element of good governance of LTSs. Transparent communication of the strategy, once designed, has many benefits, including guiding domestic decision-making, promoting understanding of the strategy, and building trust and confidence accordingly; sharing needs and identifying areas where international cooperation may be useful; enhancing implementation; and providing information for the assessment of national and global emissions, among others (Levin et al. 2018). In addition, reviewing and updating LTSs will be important to ensure that the strategies remain relevant.

International Cooperation

The development of LTSs is a new experience for many countries, and international cooperation can play a key role in supporting countries seeking to implement efficient and effective processes. Our research shows that at least 67 countries have at some point created national long-term development plans (15+ years), providing a broad base of experience from which to learn. Some countries, such as those in the G20 are already actively supporting each other and sharing lessons and experience, specifically on long-term strategies. This cooperation can also continue after the development of the strategy through to implementation on areas relevant to trade, shared markets, and technologies.

Key Questions for Good Governance of Long-Term Strategies

This paper outlines several governance considerations critical to any national climate planning effort. We have reviewed 25 existing long-term planning efforts, including official LTSs (see Scope and Methodology). To facilitate reflection of the lessons and experience of these examples, we provide a checklist of key questions (Table ES-1). National policymakers and planning officials may consider these questions when developing their own LTS. This checklist may be used at any time but may be most effective at the outset of preparing a national process to undertake development of a long-term low-emissions development strategy, in order to establish good governance practices that can be sustained through implementation. The questions are organized along the governance themes covered in the paper although some questions may be relevant to more than one theme.

Table ES-1 | Checklist of Key Questions

CATEGORY	KEY QUESTIONS
Initiation of the Process	<ul style="list-style-type: none"> ■ Does a political mandate for an LTS already exist, and, if not, what political leadership can be mobilized to initiate an LTS and how? ■ What existing political and policy cycles could support or might inhibit LTS development? ■ What bureaucratic and legislative factors may help trigger or advance the development process? ■ Is there an international or national event or window of opportunity for a political leader to set a process in motion by creating or calling upon a government authority to initiate the planning process? ■ What existing development, climate, or environmental planning priorities should be addressed through the LTS development process? ■ What near-term and existing processes is the LTS seeking to inform? ■ Are there any specific shortcomings in current planning processes that could be addressed through the development of an LTS? ■ What stakeholders are supportive of long-term climate action and planning? ■ Are financial resources available or dedicated to support development, advocacy, awareness raising, training, and other critical areas necessary to build the foundation?
Political Leadership	<ul style="list-style-type: none"> ■ What type or level of leadership is required to mobilize the right group of actors to undertake an LTS? ■ How are decisions made, and which entities or individuals have appropriate authority or mandate to lead the process? ■ Who are the key public and private leaders? ■ What resources, information, and knowledge exist across government to equip leaders to drive the process?
Technical Capacity	<ul style="list-style-type: none"> ■ What technical capacity is needed, and is there sufficient technical capacity at the domestic level to undertake an LTS? ■ Are there existing analytical teams or processes that could support LTS development, and, if not, where else could this capacity be found, or how can the scope of an LTS be modified to fit available capacity? ■ Which entities or individuals have the necessary technical capacity to undertake analysis for an LTS?
Organizational Structure	<ul style="list-style-type: none"> ■ Is there a recent national process for which institutional arrangements (such as an interministerial body, cooperative agreement or memorandum of understanding (MOU), or coordinating structure) could be adapted or built upon to develop a long-term strategy? ■ Has a mapping of relevant government actors been done to help clarify who should be involved and when? ■ Which ministry, authority, or other body is best placed to coordinate and lead the plan? If none exists, how should a new one be developed and who should be included? ■ Who should constitute the drafting team? ■ Will existing or proposed arrangements provide the opportunity for subnational authorities, civil society, private sector, and other non-state actors to contribute to the LTS and/or play a role in its implementation?
Legal Frameworks	<ul style="list-style-type: none"> ■ Are there existing legal frameworks (constitutional, statutory, or otherwise) that provide a legal basis for developing a long-term strategy? ■ Would a new statute or executive decree provide a mandate; establish roles, rights, and responsibilities; or clarify institutional arrangements in a way to support the development and implementation of a long-term strategy? ■ What, if any, are the trade-offs in efficiency and effectiveness between a legally binding instrument from the executive branch and one from parliament? ■ Is there, or could there be, political support or constituencies to strengthen legal frameworks? ■ Which governance components may need to be addressed through law (i.e., new mandates for planning, information sharing and communication, public engagement, or sector coverage of long-term strategies)?

Table ES-1 | Checklist of Key Questions (Cont'd)

CATEGORY	KEY QUESTIONS
Public Engagement	<ul style="list-style-type: none"> ■ Who are the stakeholders to be included in the engagement process, such as civil society organizations, subnational authorities, scientific institutions and universities, the private sector, citizens groups, and vulnerable and indigenous populations? ■ How will those most significantly affected by the long-term strategy, such as those tied to a fossil fuel economy, be involved in the strategy's development? ■ What will constitute effective means of engagement, such as through participation in the analysis, public consultation, in-person workshops, surveys, and/or an interactive website? ■ How will stakeholder feedback be taken into consideration and incorporated into the development process? ■ At what point will the engagement process begin, and will it continue during implementation? ■ To what extent will stakeholder engagement be sustained through monitoring and evaluation or revision? ■ Do sufficient human capacity and adequate financial resources exist to manage and sustain the means of engagement? ■ What sectors or stakeholders may challenge the process, and how can they be managed? ■ How will the engagement strategy contend with conflict among views gathered? ■ How should analytic teams be managed and guided, and how should data be collected across agencies?
Communication	<ul style="list-style-type: none"> ■ How can the strategy effectively send signals to clearly guide national, subnational, and private-sector decision-making? ■ How can the strategy be communicated in a way that will fulfill the country's communication objectives? ■ Who are the various target audiences that the communication needs to reach, and what are their information needs? ■ How should the information be provided in order to be useful for decision-making? Is additional information needed, or can the information be presented in a different way for different audiences to understand the long-term strategy? ■ How much information and detail should be provided in the long-term strategy to enable understanding of the strategy's elements, including the assumptions and methodologies underpinning the strategy? ■ How much information should be communicated regarding the long-term pathways' impact on socioeconomic factors, as well as the opportunities and trade-offs inherent in the long-term transitions? ■ How much information should be provided to enhance implementation of actions to support the plan? ■ How much information should be provided to enable an assessment of future emissions under different possible scenarios?
Review	<ul style="list-style-type: none"> ■ How should the strategy be monitored during implementation? What methods should be applied? ■ What are the objectives or principles guiding the review? ■ What goals, targets, and key performance indicators (KPIs) can the monitoring of the strategy be benchmarked against? ■ Which group (ministry/independent body) is best placed to lead and conduct the review? ■ What is the frequency of review? ■ What are the resources required for the review and revision process, and where are they committed? ■ How can the review process align with other domestic or international processes, like national adaptation plans (NAPs) and nationally determined contributions (NDCs)? ■ What independent sources can contribute to review? ■ What is parliament's role in holding the government to account? ■ How can the results of the review process inform current development plans, near-term sectoral and economy-wide policies, and infrastructure investment?
International Cooperation	<ul style="list-style-type: none"> ■ What issues would the country like to learn about or receive assistance on via international cooperation? What are good models from others that could be adapted? Accordingly, which country(ies)/group(s) would be well-placed to engage on long-term strategies? ■ What existing group(s) does the country participate in? Are any suitable to discuss long-term strategies? ■ What is the key objective of the cooperation? For example, is it to share lessons and common challenges? To explore trade impacts? To understand future transboundary challenges (e.g., water resources or migration)? To deliver capacity? To drive greater ambition? ■ How could the Paris Agreement's global stock-take processes help countries implement and improve their long-term strategies?

Source: WRI authors.

INTRODUCTION

Most countries have some experience with climate-change planning over near- and medium-term horizons through efforts such as nationally determined contributions (NDCs) and low-emissions development strategies (LEDS) (Levin et al. 2018).¹ However, current pledges are insufficient to limit warming to well below 2°C and pursue efforts to limit warming to 1.5°C, and decisions being made today can significantly affect whether this goal can realistically be met. Decisions that do not consider longer-term climate implications risk locking in an unsustainable, emissions-intensive future leading to stranded assets, stranded communities, and stranded workers and diminish opportunities for economic prosperity (New Climate Economy 2018).

Taking a farsighted approach to climate and development can guide countries on a path to meeting the temperature goal of the Paris Agreement and ensure that climate efforts support strong, sustainable, and equitable growth (Levin et al. 2018). Long-term planning for climate and development requires tailored governance and institutional arrangements. Political and budgetary cycles, sectoral planning, and other frameworks for national planning are often geared for less than 10-year time frames for most countries. This paper considers what type of governance and institutional arrangements can best support the development of long-term, low-emissions development strategies in order to bridge long-term climate implications to the decisions of today.

Background

In 2015, the nations of the world came together and adopted the landmark Paris Agreement, reinvigorating collective ambition and the global resolve to address climate change. The Paris Agreement is, in a sense, a long-term strategy, with three overarching aims: to limit global temperature rise to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C; to increase the ability to adapt to the adverse impacts of climate change and foster climate-resilient and low GHG emissions development in a manner that does not threaten food production; and to make finance flows consistent with a pathway toward low GHG emissions and climate-resilient development.² Article 4 further specifies that, in order to achieve the long-term temperature goal, the Parties aim to peak global GHG emissions as soon as possible and achieve a balance between anthropogenic emissions by sources and removals by sinks of GHGs in the second half of this century. These collective long-term goals are meant to guide a strengthened global response to the threat of climate change.

With the adoption of the Paris Agreement, countries were also invited to develop and communicate mid-century, long-term low-GHG emissions development strategies or long-term strategies (LTSs) by 2020 (UNFCCC 2015). In formulating these voluntary strategies, countries are to be mindful of Article 2 and should take into account their “common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.” As of the publishing of this paper (May 2019), 11 countries have formally communicated their strategies to the UNFCCC Secretariat.³

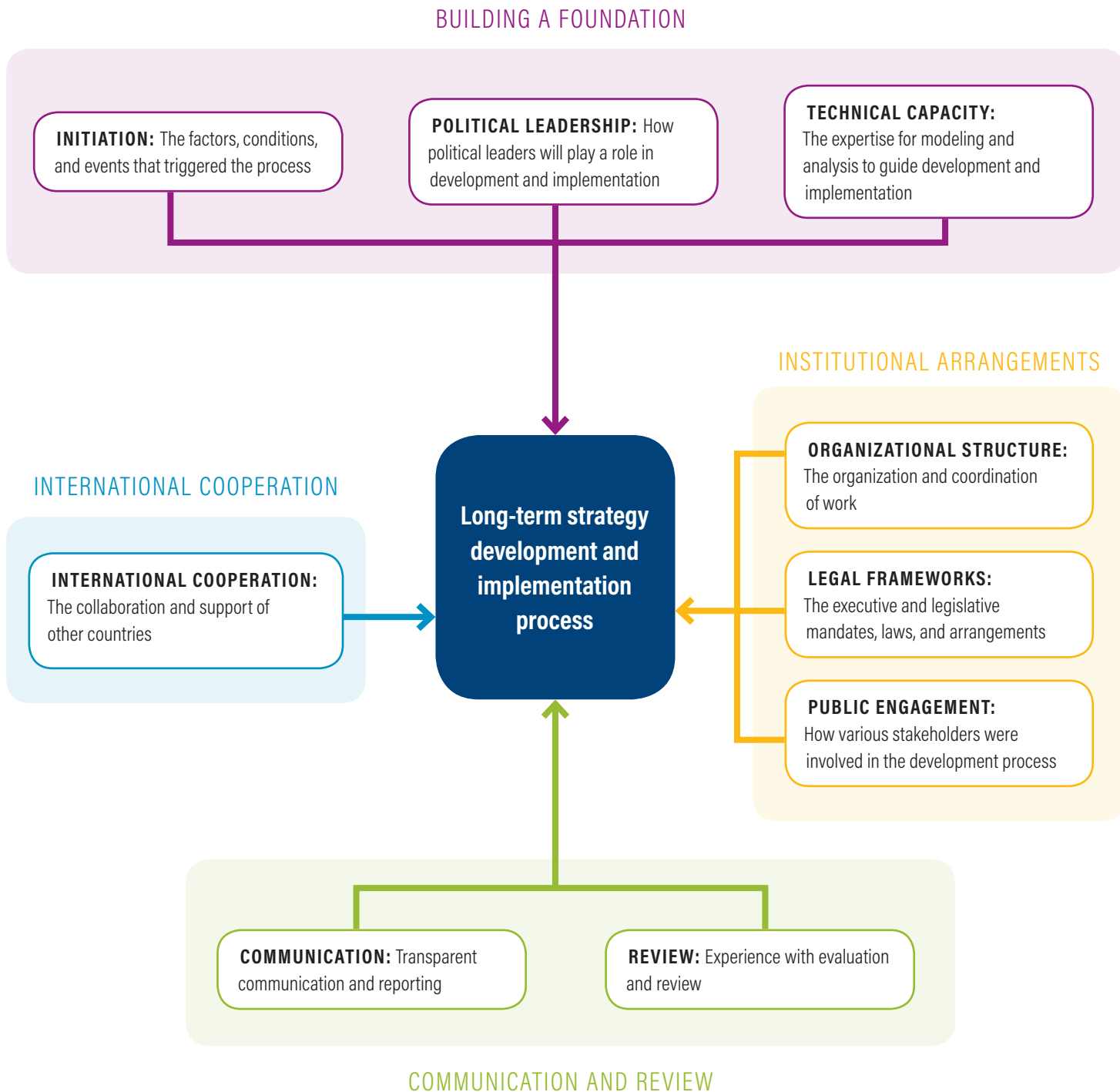
There is no precise definition, format, or approach for an LTS. However, early analysis shows that countries’ strategies share a number of common themes, including a transition to low-GHG emissions societies, enhancing climate resilience, supporting transitions in the workforce, creating quality jobs, and ensuring that economies thrive (Ross and Fransen 2017). LTSs should align with national priorities and provide a long-term vision for the future. This vision may be expressed by including several elements in the LTS, such as

- the time frame;
- a quantified outcome for reducing emissions;
- goals for sustained and inclusive development;
- goals for human and environmental well-being;
- a long-term outcome for climate adaptation and resiliency;
- consideration of the interactions between climate and development responses; and
- a trajectory toward the long-term vision (Levin et al. 2018).

Purpose and Objectives of LTSs

While the Paris Agreement establishes a global direction of travel, each country must undertake national efforts and work in this direction. As a complement to NDCs, LTSs can provide credibility and certainty that the goals of the Paris Agreement can be achieved and are an ideal tool for governments to communicate their determination to address climate change (Espinosa 2018). LTSs can inform the implementation of current NDCs and the development of NDC updates, ensuring that both align with the collective long-term goals. LTSs allow us to make better decisions for better decision-making in the present by enabling us to understand the long-term implications of alternatives (Tubiana 2018). LTSs can inform domestic action, and, in this global economy,

Figure 1 | Governance Considerations of Long-Term Planning



Source: WRI Authors.

they can also inform other countries' actions, including international trade and investment decisions.

If the global goals are to be met, major transformation will be inevitable. LTSs provide an opportunity to take a farsighted approach to climate and development in an integrated manner and enable countries to visualize the turning point in a country's development patterns (Bouyé et al. 2018). Traditional single-issue focus is in many instances insufficient for effective climate planning (UNDP 2014; Habegger 2010). Climate change cuts across development and economic challenges, including natural resource management, job creation and economic prosperity, infrastructure and transportation, agriculture and food security, and energy security. LTSs provide the opportunity for countries to map out a direction of travel for meeting the global climate goals aligned with other national priorities and in collaboration with all domestic climate actors (Levin et al. 2018).

About This Paper

This paper explores how governments have approached governance and institutional arrangements of long-term plans and strategies in order to provide insight and lessons for the development and implementation of LTSs. Good governance considerations of LTSs include the institutional framework; authority and leadership; roles and relationships; equity and inclusion; and incentives involved to ensure policy coherence, induce ownership, and promote implementation (WRI 2018). No two strategies are the same, as they are nationally driven exercises, developed in the context of national circumstances, political and economic systems, and national planning cycles—when they exist. Establishing effective, practical LTSs requires fit-for-purpose governance and institutional arrangements at the outset, during development, and through implementation; yet the arrangements in countries will differ in practice.

This paper aims to equip national decision-makers with knowledge and understanding of governance approaches for developing long-term strategies. This paper is not prescriptive and, instead, provides an overview of past and present experience in the governance approaches and institutional arrangements for long-term planning efforts. The insights and experiences captured may provide some guidance in the development of new or revised LTSs in the future.

This paper does not attempt to judge or evaluate to what extent a given governance arrangement influences or has

an impact on national decision-making. However, through analysis of the governance arrangements in the design and implementation of these strategies, we identify trends in their practical application. Specifically, this paper explores governance considerations of LTSs organized into four themes: (1) *building a foundation*, including initiation of the process, political leadership, and technical capacity; (2) *institutional arrangements*, including organizational structure, legal frameworks, and public engagement; (3) *communication and review*, including transparent communication and review procedures; and (4) *international cooperation*, covering the role for intergovernmental cooperation and shared learning (see Figure 1). At the end of each section, key questions for policymakers are identified.

