

Making Long-Term Low GHG Emissions Development Strategies a Reality

A guide to policy makers on how
to develop an LTS for submission
in 2020 and future revision cycles

MAY 2020

On behalf of:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

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Making Long-Term Low GHG Emissions Development Strategies a Reality

A guide to policy makers on how to develop an LTS for
submission in 2020 and future revision cycles

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Capacity Development for climate policy in the countries of South East,
Eastern Europe, the South Caucasus and Central Asia, Phase III

This project is part of the International Climate Initiative (IKI).
The German Federal Ministry for the Environment, Nature
Conservation and Nuclear Safety (BMU) supports this initiative on
the basis of a decision adopted by the German Bundestag.

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Federal Ministry
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SUMMARY FOR POLICY MAKERS

Context

Under the Paris Agreement, 198 Parties to the UNFCCC have collectively committed to hold global average temperature increase to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C. The latest scientific evidence unambiguously shows the need to initiate country-level transitions toward decarbonised economies as fast as possible to reach a net-zero greenhouse gas (GHG) emissions in the second half of the century globally to limit the global temperature increase accordingly.

In this context, **Article 4 of the Paris Agreement calls on Parties to formulate and communicate a long-term low greenhouse gas emission development strategy (LTS)** and submit these to the UNFCCC by 2020. This requirement is on top of the regular five-year update cycle of medium-term targets known as Nationally Determined Contributions (NDCs).

This guidance provides recommendations to policy makers on how to approach the development of a long-term low greenhouse gas emission development strategy (LTS) given the unique circumstances of individual countries in 2020, and future revisions thereof. The guide's recommendations build upon **three key concepts for consideration by policy makers**:

Concept 1

The **LTS should be an ongoing exercise in creating a vision for the future of a low emissions economy** informed by the latest science and integrated into a continuous planning process expanding beyond 2020. This long-term vision should be **harmonised with future NDC revision cycles** to ensure consistency and help drive action in the short term.



Concept 2

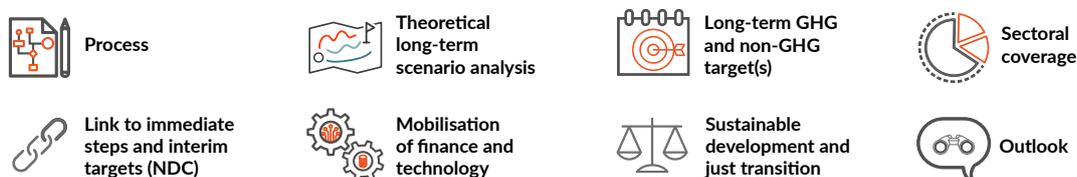
To account for country-specific circumstances and starting points, the **development of an LTS can be guided by three levels of comprehensiveness** ranging from a base level to a detailed level. By making the LTS development an ongoing visioning exercise as part of a continuous planning process, policy makers can enhance the LTS's scope, depth and robustness over time in subsequent revision rounds.

Three levels of comprehensiveness for LTS development



Concept 3

Building upon the concept of differentiated level of comprehensiveness emerging over time, the guidance identified **eight key aspects of LTSs for consideration by policy makers** and gives recommendations on how policy makers can address each aspect considering their country's situation.



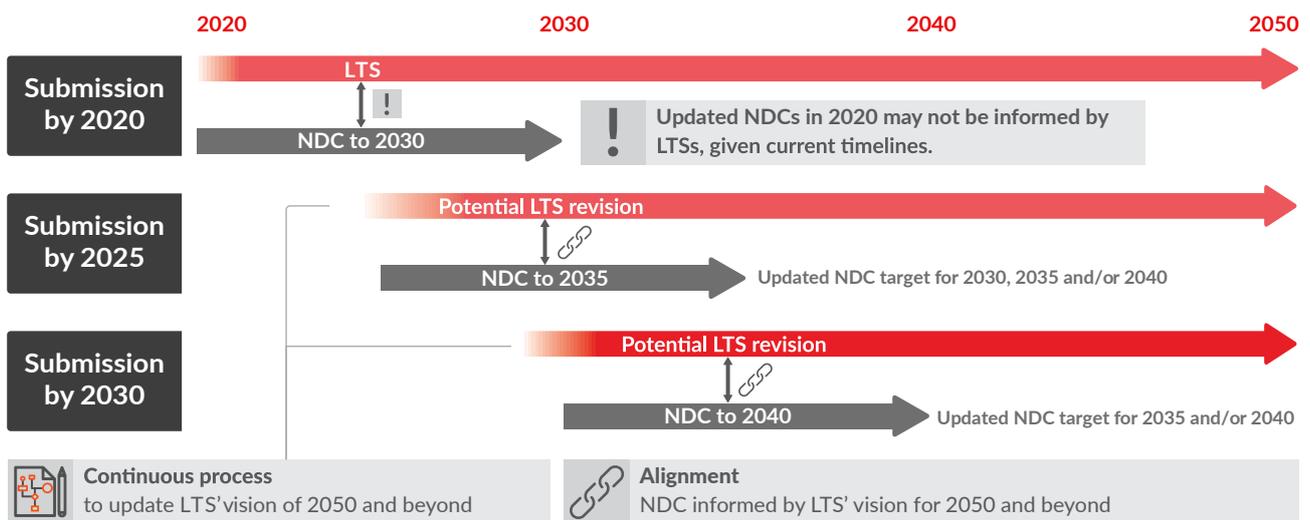
The case for ongoing revisions of LTSs beyond 2020

Harmonised revision cycles of LTSs and NDCs can improve the alignment of a country's long-term vision and medium-term targets and make sure that strategies are grounded in the latest science

The Paris Agreement and the Katowice Rulebook do not clearly specify whether Parties should update their LTSs after communicating them to the UNFCCC by 2020. A one-time submission in 2020 without further revision, however, would dismiss the idea to make an LTS an ongoing visioning exercise informed by latest science as part of continuous planning process.

The five-year revision cycles for Parties to submit their NDCs to the UNFCCC provide an opportunity to improve the alignment of countries' long-term visions (LTSs) with their medium-term targets (NDCs). This way, policy makers can ensure that a country's long-term vision informs the NDC target setting for the medium-term and incorporating the latest developments in science, policy and technology. Without ensuring such consistency, LTSs run the risk of not being adequately mainstreamed into policy and implementation planning.

The below diagram outlines the basic concept on how NDC revision cycles can be informed by the long-term vision over the course of the next ten years.



In many countries, the development of LTSs in 2020 will simply not happen in time to inform the NDC target setting in 2020. Looking ahead to future revision cycles beyond 2020, policy makers can proactively steer climate policy planning processes to align NDC revisions mandated by the Paris Agreement with updates to the country's long-term vision outlined in the LTS.

For example, policy makers could align processes in a way that LTSs will be updated in regular five-year intervals to inform future NDC submissions. Ukraine, the Republic of Marshall Islands and France have already included statements of intention to review and revise their long-term strategies at least every five years in their LTSs submitted to the UNFCCC prior to May 2020.

Factoring in country specific circumstances and starting points

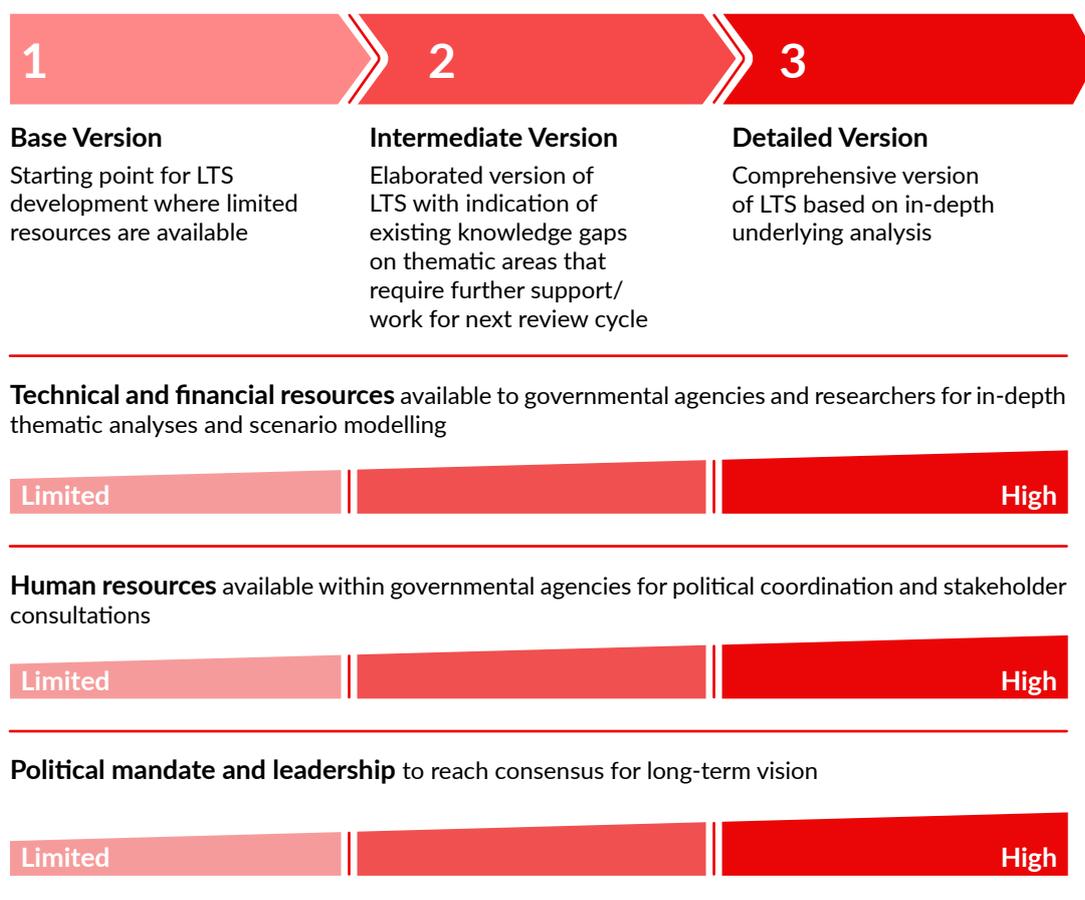
Three differentiated levels of comprehensiveness allow countries to develop LTSs appropriate to their circumstances and can build the scope and detail of their LTS with each revision cycle