Scope and Methodology

This section describes the scope and methodology for the research underpinning this working paper. As of publication, only 11 formal submissions of LTSs have been communicated to the UNFCCC, all of which are fairly recent (within the past three years). However, long-term strategic planning exists in other forms, including at the sectoral and subnational level. So, in order to draw from broader experience with governance and institutional arrangements for long-term planning, input for our analysis extends beyond the UNFCCC submissions to draw experience from other long-term planning efforts and includes examples not necessarily specific to climate change. While each effort has a specific title, we use several terms to describe these efforts in aggregate. See Box 1 for clarification of terminology used in this paper.

A literature review of good governance practice in national climate and development planning informed our identification of key considerations and normative statements throughout the paper about what governance and institutional arrangements are necessary to support planning and implementation. We then explored specific cases of long-term planning to understand how they address these governance issues in practice. We used the good governance considerations and the experience of cases to inform key questions when developing and implementing LTSs.

In total, 25 examples of long-term planning from developed and developing countries were used as input for this paper, including 6 official LTSs, 9 national development strategies, 4 sectoral strategies, 4 climate strategies, 1 sustainability plan, and 1 subnational strategy (see Figure 2 for an overview). While LTSs may include both mitigation and adaptation, the majority of cases in this paper focus on mitigation. However, two of the four climate strategies

focus on adaptation. Details of these examples were drawn from a combination of desk research, commissioned case studies, and surveys.

Our research gathers information on long-term planning efforts through three approaches: (1) surveys of countries that have developed or are in the process of developing LTSs; (2) review of case studies commissioned under WRI's long-term strategy project;⁴ and (3) landscape analysis and examination of other existing long-term planning efforts. The analysis is not exhaustive of all potentially relevant long-term plans, and other unique country experiences may exist that are not represented here. However, the selection of cases aims to provide initial understanding of how governance and institutional arrangements can support development and implementation of long-term planning efforts, including LTSs. As the concept of planning for long-term low-emissions development continues to evolve, further research will be needed to assess the impact and effectiveness of good governance of LTS. For further details on the methodology and how the 25 cases were selected, please see Appendix A.

Limitations

This paper and its methodology are not without limitations. While the long-term planning efforts used in the analysis are meant to represent a balance of developed and developing countries and a diversity of long-term planning efforts, the selection process was driven in part by several constraints, including time, information availability, preexisting knowledge of long-term planning efforts, and access to experts. The research is not comprehensive with respect to all potential cases and focuses more heavily on mitigation than adaptation and building resilience. There are also relevant governance topics that are not comprehensively addressed, including the role of subnational and nongovernmental actors in LTSs, how political cycles and administrative changes play a role in LTS development and implementation, and how to overcome governance challenges. Further exploration of these topics is beyond the scope of this paper, but they warrant future consideration. While this paper provides a sampling of experience, further research would improve understanding of the impact of LTSs and their governance and institutional arrangements.

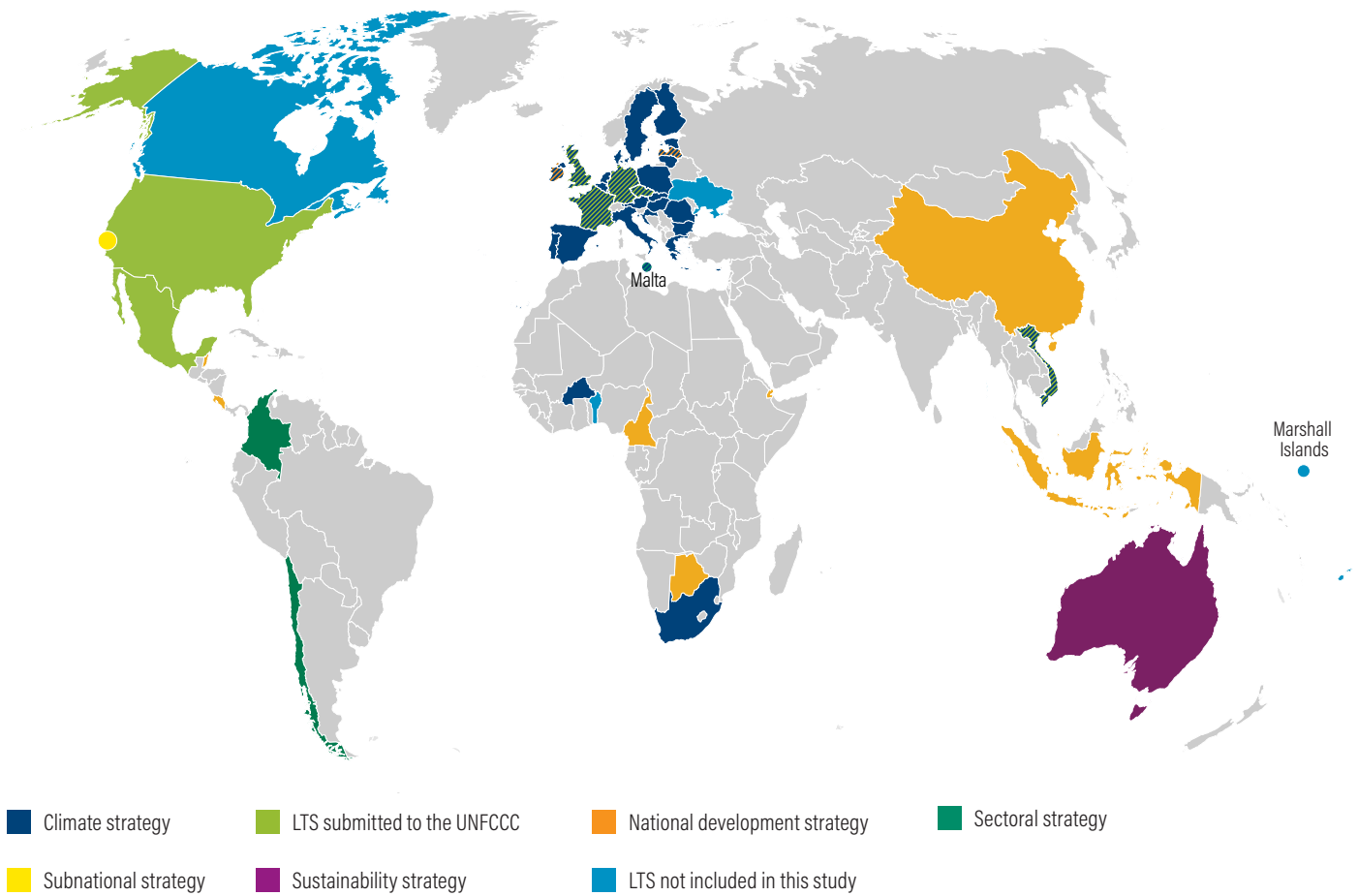
Box 1 | Terminology

Throughout this paper, various terms and titles are used to describe countries' long-term plans, strategies, and processes. While we do not attempt to define or categorize the diversity of the varying efforts, we aim to consolidate our terminology in order to provide greater clarity. We apply two basic distinctions:

1. For the purposes of this paper, the term "long-term low-GHG emissions development strategies" or *long-term strategies* (LTSs), refers to official national strategies submitted to the UNFCCC (current or future) as encouraged under Article 4 of the Paris Agreement. For the purposes of this paper, *long-term* in this context generally refers to 2050, or mid-century, as specified in Article 4. LTSs are intended to address climate change and development priorities in an integrated manner.
2. The term "long-term plan" or "long-term planning effort" is an overarching, general term referring to any variety of longer-term plan, strategy, vision, or process described in this paper. To the extent possible, when describing specific long-term planning efforts, we use the official title of the document. *Long-term* in this context may not always refer to 2050 as these efforts are not necessarily related to the Paris Agreement. These efforts may not necessarily integrate climate change and development and may instead focus on specific themes such as sectors, climate change mitigation and/or adaptation, or sustainable development.

Source: WRI Authors.

Figure 2 | Map of Cases Included in This Study



Note: This is not a comprehensive map of all long-term plans and strategies. In addition, the research did not include five LTSs submitted to the UNFCCC at the time of publication. Many other LTSs may be in development that are not noted in this figure.
 Source: WRI Authors.

GOVERNANCE IN NATIONAL CLIMATE PLANNING

Before analyzing examples of long-term planning, it is important to have a general sense of good governance practices to help focus the analysis. Governance of national climate planning is most effective when it generates broad ownership by stakeholders, addresses differentiated impacts on affected groups to promote equity, effectively coordinates key actors, and incentivizes mainstreaming of climate goals into sector planning through laws, policies, or regulations (Setzer and Nachmany 2018). Additionally, such planning should have prominent political standing—either through public awareness, parliamentary or independent oversight, and/or as part of a national development agenda—to endure through administrative changes (Inchauste et al. 2018). Similar to governance

capabilities of any national planning effort, sound long-term climate planning requires coordination and cooperation, capacity to conduct relevant analysis, and inclusive processes and policies to address inequity and discrimination. But long-term climate and development planning also poses unique challenges:

- The degree of complexity and uncertainty inherent in predicting climate impacts and their interactions with socioeconomic, political, and technological factors over 30+ years requires plans that are robust in a wider range of scenarios (Lempert and Trujillo 2018).
- Politically and economically powerful interests affected by decarbonization may threaten to derail or co-opt implementation (Worker and Northrop 2017).

- Multifaceted issues of equity and fairness stemming from climate vulnerabilities and economic transitions require cross-cutting attention (Bhardwaj et al. 2019).
- Building a strong technical case, collective ownership, and capacity for sector decision-makers to embrace a co-benefits approach and align climate goals with development objectives may require significant shifts in national planning and coordination processes.

Countries may experience these challenges differently, given their national contexts, existing capacities (institutional, analytical), and political economies. However, the literature on climate planning and long-term planning generally identifies the following governance considerations:

Political Leadership

Political leadership in the context of policy change occurs when a group or individuals are able to create a more conducive environment for change, use their authority to enable change, and free the abilities of those able to implement change (Andrews et al. 2010). Leadership may be needed to set the policy agenda; to establish the narrative for long-term climate action in the context of jobs and economic opportunity, energy security, public health, or other widely acknowledged priority; and to establish roles and responsibilities for developing policy and coordinating action, monitoring, and enforcement. Parliaments may play a leadership role by establishing subcommittees to put climate planning on the policy agenda or to pass laws requiring long-term plans and to approve budgetary resources required for preparing and implementing the policies and plans. Leadership from nongovernmental organizations (NGOs) and the private sector can provide necessary innovations and advocate for transformative action, ensuring that the issue remains visible (Mogelgaard et al. 2018). In some cases, line ministry leadership may be needed to complement high-level leadership by framing the objectives and strategies in sector-specific terms and actions (Cooke et al. 2018).

Technical Capacity

Technical capacity, although not necessarily a governance issue, is still an important consideration that is interlinked with good governance. Technical capacity includes the ability to organize, structure, and facilitate multidisciplinary expertise to produce the models, forecasts, and analysis to guide the development of mitigation pathways and adaptation options. This expertise and leadership may come from line ministries, relevant industries, academic institutions, NGOs, or other non-governmental actors.

Organizational Structure

Creating rules, incentives, and structures to efficiently and effectively develop and integrate long-term goals into short- and medium-term decision-making is crucial, given the importance of avoiding path dependency on carbon-intensive infrastructure and investments.

Countries are addressing vertical and horizontal coordination needs through interministerial committees and councils, forums, technical working groups, and other multistakeholder bodies intended to enhance the sharing of resources and information, promote policy coherence, and monitor and evaluate progress.⁵ Often the leadership role is designated to a ministry with the most technical expertise, such as environment or planning, or, in other cases, to an authority with more resources or political stature, such as finance or the prime minister's office. There can be innovative combinations, where a ministry of environment provides technical leadership and a centrally situated authority convenes sector decision-makers. As climate leadership at the subnational level continues to grow, coordinating mechanisms can ensure that subnational actors can contribute to LTSs while creating mechanisms to share information and experience to address equity and effectiveness in implementation.

Formal structures are no guarantee that effective coordination will occur, however. Coordinating efforts may be undermined if they are not supported with sufficient

budgetary and human resources, secure the participation of staff empowered to make decisions, have a high-level political mandate, have dispute resolution mechanisms, and are transparent enough to be held accountable (World Bank 2017). New incentives may be needed to induce coordination and collaboration if institutional arrangements challenge existing power structures or seats of authority (Nightingale 2017). These incentives may include new agency rules and guidance, budgetary incentives for staff time, performance metrics, and staff training and other capacity-building measures, for example.

Institutional arrangements can also establish or enhance processes for information and data sharing; stakeholder participation; and monitoring, learning, and evaluation. This may be accomplished through different measures, such as new rules or regulations, information-sharing protocols, multistakeholder platforms, and monitoring and evaluation systems that enable contributions from actors in different sectors and at different levels of government.

Legal Frameworks

Countries may look to existing legal frameworks, such as the constitution, or by enacting laws through legislatures or by executive orders or decrees. As of 2017, 70 percent of global GHG emissions were covered by either binding legislation or a climate strategy with an accompanying coordinating body (Iacobuta et al. 2018). Laws can mandate long-term planning, clarify roles and responsibilities, and establish institutions and processes, such as monitoring and oversight, stakeholder engagement, budgeting and finance. They may establish institutional arrangements to promote coherent and integrated climate and sustainable development planning or create roles or special access for vulnerable or affected groups, such as in the following examples:

- Requiring independent analysis of any legislative effort to weaken the law's goals.
- Channeling a portion of revenue from fiscal instruments toward implementation to reduce dependence on budgetary processes.
- Including measures, such as mandated terms, to insulate committee chairs or department heads from removal by political actors.
- Establishing and promoting special participatory rights for historically disadvantaged groups in the implementation process (Lazarus 2010).

Laws can provide long-term plans with some insulation against short-term political headwinds by creating independent commissions with term-protected members or creating triggers for review of any attempts to change the goals of the plan. These types of protections can be added while still allowing for flexible pathways in meeting long-term goals.

Public Engagement

Early opportunities to engage communities, interest groups, and the public at large can generate greater awareness and potentially create buy-in from constituencies that support the long-term plan's implementation. Public participation is not a panacea for effective, inclusive governance (Few et al. 2007), but historical evidence suggests that it can be most instrumental when public authorities share relevant, accessible information and respond to inputs received and when there are mechanisms for continued engagement (EPA 2016). Experts from NGOs, the private sector, academia, and donor agencies can also help staff technical committees to inform the plan's development and serve as messengers into the broader community.

Early and iterative engagement of the public and stakeholder groups for long-term climate planning may help accomplish the following objectives:

- Align a long-term plan for low carbon development with a national vision and narrative for sustainable development.
- Develop a multidirectional flow of information among national and subnational governments, communities, affected groups, and industries to understand priorities, build awareness of the planning process, and sharpen understanding of equity and fairness concerns.
- Develop a broader constituency to support long-term implementation.
- Expose any divergent views across stakeholders.
- Build awareness of opportunities and benefits of long-term low carbon development while discussing trade-offs of different pathways.

Communication and Review

Communication and review during the development and implementation of a long-term plan can build trust with stakeholders and the public and enable political and technical leaders to respond to new information and make changes in implementation strategy. Review procedures can also enable nongovernmental actors to engage more directly in the monitoring of implementation and support through technological or social innovations, research, and strategy. At times, communication may lead to criticism from stakeholder groups, but this still offers an opportunity to respond to feedback, engage in public dialogue, and consider new approaches.

Transparent communication of the strategy, once designed, could have many benefits:

- *Guiding domestic decision-making:* Providing information to maintain awareness of the long-term vision, plans, and actions can steer actions by the private sector, sectoral decision-makers, local governments, and civil society.
- *Promoting understanding:* Detailing assumptions and methodologies underpinning the long-term strategy can help promote a better understanding of the strategy and the rationale for the design of its elements, which can help build trust and confidence and, in turn, promote action. Providing information that tells the country's story promotes understanding of challenges, national circumstances, and development priorities.
- *Enhancing implementation:* Providing more detailed information about policy pathways can also enhance domestic implementation by clarifying assumptions underlying the actions needed to implement the LTS and communicating those assumptions to domestic stakeholders.
- *Assessing national and global emissions:* Providing information to global and regional institutions, other countries, businesses, and stakeholders enables global analysis of future national and global emissions.
- *Sharing needs and identifying areas where international cooperation may be useful:* Clear communication of such needs might enhance countries' abilities to mobilize public, private, national, and international investments and other resources to help take ambitious climate action while addressing other key developmental priorities (Levin et al. 2018).

Review mechanisms are critical, especially given a long-term timeline, to reassess data and assumptions; take stock of current models and forecasts and projections, as well as technological developments; address new climatic, economic, or social conditions; and facilitate an objective appraisal of the distance from the expected trajectories toward the longer-term goals. Review may be independent, providing external advice, or may be internal with a more binding nature. It may be necessary to integrate review procedures into legal frameworks and institutional arrangements to build capacity for effective monitoring and evaluation and establish coordinating mechanisms to share information.

BUILDING A FOUNDATION

Initiating the Process to Develop a Strategic Vision

Conceptually, the process of developing a long-term plan may appear linear, following a logical flow of steps (Levin et al. 2018). Our analysis of official LTSs as well as other long-term plans has shown that in practice, however, the process is often more organic and amorphous. Even the initiation of the process to develop an LTS and design a strategic vision for a country is often difficult to boil down to a single event or trigger. In many cases, there is no single trigger, and the process to undertake long-term planning is initiated out of a combination of factors, including the direct encouragement of the Paris Agreement. These factors help to shape the early stages of development and may inform how governance arrangements evolve throughout the process.

In each of the country cases analyzed, the early stages of the process differed. Distinct social, environmental, international, and political factors combined with each other to initiate each country's domestic process. Although there are interlinkages and nuances among them, contributing factors can generally be organized into the following six categories: political leadership, legislative factors, international factors, climate change and environmental factors, advocacy, and planning. In addition to initiating the process, these factors often shape the governance arrangements for development and implementation of the planning effort.

Involvement of high-level political leaders

Supportive and even visionary leadership can be critical to jump start the initiation of the LTS process. A number of countries wanted to show commitment and leadership in implementing the Paris Agreement. In the United States, one of the overarching aims of the former administration was to encourage and inspire other

countries and build momentum for early entry into force of the Paris Agreement. In this case, the highest level of authority played a role in kicking off the development process. In 2016, President Barack Obama of the United States, Prime Minister Justin Trudeau of Canada, and President Enrique Peña Nieto of Mexico met in Ottawa for the the North American Leaders' Summit where they announced a host of regional climate, clean energy, and environmental aims. This included the announcement that all three countries would develop mid-century LTSs within the year (White House 2016).

In South Africa, the cabinet, comprising the president, the deputy president, and the ministers, signed off on a mandate for the long-term mitigation scenario (LTMS) after the 2005 National Climate Change Conference. Another contributing factor to the development of the LTMS was a strong climate-change department that was trusted by national stakeholders to undertake the development process. Most recently, in Costa Rica, the president made a direct request to the minister of environment and energy to undertake the process.

In France in an address to the National Committee for the Energy Transition (CNTE), the minister for ecological transition launched a strategic exercise known as “the revision process.”⁶ The CNTE is a permanently established consultative body with governmental and nongovernmental representation.

In some cases, political leadership is linked to advocacy and stakeholder support (see also Advocacy below). For Germany, the LTS process was initiated out of a political compromise to accommodate more progressive political factions that were arguing for a national climate-action law.

Even in cases of plans that are not official LTSs, political leadership is often noted during the initiation. In Botswana, the president provided direct instruction to kick off the process by appointing a presidential task team to oversee the development of Botswana's second vision (Botswana 2016). Similarly, in Cameroon, the prime minister instructed the Ministry of Economy, Planning and Regional Development to formulate a long-term strategic development vision and continue to

provide regular updates throughout the process (Cameroon 2009).

For more examples of political leadership beyond initiation, see the section on Political Leadership below.

Legislative factors

In several cases, the LTS process was mandated by national law or executive order or triggered by the need to meet directives of regional economic integration organizations (for example, the European Union). An official mandate may trigger a formal initiation of the process, but there are often additional preceding factors leading to the inclusion of LTS development in the law in the first place.

International factors

In a number of countries, international processes such as the UNFCCC and the encouragement of the Paris Agreement, played a prominent role in initiating the development of the long-term plan. The development of long-term planning in the EU is clearly linked to developments within the UNFCCC negotiations (Duwe and Iwaszuk Forthcoming). See Box 2 for details. For South Africa, one factor leading to the development of its LTMS included the First Meeting of the Parties to the Kyoto Protocol in 2005, the outcome of which suggested there would be future mitigation obligations for developing countries. In Chile, the International Energy Agency undertook an in-depth review of Chile's energy policy and published recommendations in 2009 to develop a holistic long-term energy strategy. In a similar situation, the Australian and Queensland governments released the Reef 2050 Long-Term Sustainability Plan in response to the World Heritage Committee's recommendation that Australia develop a long-term plan to protect the reef (Australia 2018). Other countries noted that invitations from the UNFCCC to undertake long-term planning efforts were contributing factors. Such planning efforts include LTSs in the Paris Agreement, LEDs, and NAPs. International forums, such as the G20, may also play a role in driving interest and support for LTSs. The past three G20 presidencies of Germany, Argentina, and Japan have included the topic of LTSs in their annual meetings (Japan 2019; Argentina 2018; Germany 2019).

Climate change and environmental factors

In several instances, climate change and environmental factors triggered the initiation of the LTS process. In Vietnam, the 2011 National Climate Change Strategy highlighted the high level of climate-related vulnerability in the country. Sustained exposure to socioeconomic risk and ongoing environmental degradation in the Mekong Delta, Hong River, and central coastal regions led to the initiation of several adaptation planning efforts. During the 1990s in Colombia, extreme drought led to a water and energy crisis that resulted in extensive blackouts, triggering a re-engineering of the country's electricity system and its long-term energy planning process. In 2015, EU regional partners urged the Government of Malta to address negative externalities arising from traffic congestion, including air pollution, GHG emissions, and economic costs of delay to local businesses (Sutton 2018).

Advocacy

The level of constituency support for efforts on climate change is also an important factor in the initiation of the long-term planning process. An active and engaged civil society and positive interest and support from the business community can trigger governmental action in LTS development. In some cases, a heightened awareness of climate change and the failure of current policy to achieve desired effects can mobilize citizen support for the LTS. In Costa Rica, President Carlos Alvarado responded to bottom-up demand from civil society for decarbonization—in particular, calls for zero emissions electric mobility, given Costa Rica's nearly 100 percent renewable electricity. Transportation is the main driver of carbonization in Costa Rica, and this activism was the result of a coalition of stakeholders pushing for electric mobility legislation.

Box 2 | The Initiation of a Long-Term Plan in the European Union

The backstory to the initiation of the process to develop a long-term climate strategy is often a combination of factors. This is the case in the European Union, where there is a clear relationship to the ongoing processes under the United Nations Framework Convention on Climate Change.

Despite leadership efforts of EU member states, a lackluster outcome at the 2009 Copenhagen climate summit shook the credibility of the regime and dampened progress on climate change in the EU. With renewed focus to reinvigorate the process, a year later in 2010, COP16 adopted a series of decisions to overcome the stagnation, including the requirement for developed countries to produce low-carbon development strategies. Shortly thereafter, the European Commission published its first draft of its 2050 strategy, called "A Road Map for Moving to a Competitive Low-Carbon Economy in 2050," developed by the Directorate-General for Climate Action. While the aim of this strategy was to invigorate EU climate policy, this longer-term view was a departure from a more familiar approach focusing on 2020. The implication of the long-term modeling exercise was that it would be in the economic self-interest of the EU to increase its 2020 target even without corresponding assurances that other nations would do likewise. Ultimately, this initial attempt turned out to be too politically controversial and was never formally endorsed by EU member states.

Even though the road map lacked official legal status, it stimulated national 2050 planning processes in several countries. In addition, a separate "Energy Roadmap 2050" was prepared by the Directorate-General for Energy within the European Commission. These efforts showed a growing recognition for the need to develop long-term perspective in addressing climate planning. In 2013, the EU established legislation requiring member states to develop national low-carbon development strategies although no deadline was established.

Taking a cue again from the UNFCCC, once long-term low emissions development strategies were included in the Paris Agreement, support for LTSs grew across Europe. The Commission took up the request and prepared new legislation for a post-Paris climate and energy governance framework, generally known as the Governance Regulation, which included a mandate for all member states to develop an LTS. Bolstered by further support from member states, the European Commission was requested to prepare and present a union-wide 2050 strategy by April 1, 2019, although the first draft was published in November 2018. At the time of this writing, the strategy has not yet been finalized (Duwe and Iwaszuk Forthcoming).

Source: The details included in this box are drawn exclusively from Duwe and Iwaszuk (Forthcoming).

Planning

Many governments recognized LTSs as an opportunity to better understand economic and development pathways and explore long-term transformations on a variety of different themes. For the UK, the government was required to produce a plan describing policies and actions to meet the fourth and fifth carbon budgets and also to be on track with its 2050 target.⁷ To increase resilience of the electricity sector to avoid future black-outs, Colombia aimed to develop long- and mid-term planning tools able to forecast expected electricity demand, as well as the infrastructure required to fulfill it (Sanchez-Sierra and Sofrony 2018). In Vietnam, the government wanted to explore integrated approaches for long-term adaptation and strengthening the resilience of the ecosystems, populations, and sectors most affected by climate change (Smajgl 2018). Some sector development plans have already integrated these approaches as mandated by the Law on Environmental Protection in 2014. In the United States, experts saw the mid-century strategy (MCS) as an opportunity to explore the potential for long-term deep emissions reductions in order to guide near-term policies and investment decisions.

Political Leadership

As noted above, leadership was important in several cases to support initiation of the process to design LTSs. For the purposes of this paper, political leadership may be understood as the necessary level of governmental authority required in order to advance or sustain the LTS process. Strong political leadership can provide overall direction to ensure that the process involves the whole of government and that the strategy can support integration into other planning processes after design is complete. Depending on the country context, leadership may come from different levels of government and also outside government, and leaders may have different roles, including serving as focal points for the process, providing oversight and direction, convening consultations of stakeholders, tracking progress, and mobilizing funds and other support.

In all the cases explored, minister-level-equivalent leadership or higher was provided at some point in the initiation, development, or implementation of the LTS. All of the countries reviewed that have submitted LTSs have noted the importance of high-level, visible political leadership in mobilizing government actors with resources and authority to inform the plan, establish

KEY CONSIDERATIONS | INITIATION OF THE PROCESS

- Does a political mandate for an LTS already exist, and, if not, what political leadership can be mobilized to initiate an LTS and how?
- What existing political and policy cycles could support or might inhibit LTS development?
- What bureaucratic and legislative factors might help trigger or advance the development process?
- Is there an international or national event or window of opportunity for a political leader to set a process in motion by creating or calling upon a government authority to initiate the planning process?
- What existing development, climate, or environmental planning priorities should be addressed through the LTS development process?
- What near-term and existing processes is the LTS seeking to inform?
- Are there any specific shortcomings in current planning processes that could be addressed through the development of an LTS?
- What stakeholders are supportive of long-term climate action and planning?
- Are financial resources available or dedicated to support development, advocacy, awareness raising, training, and other critical areas necessary to build the foundation?

technical and coordination bodies, and raise public awareness on its importance.⁸ In many cases, the overall successful completion of the LTS was attributed in part to a high level of political involvement.

Initiation: As described above, involvement of high-level political leaders is often found in the early stages of development in the cases. See section on “Involvement of high-level political leaders” for examples.

Development: Sustaining the process from initiation through development often requires political leaders to hand the baton to an individual or group that will oversee the process, ensure that relevant stakeholders are engaged, and take ownership. See Tables 1.1 and 1.2 for examples.

Implementation: Once the strategy is developed, transitioning to implementation and informing policies and actions may require further political involvement. Formal acknowledgment, approval, or adoption by political leadership may be needed in order to transition to implementation.

Table 1 | **Select Examples of Political Leadership during Development of the LTS**

COUNTRY/ CASE	LEADERSHIP EXPERIENCE
Mexico	The minister of Environment mandated the process, which was led by the undersecretary for Environmental Planning and Policy, together with a team of government experts from relevant departments, ministries, and institutions.
Costa Rica	Under direction of the president, the minister of Environment and Energy assigned the Climate Change Directorate to oversee the development process.
France	The minister for Ecological Transition played a supervisory role as the ministry was responsible for developing the plan.
South Africa	The Interministerial Committee on Climate Change oversaw the Department of Environmental Affairs and Tourism (DEAT) as it managed the LTMS process. The DEAT deputy director general chaired the project management team.
UK	Under the Climate Change Act, the secretary of state, with the Department for Business, Energy and Industrial Strategy (BEIS), was responsible for preparing the LTS.

Source: WRI Authors.

Table 2 | **Select Examples of Political Leadership Related to Implementation of the LTS**

COUNTRY/ CASE	LEADERSHIP EXPERIENCE
California, USA	All branches of California government have played a role in establishing and reaffirming strong commitments toward reducing GHGs, and through dedicated leadership, California has adopted rules and regulations. For example, California's long-term planning process, known as the Scoping Plan, led to the implementation of and support for California's cap-and-trade program by the regulated community (Kessler and Sahota 2019).
Djibouti	A formal conference was held in 2014 during which Prime Minister Mohamed Kamil Abdoukader gave a speech to officially launch the national "Vision 2035" (Djibouti 2014).
Vietnam	With the approval of the Mekong Delta Plan in 2014 by the prime minister of Vietnam, several governments and international agencies began to pour in offers for financial support.* The prime minister's endorsement also encouraged line ministries to map sector assessments and align sector master plans with the desirable scenarios of the Mekong Delta Plan. A few years later, in 2017, the prime minister established Resolution 120, which defined the "Sustainable and Climate-Resilient Development of the Mekong Delta of Viet Nam" and outlined a vision to 2100, a set of objectives for 2050, and a series of concrete agency-specific tasks to help take the strategy from plan to action (Smajgl 2018).
France	Recently, the parliament has sought to strengthen its role in oversight of implementation with members from all parliamentary groups launching an initiative. This group has already started to organize hearings, take public positions challenging the government orientations, and suggest changes in procedures to reinforce the role of parliament. In 2018, France also established an independent advisory body on climate change, the High Council on Climate Change, which will advise the government on policy and hold it accountable if legislation is out of step with the country's climate commitments.

Note: * Support included an initial \$300 million from the World Bank and more recently another \$560 million in loans and credits, as well as financial contributions from Australia, Germany, the United States, and several other countries (Smajgl 2018).

Source: WRI Authors.

Updating: Political leadership may also be necessary to trigger a review or update strategies. For example, in California, the Scoping Plan was established in 2006 through legislation, with the first iteration released in 2008 and two subsequent iterations in 2013 and 2017. Both the legislature and the governor can instigate new updates. The most recent update to the Scoping Plan was initiated by then-Governor Brown through Executive Order B-30-15, which established a specific mid-term reduction target of 40 percent below 1990 levels by 2030. This level of action will keep California on target to achieve the level of reductions necessary to meet the Paris Agreement goals (CARB 2017). This latest iteration provides a path toward achieving the new target within the context of achieving long-term emission reductions of at least 80 percent below 1990 levels by 2050. Since then, additional legislation (SB 100) was passed by the California legislature requiring the state to plan for 100 percent of retail electricity from zero-carbon sources by 2045. Executive Order B-55-18 calls for future Scoping Plans to determine how California can achieve carbon neutrality (Kessler and Sahota 2019).

Technical Capacity

Technical capacity, although not necessarily a governance issue, is still an important consideration when building the necessary foundation for LTSs. Technical capacity can provide guidance and advise in the development and implementation of LTSs and ensure that design teams have sufficient expertise to handle technical modeling questions.

Designing a strategic vision, modeling, and scenario development requires significant technical knowledge and expertise in order to analyze potential pathways and scenarios. Thus, the development of LTSs often requires technical capacity from a wide range of experts within and outside the government, including modelers from relevant agencies and institutions, universities,

and think tanks (Levin et al. 2018). Many of the respondents surveyed highlighted the importance of technical capacities for scenario development as well as subject-matter expertise across a wide range of sectoral policies, technologies and politics, and development pathways.

Technical capacity will enable countries to examine different development pathways, understand direct and indirect effects of policies and actions as well as their interactions, and build more robust LTSs. A review of several long-term planning efforts highlights four common features that are important for building and sustaining this technical capacity for LTSs (Hultman et al. Forthcoming):

- **DURABLE INSTITUTIONS:** Analytical capacity can come from anywhere; however, capacity is sustained by housing researchers in durable institutions that allow researchers sufficient time to develop experience. National laboratories, internal research institutions, or universities can play such a role.
- **SUSTAINED SUPPORT:** A stable supply of funding can sustain analytical capacity and continual support for development and improvement.
- **ANALYSIS AND APPLICATION:** Technical capacity not only depends on the capacity to undertake the analysis itself, but also the capacity and willingness to interpret and use results for policymaking.
- **INTERNATIONAL ENGAGEMENT:** Countries with little current analytical experience, as well as those with substantial analytical capacity, may benefit from participating in international modeling and analysis activities as a means of continuing to learn and build capacity.

In addition, building the technical capacity to undertake an LTS scenario can grow through practice. Prior to COP21 in 2015, research teams in several countries,

KEY CONSIDERATIONS | POLITICAL LEADERSHIP

- What type or level of leadership is required to mobilize the right group of actors to undertake the LTS?
- How are decisions made, and which entities or individuals have appropriate authority or mandate to lead the process?
- Who are the key public and private leaders?
- What resources, information, and knowledge exist across government to equip leaders to drive the process?

six of which have submitted LTSs (Canada, France, Germany, Mexico, the United Kingdom, and the United States), participated in the Deep Decarbonization Pathways Project and produced long-term scenarios toward a 2°C compliant future by backcasting from the 2050 emissions goal.⁹ In several cases, these initial exercises were influential in the development of the official LTS by showing that sectoral pathways toward decarbonization are technically possible (Bataille 2018).

Technical leadership and capacity to steer the analytical portion of long-term planning efforts can be found within and outside the governmental entities. In most of the cases reviewed, technical expertise is drawn from within the lead ministry and other relevant agencies, including national research institutions. Some countries established consultative bodies comprising governmental and nongovernmental representation, and occasionally technical support and direction was provided from expert advisers and consultants. As with many countries, for France, it was extremely important to have strong analytical capacity within the development team in order to manage in-depth technical discussions across a wide variety of issues. The team needed to be able to understand varying perspectives from different sectors—for example, how the cement industry is developing, what changes are expected in the agriculture sector, or where there is international competition and disruptive technology. This critical information informed the construction of scenarios and the identification of policy approaches.