In the run-up to the LTS submissions to the UNFCCC in 2020, policy makers in many countries will have to determine how to develop a long-term vision while accounting for their country-specific circumstances. The approach for LTS development presented in this guide aims to inform policy makers on how to develop and revise a country's LTS in a gradual iterative process, acknowledging the countries' different starting points and enhancing the LTS's scope and depth over time.

This guide introduces the concept of three differentiated levels of comprehensiveness to acknowledge and account for the different circumstances that countries face while developing their LTSs in 2020. The country-specific starting points can differ both in available human and financial resources as well as in political leadership or experience in reaching consensus among diverse stakeholders.

In this context, the below figure outlines the rationale for three levels of comprehensiveness, building upon one another: a base version, an intermediate version, and a detailed version. While some countries might opt for a base version for submission to the UNFCCC in 2020 or shortly thereafter, they can explicitly communicate support needs to the international community in order to elaborate a more substantiated version in future revision cycles.

Three levels of comprehensiveness for LTS development



Eight key aspects of LTSs for consideration

A differentiated approach on how policy makers can consider key aspects for LTS development accounting for their country's circumstances

This guide introduces eight key aspects for consideration when developing an LTS in a country-specific context informed by recently published literature on LTS development. The below diagram makes use of the concept of three levels of comprehensiveness to present an approach on how policy makers can address each aspect considering their country's situation.

Key aspects for consideration in an ongoing LTS development process

| Key aspects for consideration | Base Version | Intermediate Version | Detailed Version |
|--|--|--|--|
|  Process | For any of the LTS version types, LTS development should build on extensive coordination efforts and wider stakeholder engagement, to reach a strong consensus among stakeholders. | | |
|  Theoretical long-term scenario analysis | Acknowledgement of scientific findings | First estimates of Paris Agreement aligned scenarios | Country-specific Paris Agreement aligned scenarios |
|  Long-term GHG and non-GHG target(s) | Statement of intention to fully decarbonise | Indicative targets, but not enshrined in national policy | Targets enshrined in national policy |
|  Sectoral coverage | Focus sectors | Focus sectors with other sectors in lesser detail | All sectors in detail |
|  Link to immediate steps and interim targets (NDC) | Reflection on enhanced alignment of medium-term targets (NDCs) and short-term actions with the country's long-term vision —————→ | | |
|  Mobilisation of finance and technology | Reflection of improved understanding on mobilisation of domestic and international finance and technology resources over time —————→ | | |
|  Sustainable development and just transition | Reflection on improved mainstreaming of sustainable development and just transition considerations —————→ | | |
|  Outlook | Transparent communication of intention to further develop LTS over time and additional international support needs required —————→ | | |

Policy makers have full flexibility to customise this approach to country-specific circumstances, for example by choosing a suitable level of detail for each listed aspect. This guide presents each of the eight key LTS aspects in more details, as well as real-world examples from existing LTS submissions as of May 2020, in Chapter 2 of this report.

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1 ROLE OF THE LTS FOR NATIONAL CLIMATE POLICY PLANNING

This guidance provides recommendations to policy makers on how to approach the development of an LTS in 2020 or shortly thereafter, and future revisions thereof. This can help policy makers to understand the multiple benefits for them to engage in an LTS development process in order to advance a country's societal and economic development agenda in a climate-friendly manner. For this purpose, the guidance draws upon a range of ideas, observations and concepts from previously published research and analysis (Ecologic Institute, 2017; Williams and Waisman, 2017; CAN Europe, 2018; Levin et al., 2018; Cox, 2019; Waisman et al., 2019; World Bank Group and Navigant, 2019; WRI, 2019).

A responsibility under the Paris Agreement

The Paris Agreement's temperature limit and science's unambiguous call for action

Under the Paris Agreement, 198 Parties to the UN-FCCC have collectively committed to hold global average temperature increase to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C. For this to happen, Article §4.1 of the Paris Agreement calls for global emissions to peak as soon as possible and to decrease rapidly to reach “a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases” (i.e. net-zero emissions) in the second half of the century.

The latest scientific evidence unambiguously shows the need to initiate a transition toward a decarbonised economy as fast as possible. The process of an LTS development can help countries to facilitate the dialogue among stakeholders on how to initiate and translate these ambitious transitions into action, considering country-specific circumstances. The LTS development process thus helps to develop a common long-term vision that integrally addresses environmental, economic and just transition aspects.

Limiting global warming to 1.5°C will require global greenhouse gas emissions to peak by 2020, reduce by 45% below 2010 levels by 2030 and be reduced to net zero by around 2070, with carbon emissions to reach net zero around mid-century and the upholding of negative emissions thereafter (IPCC, 2018). Figure 1 compares the recommendation of the IPCC's Fourth Assessment Report of 2007 with the IPCC's special report 'Global Warming of 1.5°C' published in late 2018.

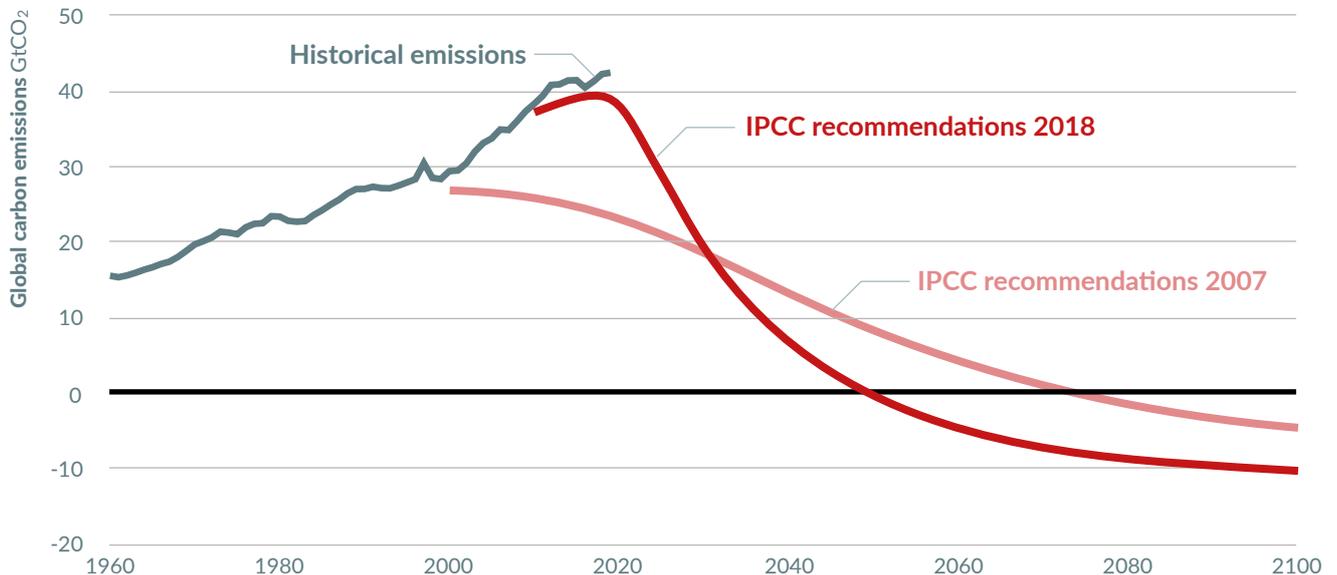


Figure 1

Pathways of global CO₂ emissions recommended by the IPCC in the Fourth Assessment Report of 2007 (445 to 490 ppmCO₂eq leading to 2-2.4°C) and by the IPCC special report on 1.5°C in 2018 for low- and no-overshoot scenarios leading to 1.5°C increase (only the average of the ranges are shown). Overshoot implies a peak followed by a decline in global warming, achieved only through the anthropogenic removal of CO₂ in excess of remaining global CO₂ emissions. Data used from the Fourth Assessment Report of 2007 (IPCC, 2007) and the IPCC's special report on 'Global Warming of 1.5°C' published in 2018 (IPCC, 2018).

The Paris Agreement's articles provide only vague guidelines on LTS development

Article 5 of the Paris Agreement calls on Parties “to formulate and communicate long-term low greenhouse gas emission development strategies” (LTSs), mindful of the temperature goals, and submit these to the UNFCCC. The Katowice Climate Package¹, also commonly referred to as Katowice Rulebook, brought more clarity for the operationalisation of some aspects of the Paris Agreement.