Expert teams were constituted differently in different cases. In the United States, the aim to deliver a high-quality set of emission pathways on a limited time frame required pulling together a top-rate team with relevant

expertise. The team drew from modeling capacity within the U.S. Environmental Protection Agency as well as expertise from the Department of Energy and its National Laboratories, the Department of Agriculture, the Department of State, and the Department of Transportation. In the United Kingdom, BEIS has a strong in-house analytical team, which has many years' experience producing energy and emissions projections for the United Kingdom, including developing baseline projections as well as some modeling capability for assessing the impacts of policies. Although the capacity exists in house, it has been informed and developed through past work, including engagement with academia and consultancies. The UK Climate Change Committee (CCC) also provided technical input and leadership, as it is an independent body that advises on emission reduction targets and how they can be achieved, monitors progress toward reaching long-term targets, and reports progress to parliament. This helped ensure that meeting the plan's targets remained a parliamentary priority and were embodied in policies and programs. In South Africa, DEAT had a strong academic modeling team that used actual industry data in many instances.

To simplify the organization of this paper, the political and technical sides of the LTS process are separated, but it is also worth noting that there is interplay between them. Modeling and scenario development will be informed by national priorities, and, depending on who leads or is engaged in the analytic work, different priorities, policies, and solutions may take precedent. To the extent possible, it is advisable that the technical process remain transparent and that all affected stakeholders have the opportunity to engage either in the process itself or at least in the results.

KEY CONSIDERATIONS | TECHNICAL CAPACITY

- What technical capacity is needed, and is there sufficient technical capacity at the domestic level to undertake an LTS?
- Are there existing analytical teams or processes that could support LTS development, and, if not, where else could this capacity be found, or how can the scope of the LTS be modified to fit available capacity?
- Which entities or individuals have the necessary technical capacity to undertake analysis for an LTS?
- How can domestic expertise be further developed and sustained?

INSTITUTIONAL ARRANGEMENTS

Long-term strategies call for cooperation, coordination, and collaboration across a wide range of actors and institutions, often at different levels and branches of government, and with nongovernmental actors. Thus, structures, systems, and processes—described here as institutional arrangements—are needed to channel intent into the development of a long-term strategy than that can be successfully implemented across a government. This section draws on surveys and case studies to describe country experiences with organization and coordination, legal frameworks, and public engagement to develop and implement long-term strategies.

Organizational Structure

On the basis of case study and survey evidence, countries that have developed long-term plans have taken steps to establish or adapt existing committees and councils to structure and coordinate decision-making, information sharing, rulemaking, capacity building, and other governance functions. Where existing structures were relied upon, they were developed within the past decade as the result of legislative, strategic, or planning processes and were adapted for the LTS. All countries developed some process, of varying formality, to foster intragovernmental cooperation; however, in only some cases were there explicit roles for subnational actors, the private sector, or civil society. Similarly, not all countries have developed formal mechanisms for review, including monitoring, evaluation, and oversight.

Building on existing arrangements

The United States, Mexico, France, Germany, and the United Kingdom were all able to rely on existing institutional arrangements that had been established during previous cross-governmental efforts to develop climate policies, laws, or strategies. The United States' Mid-Century Strategy for Deep Decarbonization was produced primarily by the Obama Administration through the Council on Environmental Quality and the Domestic Policy Council, which had already led the development of the United States' 2013 Climate Action Plan and its Intended NDC to the UNFCCC Paris Agreement.¹⁰ The White House drew technical support from the Environmental Protection Agency, the Department of Energy, the Department of Agriculture, the Pacific Northwest National Laboratory, and other agencies. However, due

to the compressed timeline to produce the LTS before the end of President Obama's term, the White House did not conduct a broader public engagement process.

Mexico's Climate Change Mid-Century Strategy was carried out by leadership within the Ministry of Environment and Natural Resources with coordination and support from the National Institute of Ecology and Climate Change (INECC) and the Climate Change Interministerial Commission (CICC). INECC serves as a technical hub for climate-change modeling and analysis for government agencies at the national and subnational level—in effect, supporting capacity building for mainstreaming and policymaking. The CICC developed Mexico's previous National Strategy on Climate Change, which provided the structure for the Mid-Century Strategy.

Similar to Mexico, France's development of its *Stratégie nationale bas-carbone* (SNBC) adhered closely to the institutional process used to enact its 2015 Act on Energy Transitions for Green Growth. The Ministry for an Ecological and Inclusive Transition, second only to the Prime Minister's Office in authority, was mandated with leading the development of the strategy. The ministry's relatively high-ranking authority was useful in gathering expertise and building ownership with other ministries, according to interviews. Within this ministry, the Department to Combat the Greenhouse Gas Effect led coordination, drafting, and stakeholder consultation to produce a mandated long-term climate plan to meet substantive and procedural targets. France's CNTE—consisting of 50 members of equal representation across six constituencies: businesses, trade unions, environmental NGOs, consumer interest NGOs, locally elected authorities, and members of parliament—contributed throughout the LTS development process. A survey cited the engagement of the Ministry of Agriculture in the development of the strategy as positively influencing its capacity and willingness to support implementation. In addition, an independent committee of high-level experts from different constituencies contributed to more widespread visibility of the process and goals and legitimacy of the outcomes.

Germany's process to develop its Climate Action Plan 2050 followed previously established institutional arrangements by focusing solely on mitigation and building on previous agreements, policies, and instru-

ments.¹¹ A 2013 coalition agreement between the Social Democratic Party and the Christian Democratic Union included the requirement to produce a climate action plan during 2013–2017. The plan was developed and coordinated by the Federal Ministry for Environment, Nature Conservation, and Nuclear Safety, which has the mandate to address climate policy. The Federal Environment Agency within the ministry commissioned scientific studies resulting in visions and targets. To provide technical leadership for each sector, the plan was co-developed by the ministries for Economic Affairs and Energy, Transport, and Agriculture. Other ministries, such as the ministries of Finance, Economic Cooperation and Development, and Foreign Affairs, provided their input on cross-cutting elements of the Plan (Wagner and Tibbe Forthcoming).

In the United Kingdom, the secretary of state for BEIS has an existing strategy team that was in place to lead the development of the Clean Growth Strategy. BEIS coordinated with the Treasury, the departments for Transport and Environment, and the Ministry for Housing and Local Government. In addition, the CCC is the independent advisory body that provided input and advice to the UK Government during the process. The CCC continues to play a significant role by providing independent assessment of the Clean Growth Strategy, evaluating progress, and providing analysis to inform opportunities to strengthen commitments. In May 2019, for example, the CCC released a statement calling on the UK to strengthen the law to increase ambition net zero emissions by 2050, on the grounds that it is a necessary contribution to the 1.5°C global target and achievable through known technologies (CCC 2019). The existence of statutory requirements in the United Kingdom have helped solidify the organizational structure and create a culture of collective action where, if one authority under-contributes, the responsibility for the effort would be shifted to others; so there is pressure on all to deliver.

Relevant experience with institutional arrangements for organization and coordination of long-term planning also exist outside the theme of climate change. China, for example, has had a long-standing history of long-term strategic national planning. See Box 3 for details.

Box 3 | **The Long and Short of Strategic Planning in China**

China's rapid economic growth and development has been guided by a series of multi-step long-term plans, charted through shorter five-year plans and regional and sector development strategies. The strategic goals are promulgated by the central party leaders—initially Mao Zedong and Zhou Enlai in the 1960s, then by Deng Xiaoping who in 1987 formalized China's three-step development strategy targeting energy, education, science and technology, and transportation in a phased approach to modernize China's economy by 2050. At China's National Congress in 2017, Xi Jinping further elaborated and updated the third phase for China to be a modern socialist country that is "prosperous, strong, democratic, culturally advanced, and harmonious" by 2050 (Feng and Jiang Forthcoming). China's five-year national development plans ensure that sectors, regions, and provinces are on track. The plans are developed principally by the National Development and Reform Commission, which is responsible for macroeconomic regulation and through which all ministries contribute according to their mandate. Sectors and provinces develop their own five-year plans, which must align with centralized planning goals and are monitored accordingly. More recently, several regional development strategies have been created to address regional economic imbalances, environmental quality, and rapid urban development problems and promote economic cooperation with China's neighbors.

Establishing new public authorities

The Czech Republic, Burkina Faso, and Malta all created new government bodies with powers and mandates to develop long-term planning. After an initial review, Australia created a new committee of senior government officials (see Box 4).

The development of the Climate Protection Policy of the Czech Republic—which has 2020 and 2030 primary emission reduction targets and 2040 and 2050 indicative emission reduction targets—was led by the Ministry of Environment but coordinated through an interministerial working group (including also business and NGOs) that was established for the development and implementation of the policy. Other government agencies and NGOs made technical and sector-based inputs and provided revision and review. However, given its legal status after being officially adopted, the policy mandates that other ministries align their policies and plans with its goals and cooperate with the Ministry of Environment during evaluation and revision processes, which must take place by 2023.

Burkina Faso established an interministerial technical monitoring committee led by the Permanent Secretariat of the National Council for the Environment and Sustainable Development to lead the development of its long-term NAP (2015–2050) (Bayala Forthcoming). The committee members included nine directors in charge of sectoral studies and planning and representatives from

the Prime Minister’s Department of Rural Economy and the Environment, the Permanent Secretary for the Coordination of Sectoral Agricultural Policies, the Burkina Faso National Employers Council, and the United Nations Development Programme (UNDP).

Malta responded to years of unclear institutional arrangements and overlapping authorities in its transportation planning by creating a new entity, Transport Malta, to help it implement its 2050 National Transport Strategy. Transport Malta is credited with having a clear structure, function, and mission to better develop synergies among transportation modes, policy integration, and a cross-sectoral approach to long-term planning. The entity was established by a new law that subsumed multiple, fragmented, and conflicting entities into one. During the preparation of the strategy, Transport Malta undertook periodic political checks to ensure the strategy’s viability and to validate it. According to a case study, early results suggest that Transport Malta is influencing planning and investment (Sutton 2018).

Informal and hybrid arrangements

South Africa’s Department of Environmental Affairs produced its LTMS in 2005–08 under the guidance of the IMCCC. While technically not a strategy or plan, the resulting scenarios were used in international pledges, and the LTMS process and outputs have influenced more recent mitigation policy.¹² The scenarios were developed by a 70-member multistakeholder body

Box 4 | Institutional Arrangements in Australia’s Reef 2050 Long-Term Sustainability Plan

In June 2014, under joint management of the Australian and Queensland government environment ministers, a partnership group formed to help develop the Reef 2050 Long-Term Sustainability Plan. The group brought together government officials, traditional owners (indigenous groups), key industry organizations, scientists, and interest groups. The plan was released in 2015, and the partnership group eventually evolved into two formal advisory groups under the Plan: the Reef 2050 Advisory Committee and the Independent Expert Panel of scientists. Implementation of the plan is guided by the Great Barrier Reef Ministerial Forum, consisting of relevant Australian and Queensland government ministers.

Review of the plan was originally scheduled for five-year increments, but after massive coral bleaching events in 2016 and 2017, mid-term review of the plan was moved forward.

During the review and revision process, Australia commissioned an independent review of its institutional arrangements for managing the Great Barrier Reef. Notably, the Great Barrier Reef Intergovernmental Agreement 2009 was updated to include the Reef 2050 Plan. This cooperative agreement between the Australian and Queensland Governments provides a transparent framework for facilitating cooperative management of the World Heritage Area. The plan includes the following additional actions:

- A more streamlined advisory committee to enable more effective input from traditional owners, industry, researchers, and communities
- An advisory committee and independent expert panel to meet regularly to review progress and provide comment on government actions
- A committee of senior government officials to coordinate reef-related activities across government and ensure coherence with the meetings of the Great Barrier Reef Ministerial Forum (Australia 2019)

composed of teams focusing on management, research, technical advice, and facilitation which met six times over an 11-month stretch (Tyler and Gunfaus 2015).

Costa Rica's National Decarbonization Strategy was developed without a formalized set of arrangements or coordinating body. There was no legal mandate to develop the plan, which contributed to some sectors

seeking to be exempted from the plan. The plan was developed by a small team within the Ministry of Environment and Energy, the Office of Climate Change, the Ministry of Planning, the University of Costa Rica, and a few external consultants.

For a summary of organizational structures, see Table 2.

Table 2 | **Summary of Organizational Structures in Case Studies of Long-Term Planning Efforts**

COUNTRY	NEW OR EXISTING ARRANGEMENTS	LEAD ENTITY
Australia	The Great Barrier Reef Ministerial Forum, the Reef 2050 Advisory Committee, and the Independent Expert Panel of scientists	Australian and Queensland government environment ministries (co-leads)
Burkina Faso	New – Interministerial Technical Monitoring Committee	The Permanent Secretariat of the National Council for the Environment and Sustainable Development
Costa Rica	New – Informal, trusted group of governmental and nongovernmental experts	Ministry of Environment and Energy and Ministry of Economic Planning
Czech Republic	New – Interministerial Working Group on Climate Change Issues	Ministry of the Environment and the National Committee for an Energy Transition
France	Existing	Ministry for an Ecological and Inclusive Transition
Germany	Existing	Federal Ministry for Environment, Nature Conservation and Nuclear Safety
Malta	New – Authority for Transport Malta (Transport Malta)	Transport Malta led three-year development plan
Mexico	Existing	Ministry of Environment and Natural Resources
South Africa	Existing	Department of Environmental Affairs and Tourism
United Kingdom	Existing	BEIS
United States	Existing	The White House, Executive Office of the President

Source: WRI Authors.

KEY CONSIDERATIONS | ORGANIZATIONAL STRUCTURE

- Is there a recent national process for which institutional arrangements (such as an interministerial body, cooperative agreement or MOU, or coordinating structure) could be adapted or built upon to develop a long-term strategy?
- Has a mapping of relevant government actors been done to help clarify who should be involved and when?
- Which ministry, authority, or other body is best placed to coordinate and lead the plan? If none exists, how should a new one be developed, and who should be included?
- Who should constitute the drafting team?
- Will existing or proposed arrangements provide the opportunity for subnational authorities, civil society, the private sector, and other nonstate actors to contribute to the LTS and/or play a role in its implementation?

Legal Frameworks

The previous sections highlight how recently passed laws have affected long-term climate strategies in France, Mexico, and the United Kingdom especially. Countries have used legislation to create new institutional mandates, coordinating structures, stakeholder and public engagement modalities, technical capacity development, and monitoring and evaluation functions—in addition to setting long-term climate goals. While some countries have accomplished this without the passage of a law, legal frameworks, when well designed, may provide lasting clarity of goals, roles, responsibilities, and timelines. Legal frameworks can also serve to counter political headwinds against long-term planning in the future.

Legal statutes may compel action in ways that non-legally binding policies cannot in countries where rule of law has at least some bearing on actor behavior. Once these forces are in motion, government bodies make organizational decisions and build or strengthen new capacities and internal structures to carry out new functions. Businesses respond to a new regulatory environment by shifting investment strategies, and civil society constituencies may develop around the implementation of the law, making it more politically costly to repeal.

Establishing a mandate for long-term climate planning

Mexico's General Climate Change Law (2012) mandated the development, evaluation, and revision of a national climate-change strategy. Similarly, France's 2015 Act on the Ecological Transition and Green Growth established the mandate to develop the plan. In Malta, the Authority for Transport in Malta Act subsumed a multitude of different entities with overlapping responsibilities to create Transport Malta, which was given a clear mandate for long-term transportation planning (Sutton 2018). In addition to establishing the CCC, the United Kingdom's 2008 Climate Change Act established a 2050 target to reduce emissions by 80 percent. Vietnam's 2014 Law on Environmental Protection establishes that all govern-

Box 5 | Indonesia's Use of Statutes to Embed Long-Term Planning

Indonesia's Law Number 25 of 2004 (art 13, p. 1) on the National Development Planning System created a legal requirement for Long-Term Development Planning to fulfill the development aspirations of the 1945 Constitution. In 2005, Indonesia launched its 2005–2025 Long-Term National Development Plan. Two years following, in 2007, Indonesia passed another law—Number 17 of 2007—effectively embedding the 2005–2025 Development Plan into law. As of 2018, the Long-Term Plan for National Development is still guiding the development of short- and medium-term plans. The law also establishes rights to public participation in the development of short- and medium-term plans at the provincial and national levels (President of the Republic of Indonesia, 2007).

ment bodies at all administrative scales must develop action plans on environmental protection and climate change for their sectors of expertise. It also requires climate-change responses to be integrated into the planning and strategies for socioeconomic development, as well as industrial and sector development (National Assembly of the Socialist Republic of Vietnam 2014). In Indonesia, laws were used both to mandate the development of a long-term plan and then again to adopt the plan (See Box 5 for details.)

To be sure, the adoption of a law does not guarantee corresponding action. Loopholes; unclear language; and political opposition in the form of starving the budget for new programs, refusal to appoint key positions, or appointing ineffective personnel; and lack of implementing regulations are all common pitfalls. In some countries, rule of law is weak, and informal institutions (norms, customary relationships, etc.) are more influential.

For a summary of the legal frameworks noted throughout the paper, see Table 3.