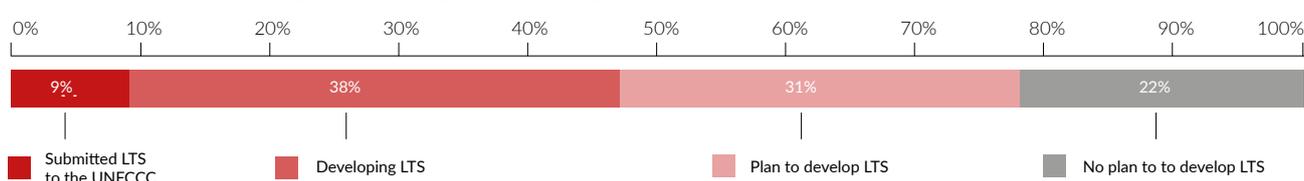
For LTSs, however, the Rulebook only reiterates the invitation to communicate an LTS by 2020², without specifying requirements for future updates. Few Parties have developed LTSs as of May 2020, and there remains a lack of common understanding on what

the scope and format of an LTS should be, reflecting the typically vague nature of UNFCCC documents, stemming from the recognition of individual Parties' self-determination and the need for flexibility.

Out of 86 respondents for governments worldwide in November 2019, the latest available survey in the NDC Update Report found that 52% of respondents' countries are in the process of developing an LTS or start planning processes soon, as displayed in Figure 2 (Roeser et al., 2019). 48% of respondents' countries either have no intention of developing an LTS or face uncertainty regarding when to start such process.

NDC Global Outlook Report 2019 by UNDP and UNFCCC

Overview of country progress on long-term strategy development (n=140)



NDC Update Report of November 2019 by NewClimate Institute and TNO

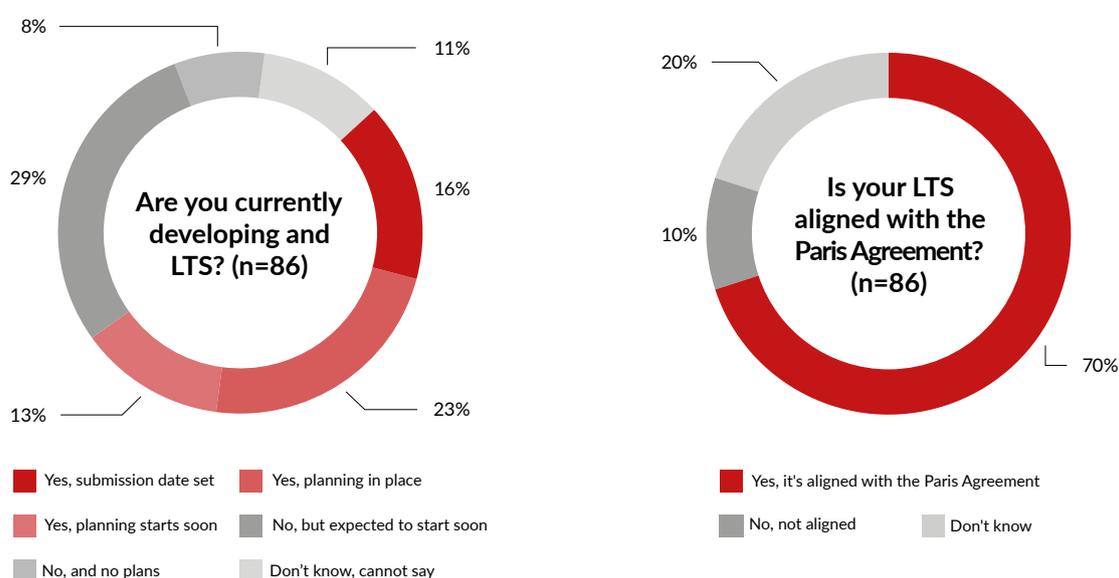


Figure 2

Survey results in NDC Global Outlook Report 2019 of September 2019 (UNDP and UNFCCC, 2019) and NDC Update Report of November 2019 on LTS development and Paris Agreement alignment (Roeser et al., 2019)

1 The Katowice Climate Package can be accessed at <https://unfccc.int/process-and-meetings/the-paris-agreement/paris-agreement-work-programme/katowice-climate-package>.

2 All LTSs submitted to the UNFCCC accessible at <https://unfccc.int/process/the-paris-agreement/long-term-strategies>.

Aligning future NDCs and LTSs through iterative revision cycles

Future LTS revisions allow policy makers to keep a country's long-term planning up to date

While the Paris Agreement and the Katowice Rulebook invite Parties to communicate an LTS to the UNFCCC by 2020, they do not clearly specify whether Parties should update their long-term commitments over time. A one-time submission in 2020 without further revision, however, would dismiss the idea to make an LTS an ongoing exercise in creating a vision for the future of a low emissions economy informed by latest science as part of continuous planning process in a country over time.

LTSs should be considered as an ongoing visioning exercise, which needs to align with policy implementation and planning at the sectoral level. Foresight into the future remains imperfect and only implementation will tell which strategies will be successful or not. Technology breakthroughs and other economic and social developments require a continuous process to ensure that the latest knowledge is always accounted for. Countries can use future LTS revisions to update their vision based on the latest scientific evidence on climate change, an evolving understanding of mitigation and adaptation needs, and technological innovations and developments for low-carbon solutions.

Furthermore, LTSs should be about the continuous planning process and not a single, one-time document. The LTS submission itself can be a concise, strategic document, well aligned with other processes and strategies to avoid duplication. The continuation and enhancement of established planning processes, however, can ensure consistency and robustness of policy making for long-term planning going forward beyond 2020. For this purpose, a continuous planning process can build upon regularly updated analyses and extensive public and private stakeholder engagement.



Harmonised revision cycles of NDCs and LTSs allows for alignment of climate planning

The five-year revision cycles for Parties to submit their NDCs to the UNFCCC provide an opportunity to improve the alignment of countries' long-term visions (LTSs) with their medium-term targets (NDCs). This way, policy makers can ensure that a country's long-term vision informs the NDC target setting for the medium-term. Without ensuring such consistency, LTSs run the risk of not being adequately mainstreamed into policy and implementation planning. Figure 3 provides a basic concept on how NDC revision cycles can be informed by the long-term vision over the course of the next ten years.

The timeline for submission of updated NDCs and the first submissions of LTSs in 2020 gives policy makers an opportunity to use their LTSs to inform their updated medium-term targets. However, current climate policy planning processes at the national level for 2020 often do not account for such alignment between NDCs and LTSs. In many countries' contexts, the development of LTSs will simply not happen in time to inform the NDC target-setting in 2020 (see, for example, survey results in Figure 2 in Section 1.1). For this reason, some updated NDCs may not be informed by upcoming LTSs in 2020.

Looking ahead to future revision cycles beyond 2020, policy makers can proactively steer climate policy planning processes – both at the national and sectoral level – to align NDC revisions mandated by the Paris Agreement with updates to the country's long-term vision outlined in the LTS. For example, policy makers could align processes in a way that LTSs will be updated in regular five-year intervals to inform future NDC submissions.

Ukraine, the Republic of Marshall Islands and France have already included statements of intentions to review and revise their long-term strategies at least every five years in their LTSs submitted to the UNFCCC prior to May 2020 (Roeser et al., 2019). Such an approach might require proactive awareness raising among stakeholders to transparently communicate the process structure and required inputs by stakeholders. In addition, base governmental support and a clear legal mandate for the responsible institution to conduct such recurring revisions facilitate overall coordination and involvement of sector ministries.

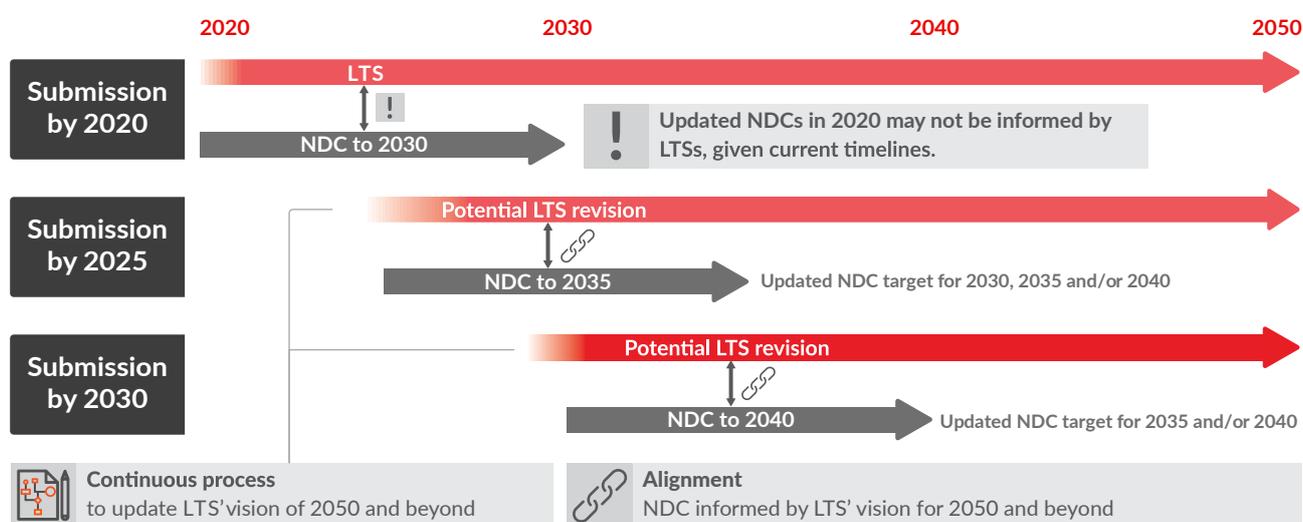


Figure 3

Proposal for harmonized revision cycles of NDCs and LTSs for alignment of climate commitments

Key benefits for policy makers

The development of an LTS for submission to the UNFCCC in 2020 and subsequent updates in future revision cycles provide several key benefits for policy makers and the wider society. These benefits include the alignment of climate planning processes, improved mobilisation of domestic and international financial and technological resources, and efficient use of public resources. The following overview introduces some of these key benefits worthwhile to consider by policy makers going forward.

1 Increased political consensus on the long-term direction makes it easier to plan in the short and medium term.

The process to develop an LTS provides a valuable platform for engagement and building consensus across diverse group of stakeholders. A common understanding among these stakeholders on the long-term vision can subsequently facilitate decision making for targets and actions in the short and medium term, for example when discussing the level of mitigation ambition as part of an NDC revision process. This further allows to improve coordination of climate objectives across sectors and ministries given a common framework on long-term objectives at the sectoral and economy-wide level.

2 Providing the private sector with a clear long-term signal can improve conditions for private sector investment in line with the Paris Agreement's temperature limit.

A credible long-term vision provides clarity on the future framework for private actors to make their investment decisions, thereby accelerating climate action while relying less on government budgets. For example, a credible phase-out plan for coal power plants allows private actors such as energy utilities, mining companies, insurance companies and investors to redirect their private sector investments toward other low- and zero-carbon technologies and avoid stranded assets.

3 International climate finance might flow more easily to a country with a clear long-term pathway and a pipeline of projects proven to be aligned with this national strategy.

For example, several Multilateral Development Banks (MDBs) announced at COP24 in 2018 the intention to align their financial flows to the objectives of the Paris Agreement in order to catalyse low-emissions and climate-resilient development (World Bank, 2018). In this context, MDBs and other international organisations can be expected to have an interest in well-developed and robust LTSs that transparently outline a country's mitigation ambition and investment project pipelines in line with the Paris Agreement's goals. Long-term planning thus enables policymakers to demonstrate leadership at the international level to those who look to support ambitious countries.

4 Future climate planning for NDC revisions or sectoral climate action plans become more streamlined and efficient processes if occurring as part of an iterative process alongside an LTS.

Fewer resources will be required each time in order to 'make a start' and mobilise stakeholders, while more resources can be spent on discussing actual plans. For example, LTSs and NDCs commonly rely on theoretical scenario modelling to determine future development pathways. A common set of modelling scenarios and approaches effectively reduces financial and technical resources required to conduct these modelling exercises. A harmonised approach is simpler and more resource-efficient than developing separate analyses for each exercise and attempting to reconcile them afterwards (Levin and Fransen, 2019). This is particularly relevant for countries with limited personnel and financial resources available for institutions to coordinate climate planning processes and draft respective submission to the UNFCCC.

2 LTS DEVELOPMENT UNDER COUNTRY-SPECIFIC CIRCUMSTANCES

In the run-up to the LTS submissions to the UNFCCC in 2020, policy makers in many countries will have to determine how to develop a long-term vision given their country-specific circumstances. The approach for LTS development presented in the following sections aims to inform policy makers on how to **develop and revise a country's LTS in a gradual iterative process** acknowledging the countries' different starting points. By making the LTS development an ongoing exercise in creating a vision for the future of a low emissions economy as part of a continuous planning process, policy makers can enhance the LTS's scope, depth and robustness over time.

A concept to enhance LTS development over time

The concept of three levels of comprehensiveness introduced in this section aims to acknowledge and account for the different starting points of countries to develop their LTS in 2020. The country-specific starting points can differ both in available human and financial resources to develop an LTS as well as in political leadership and experience to reach consensus for long-term visions. In this context, Figure 4 below outlines the rationales for three

levels of comprehensiveness, building upon one another: a base version, an intermediate version, and a detailed version. While some countries might opt for a base version for submission to the UNFCCC in 2020 or shortly thereafter, they can explicitly communicate support needs to the international community in order to submit a more substantiated version in future revision cycles.

Three levels of comprehensiveness for LTS development

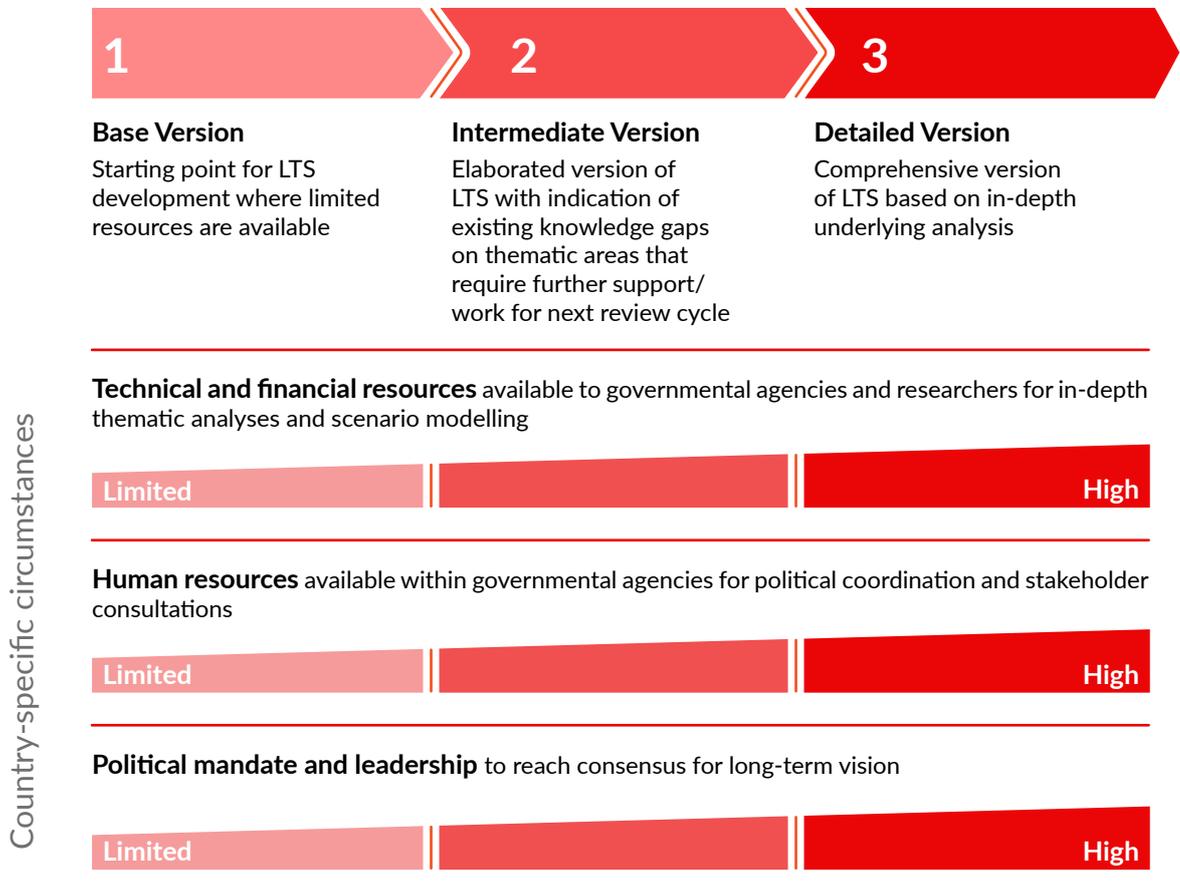


Figure 4
Concept of three levels of comprehensiveness to guide the development of long-term low GHG emission development strategies (LTSs) and respective characteristics

Explaining key LTS aspects for consideration for each level of comprehensiveness

An increasing body of recently published literature identifies key aspects that countries can consider when conceptualising and developing their LTSs in 2020 or thereafter (Roeser et al., 2019). While most authors acknowledge the relevance of certain aspects (as the ones listed in Table 1) in the elaboration of a country's long-term vision, no common understanding currently exists on how countries can take up these aspects in their LTSs.

Table 1 presents a differentiated approach on how policy makers can address each aspect considering their country's situation. Policy makers have full flexibility to customise this approach to country-specific circumstances, for example by choosing a suitable level of detail for each listed aspect.