Table 3 | Summary of Legal Frameworks

COUNTRY/ CASE	LEGAL ARRANGEMENT	YEAR	ESTABLISH INSTITUTIONAL ARRANGEMENTS	MANDATE LONG-TERM TARGET OR VISION	MANDATE TO DEVELOP, ADOPT, OR IMPLEMENT STRATEGY
Burkina Faso	Decree 2015-1189/ PRESTRANS/PM/ MERH/MEF	2015	N/A	N/A	Burkina Faso's NAP was formally approved under this decree.
California	Senate Bill 32	2016	N/A	Establish an emissions reduction target of 40% below 1990 levels by 2030	Mandated an update to the Scoping Plan to identify the policies necessary to achieve California's 2030 target, while also helping put the state on the path toward achieving its 2050 climate target to reduce GHG emissions by at least 80% below 1990 levels (Kessler and Sahota 2019).
France	Law on the Energy Transition for Green Growth (LTECV)	2015	Institutionalized the formerly ad hoc Council for the Energy Transition (CNTE)	The law defines a series of policy objectives and overarching targets in both the medium (2025–30) and long term (2050) (Colombier 2018)	Established mandate for the SNBC to cover all sectors and explore transition scenarios with a long-term (2050) horizon.
Indonesia	Law Number 25 of 2004 and Law Number 17 of 2007	2004 and 2007	N/A	Establishes the long-term development plan in the context of the national goal of Indonesia contained in the Preamble of the 1945 Constitution of the Republic of Indonesia including the vision, mission, and direction of national development	Law Number 25 created a legal requirement for long-term development planning and provides details of the planning process (Indonesia 2004). Law Number 17 embedded the 2005–2025 Development Plan into law.
Malta	Authority for Transport in Malta Act	2010	Establishes the Authority for Transport Malta (Transport Malta) within the Ministry for Transport	N/A	Sets out the guiding principles for Transport Malta as a statutory body, which includes the objective to develop integrated transportation policies aimed at achieving modal shifts that favor nonpolluting strategies
Mexico	General Law on Climate Change	2012 (reformed in 2018)	Transformed the National Institute of Ecology into the National Institute of Ecology and Climate Change (INECC).	Commits the country to an indicative objective or aspirational goal of reducing its emissions by 30% by the year 2020 with respect to the baseline scenario, as well as a 50% reduction in emissions by 2050, as compared with the emissions in the year 2000 (Mexico 2012)	Delegates federal authority SEMARNAT to develop a national climate change strategy with participation from INECC, the advice of the CCC, and the approval of the Interministerial Commission with implementation evaluation carried out by a third party—chaired by INECC with independent advisers from outside the government. This provided a foundation for the Mid-Century Strategy and requires evaluation of the strategy's implementation by a third-party body
United Kingdom	Climate Change Act	2008	Established an independent body—the CCC	Established a 2050 target and a system of carbon budgets—legally binding limits on the amount of emissions in successive five-year periods starting in 2008—that must be met to remain on track toward the 2050 target	While the Climate Change Act did not directly mandate the development of a long-term strategy, the Clean Growth Strategy was prepared to meet the requirement to produce a plan setting out policies and proposals to meet the budget. It is focused on what is needed to meet the fourth (2023–27) and fifth (2028–32) carbon budgets on track to the 2050 target (Gault 2018)

Table 3 | **Summary of Legal Frameworks (Cont'd)**

COUNTRY/ CASE	LEGAL ARRANGEMENT	YEAR	ESTABLISH INSTITUTIONAL ARRANGEMENTS	MANDATE LONG-TERM TARGET OR VISION	MANDATE TO DEVELOP, ADOPT, OR IMPLEMENT STRATEGY
Vietnam	Decision 2068	2015	N/A	Aims to minimize GHG emissions in energy activities compared to the normal development plan: About 5% by 2020; about 25% by 2030 and about 45% by 2050	Mandates developing and using renewable energy sources to implement sustainable environmental goals and to development a green economy and increase the total renewable energy sources produced
	Prime Minister Resolution 120	2017	N/A	Defines a sustainable and climate-resilient development 2100 vision and a set of objectives for 2050	Defines a long list of sector-specific tasks for 16 ministries and clarifies roles and responsibilities
	Law on Environmental Protection	2014	Created requirement for ministries, quasi-ministries, and the People's Assembly to develop climate action plans	Does not specify a long-term timeline	Requires climate planning at all sectors and scales and for climate to be integrated into sector, industry, and socioeconomic development planning

Source: WRI Authors.

KEY CONSIDERATIONS | LEGAL FRAMEWORKS

- Are there existing legal frameworks (constitutional, statutory, or otherwise) that provide a legal basis for developing a long-term strategy?
- Would a new statute or executive decree provide a mandate; establish roles, rights, and responsibilities; or clarify institutional arrangements in a way that would support the development and implementation of a long-term strategy?
- What, if any, are the trade-offs in efficiency and effectiveness between a legally binding instrument from the executive branch and that of parliament?
- Is there, or could there be, political support or constituencies to strengthen legal frameworks?
- Which governance components may need to be addressed through law (i.e., new mandates for planning, information sharing and communication, public engagement, sector coverage of long-term strategies)?

Public Engagement

Public engagement is a cornerstone of good governance and can lead to better decision-making outcomes for those that are affected (NRC 2009).¹³ In the context of long-term strategies, public engagement is particularly important because of the transformation that will be required in the coming decades, the scale and range of risks, and expected impacts of various pathways. Planning out to mid-century will create winners and losers in the transition, and will require a careful management of the transition to ensure that the net benefits are maximized. The public will need to be fully informed and involved from the outset to ensure that difficult decisions—for example, regarding transitions for those adversely affected—are taken in an open and transparent manner.

In addition to building support for a long-term strategy, public engagement can also lead to a better-quality long-term strategy, as stakeholders hold relevant information that can inform the strategy. Engaging the public can help shape a country's future vision, and stakeholders can help prioritize policies on the basis of their needs, hopes, and acceptable levels of risk. Public engagement can accordingly build trust and awareness and increase governmental accountability.

However, with many policy processes, public engagement is often an afterthought, and stakeholders and affected communities are consulted too late in the planning and policymaking process after the draft has been finalized. Instead, public engagement should involve close collaboration and exchange between government and stakeholders, rather than be reduced to a superficial exercise to share information once decisions have been made. Engagement should be seen as an asset, not a burden. See Box 6 for an example of the participatory process for developing the long-term vision in Djibouti.

While some of the LTSs submitted—such as those for Germany and France—undertook an extensive stakeholder engagement and public review process, others, such as that of the United States, did not.¹⁴ In the latter case, a short timeline limited more extensive engagement.

Whom to engage

This section defines public engagement to include not only affected communities but also civil society organizations, scientific institutions, universities, and the private sector, as well as organizations that represent individual citizens or groups of citizens.

A diversity of stakeholders has been engaged in many of the long-term planning exercises. For example, many countries have conducted consultation processes with the private sector, for example, with industry chambers and associations (Costa Rica), business interest groups (Czech Republic), trade unions and businesses (France and Germany), and lobby groups (Malta), among others. Countries have also engaged subnational governments, including with specific outreach to local authorities in Botswana, France, and Germany. Nongovernmental actors have also been consulted, including representatives from environmental, social, research, civic, and consumer organizations, across countries. Lastly, a variety of means were pursued to engage the public itself throughout the plan's development process.

See Table 4 for a description of the types of stakeholders that various countries have engaged in the long-term planning process.

Box 6 | Djibouti's Participatory Visioning Process

The East African nation of Djibouti launched its "Vision 2035" in 2014 following an extensive public engagement process in which national and subnational authorities assembled a "representative" sample of nomads, farmers, managers and workers in the public and private sectors; enterprises; trade union leaders; workers in the informal sectors; traders, workers, stay-at-home mothers, out-of-school youth and students; politicians; and religious leaders to discuss key pillars of the country's development strategy. The final strategy summarizes the input from this process, including those inputs that were critical of the government's past progress. This occurred during a time in which Djibouti was becoming a more open multiparty democracy after years of authoritarian rule and had established other governance institutions such as an election commission and ombudsman.

Table 4 | Diversity of Stakeholders Engaged in Select Long-Term Planning Processes

COUNTRY/CASE	STAKEHOLDER PROCESS
Botswana Vision 2036	A country-wide consultation process occurred, with Kgotla meetings, which were forums for the community, and focus group discussions were held to get consensus. Over the course of developing the strategy, 103 localities were visited (Botswana 2016).
Costa Rica National Decarbonization Strategy	Nongovernmental actors were consulted in the process of developing the long-term strategy. These included NGOs, the private sector (including industry chambers, agriculture and livestock groups, car importers, bus companies, truck owners' association, companies, sustainability initiatives, and utilities), representatives from municipalities, and academia.
Czech Republic Climate Protection Policy of the Czech Republic	In developing the long-term strategy, a wide range of stakeholders was consulted. These stakeholders included business interest groups (e.g., the Confederation of Industry of the Czech Republic, the Czech Chamber of Commerce), local governments (Local Government Association), labor groups (The Bohemian-Moravian Confederation of Trade Unions, Association of Independent Trade Unions), central government entities (Czech Statistical Office, Czech Mining Office, etc.), environmental NGOs, and others, such as the Czech Academy of Sciences. These stakeholders commented on the final draft; some were consulted during the drafting process.
France Low-Carbon National Strategy	In France, a consultative process for the preparation of the 2015 Transition Law created an ad hoc Council for the Energy Transition (CNTE), which was later institutionalized by law. This council included representatives from business, NGOs (environmental, social, and consumer organizations), trade unions, subnational authorities, and members of the National Assembly and Senate. A plenary of more than 130 representatives was created, which met monthly. In addition, the CNTE had a consultative body of 50 people with an equal share of representation of six constituencies: businesses, trade unions, environmental NGOs, caritative and consumer NGOs, local authorities (elected representatives), and members of parliament. Independent experts supported the plenary and working groups. Interestingly, the stakeholder consultation and national debate was organized not by the Minister but an independent steering committee with five members of business, academia, and civil society. Lastly, a citizens group was brought together to provide advice on the organization of the stakeholder process, the prioritization of issues discussed, and the review of public documents. The resulting law, adopted in 2015, mandates that a long-term strategy has to be prepared and revised every five years, in a consultative process with the CNTE.
Germany Climate Action Plan 2050	Representatives of states (known as the Länder), local authorities, and associations, including trade unions and businesses, proposed measures. Scientific institutions helped to refine the proposed measures, and the Institute for Applied Ecology conducted impact assessments on the measures. In addition, about 500 members of the public, randomly selected, were included in citizens' conferences that took place in five different cities. An online dialogue was open to everyone. Stakeholder groups also met in five thematic working groups. The participation process was designed by organizations that specialized in participation and process design, and the process itself was evaluated using analysis and interviews with participants.
Malta National Transport Strategy, 2050	The following stakeholders were consulted in Malta's mid-century transportation strategy: other ministries, national authorities, academics, scientists, specialists in transportation planning and economics, transportation users, lobby groups, and members of civil society; technical oversight came from the Joint Assistance to Support Projects in European Regions, an agency partnership set up between the European Investment Bank and the European Commission.
Mexico Climate Change Mid-Century Strategy	There was no stakeholder engagement for the Mid-Century Strategy, but there was a public consultation process with NGOs and broader society for the Mexican National Strategy, which informed the Mid-Century Strategy.
South Africa Long Term Mitigation Scenarios	In South Africa, business, industry bodies, civil society, labor, academia, local governments, and government agencies were involved in the scenario-building team. In addition, there were several high-level round tables for government (including the directors general of various government departments), civil society (including a dozen major NGOs, research, faith-based, and civic organizations), labor, and business. These round tables were aimed at communicating the LTMS results across the country's leadership.
United States Mid-Century Strategy for Deep Decarbonization	Due to the compressed timeline of developing the long-term strategy, the United States was unable to allow time for a formal notice and comment period, relying instead on structured discussions with the private and nonprofit sectors, respectively, in a few meetings. Those consulted included companies and NGOs that had been engaged with the administration over the prior 7 years of the administration.

Source: WRI Authors.

Equity considerations in long-term planning

According to the case studies and survey responses, some countries made an effort to consider equity throughout the process. Of those profiled, France, Costa Rica, Mexico, and the United States (California) cited specific measures to identify and address equity concerns across groups or generations.

- In France, major civil society organizations focused on poverty and social inclusion were involved early in the LTS process, and the priorities in the LTS reflect these contributions, including a greater focus on energy efficiency and sufficiency as well as specific programs focused on the poorest households.
- Mexico's LTS included specific criteria on equity and social inclusion and states that measures with local co-benefits for vulnerable groups should be prioritized.
- Costa Rica's LTS includes a cross-cutting strategy on human rights and gender and on a just transition.

- California's AB32 requires an Environmental Justice Advisory Committee (EJAC) that draws its membership from state communities with greatest exposure to air pollution to advise the California Air Resources Board on implementation decisions. In the 2017 Scoping Plan, the EJAC recommended a focus on multipollutant stationary sources that create health hazards for at-risk and marginalized communities as well as the need for built and natural infrastructure improvements to address quality-of-life disparities across communities.

How to engage

Public engagement can use several different means of involvement, such as public hearings and collection of comments. See Table 5, which describes some of the engagement strategies used by countries in long-term planning.

Table 5 | Means of Engagement in Select Countries

	COSTA RICA	CZECH REPUBLIC	FRANCE	GERMANY	MEXICO	SOUTH AFRICA LTMS	UNITED STATES
Survey or Questionnaire	No	No	No	Yes	No for Mid-Century Strategy (MCS); yes, for National Strategy (NS), which fed into MCS	No	No
In-Person Workshops	Yes	Yes	Yes	Yes	No (MCS); yes (NS)	Yes	No
Public Consultations	Yes	Yes	Yes	Yes	No (MCS); yes (NS)	Yes	Yes
Interactive Website	No	No	Yes	Yes	No (MCS); yes (NS)	No	No
Open Comment Period	No	Yes	Yes	Yes	No (MCS); yes (NS)	No	No

Source: WRI Authors.

When to engage

Public engagement can be seen as relevant at all stages of the policy cycle: at initiation of the long-term strategy; while the strategy is being drafted, including the development of the long-term vision and sectoral pathways; once the strategy is finalized; and when it is monitored, evaluated, and eventually revised.

Engaging the public early is essential. During the initial stages of developing the strategy, it is important to ensure that all stakeholder groups be represented and have a “seat at the table” when designing the vision of where society should be by mid-century. They can accordingly share their knowledge, interests, concerns, and motivations (Colombier 2018). For example, in France, stakeholders requested a more systematic study of co-benefits, which was embraced during the development process. While time was limited to do so comprehensively, some additional indicators were studied as a result of the stakeholder requests (Colombier 2018).

Engaging scientific organizations and universities during the vision development can help in data collection and any modeling efforts. For example, the scenarios studied for the French long-term strategy were supplied by academia, the private sector, the transmission system operators, state agencies, and NGOs. In the United Kingdom, the CCC recommended carbon budgets that were on the trajectory to achieving the 2050 target.

After the vision is developed, public engagement can greatly facilitate the development of sectoral pathways, implementation strategies, and/or any prioritization of actions included in the LTS. It will be important that policymakers engage those that will drive or be most affected by the transitions implied by the LTSs, particularly those that will face greater changes in their livelihoods, such as those tied to a fossil fuel economy. Engagement is essential for building support for the long-term strategy. If that engagement is absent, policies may backfire or fail altogether, with a loss of support for action.

It can be strategic to plan for public engagement opportunities with the dates of related milestones in the development of the LTS, external events (e.g., elections), and/or after events that could raise attention and awareness of the LTS.

Resolving conflict among stakeholders

During the process of consulting a diverse set of actors, conflicting views may emerge. For example, in the Czech Republic some comments contradicted each other, for example, with regard to nuclear energy. In those cases, the ministry was guided by governmental views from other ministries. In the case of South Africa’s LTMSs, consensus among stakeholders was not a requirement. In France, some options—such as nuclear phase-out, shale gas development, and biofuels—were supported by some but strongly opposed by others and, accordingly, did not make it into the strategy. The CNTE debated a series of questions, and a synthesis report, identifying options and the reasons why consensus was not possible, was prepared for the ministry. Accordingly, the government was aware of different groups’ opinions on various options while designing the plan. In Costa Rica, the stakeholder process involved a professional moderator, who helped defuse tensions, focus on specific issues (e.g., lack of financing options, concerns about the ambition of the plan), and move on from the calls to not have the plan at all. Subsequently, there have been divergent views about the technologies that will be prioritized for transportation (e.g., fleets in particular). Tensions emerged after the publication of the plan because of the state-owned oil refinery’s prioritization of ethanol even though the plan largely favors zero-emissions electric mobility. The government decided to postpone the refinery’s ethanol decision for a year to collect further technical feedback and make a later decision.

It is important to be consistent and up-front with stakeholders about the goals of the process, how input will be considered, and what sort of uses the plan will be put to as well, to help mitigate loss of public support after the strategy is complete. In South Africa, the LTMS

scenarios were used to inform South Africa’s Copenhagen pledge, which served to anchor South Africa’s NDC, but—according to interviews—this created acrimony among certain domestic stakeholders who believed that the decision to use the scenario results as official national targets was done without broader consultation and buy-in (Tyler and Gunfaus 2015).

Sustaining engagement

Stakeholder processes, when carried out comprehensively, do take significant time and resources. In France from start to end, stakeholder engagement took a year and a half. Workshops started about two months after the launch of the process and involved six to eight months of consultation. Online consultation occurred

one year after the launch of the process when the publication was in its first draft and involved two months of consultation. On the other hand, in Costa Rica, there was a trade-off between an in-depth consultation and the urgency to deliver the president’s bold vision. Given the up-front investments required for stakeholder engagement, ideally it is that such engagement should be continued throughout the implementation and monitoring and evaluation process so that capacity is maintained when the strategy is revised. In Germany, for example, the participation process will be continued throughout the development of the first implementation program (“program of measures 2030”), as well as during further development of the long-term strategy itself in 2019–20.

KEY CONSIDERATIONS | PUBLIC ENGAGEMENT

- Who are the stakeholders to be included in the engagement process? Examples include civil society organizations, subnational authorities, scientific institutions and universities, the private sector, citizens groups, and vulnerable and indigenous populations.
- How will those most significantly affected by the long-term strategy, such as those tied to a fossil fuel economy, be involved in the strategy’s development?
- What will constitute effective means of engagement, such as through participation in the analysis, public consultation, in-person workshops, surveys, and/or an interactive website?
- How will stakeholder feedback be taken into consideration and incorporated into the development process?
- At what point will the engagement process begin, and will it continue during implementation?
- To what extent will stakeholder engagement be sustained through monitoring and evaluation or revision?
- Do sufficient human capacity and adequate financial resources exist to manage and sustain the means of engagement?
- What sectors or stakeholders may challenge the process and how can they be managed?
- How will the engagement strategy contend with conflict among views gathered?
- How should analytic teams be managed and guided, and how should data be collected across agencies?

COMMUNICATION AND REVIEW

Communication

Once the strategy has been drafted, a key step is communicating it in a clear and transparent manner, with a compelling narrative that is comprehensible for non-experts and also resonates with the priorities and values of a broad range of stakeholders. In designing a long-term strategy, countries will already have considered much of the information required to communicate their LTS. Therefore, transparent communication of the strategy itself should not create additional burdens. However, it is important that the information gathered during the process be clearly synthesized and communicated. For example, given the lively discussions in France on the long-term strategy, there was reporting and synthesis of so much information that it posed challenges for comprehension (Colombier 2018). In the case of Costa Rica, the plan was launched on a Sunday with a citizen fair in the capital. Given the importance of communications for the appropriation of the plan, a cross-cutting strategy for “education and culture” to promote a shift to a fossil free society complements the plan’s 10 sectoral pathways.

Appendix B lists information that can be provided to communicate long-term strategies.

Review Procedures

The process of evaluation and review provides an opportunity to reflect on past progress, successes, and obstacles in order to improve the efficiency and effectiveness of policies and plans. Reviewing and updating long-term strategies at regular intervals will be important to ensure that the strategies remain up to date in light of

- changes/updates in domestic policies;
- changes in emission profile and in the national or global economy;
- international climate negotiations;
- the latest climate science;
- improved projection tools and new information;
- assessments of the effectiveness of the long-term strategy in driving near-term actions;
- innovation and research, development, and demonstration (RD&D); and
- the evolving costs of technologies.

KEY CONSIDERATIONS | COMMUNICATION

- How can the strategy effectively send signals to clearly guide national, subnational, and private-sector decision-making?
- How can the strategy be communicated in a way that will fulfill the country’s communication objectives?
- Who are the various target audiences the communication needs to reach, and what are their information needs?
- How should the information be provided in order to be useful for decision-making? Is additional information needed, or can the information be presented in a different way, for different audiences to understand the long-term strategy?
- How much information and detail should be provided in the long-term strategy to enable understanding of the strategy’s elements, including of assumptions and methodologies underpinning the strategy?
- How much information should be communicated regarding the long-term pathways’ impact on socioeconomic factors, as well as the opportunities and trade-offs inherent in the long-term transitions?
- How much information should be provided to enhance implementation of actions to support the plan?
- How much information should be provided to enable an assessment of future emissions under different possible scenarios?

It can be also helpful to update long-term strategies in line with the five-year cycle of review under the provisions of the Paris Agreement. This will allow countries to update their NDCs and long-term strategies in a single process, thus better aligning near-term policy, planning, and targets with long-term goals and helping to minimize the risk of carbon lock-in and stranded assets (Ross and Fransen 2017).

All 11 long-term strategies that have been communicated to the UNFCCC to date include intentions to review and revise their strategies as national and international circumstances change and new learning takes place. It is clear that countries recognize the importance and value of revisiting their strategies regularly, as the following examples demonstrate:

Germany plans to update its long-term strategy in line with the five-year cycle of review under the provisions of the Paris Agreement.

France is already revisiting its long-term strategy (the SNBC) that was adopted in 2015. The revision was anticipated by the law (revision every five years, except the first time when the revision would occur after three years). This revision started with a clear mandate to reflect on pathways and options for meeting France's new mid-century carbon neutrality goal. The process for updating the strategy included a brand-new strategic exercise encompassing scenario development, impact assessment, and public consultation, which led to a full new document (Colombier 2018).

Other countries with experience in planning over longer time horizons also see the value in reviewing long-term plans at regular intervals. See Box 7 for an example of how review has informed Botswana's second national vision: Vision 2036.

The UK has asked the standing CCC (an independent body) for advice on a new mid-century target in light of the findings of an IPCC 1.5°C special report. Government decisions following that advice will have a resulting impact on the country's Clean Growth Strategy, which was formally communicated to the UNFCCC in

2018. The UK plans to update its strategy regardless in light of continuing developments and decisions taken on new carbon budgets allocations. Advice on the sixth carbon budget (the limit on emissions 2033–2037) will be provided by the standing CCC by December 2020, and the government will legislate a level for the sixth carbon budget by June 2021 (Gault 2018). The United Kingdom, as well as Mexico, both stressed the importance of establishing cycles of review and updating—not only for the substantive benefit, but to establish expectations and accountability in advance.

In Vietnam, the government regularly reviews its national 2011–20 Power Development Plan (PDP) halfway through its implementation period to identify whether the interim targets of power generation capacity and transmission system were achieved, as well as factors that could affect the plan's implementation. This review process also stimulated other positive changes with national policy, such as the gradual modification of the PDP process to better integrate environmental and societal elements, as well as align with national development policies and goals (Huyen 2019). Vietnam also revises the Mekong Delta Plan at the strategic level every five years in coordination with socioeconomic planning for the Mekong Delta. This process implicitly includes a consultation process where different entities (the private sector, other government branches, higher education, and research institutions) can present their comments before formal adoption (Smajgl 2018).

Australia has already reviewed its 2015 mid-century sustainability plan for the Great Barrier Reef, which was released in 2015. This was triggered by unprecedented climate-driven mass coral bleaching events in 2016 and 2017 and severe Tropical Cyclone Debbie in 2017. The aim of the review was to ensure that the plan addresses current pressures and remains effective. Australia is to review the plan in five-year cycles, which will be “informed by improved scientific understanding and incorporation of diverse knowledge systems and community views. . . It is anticipated that targets, actions and priorities within the Plan could change following the review process” (Australia 2018).

Botswana has long been touted as a post-colonial development success story that managed to reject the resource curse and exploit its diamond wealth for inclusive economic growth. Poverty fell from 31 percent to 19 percent from 2002 to 2010 and is expected to be at or near 10 percent by 2020 (World Bank 2015). Botswana has held free elections since independence in 1966 and consistently ranks as the least corrupt country in Africa in the 2018 Corruption Perceptions Index (Transparency International 2018). This has been evident in the country's success developing and implementing long-term development strategies. Botswana's Vision 2036 was launched in 1996, and over 20 years, several, although not all, objectives were met. In 2016, Botswana launched Vision 2036 to build on what was learned during the past 20 years, offering a frank assessment of where it has met successes and failures. The vision notes as key lessons: the need for a strong delivery system to ensure implementation of policies, the importance of monitoring and evaluation from the start with accompanying statistical capacity, and the importance of ensuring that short-term development plans align with the vision (Botswana 2016).

ROLE OF INTERNATIONAL COOPERATION

The development of a long-term strategy will be a new experience for many countries. International cooperation can play a key role in bridging this learning gap and supporting longer-term transitions in several ways:

- Sharing knowledge and serving as models for other countries to emulate or use as inspiration;
- Finding areas for collaboration
- Discussing common challenges
- Developing understanding of where are the best opportunities for abatement and for removals
- Accelerating innovation in clean technologies
- Developing confidence and ambition, armed with the understanding that peers are contributing at least equivalent (or more) effort to tackling climate change
- Helping bring capacity to countries that need it most

KEY CONSIDERATIONS | REVIEW

When establishing the governance arrangements associated with review and revision, it can be helpful to consider:*

- How should the strategy be monitored during implementation? What methods should be applied?
- What are the objectives or principles guiding the review?
- What goals, targets, and key performance indicators (KPIs) can the monitoring of the strategy be benchmarked against?
- Which group (ministry/independent body) is best placed to lead and conduct the review?
- What is the frequency of review?
- What are the resources required for the review and revision process, and where are they committed?
- How can the review process align with other domestic or international processes, like NAPs and NDCs?
- What independent sources can contribute to review?
- What is the role of parliament in holding the government to account?
- How can the results of the review process inform current development plans, near-term sectoral and economy wide policies, and infrastructure investment?

*Adapted from UNDP 2009.

International cooperation on long-term strategies has played out in various ways since the adoption of the Paris Agreement. It is apparent that countries see value in cooperating with neighbors, peers, and groups in the development of long-term strategies.

Formal Cooperation through the G20

Strong leadership from major economies will be important for galvanizing action and driving momentum toward global action on climate change. The G20, which is responsible for 78 percent of global GHG emissions and 85 percent of global gross domestic product (GDP), has a key role to play in setting the tone and leadership direction toward a sustainable future. The topic of long-term strategies has been explored in the Climate and Sustainability Working Group of the G20, both in the 2018 process under the Argentine presidency and the 2019 process under the Japanese presidency. Among key messages emerging from these discussions are that countries welcome the sharing of experiences and best practices on long-term strategies in the context of the G20 and other international fora.

Formal Cooperation in Setting Ambitious Mid-century Targets

Formal cooperation can also occur among countries in the establishment of mid-century targets. For example, in January 2019, the Nordic countries released the “Declaration on Nordic Carbon Neutrality,” which states that Iceland, Denmark, Sweden, Finland, and Norway will assess, in 2020, the scenarios for how they can achieve carbon neutrality, including implications for various sectors. This group also commits to increasing ambition by 2020, consistent with the long-term temperature goal of the Paris Agreement, through measures including ambitious long-term strategies (Ministers of Nordic Countries 2019).

Formal Cooperation in the Development of Long-Term Strategies

Formal cooperation in the actual development of long-term strategies has been conducted in various ways since the adoption of the Paris Agreement. In 2016,

Canada, Mexico, and the United States worked together to align and coordinate the development of their long-term strategies. This followed an announcement by Prime Minister Justin Trudeau, President Barack Obama, and President Enrique Peña Nieto in June 2016 that they would develop their national strategies that year (White House 2016). All three countries reflected on what a useful experience this was, recognizing that their integrated economies and energy systems afford a tremendous opportunity to harness growth in the continuing transition to a clean energy economy.

Established in 2016, the 2050 Pathways Platform gathers 27 countries, as well as numerous local governments and businesses, that acknowledge the importance of long-term strategies in maintaining climate ambition and agreed to share information on how they progress in the development of their respective LTSs.¹⁵

The Carbon Neutrality Coalition was launched at the One Planet Summit in 2017 to bring together a group of countries that have agreed to develop ambitious climate strategies to meet the long-term objectives of the Paris Agreement, to do so ahead of 2020, and to explore net-zero emissions as a critical objective with the aim of sharing experiences and providing leadership (Carbon Neutrality Coalition n.d.). Nineteen countries have joined the coalition to date, including both developed and developing countries.

Informal Cooperation in Other Long-Term Planning Efforts

Countries with experience in planning over long time horizons also recognize the benefit of working with neighbors and peers, especially trade partners. For example, Cameroon’s development vision to 2035 states that the country will “seek to expand regional economic cooperation with Nigeria, with which it shares a common border of over 1,000 km, given the size of this market and the possibility of domestic agricultural products to be exported to this country” (Cameroon 2009). Djibouti also looked outward for its development vision to 2035, which was developed in consultation with neighbors to develop a shared vision toward achieving the twin goals of poverty reduction and inclusive growth (Djibouti 2019).

KEY CONSIDERATIONS | INTERNATIONAL COOPERATION

- What issues would the country like to learn about or receive assistance on via international cooperation? What are good models from others that could be adapted? Accordingly, which country(ies)/group(s) would be well-placed to engage on long-term strategies?
- What existing group(s) does the country participate in? Are any suitable to discuss long-term strategies?
- What is the key objective of the cooperation? For example, is it to share lessons and common challenges? To explore trade impacts? To understand future transboundary challenges (e.g., water resources or migration)? To deliver capacity? To drive greater ambition?
- How could the Paris Agreement's global stocktake processes help countries implement and improve their long-term strategies?

CONCLUSIONS AND KEY QUESTIONS

From initiation through development and on to implementation, long-term planning for climate and development requires tailored governance and institutional arrangements. But countries don't need to start from scratch. Many countries already have some experience with long-term planning and provide insight into how certain governance approaches and institutional arrangements may affect design and implementation. Oftentimes, these exercises build on existing governance arrangements and can continue to build and strengthen overall climate action and ambition.

Several elements of good governance practice are relevant to LTSs. These include political leadership, technical capacity, organizational structure, legal frameworks, public engagement, communication, review, and international cooperation. While this paper does not judge country experience or prescribe a particular approach for developing and implementing LTSs, several general points can be gleaned from this research:

- **Long-term planning efforts:** These are highly diverse and must be aligned with national circumstances and priorities. Accordingly, these have unique initiation and development processes and customized implementation.
- **Political leadership:** High-level leadership will likely be needed at some point in the development and/or implementation of an LTS and can support all steps, including but not limited to initiating the process, advancing and guiding development, communicating advocacy efforts, stimulating review, and driving implementation.
- **Technical Capacity:** Development and refinement of LTSs requires technical capacity and leadership, which may come from within government or outside actors to support analysis.
- **Organizational Structure:** Countries may elect to establish new or adapt existing committees and councils to structure and coordinate decision-making, information sharing, rulemaking, capacity building, and other governance functions. These structures may be formal or informal.
- **Legal Frameworks:** Countries have used legislation to create new institutional mandates, coordinating structures, stakeholder and public engagement modalities, technical capacity development, and monitoring and evaluation functions—in addition to setting long-term climate goals or mandating the development of an LTS. Legal frameworks, when well designed, may provide lasting clarity with

respect to national priorities, goals, roles, responsibilities, and timelines.

- **Public Engagement:** Stakeholder participation is critically important to LTSs because of the transformation that will be required, the scale and range of risks, and expected impacts. Planning out to mid-century will create winners and losers in the transition and requires careful management to ensure that the net benefits are maximized. The public will need to be fully informed and involved from the outset to ensure that difficult decisions are taken in an open and transparent manner. Countries have included a wide variety of stakeholders and have used different means at different times in the process.
- **Communication:** Domestic and international communication is a critical step. A transparent, comprehensible, and compelling narrative that resonates with the priorities and values of a broad range of stakeholders can help build support for the strategy.
- **Review:** Building a review process into the LTS can provide the opportunity to reflect on past process, incorporate new data and methodologies, and adjust course on implementation.
- **International Cooperation:** Formal and informal cooperation has encouraged and supported countries in developing long-term plans.

This paper is not comprehensive in terms of all long-term climate and development planning experience and does not cover all potentially relevant facets of governance. Further research, including surveys to more countries that submit LTSs, would help to advance understanding of the role and effectiveness of good governance and institutional arrangements in development and implementation of LTSs. Several topics warrant further exploration, including in-depth analysis of how governance arrangements have been transformed or adapted from near-term to long-term planning, how challenges in implementing the governance approaches described can be overcome, and the role of monitoring and verification throughout implementation.

Finally, review of the experiences from other long-term planning efforts suggests a number of key questions that may help guide national policymakers and planning officials through the process of developing LTSs (Table 6). This checklist may be used at any time but may be most effective at the outset of preparing a national process to undertake development of a long-term low emissions development strategy, in order to establish good governance practices that can be sustained through implementation. The questions are organized along the governance themes covered in the paper although some questions may be relevant to more than one theme.