Table 1
Key aspects for consideration in an ongoing LTS development process

| Key aspects for consideration | Base Version | Intermediate Version | Detailed Version |
|--|--|--|--|
|  Process | For any of the LTS version types, LTS development should build on extensive coordination efforts and wider stakeholder engagement, to reach a strong consensus among stakeholders. | | |
|  Theoretical long-term scenario analysis | Acknowledgement of scientific findings | First estimates of Paris Agreement aligned scenarios | Country-specific Paris Agreement aligned scenarios |
|  Long-term GHG and non-GHG target(s) | Statement of intention to fully decarbonise | Indicative targets, but not enshrined in national policy | Targets enshrined in national policy |
|  Sectoral coverage | Focus sectors | Focus sectors with other sectors in lesser detail | All sectors in detail |
|  Link to immediate steps and interim targets (NDC) | Reflection on enhanced alignment of medium-term targets (NDCs) and short-term actions with the country's long-term vision —————→ | | |
|  Mobilisation of finance and technology | Reflection of improved understanding on mobilisation of domestic and international finance and technology resources over time —————→ | | |
|  Sustainable development and just transition | Reflection on improved mainstreaming of sustainable development and just transition considerations —————→ | | |
|  Outlook | Transparent communication of intention to further develop LTS over time and additional international support needs required —————→ | | |

Key aspects for consideration in practical terms

The following sections develop the eight key aspects introduced above and further elaborate how policy makers can address them in their country-specific context. Each section also provides examples from existing LTS submissions, as of May 2020. A more detailed overview of all LTS submitted as of December 2019 can be found in the NDC Update Report on Long-term, society-wide visions for immediate action by NewClimate Institute and TNO (Roeser et al., 2019)



Process



Theoretical long-term scenario analysis



Long-term GHG and non-GHG target(s)



Sectoral coverage



Link to immediate steps and interim targets (NDC)



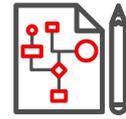
Mobilisation of finance and technology



Sustainable development and just transition



Outlook



Process

The development of an LTS is about the process to determine a country’s long-term vision, not only a final one-off document. The LTS submission itself can be a concise, strategic document that policy makers align with other processes and strategies. The establishment of robust planning processes, however, serves as the backbone of any inclusive LTS development.

For this purpose, the planning process should be built on extensive (political) coordination and wide public and private stakeholder engagement across all governance levels, whichever LTS version is chosen. This approach can ensure that a country’s long-term vision reflects a broad consensus among

stakeholders and increase chances of successful implementation, rather than being perceived only as a ‘top-down’ decision by responsible institutions within government.

The relevance of coordination and stakeholder engagement is equally high for any type of LTS, regardless of the level of detail of the document. Countries, however, might find themselves at different starting points in terms of available resources for governmental agencies and the political mandate to steer the LTS development process. Table 2 summarises these aspects and provides an example of a country that has submitted an LTS as of May 2020.

*Table 2
Process coordination and stakeholder engagement as part of the LTS development process*

|  | Process |
|---|--|
| Base Version | <p>For any of the LTS version types, LTS development should build on extensive coordination efforts and wider stakeholder engagement, to reach a strong consensus among stakeholders.</p> |
| Intermediate Version | <ul style="list-style-type: none"> » A country’s LTS is about the development of a planning process, not only the final document. » Extensive coordination and stakeholder engagement can ensure that a country’s long-term vision reaches broad consensus among private and public stakeholders, which increases chances of successful implementation. |
| Detailed Version | <ul style="list-style-type: none"> » Countries might want to allocate sufficient (financial and human) resources and set a robust political mandate for responsible government institutions to steer the coordination process. |
| Real-world example | <p>Example for ‘intermediate version’ - Germany’s LTS</p> <p>In 2015, the German government initiated the Climate Action Alliance to inform Germany’s LTS development process. This framework triggered the participation of and dialogue between federal states (Länder), local authorities, associations and members of the public to agree on 100 measures to inform the German LTS. The Climate Action Alliance will also be involved in the implementation and revision of the programmes identified in the LTS. In a detailed LTS version, this process could be coupled with a governance framework for inter-ministry coordination, for example to strengthen sector-coupling and facilitate dialogue and interactions between German ministries.</p> <p><i>Source: https://unfccc.int/documents/181390</i></p> |



Theoretical long-term scenario analysis

Long-term scenario analysis on GHG emission pathways until 2050 can provide a theoretical underpinning to inform a country's long-term vision. Policy makers can use this scenario analysis to set a vision for achieving full decarbonisation across all sectors and perform analysis to evaluate whether the vision is compatible with the Paris Agreement's temperature limit. The analysis can also directly inform the GHG and non-GHG target setting in line with developed scenarios (see Section 2.3.3).

GHG emission pathways can provide a clear indication of where each sector is heading towards and allow stakeholders to develop a common understanding on the long-term perspective. The inclusion of theoretical Paris Agreement-compatible pathways in an LTS document can be an important factor to trigger the radical rethink that is required across the economy. The technical and financial resources available to governmental agencies and researchers for scenario modelling critically determine a country's capacity to develop such analytical inputs as part of its LTS development.

Scenario modelling can also be closely interlinked with assessments of technological solutions on a sectoral level (see Section 2.3.6), especially for countries that have limited capacities for ambitious decarbonisation efforts. An informative process involving policy makers, sector experts, and modelers can identify technological options and respective cost considerations to inform different long-term sector pathways. This can include pathways informed by currently implemented policies and more ambitious scenarios, for example by highest plausible ambition scenarios.

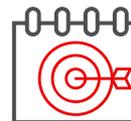
Table 3 presents a differentiated approach to develop theoretical long-term scenario analyses on GHG emission pathways accounting for country-specific circumstances and provides examples of countries that have submitted LTSs as of May 2020.

The Annex of this guide further introduces the concept of updating the theoretical long-term scenario analyses over time, for example by updating emission pathways in five-year intervals based on latest technological, economic, and social developments. Figure 5 in the Annex illustrates in a stylized manner how a country can develop long-term scenario pathways in 2020 and subsequently update them before 2025, in time to inform the next NDC review and revision cycle of 2025.



Table 3
Differentiated approach to theoretical long-term scenario analysis

|  | Theoretical long-term scenario analysis |
|---|---|
| Base Version | <p>Acknowledgement of scientific findings</p> <ul style="list-style-type: none"> » Review of available (country-specific) literature and findings by the IPCC as starting point for exchange on long-term scenarios » Acknowledgment of scientific findings (e.g. need of net-zero CO₂ emissions by 2050 or shortly thereafter) for country's long-term modelling with transparent identification of currently existing knowledge gaps » Consultative process by researchers and policy makers to determine next steps and support needs for future analysis |
| Intermediate Version | <p>First estimate of Paris Agreement aligned scenarios</p> <ul style="list-style-type: none"> » Initial (country-specific) economy-wide aligned scenarios developed with some focus sectors covered in more detail » Remaining uncertainty of obtained results due to the need for modelling improvements (e.g. limited number of modelling runs, missing data inputs, limited peer-review, etc.) might make results highly indicative » Cooperative process by researchers and policy makers to develop scenarios, determine next steps, and identify additional support needs |
| Detailed Version | <p>Country-specific Paris Agreement aligned scenarios</p> <ul style="list-style-type: none"> » Country-specific aligned scenarios developed for all sectors and economy-wide scenarios (aggregated across sectors) » Robust methodologies and models applied and in-depth (peer) review » Cooperative process by researchers and policy makers to co-develop scenarios and to validate key inputs, assumptions and results |
| Real-world example | <p>Example for 'detailed version' - Portugal's LTS</p> <p>Portugal's LTS acknowledges the latest science and references the Paris Agreement temperature limit and the IPCC Special Report on 1.5°C, which both frame the need for full decarbonisation by 2050. The economy-wide scenarios behind the LTS were developed in iterative phases, gathering contributions from and peer-reviewing of various national institutions and experts, for instance through technical workshops on assumptions and trends.</p> <p>The process resulted in three comprehensive scenarios encompassing all sectors, tailored to country-specific circumstances and based on robust methodologies (e.g. 2006 IPCC guidelines) and models (e.g. the TIMES_PT optimisation model for the energy sector or GEM-E3_PT, a dynamic, general equilibrium recursive model aggregating all sectors across the economy). In a final step, a draft of the LTS underwent a three months consultation process to engage stakeholders in a series of events and gather feedback.</p> <p><i>Source: https://unfccc.int/sites/default/files/resource/RNC2050_EN_PT%20Long%20Term%20Strategy.pdf</i></p> |



Long-term GHG and non-GHG target(s)

Long-term targets provide an opportunity for countries to communicate their commitments by mid-century in a transparent and quantifiable way. Such long-term targets generally constitute the headline component of an LTS. Policy makers have the option to include both GHG and non-GHG targets in an LTS, which can be set at a sector-level or economy-wide.

Long-term GHG targets constitute commitments to GHG emission reductions within a country's jurisdiction beyond 2030, for example a x% reduction of economy wide GHG emissions by 2050 compared to a 2015 base year. Countries can define GHG targets both on a sectoral level as well as for economy-wide emissions. GHG emission targets can generally be informed by and even directly derived from theoretical scenario modelling (see Section 2.3.2).

Long-term non-GHG targets represent commitments to reach specifically defined levels of climate action that can be closely linked to the decarbonisation of sectors, for example renewable energy and energy efficiency targets, deforestation bans, or the phase-out of fossil-fuel based technologies by a specific year.

Countries face different starting points as to which long-term targets already exist, the political consensus to formulate new targets beyond 2030, and the process/political willingness to enshrine these targets in legally binding legislation. For these reasons, Table 4 outlines a differentiated approach to include long-term GHG and non-GHG targets in an LTS and provides an example of a country that has submitted an LTS as of May 2020.