Table 6 | Checklist of Key Questions to Ask When Developing Governance Arrangements for Long-Term Strategies

CATEGORY	KEY QUESTIONS
Initiation of the Process	<ul style="list-style-type: none"> ■ Does a political mandate for an LTS already exist, and, if not, what political leadership can be mobilized to initiate an LTS and how? ■ What existing political and policy cycles could support or might inhibit LTS development? ■ What bureaucratic and legislative factors may help trigger or advance the development process? ■ Is there an international or national event or window of opportunity for a political leader to set a process in motion by creating or calling upon a government authority to initiate the planning process? ■ What existing development, climate, or environmental planning priorities should be addressed through the LTS development process? ■ What near-term and existing processes is the LTS seeking to inform? ■ Are there any specific shortcomings in current planning processes that could be addressed through the development of an LTS? ■ What stakeholders are supportive of long-term climate action and planning? ■ Are financial resources available or dedicated to support development, advocacy, awareness raising, training, and other critical areas necessary to build the foundation?
Political Leadership	<ul style="list-style-type: none"> ■ What type or level of leadership is required to mobilize the right group of actors to undertake an LTS? ■ How are decisions made, and which entities or individuals have appropriate authority or mandate to lead the process? ■ Who are the key public and private leaders? ■ What resources, information, and knowledge exist across government to equip leaders to drive the process?
Technical Capacity	<ul style="list-style-type: none"> ■ What technical capacity is needed, and is there sufficient technical capacity at the domestic level to undertake an LTS? ■ Are there existing analytical teams or processes that could support LTS development, and, if not, where else could this capacity be found, or how can the scope of LTSs be modified to fit available capacity? ■ Which entities or individuals have the necessary technical capacity to undertake analysis for an LTS?
Organizational Structure	<ul style="list-style-type: none"> ■ Is there a recent national process for which institutional arrangements (such as an interministerial body, cooperative agreement or MOU, or coordinating structure) could be adapted or built upon to develop a long-term strategy? ■ Has a mapping of relevant government actors been done to help clarify who should be involved and when? ■ Which ministry, authority, or other body is best placed to coordinate and lead the plan? If none exists, how should a new one be developed, and who should be included? ■ Who should constitute the drafting team? ■ Will existing or proposed arrangements provide the opportunity for subnational authorities, civil society, the private sector, and other nonstate actors to contribute to the LTS and/or play a role in its implementation?
Legal Frameworks	<ul style="list-style-type: none"> ■ Are there existing legal frameworks (constitutional, statutory, or otherwise) that provide a legal basis for developing a long-term strategy? ■ Would a new statute or executive decree provide a mandate; establish roles, rights, and responsibilities; or clarify institutional arrangements in a way to support the development and implementation of a long-term strategy? ■ What, if any, are the trade-offs in efficiency and effectiveness between a legally binding instrument from the executive branch and one from parliament? ■ Is there, or could there be, political support or constituencies to strengthen legal frameworks? ■ Which governance components may need to be addressed through law (i.e., new mandates for planning, information sharing, and communication; public engagement; or sector coverage of long-term strategies)?

Table 6 | Checklist of Key Questions to Ask When Developing Governance Arrangements for Long-Term Strategies (Cont'd)

CATEGORY	KEY QUESTIONS
Public Engagement	<ul style="list-style-type: none"> ■ Who are the stakeholders to be included in the engagement process, such as civil society organizations, subnational authorities, scientific institutions and universities, the private sector, citizens groups, and vulnerable and indigenous populations? ■ How will those most significantly affected by the long-term strategy, such as those tied to a fossil fuel economy, be involved in the strategy's development? ■ What will constitute effective means of engagement, such as through participation in the analysis, public consultation, in-person workshops, surveys, and/or an interactive website? ■ How will stakeholder feedback be taken into consideration and incorporated into the development process? ■ At what point will the engagement process begin, and will it continue during implementation? ■ To what extent will stakeholder engagement be sustained through monitoring and evaluation or revision? ■ Do sufficient human capacity and adequate financial resources exist to manage and sustain the means of engagement? ■ What sectors or stakeholders may challenge the process, and how can they be managed? ■ How will the engagement strategy contend with conflict among views gathered? ■ How should analytic teams be managed and guided, and how should data be collected across agencies?
Communication	<ul style="list-style-type: none"> ■ How can the strategy effectively send signals to clearly guide national, subnational, and private sector decision-making? ■ How can the strategy be communicated in a way that will fulfill the country's communication objectives? ■ Who are the various target audiences the communication needs to reach, and what are their information needs? ■ How should the information be provided in order to be useful for decision-making? Is additional information needed, or can the information be presented in a different way for different audiences to understand the long-term strategy? ■ How much information and detail should be provided in the long-term plan to enable understanding of the plan's elements, including assumptions and methodologies underpinning the strategy? ■ How much information should be communicated regarding the long-term pathways' impact on socioeconomic factors, as well as the opportunities and trade-offs inherent in the long-term transition? ■ How much information should be provided to enhance implementation of actions to support the plan? ■ How much information should be provided to enable an assessment of future emissions under different possible scenarios?
Review	<ul style="list-style-type: none"> ■ How should the strategy be monitored during implementation? What methods should be applied? ■ What are the objectives or principles guiding the review? ■ What goals, targets, and KPIs can the monitoring of the strategy be benchmarked against? ■ Which group (ministry/independent body) is best placed to lead and conduct the review? ■ What is the frequency of review? ■ What are the resources required for the review and revision process, and where are they committed? ■ How can the review process align with other domestic or international processes, like NAPs and NDCs? ■ What independent sources can contribute to review? ■ What is the role of parliament in holding the government to account? ■ How can the results of the review process inform current development plans, near-term sectoral and economy-wide policies, and infrastructure investment?
International Cooperation	<ul style="list-style-type: none"> ■ What issues would the country like to learn about or receive assistance on via international cooperation? What are good models from others that could be adapted? Accordingly, which country(ies)/group(s) would be well-placed to engage on long-term strategies? ■ What existing group(s) does the country participate in? Are any suitable to discuss long-term strategies? ■ What is the key objective of the cooperation? For example, is it to share lessons and common challenges? To explore trade impacts? To understand future transboundary challenges (e.g., water resources or migration)? To deliver capacity? To drive greater ambition? ■ How could the Paris Agreement's global stocktake processes help countries implement and improve their long-term strategies?

Source: WRI Authors.

APPENDIX A. METHODOLOGY

This appendix describes the research approach for this working paper. Twenty-five cases in total were reviewed as input for this study. A literature review of good governance practice in national climate and development planning informed identification of key considerations and normative statements throughout the paper about what governance and institutional arrangements are critical to support planning and implementation. Specific cases of long-term planning were then explored in order to understand how they address these governance issues and identify trends. The good governance considerations and the experience of cases were used to inform key questions when developing and implementing LTSs.

The authors reviewed the governance and institutional arrangements of 6 of the 11 official long-term, low-emissions development strategies that have been developed, and 19 cases of other long-term strategic planning efforts covering climate change, sustainable development, energy

and transportation planning, and adaptation, representing 9 developed countries, 13 developing countries, the European Union, and 1 subnational government. See Table A1 for a full list and descriptions of the planning efforts included in this study.

Our research gathers information on long-term planning efforts through three approaches: surveys of countries that have developed or are in the process of developing official LTSs, review of case studies commissioned under WRI's long-term strategy project,¹⁶ and landscape analysis and examination of other existing long-term planning efforts. The analysis is not exhaustive of all potentially relevant long-term planning efforts, and other unique country experiences may exist that are not represented here. However, the selection of cases aims to provide initial understanding of how governance and institutional arrangements can support development and implementation of long-term planning efforts, including LTSs. As the concept of planning for long-term low-emissions development continues to evolve, further research will be needed to assess the impact and effectiveness of good governance of LTSs.

Table A1 | **List of Long-Term Planning Efforts Considered in This Study**

COUNTRY / CASE	NAME OF LONG-TERM PLANNING EFFORT	TIMELINE	DESCRIPTION
Australia	Reef 2050 Long-Term Sustainability Plan	2015–2050 (Updated in 2018)	The Reef 2050 Long-Term Sustainability Plan focuses on developing resilience of Australian reefs in the face of a variable and changing climate. The plan has seven overarching themes reflecting the priorities for action: ecosystem health, biodiversity, heritage, water quality, community benefits, economic benefits, and governance (Australia 2018).
Belize	Horizon 2030: National Development Framework for Belize	2010–2030	The Horizon 2030 Framework captures the vision and core values for Belize in the year 2030. The framework includes long-term development goals, targets, and indicators that will guide concerted action by all stakeholders involved in the development, implementation, and monitoring and evaluation of sector programs and the government's long- and medium-term development strategies (Belize 2010).
Botswana	Vision 2036	2016–2036	Vision 2036 is the successor to Vision 2016, set in 1996, and was launched at the country's 50th independence anniversary on September 30, 2016. The framework for "Achieving Prosperity for All" aims to drive Botswana's development toward high-income status by 2036 and to build the nation's resilience as it pursues its development priorities (Botswana 2016).
Burkina Faso	Burkina Faso National Climate Change Adaptation Plan (NAP)	2015–2050	Burkina Faso formulated a long-term national adaptation plan building on implementation efforts from 2009 to 2013, as well as three National Adaptation Programs of Action projects that enabled "(1) the testing of best practices for adaptation in agriculture, forestry, animal husbandry, and hydrology; (2) capacity building with respect to climate change for actors and stakeholders; and (3) the assessment of climate risks in the medium and long term for different development sectors" (Bayala Forthcoming). The NAP will also serve as a baseline in tracking progress of climate action in the relevant sectors.
California	Scoping Plan	2008–2030 (Updated in 2014 and 2017)	California's Scoping Plan explores policy options that could provide a technically and economically feasible path to help the state achieve California's 2030 emission reduction target, as well as a low- to zero-carbon economy in the future. The plan was updated in 2014 and most recently in 2017 (Kessler and Sahota Forthcoming).
Cameroon	Vision 2035	2009–2035	Cameroon's vision 2035 formulates the country's bold vision for long-term development and builds on the results of past studies identifying Cameroonians' needs and aspirations and political priorities. The vision's overall objective is to make Cameroon an emerging country over the next 25 to 30 years. In the medium term, the vision aims to alleviate poverty, achieve middle-income status, make Cameroon a newly industrialized country, and consolidate democracy and national unity while respecting the country's diversity (Cameroon 2009).

Table A1 | List of Long-Term Planning Efforts Considered in This Study (Cont'd)

COUNTRY / CASE	NAME OF LONG-TERM PLANNING EFFORT	TIMELINE	DESCRIPTION
Chile	Energy 2050	2015–2050	Energy 2050: Chile's Energy Policy was developed over 18 months and proposes a vision for Chile's energy sector in 2050 to be reliable, inclusive, competitive, and sustainable. This vision is part of an overarching goal to achieve and maintain the reliability of the entire energy system while meeting sustainability and inclusion criteria and contributing to the competitiveness of the nation's economy. The plan was subject to a strategic environmental assessment and was developed with direct input from citizens (Chile 2019).
China	National Development Strategy	1987–2050	China's national development strategy includes three steps: first, to double the gross domestic product (GDP) of 1980; second, double GDP again by the end of the century (2000); and third, ensure that per capita GDP reaches the level of moderately developed countries and livelihoods so that China will be prosperous by 2050 (Feng Forthcoming).
Colombia	Reference Expansion Plan	2016–2030 (Repeatedly updated since 1993)	Colombia's Reference Expansion Plan (REP) is the main instrument for electricity planning and guides the expansion of the electrical grid, providing information about projected demand and electricity projects. The process was first initiated in 1993, and the REP has been repeatedly updated since then. The REP process has helped increase the electricity system's flexibility and reliability under changing technical, economic, financial, and environmental conditions (Sanchez-Sierra and Sofrony 2018).
Costa Rica	National Decarbonization Strategy	2018–2050	Costa Rica's National Decarbonization Strategy will guide the country toward its 2050 goals with a strong focus on inclusiveness and modernization in the context of the Fourth Industrial Revolution. The strategy is an economy-wide plan with 10 focus areas and 8 cross-cutting strategies (e.g., green fiscal reform, just transition, financing). It is structured in three phases (2018–2022, 2023–2030, and 2031–2050). For the first time, decarbonization is a pillar of the NDP (the most important document for any government), and the Ministry of Economic Planning (which is in charge of the NDP) has engaged actively in mainstreaming the decarbonization imperative in its planning activities.
Czech Republic ¹	Climate Protection Policy of the Czech Republic	2017–2050	The Climate Protection Policy of the Czech Republic was prepared by the Ministry of the Environment and is the government's response to the needs and priorities set by the international community (UNFCCC) and the European Union in tackling the challenges linked to climate change.
Djibouti	Vision 2035	2014–2035	Vision 2035 is the government's long-term strategy for Djibouti to build the country's future. This government-driven strategy was developed to help the country position itself as a regional hub for trade and commerce. The vision is based on five pillars: peace and national unity; good governance; a diversified economy; investing in human capital; and regional integration. (Djibouti 2019).
European Union (EU)	Long-term plan (Title pending: A Clean Planet for All: A European strategic long-term vision for a prosperous, modern, competitive and climate-neutral economy)	2020–2050 ²	As a result of new climate and energy legislation, EU member states are required to produce national LTSs by January 1, 2020. The same legislation also commits the European Commission to draft a strategy for the EU as a whole. As of May 2019, 12 out of 28 of the EU member states already have LTSs in place. The existing strategies differ widely in ambition, scope, format, and legal form. The initial proposal for the broader EU plan, as presented by the European Commission, paints a vision for a net-zero emission future for Europe by 2050, although many of the details are still to be determined (Duwe and Iwaszuk Forthcoming).
France ¹	Low-Carbon National Strategy	2019–2050 and 2018–2033 carbon budgets (Revision of the 2015–2028 plan)	The Law for Energy Transition and Green Growth (2015) established the low-carbon long-term strategy (SNBC), which explores transition scenarios with a long-term horizon (2050). The SNBC is revised every 5 years, and multiannual energy programming needs to be compatible with the SNBC.
Germany ¹	Climate Action Plan 2050	2016–2050	The Climate Action Plan provides a framework for climate policies at the federal level as well as for the Länder and municipalities. The strategy includes a long-term mitigation target for 2050 and economy-wide and sectoral 2030 targets. It also describes transformative pathways to 2050 for all sectors (Wagner and Tibbe Forthcoming).

Table A1 | **List of Long-Term Planning Efforts Considered in This Study (Cont'd)**

COUNTRY / CASE	NAME OF LONG-TERM PLANNING EFFORT	TIMELINE	DESCRIPTION
Indonesia	National Long-term Development Plan	2005–2025	The National Long-Term Development Plan (RPJPN 2005–2025) of Indonesia that spans 20 years and aims to achieve the development goals as mandated in the Preamble to the Constitution of 1945. This long-term plan strives to “protect the entire people and whole nation of Indonesia, advancing public prosperity, enhancing the education of the people, and participating in the implementation of maintaining world order on the basis of freedom, lasting peace, and social justice, in the form of the formulation of the vision, mission and direction of national development” (Indonesia 2007). The Indonesian Government has recently released a report, titled <i>Low Carbon Development Indonesia</i> , which lays out a low-carbon development pathway to 2045 (Bappenas 2018).
Ireland	Project Ireland 2040: National Planning Framework	2018–2040	Project Ireland 2040 is an overarching policy initiative informed by the National Planning Framework to 2040 and the NDP 2018–2027. Project Ireland 2040 emphasizes social outcomes and values ahead of economic targets and prioritizes the well-being of all citizens (Ireland 2019). The National Planning Framework aims to guide development and investment and empower regions to lead in the planning and development of their communities.
Latvia	Sustainable Development Strategy of Latvia	2010–2030	The Sustainable Development Strategy of Latvia outlines national sustainable development objectives and recommends solutions for efficient and sustainable use of culture, nature, economic, and social capital. The strategy focuses on Latvia’s fundamental value of human capital and the development of cultural spaces (Latvia 2010).
Malta	National Transport Strategy	2016–2050	Malta’s National Transport Strategy creates the strategic framework for the development of the near-term Transport Master Plan. The Transport Master Plan provides guidance for implementing transportation-related policies, actions, or measures. (Sutton 2018).
Mexico ¹	Mexico’s Climate Change Mid-Century Strategy	2016–2050	Mexico’s mid-century climate change strategy provides the vision, principles, goals, and main lines of action to build a climate-resilient society and transition toward low-emissions development.
South Africa	Long-Term Mitigation Scenarios	2010–2050	The process to develop South Africa’s LTMS occurred from 2006 to 2007 with the aim of exploring opportunities for South Africa to mitigate climate change. The process included facilitated stakeholder engagement and technical research and modeling to develop GHG emission scenarios through 2050 (Tyler 2018).
United Kingdom ¹	Clean Growth Strategy	2017–2050	The UK’s Clean Growth Strategy was developed under the 2008 Climate Change Act. It proposes approaches to meet national emissions limitations under the “fifth carbon budget” (emissions limit from 2028 to 2032) and also includes a long-term view to meet at least an 80% reduction in 2050 emissions relative to 1990 levels (Gault 2018).
United States ¹	United States Mid-Century Strategy for Deep Decarbonization	2016–2050	The United States Mid-Century Strategy (MCS) charts pathways to achieve at least an 80% reduction in GHG emissions below 2005 levels by 2050. The MCS demonstrates how the United States can meet growing energy demand while reducing emissions and sustain a thriving economy, including for the American workforce, connected to fossil fuel production and use (Duke and Hansel 2018).
Vietnam	Vietnam Revised National Power Development Plan VII	2015–20, with a vision to 2030	Vietnam’s Power Development Plan is a strategic tool for national electricity development and informs investment projects in the power sector for a period of 10 years. Through a continual planning process, each plan is updated to reflect socioeconomic conditions every 5 years. The plan aims to accelerate the development of power generation from renewable energy (hydroelectric, wind power, solar power, biomass power, etc.) to advance the power sector (Huyen Forthcoming).
Vietnam	Mekong Delta Plan	2014–2050	The objective of the Mekong Delta Plan is to develop a long-term strategic vision toward a safe, prosperous, and sustainable region. The plan serves as a reference document for the Vietnamese government in development planning, spatial planning, and sectoral master planning for the Mekong Delta and also guides decision-making, legislation, and investments. The plan outlines four socioeconomic scenarios focused on 2050 and 2100 (Smajgl 2018).

Notes:

¹Denotes official long-term low-emissions development strategies submitted to the UNFCCC.