Table 4
Differentiated approach to include long-term GHG and non-GHG target(s) in an LTS

|  | Long-term GHG and non-GHG target(s) |
|---|--|
| Base Version | <p>Statement of intention to fully decarbonise</p> <ul style="list-style-type: none"> » Inclusion of currently existing long-term targets (both enshrined in legislation and not) that support the transition to a decarbonised economy » Opportunity for countries to include additional intentional targets (based on theoretical scenario modelling if available), for example by acknowledging a country's general intention to achieve net-zero CO₂ emissions by 2050 and net-zero GHG emissions by 2070 » Option to transparently explain a country's intention to formalise GHG and non-GHG targets going forward |
| Intermediate Version | <p>Indicative targets, but not enshrined in national policy</p> <ul style="list-style-type: none"> » Identification of targets that support the transition to a decarbonised economy, but have not been included in legally binding national policy » Such targets ideally would include an indicative economy-wide GHG emissions target, for example a net-zero CO₂ emissions target for 2050 » Such indicative GHG emission targets can generally be informed by and even directly derived from theoretical scenario modelling (see Section 2.3.2) » Such indicative and non-binding targets provide a clear indication on the country's long-term vision, even if countries do not want to commit to such targets in a legally binding way due to country-specific circumstances |
| Detailed Version | <p>Targets enshrined in national policy</p> <ul style="list-style-type: none"> » Identification of targets that are or will be enshrined in national policy » Such targets ideally include legally binding economy-wide GHG emissions target, supported by specific sector-level GHG emission targets » Such GHG emission targets, enshrined in national policy, can generally be informed by and even directly derived from theoretical long-term scenario modelling (see Section 2.3.2) » Non-GHG targets can further supplement these national-level and sector-level GHG emission targets, for example targets for coal and fossil fuel phase-outs or renewable and energy efficiency targets |
| Real-world example | <p>Example for 'detailed version' - UK's LTS</p> <p>The UK's LTS is based on existing legislation such as the Climate Change Act (2008), which commits the UK government by law to reduce greenhouse gas emissions. In parallel to the LTS, the 80% reduction target by 2050 was amended in June 2019 to "at least 100% of 1990 levels (net zero) by 2050".</p> <p>The Act includes the setting of sectoral carbon budgets to be revised by the Secretary of State every four years. It is noteworthy to mention that while the long-term mitigation target was amended, the carbon budgets are still based on the previous target of an 80% reduction. The Act led to non-GHG targets, most notably UK's coal phase-out by October 2014.</p> <p><i>Source: https://unfccc.int/documents/65798</i></p> |



Sectoral coverage

LTSs ideally encompass all sectors of the economy as specified in the IPCC reporting framework, including international aviation and maritime shipping as international bunkers if possible. Given country-specific circumstances, countries might opt to focus on certain key sectors given their relevance or existing knowledge gaps. Table 5 introduces a differentiated approach for the sectoral coverage of an LTS and provides an example of a country that has submitted an LTS as of May 2020.

Table 5

Differentiated approach for sectoral coverage in an LTS

|  | Sectoral coverage |
|---|---|
| <p>Base Version</p> | <p>Focus sectors</p> <ul style="list-style-type: none"> » Focus sectors are covered and existing knowledge gaps for further improvements are identified » Other sectors can be covered to the degree possible, for example based on limited already existing analysis |
| <p>Intermediate Version</p> | <p>Focus sectors with other sectors in lesser detail</p> <ul style="list-style-type: none"> » Focus sectors are covered in detail » Other sectors are covered in lesser detail, for example as more detailed (underlying) analysis might not be available given existing knowledge gaps or lack of available resources at time of an LTS development |
| <p>Detailed Version</p> | <p>All sectors in detail</p> <ul style="list-style-type: none"> » All sectors of the economy are covered in detail, including international aviation and maritime shipping » If considered useful, countries can additionally emphasise certain sub-sectors that are particularly relevant in each country's context |
| <p>Real-world example</p> | <p>Example for 'base version' - Marshall Islands' LTS</p> <p>While most of the LTSs submitted to the UNFCCC by May 2020 include all sectors (generally split as the energy supply sector, transport, buildings, agriculture, land use and forestry, industry and waste sectors), the Marshall Islands' LTS breaks national emissions down to four focus sectors: electricity; transportation (land and sea); waste; and cooking & lighting.</p> <p>The LTS emphasises the need for further assessment, e.g. through surveys, to better understand emissions sources. The LTS leaves out international transportation and explicitly aims to better understand the housing sector, beyond emissions from cooking and lighting.</p> <p>Source: https://unfccc.int/documents/182635</p> |



Link to immediate steps and interim targets (NDC)

Beyond providing a long-term perspective, LTSs can be used to inform target setting in the medium-term and define necessary steps in the short-term to put a sector or the economy on a pathway towards decarbonisation. Without explicitly linking the country's long-term vision with specific targets and actions in the short and medium-term, LTSs run the risk of becoming yet another visioning exercise that is not mainstreamed into policy and implementation planning. In addition, immediate and short-term interventions which align with the long-term vision are likely to save costs and resources later on.

The long-term vision can inform short- and medium-term targets through a back-casting approach. For example, long-term GHG emission pathways can inform the target setting for 2030 that would be in line with long-term GHG emission targets (see Section 2.3.3), including full decarbonisation by 2050 or shortly thereafter. Such back-casting to inform target setting can be done both at an economy-wide and sectoral level. The back-casting approach generally requires a country's long-term vision, contained in the LTS, be developed before or (at least) in parallel to the NDC.

In many countries, LTSs for submission in 2020 or shortly thereafter will not be developed in time to inform the revision of NDCs to be resubmitted to the UNFCCC in 2020, as mandated by the Paris Agreement. In such cases, policy makers can transparently explain their intention to (better) inform medium-term targets in NDCs and short-term actions in future revisions going forward.

The extent to which, and the way in which, LTSs inform (or even identify) immediate next steps crucially depends on what other short- or medium-term climate planning processes exist in the country. The LTS should generally inform any such processes while (ideally) not duplicating any existing ones. The LTS could potentially be a place to identify actions in the exceptional case that other (sector-level) climate planning processes do not exist, despite not being its main objective. Table 6 summarises key messages on informing NDCs and immediate steps by a country's long-term vision and provides an example of a country that has submitted an LTS as of May 2020.



Table 6
Differentiated approach to Link to immediate steps and interim targets (NDC)

|  | Link to immediate steps and interim targets (NDC) |
|---|---|
| Base Version | <p>Reflection on enhanced alignment of medium-term targets (NDCs) and short-term actions with the country's long-term vision</p> <ul style="list-style-type: none"> » Using LTS to inform medium-term targets in the NDC and immediate action presents an opportunity to better align short-, medium- and long-term planning |
| Intermediate Version | <ul style="list-style-type: none"> » For this purpose, policy makers can apply a back-casting approach to inform the target setting for 2030 in line with pathways to full decarbonisation by 2050 or shortly thereafter » Countries can start to inform medium-term targets for some focus sectors of particular relevance in country-specific contexts in the beginning, for example by setting medium-term targets for some focus sectors directly informed by the pathways identified by the LTS long-term vision |
| Detailed Version | <ul style="list-style-type: none"> » Policy makers can also opt to transparently state their intention to better align the LTS with medium-term targets in NDC and short-term steps in future revisions |
| Real-world example | <p>Example for 'detailed version' - Fiji's LTS</p> <p>Fiji's LTS builds onto existing mitigation and adaptation actions that are being undertaken by the Fijian government. In this context, the LTS is seen as a "a key tool, a guiding light, and a fundamental pillar" to inform, enhance and raise ambition of future NDCs. The LTS provides emission targets in five-year intervals between 2020 and 2050 in all scenarios developed in the LTS process. A key pillar of Fiji's LTS is to reflect on immediate, short-, medium- and long-term priority actions informed by long-term pathway scenarios. The LTS sets "both economy-wide and sector-specific development targets" linked to Fiji's NDC, which spans from 2017 to 2036 (see Table 2 of the LTS).</p> <p>The LTS's Annex further provides a long list of policy actions by sector. For each policy action, the LTS defines an implementation timeframe, a main implementing institution, an approximation of finance required and the long-term scenario the policy related to. A further step would be to settle on a long-term scenario and develop actionable immediate, short- and medium-term policies.</p> <p><i>Source: https://unfccc.int/documents/193323</i></p> |



Mobilisation of finance and technology

Whilst an LTS should not be treated as an investment plan or proposal to access financial support, it can be used to communicate how much financing and other (technological) support a country requires in addition to domestic resources. The Paris Agreement foresees that all countries pursue an ambitious low-emissions development path. The Paris Agreement sets out equity considerations in the principle of “common but differentiated responsibilities” (Art 4 § 3). Countries with, for example, higher capacities and more responsibility due to higher historical emissions need to support those with lesser means to achieve accelerated decarbonisation. At the same time, all countries could redirect their spending of fiscal revenues and other resources towards low emissions development.

In this context, policy makers can proactively identify key fields of action for the mobilisation of finance and technology in line with pathways of accelerated mitigation ambition. The approach outlined in the following aims to provide some key considerations to structure this process.