²The European Union is currently undertaking a process to develop a new long-term plan. The initial proposal paints a vision for a net-zero emission future for Europe by 2050, and this process should enable the EU to deliver a strategy by 2020. However, at the time of writing, much of the concept is still in flux; and many details are still to be sorted out.

Source: WRI Authors.

Survey Results

Surveys were used to extract specific details related to governance and institutional arrangements for LTSs that had been officially submitted to the UNFCCC or were in development at the start of the research process. Invitations were extended to 11 in-country experts involved in the development of LTSs in Canada, Costa Rica, Czech Republic, France, Germany, Japan, Marshall Islands, Mexico, South Africa,¹⁷ the United Kingdom, and the United States. These cases were prioritized in an attempt to provide a balance of geographies and experience. Due to time constraints during the research process, three countries with LTSs (Benin, Fiji, and Ukraine) were not contacted for this study. Seven experts provided responses to the questionnaire representing Costa Rica, Czech Republic, France, Mexico, South Africa, the United Kingdom, and the United States. Respondents answered questions on a range of topics, including institutional leadership, roles and responsibilities, institutional coordination, legal frameworks, stakeholder engagement, and governance for implementation. The list of experts is included in Table A2, and the questionnaire is included in Box A1.

Case Studies

Insights into governance and institutional arrangements were also drawn from a series of case studies on long-term planning efforts commissioned by the World Resources Institute. A total of 21 case studies are being authored and reviewed by governmental and nongovernmental experts involved in or deeply familiar with each case. From an initial review of nearly 40 existing long-term plans, case study topics were selected according to the following criteria:

- Did the example have enough history to evaluate and interpret its findings? If not, can we draw lessons from the long-term plan's initiation (as opposed to implementation)?
- Does it have at least a 15-year time horizon?
- Is the long-term plan publicly available?
- Is there any indication that the plan is having an impact on near-term planning?
- Does the case have sufficient information readily available?
- Could experiences or lessons learned be applied to other countries? Are the lessons learned replicable?¹⁸

A geographic balance was also considered but limited by the criteria. Case studies are cited accordingly throughout the publication and are available online.¹⁹ Of the 21 case studies pursued, 18 were included in this analysis from the following countries: Burkina Faso, Chile, China, Colombia, France, Germany, Indonesia, Malta, Mexico, South Africa, United Kingdom, and the United States, as well as two cases from Vietnam and one subnational case study on California. In addition, three case studies explored the experience of consortium efforts. These include a look at the current ongoing efforts in the European Union toward developing a collective long-term plan; the experience of support provided by the Deep Decarbonization Pathways Project; and analysis of the elements of analytical capacity across five countries (Brazil, China, Germany, India, and the United States). Case studies are cited accordingly throughout the publication. See Table A1 for a list of the plans included in this study.

Landscape Analysis

To supplement the analysis of the surveys and case studies, a landscape analysis was conducted to identify existing long-term planning efforts that could serve as examples for this study. Some of these planning efforts were directly related to climate change, and some were either broader development strategies or more specific sectoral strategies. Through an internet-based search, 67 potential examples of long-term planning were identified. In order to narrow down the examples to include in the study, several criteria were considered, including the time frame of the long-term planning effort (at least a 20-year time horizon), when it was launched (preference for efforts with a longer history), the scope of the effort (preference for economy-wide over sectoral or other plans), whether the effort was publicly available, and whether there was sufficient information available regarding the governance and institutional arrangements to support analysis.

Ten long-term planning efforts were selected based on these criteria although all examples were not always able to meet all the criteria. Other elements that we considered in selecting planning efforts were geographic, economic, and political diversity. Based on this refinement, we selected efforts from the following 10 countries: Australia, Belize, Botswana, Cameroon, Chile, China, Djibouti, Indonesia, Ireland, and Latvia. (See Table B1 for descriptions of these cases.) This sampling does not represent best practice but, instead, provides insights based on diverse national contexts, timing, and governance approaches for developing and implementing long-term plans.

See Box B1 for the questionnaire used in the survey. In some cases, the respondents were not able to answer all the questions. The responses provide insight into governance arrangements surrounding the development, integration, and implementation of these planning efforts.

Table A2 | Survey Respondents

COUNTRY	ORGANIZATION	RESPONDENT
Costa Rica	Ciudadanos por una Costa Rica Limpia SRL	Monica Araya
Czech Republic	Ministry of the Environment	Ing. Pavel Zámyslický, Ph.D.
France	IDDRI	Michel Colombier
Mexico	Instituto Nacional de Ecología y Cambio Climático	Claudia Octaviano
South Africa	Independent	Emily Tyler
United Kingdom	Committee on Climate Change	Adrian Gault
United States	Gigaton Strategies	Rick Duke

Source: WRI Authors.

Figure A1 | Questions for Survey of National Experts Involved in Long-Term Climate Planning Efforts (Cont'd)

- 11)** Please describe any legal or political tools that were used during the initiation and development of the plan (for example, MOUs, TORs, mandates, directives, regulatory action, or other political guidance for the key components of the plan). How effective were they?
- 12)** Was this plan developed independently from other national planning processes? Was there any need to coordinate or consider the development of the long-term plan in the context of other national planning efforts (development, economic, sectoral, yearly budget cycle, etc.)?
- 13)** What recommendations would you have for another country when developing a coordination body or applying legal frameworks?

B.3 Stakeholder engagement

- 14)** Which nongovernmental actors² were involved in development of the plan, and what were their respective roles and responsibilities:
- 15)** At what point(s) or stage(s) were these actors involved in the process, and for how long?
- 16)** Were any actor groups or agencies reluctant or unable to participate, and how did you address this challenge?
- 17)** Were issues of equity and social inclusion considered in identifying stakeholders to involve? If so, how were specific groups, such as climate vulnerable communities, historically poor or marginalized populations, women's groups, etc., included; and how did their involvement affect the development of the plan?
- 18)** How did the lead agency/department/authority or coordination body secure the commitment and participation of relevant actor groups or agencies?
- 19)** Were any of the following type(s) of stakeholder engagement process(es) applied?
- | | | |
|----------------------------------|------------------------------|-------------------------------|
| 1) survey or questionnaire (Y/N) | 2) in-person workshops (Y/N) | 3) public consultations (Y/N) |
| 4) interactive website (Y/N) | 5) open comment period (Y/N) | |
- 20)** What were the results of stakeholder engagement, and how were they taken into account in the final plan? (Please provide examples of ideas or recommendations that were accepted, and, if possible, examples of those that were rejected.)
- 21)** Would you describe the stakeholder engagement process as effective? Are there any ways in which it could have been improved? Please explain.
- 22)** What recommendations would you have for another country developing a stakeholder engagement process?

C. LONG-TERM PLAN: IMPLEMENTATION³

C.1 Institutional leadership, actors, roles and responsibilities

- 23)** What is the current status of implementation of the long-term plan?
- 24)** What near-term actions and policies were changed as a result of the plan?
- 25)** Government actor with the highest level of authority involved in implementation:
- 26)** Number of government staff involved in implementation (approximate okay):
- 27)** Which government agencies and departments are involved in implementation of the plan, and what are their respective roles and responsibilities? If there is a legal arrangement, please describe any authorities vested in ensuring implementation:

C.2 Institutional coordination, legal frameworks, and stakeholder engagement

- 28)** Please describe how implementation is coordinated.
- 29)** Related to the above, to what extent has the long-term plan been integrated into everyday decision-making and planning and into all relevant ministries and their decision-making? (Please consult relevant government counterparts as needed.)
- 30)** What, if any, governance measures can countries adopt to reduce the possibility that a change in administration will compromise implementation of the plan?
- 31)** Please describe any legal or political tools in place to facilitate implementation (for example, MOUs, TORs, mandates, directives, regulatory action, or other political guidance).
- 32)** Are there mechanisms or institutions—legal or otherwise—to enable public disclosure of information to track progress on implementation? Have these been implemented?
- 33)** Please describe any coordinated role(s) for nongovernmental actors in implementation of the plan.

D. ADDITIONAL QUESTIONS

- 34)** Was there any engagement with other countries or donors in the development or implementation of the long-term plan? How did this affect the process?
- 35)** From your experience, what is the single most important element of governance, institutional arrangements, and stakeholder engagement that is critical for the success of the long-term plan?
- 36)** Any additional comments?

Notes:
¹ This may be any kind of long-term plan, including low-emissions development strategies submitted to the UNFCCC or other national sectoral or development plans. For the context of this project, "long-term" may be understood as looking forward to mid-century (2050) or >20 years.
² These may include NGOs, private sector actors, local or regional governments, industry and labor unions, and civil society organizations, among others.
³ Please complete relevant questions, if applicable.

APPENDIX B: INFORMATION FOR COMMUNICATION OF A LONG-TERM STRATEGY

The following information can be considered for communication of long-term strategies:²⁰

- description of the long-term vision
- development objectives of the long-term vision, which may include
 - goals for sustained and inclusive development and a just transition for workers, creation of decent work and quality jobs, and poverty reduction (described qualitatively or quantitatively);
 - goals for human and environmental well-being
- mitigation elements, which may include
 - a long-term quantified outcome for GHG emissions reductions, including the following information:
 - base year/period of GHG and non-GHG targets and base year/period emissions;
 - time frame for the strategy and target year of any GHG or non-GHG gas targets;
 - expected national emissions/non-GHG outcomes in the target year/period;
 - intended peaking year and peaking emissions level implied by the trajectory;
 - implied annual rate of emissions reductions and/or expected emissions trajectory;
 - implied deviation from business-as-usual emissions;
 - description of how the vision will limit cumulative emissions over time;
 - relevant definitions (such as *carbon neutrality*, if applicable);
 - sectors covered (e.g., all IPCC sectors covered in national GHG inventory or all economic sectors as defined by national sector classification);
 - GHGs covered;
 - assumptions and methodological approaches, including for estimating and accounting for anthropogenic GHG emissions and, as appropriate, removals;
 - assumed IPCC inventory methodologies and global warming potential values;
 - any intermediate targets to support the long-term vision;
 - modeling that underpins the mitigation vision, including a description of the methodology used to project the baseline scenario, including the projection method (e.g., name and type of models), the cutoff year for policies included in the baseline scenario and any significant policies excluded from the baseline scenario, the emissions drivers included and assumptions and data sources for key drivers, and assumptions about negative emissions;
 - description of qualitative approaches used to develop the mitigation vision;
 - description of how the long-term strategy is aligned with the Paris Agreement's temperature goals
- adaptation elements, which may include
 - long-term outcomes for climate adaptation and resiliency;
 - description of the risks of inaction, with consequences for environmental, social, human, and economic outcomes;
 - goals to enhance adaptive capacity, strengthen resilience, and reduce vulnerability;
 - assessment of the impacts of changes in climate on long-lived infrastructure, land-use planning, ecosystem services, and/or social change;
 - identification of vulnerable groups and sectors within the country;
 - links to national adaptation plans;
 - co-benefits of mitigation actions for adaptation/resilience and vice versa;
 - consideration of how to strengthen the resilience of mitigation actions proposed in the long-term strategy;
 - description of synergies between development gains and mitigation and adaptation responses
- sectoral strategies to achieve the long-term vision, which could include
 - any sectoral GHG or non-GHG gas targets;
 - description of prioritized actions and measures;
 - description of how the transition will be managed to ensure that it is just for affected populations;
 - opportunities for innovation and research, development, and demonstration;
 - description of how the long-term strategy will be mainstreamed into sectoral policies and plans;
 - additional context, including importance of the sector to the economy, vulnerability to climate change, sectoral potential, trends and projections, and innovation opportunities, among others
- description of the process for preparation of the long-term strategy (such as stakeholder engagement and public consultation; process, data, and analysis for developing the long-term vision; and decision-making processes)
- implementation approaches for the strategy, including
 - description of how the long-term vision will guide short- and medium-term sectoral and cross-sectoral decision-making;
 - capacities and resources required for implementation;
 - coherence with existing planning efforts;
 - priority measures for implementation of the strategy;

- institutional arrangements and legal frameworks for implementation of the strategy;
- stakeholder consultation plans during implementation;
- efforts to manage the transition in a just manner
- monitoring plans, including
 - institutional roles, including the entities or institutions responsible for collecting and compiling data;
 - data or indicators to be tracked, as well as sources of data;
 - duration and frequency of monitoring;
 - measurement or data collection methods (e.g., surveys, censuses)
- review and revision process, including
 - frequency and process for stakeholder engagement;
 - objectives or principles guiding the review, with a description of which elements get reviewed;
 - ministries/agencies responsible for the review process;
 - alignment of the review process with other domestic or international processes
- other relevant information, including
 - emissions (e.g., past, current, or projected emissions, emissions per capita, emissions intensity, or emissions as a percentage of global emissions);
 - economic and development indicators (e.g., GDP, GDP per capita, indicators related to health, energy access, energy prices, education, housing, etc.);
 - costs or relative costs of action;
 - mitigation potential (e.g., renewable energy potential);
 - benefits of action (e.g., co-benefits) or other factors;
 - projected business-as-usual emissions;
 - recent historical emission trends;
 - benchmarks for annual rate of emissions reductions or other factors;
 - priority sectors;
 - other information on national circumstances

Depending on the strategy's scope and objectives, these elements may be more or less relevant to a given country's long-term strategy.

ENDNOTES

1. Similar to the approach from Verner et al. (2019), for the purposes of this paper, "near term" and "short term" are within approximately five years. "Medium term" is within approximately 10 or 15 years, or to 2030, including current and future NDCs. "Long term" is within or beyond approximately 20 years, or to mid-century. However, for several cases included in this paper, "long term" may not always refer to mid-century.
2. The three aims stated in Article 2 of the Paris Agreement are in the context of sustainable development and efforts to eradicate poverty. In addition, Article 2 also indicates the Agreement will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances. Thus, these overarching principles are relevant to long-term, low emissions development strategies.
3. Submitted strategies can be accessed on the UNFCCC website: <https://unfccc.int/process/the-paris-agreement/long-term-strategies>.
4. For details, visit www.longtermstrategies.org.
5. See, for instance Kenya (http://www.kccap.info/index.php?option=com_content&view=article&id=4&Itemid=14), South Africa (<https://www.climatechange.gov.za/home/gp/7.1>), and Mexico (<https://www.gob.mx/inecc/acciones-y-programas/sistema-nacional-de-cambio-climatico-sinacc>).
6. Although called a revision process, in this case, this is not an update of the previous document. It means that the strategic exercise—including scenario development, impact assessment, consultation, and drafting—is being done again and will result in an entirely new document.
7. The UK government has set five-year carbon budgets to meet its targets under the Climate Change Act. They restrict the amount of GHG the UK can legally emit in a five-year period. The UK is currently in the third carbon budget period (2018 to 2022).
8. For the purposes of this paper, "high level" generally refers to political leaders at the minister-equivalent level or higher and may include the prime minister or president, depending on the country.
9. Modeling teams were selected according to their capacity for exploring deep decarbonization, with widely varying modeling capabilities. Some teams involved government representatives but participated in a research capacity.

10. The Council on Environmental Quality (CEQ) is part of the Executive Office of the President.
11. Germany's Basic Law devolves significant authority to the state level (Länder), including the responsibility to implement climate adaptation plans. Given this, and considering that Germany had previously adopted a National Adaptation Plan, the Climate Action Plan 2050 focused on mitigation.
12. For instance, the LTMS scenario was foundational for South Africa's mitigation policy informing the National Climate Change Response White Paper, South Africa's Copenhagen Pledge, and its NDC.
13. Many of the concepts in this section are drawn from WRI, UNDP, UNEP, and WB (2011).
14. The U.S. mid-century strategy was not a law, but rather just a submission to the UN Climate Secretariat, so it did not carry the same legal standing as some other long-term plans.
15. Find out more at <https://2050pathways.org>.
16. For details, visit www.longtermstrategies.org.
17. In the case of South Africa, while the country is preparing an official LTS, the survey focused on the Long-Term Mitigation Scenarios (LTMS). While this is not an official LTS, South Africa was one of the early pioneers in national long-term climate planning and has longer history and experience to draw from, so it was included in the analysis.
18. Cases were considered replicable if there was potential for the approach to be taken up in multiple countries, or if the conditions and circumstances surrounding the case were not entirely country-specific but also possible in other country contexts.
19. To access the published case studies, visit: www.longtermstrategies.org.
20. An LTS could be supplemented by background document(s) with further technical information.

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ABOUT WRI

World Resources Institute is a global research organization that turns big ideas into action at the nexus of environment, economic opportunity, and human well-being.

Our Challenge

Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

Our Vision

We envision an equitable and prosperous planet driven by the wise management of natural resources. We aspire to create a world where the actions of government, business, and communities combine to eliminate poverty and sustain the natural environment for all people.

Our Approach

COUNT IT

We start with data. We conduct independent research and draw on the latest technology to develop new insights and recommendations. Our rigorous analysis identifies risks, unveils opportunities, and informs smart strategies. We focus our efforts on influential and emerging economies where the future of sustainability will be determined.

CHANGE IT

We use our research to influence government policies, business strategies, and civil society action. We test projects with communities, companies, and government agencies to build a strong evidence base. Then, we work with partners to deliver change on the ground that alleviates poverty and strengthens society. We hold ourselves accountable to ensure our outcomes will be bold and enduring.

SCALE IT

We don't think small. Once tested, we work with partners to adopt and expand our efforts regionally and globally. We engage with decision-makers to carry out our ideas and elevate our impact. We measure success through government and business actions that improve people's lives and sustain a healthy environment.

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