1 Identification of national capabilities to mobilise finance and technology

The identification of a country's capabilities and capacities to mobilise finance and technology requires in-depth sector-level analysis, generally to be conducted by sector ministries together with sector experts. This analysis supports policy makers in identifying available domestic resources to foster sectoral transitions towards decarbonisation. Such assessments can ideally be combined with the theoretical long-term scenario analysis (see Section 2.3.2). An informative process involving policy makers, sector experts, and modelers can identify technological options and respective financing to inform long-term sector pathways and actionable next steps going forward. Such analysis should regularly be revisited and updated given accelerated technological innovation and other trends over time.

2 Specifying key fields of action to address barriers for accelerated sector transitions

Based on the above, policy makers can determine key fields of action in each sector to mobilise technological solutions and financing to address existing barriers to accelerated sector transitions. These key fields of action link the long-term vision to short- and medium-term action on the ground to enable accelerated climate action. Policy makers can transparently outline how domestic spending of fiscal revenues and other resources will be redirected to successfully deploy identified technologies and develop necessary human and institutional capacities.

3 Communication of international support needs beyond domestic capabilities

For many countries, domestically available financial resources and technological solutions remain inadequate to implement the key fields of action in each respective sector. Policy makers can thus opt to transparently communicate support needs to the international community based on the underlying analysis above. The communication of such international support needs directly linking to key fields of action enables international donors to understand (1) where exactly international support is required to complemented domestic efforts and (2) how such (short- and medium-term) support enables a country's long-term vision.

The coverage of aspects related to finance and technology in an LTS can be rather concise and driven by country-specific circumstances. Policy makers can opt to mainly focus on most relevant messages for each sector. Table 7 summarises key points on the coverage of finance and technological in an LTS and provides an example of a country that has submitted an LTS as of May 2020.



Table 7
Differentiated approach to address finance and technology (support) needs in an LTS

|  | Mobilisation of finance and technology |
|---|---|
| Base Version | <p>Reflection of improved understanding on mobilisation of domestic and international finance and technology resources over time</p> <ul style="list-style-type: none"> » Opportunity to transparently communicate how much international financing and other (technological) support a country requires in addition to the contribution of domestic resources |
| Intermediate Version | <ul style="list-style-type: none"> » Aspects related to finance and technology covered in an LTS can reflect the current state of knowledge on key fields of actions to address barriers to accelerated sector transitions in a country-specific context » Regularly updated analyses might enable policy makers to better communicate a country's support needs beyond domestic capabilities to the international community |
| Detailed Version | <ul style="list-style-type: none"> » Policy makers can opt to closely interlink the theoretical long-term scenario analysis with assessments on finance and technology required for pathways of accelerate mitigation ambition |
| Real-world example | <p>Example for 'detailed version' - Costa Rica' LTS</p> <p>Costa Rica' LTS includes seven cross-sector strategies, of which two strategies aim to mobilise and allocate funds in support of the country's decarbonisation pathway. Strategy B aims to elaborate and implement a domestic "Green Tax Reform" to be led by the Ministry of Finance. The reform will be designed to mobilise new revenue sources for the transport sector transition with a focus on taxing negative externalities along the following three steps: (1) a comprehensive analysis of the tax system and tax charges, (2) the implementation of carbon pricing schemes and, and (3) the elimination of fossil fuel subsidies.</p> <p>Strategy C, to be led by several Ministries such as the Ministry of Foreign Affairs and the Ministry of Foreign Trade of Costa Rica (COMEX), will focus on mobilising national and international fund from both public and private sources, for example through integrated strategies to access climate facilities financing such as the Green Climate Fund. In a first step, Costa Rica agreed on a USD 230 million loan with the Inter-American Development Bank to implement NDC and LTS policies that support the country's sustainable development strategy (IDB, 2020).</p> <p>Source: https://unfccc.int/documents/193323</p> |



Sustainable development and just transition

Policy makers should aim to enhance the alignment of the country's long-term vision with the nationally articulated Sustainable Development Goals (SDGs) and address questions around Just Transition (JT) for affected communities. Whilst an LTS generally centres around long-term decarbonisation pathways and respective targets³, these need to reflect country-specific adaptation challenges, ensure development objectives can be met, and potential trade-offs be minimised or managed accordingly. The following explanations within the scope of this guide represent initial thoughts that will need to be further elaborated in future work, also after reviewing the first round of LTSs submitted in 2020 or shortly thereafter.

The mainstreaming of a country's sustainable development agenda into climate policy and medium-term targets (NDCs) has been intensively discussed at the international and national levels in recent years (Gonzales-Zuñiga et al., 2018). In a similar manner, policy makers can proactively approach the mainstreaming of domestic sustainable development considerations into a country's long-term vision. In this context, the LTS can elaborate on (1) the current status quo of mainstreaming a country's sustainable development agenda, (2) key considerations to ensure further alignment in the future, and (3) central methods and processes to track and evaluate progress towards SDGs.

In the context of accelerating sector transitions toward decarbonisation, Just Transition (JT) strategies for affected communities become highly relevant for forward-looking policy making. Such strategies can be understood as a package of policies and actions aimed to anticipate potential negative impacts of climate action on employment, protecting and even improving workers' livelihoods (health, skills, rights), and supporting their communities (Rosemberg, 2017, 2019; Glynn, Błachowicz and Nicholls, 2020). A country's LTS provides the opportunity to transparently outline (1) key considerations for targeted interventions, (2) anticipated labour market

policies and social protection, and (3) required platforms for social dialogue such as a multi-stakeholder commission for managing a coal phase-out. While the development of Just Transition (JT) strategies itself remains beyond the scope of an LTS process, the LTS can build up on currently ongoing initiatives and identify areas for Just Transition (JT) strategies in the context of a country's long-term vision.

The coverage of aspects related to sustainable development and just transition strategies in an LTS can be rather concise and driven by country-specific circumstances. Policy makers can opt to mainly focus on key aspects considering the mainstreaming of a country's sustainable development agenda and Just Transition (JT) strategies. Table 8 summarises key messages on these aspects and provides examples of countries that have submitted LTSs as of May 2020.

³ Please note that this is the author's interpretation considering that LTS play a vital role in reaching the temperature goals of the Paris Agreement although not explicitly part of the 'ambition mechanism' (Roeser, 2018; Roeser, Höhne and Kahlen, 2019).



Table 8

Differentiated approach to address sustainable development and just transition aspects in an LTS

|  | Sustainable development and just transition |
|---|--|
| Base Version | <p>Reflection of improved mainstreaming of sustainable development agenda and just transition considerations</p> <ul style="list-style-type: none"> » LTSs can reflect on the mainstreaming of a country’s sustainable development agenda into their long-term vision for decarbonisation and related just transition strategies for affected communities |
| Intermediate Version | <ul style="list-style-type: none"> » As for the sustainable development agenda, policy makers can elaborate on key considerations to ensure and enhance the alignment of SDGs with a country’s long term-vision and methods/processes to track and evaluate progress towards SDGs |
| Detailed Version | <ul style="list-style-type: none"> » As for just transition strategies, policy makers can transparently outline key considerations for targeted interventions, anticipated labour market policies and social protection measures, and required platforms for social dialogue (e.g. a multi-stakeholder commission for managing a coal phase-out) |
| Real-world example | <p>Example for ‘intermediate version’ - Costa Rica’s LTS</p> <p>Costa Rica’s LTS includes seven cross sector strategies. Strategy E, to be led by the Ministry of Labour, specifically addresses labour strategies to support a “just transition”. The LTS acknowledges that the decarbonisation of the economy will impact economic sectors and the labour markets associated with them and highlights the need of processes to adapt to the opportunities and challenges accompanying the transition. Strategy E starts with a scoping exercise to identify international best practices of just transition processes applicable to Costa Rica. It further aims to elaborate a funding strategy to support intervention and communication strategies in those sectors most affected.</p> <p>Source: https://unfccc.int/documents/204474</p> |



Outlook

The differentiated approach to develop a country's LTS set out in this guide fundamentally builds on the concept of future LTS revisions over time. LTSs for submission in 2020 or shortly thereafter might already reflect a currently existing consensus on a country's long-term vision among stakeholders and the current state of knowledge to the highest degree possible. Existing limitations in some countries on technical and financial resources available for in-depth thematic analyses, scenario modelling, political coordination and stakeholder consultations, or a limited political mandate might make a future revision indispensable. Future LTS revisions can address the potential shortcomings of an earlier submission while taking account of most recent societal, technological, and economic developments that allow to keep a country's long-term vision up to date.

For these reasons, policy makers can opt to transparently communicate their intention to further develop and update their LTSs over time. In addition, countries have the opportunity to communicate any support needs for future revision, for example supported training to enhance domestic scenario modelling capacities. Table 9 summarises these key aspects on future revisions and provides examples of countries that have submitted LTSs as of May 2020.

Table 9

Providing an outlook for future LTS revisions and (potential) support needs

|  | Outlook |
|---|---|
| Base Version | <p>Transparent communication of intention to further develop LTS over time and of additional international support needs required</p> <ul style="list-style-type: none"> » Policy makers can transparently communicate a country's intention to further develop and update a country's LTS going forward, for example in five-year intervals ahead of NDC revisions |
| Intermediate Version | <ul style="list-style-type: none"> » Such communication can even emphasis focus areas for further improvements in a next revisions cycle |
| Detailed Version | <ul style="list-style-type: none"> » Countries facing limitations in technical and financial resources for analyses additionally have the option to specify international support needs for future revisions beyond domestic capabilities |
| Real-world example | <p>Ukraine, the Republic of Marshall Islands, France and Czech Republic's LTS</p> <p>The LTSs of Ukraine, the Republic of Marshall Islands and France all include statements of intentions to review and revise their LTSs at least every five years. The proposed frequency of updates in five-year intervals corresponds to the NDC revision cycles mandated by the Paris Agreement. The Czech Republic's LTS explicitly aims to (re-)evaluate its long-term vision by the end of 2021 to publish a revised LTS by the end of 2023.</p> <p>Source: https://unfccc.int/documents/181275 (Ukraine) Source: https://unfccc.int/documents/182635 (Marshall Islands) Source: https://unfccc.int/documents/181284 (France) Source: https://unfccc.int/files/na/application/pdf/cze_climate_protection_policy_summary.pdf (Czech Republic)</p> |

3 SUPPORTING THE DEVELOPMENT OF FUTURE LTS REVISIONS

This document provides guidance for navigating the exercise of developing an LTS for the very first time, to respond to the call of the Paris Agreement to do so by 2020. Moving ahead, there is ample scope for further work at the international level to provide more clarity on the future role of the LTS within the framework of the Paris Agreement, and to improve the enabling conditions for LTS development. Such steps could better support countries to build upon and improve their LTS planning, and to embed such planning into a continuous and iterative process.

The international community could set clearer guidance on the revision cycles for LTS, beyond a first submission in 2020. The current lack of clarity on the role of LTS in the future might already lead to the outcome that some countries approach the LTS development process in 2020 or shortly thereafter as a one-off exercise, potentially limiting the efforts invested to ensure it is embedded and aligned with other climate change and sector development planning processes. Although this guidance document has outlined the advantages of establishing the LTS as an iterative process and aligning that process with other climate change planning processes such as the NDC revision cycle, there is currently no mandate from the international level to encourage countries to structure their processes this way. As countries attempt to consolidate and align their various climate and sector development planning processes for the years ahead, this remains an uncertainty that is not conducive to those consolidation efforts, or even undermines them. The Conference of Parties and the UNFCCC Secretariat could take note of the various existing inputs, including this guidance document, to set clearer guidelines that would provide countries with the clarity that is required to setup a continuous and iterative LTS process in the most advantageous way.

An online platform could track and share experiences on the approaches that countries use to address the various components of their LTSs. Section 2.3 outlines some of the key components of an LTS and shows how these components could be approached in different ways, according to the circumstances and capabilities of individual countries. A platform or registry which would share objective information about the approaches that countries have taken to address these components could be very useful for countries to better understand how they can build on and improve their current LTS processes.

Further research and dialogues should collect experiences and lessons learnt from this first round of LTS development, in order to generate further insights on the role of the LTS for national climate policy planning. In particular, the issues of the link to immediate steps and interim targets (i.e. the NDC) (Section 2.3.5), the link to mobilize finance and technology (Section 2.3.6), and the link to sustainable development and just transition (Section 2.3.7) could benefit from further practical experiences and lessons learnt. This way, policy makers might be able to better determine the most advantageous way LTSs could link to these different issues in future iterations. In addition to continued research efforts, such experience sharing could take the form of global or regional peer-exchange platforms between national climate change focal points and planners.

Given the considerable scope for sharing new experiences and lessons learnt in the year ahead, during and after the first round of LTS development, the guidance in this document should be understood as evolving; developments along the three action areas highlighted above would allow for such a guidance to be updated and to provide even more clarity on countries' options for embedding their iterative LTS processes in their post-2020 climate policy planning.

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ANNEX

Section 2.3.2 introduces the concept of updating a country's theoretical long-term scenario analyses over time based on latest technological, economic, and social developments. For example, policy makers in close cooperation with sector experts and modelers can update long-term emission pathways in five-year intervals for future revisions of LTS documents over time. Figure 5 of this Annex illustrates in a stylised manner how a country can develop long-term scenario pathways in 2020 and subsequently updated these before 2025, in time to inform the next NDC review and revision cycle of 2025. A subsequent update could then take place before 2030 to inform the NDC review and revision cycle of 2030 (not displayed in this figure).

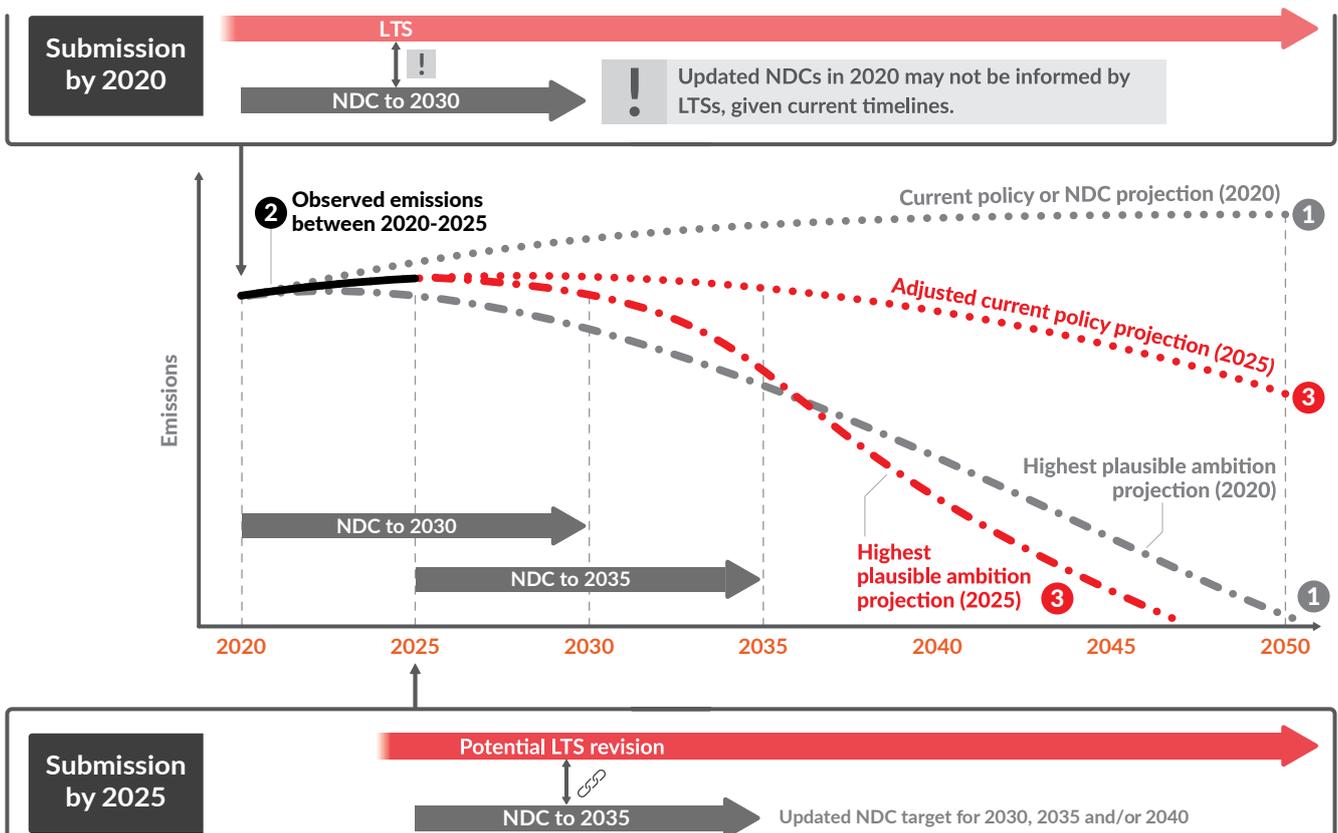


Figure 5
Updating the theoretical scenario modelling over time in line with harmonised revision cycles

- 1** **First scenario modelling in 2020** (grey lines in graph):
A first theoretical scenario modelling is conducted in 2020 for both a current policy scenario and highest plausible ambition scenario, ideally informed by a process involving policy makers, sector experts, and modelers. Policy makers can include other scenario types such as a realistic unilateral ambition scenario as well (not displayed in this figure).
- 2** **GHG emissions pathway between 2020 and 2025** (black line in graph):
The observed GHG emissions between 2020 and 2025 reflect the level of mitigation ambition implemented in the short-term. These observed emissions between 2020-2025, as stylized here, might be above a highest plausible ambition scenario given the challenges to effectively adjust (sector-level) planning, redirect spending of fiscal revenues, and deploy low-carbon technologies to the highest extend possible in the given time frame.
- 3** **Updated scenario modelling in 2025** (red lines in graph):
After five years, the updated theoretical scenario modelling in 2025 can account for latest technological, economic, societal, and policy developments. Both the current policy scenario and highest plausible ambition scenario can thereby include most recent developments in technological innovation, spill-over effects from other countries (cost reductions for low-carbon technologies for example), past finance “bending” the curve through (sectoral) transformation effects, and higher level of mitigation ambitions considered realistic.

BACKGROUND OF THIS WORK

This guidance provides recommendations to policy makers on how to approach the development of a long-term low greenhouse gas emission development strategies (LTS). The guidance is an output of the Capacity Development for Climate Policy programme implemented by GIZ and NewClimate Institute, with the support of the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

This guidance document forms part of a series of outputs from the Capacity Development for Climate Policy (CDCP) programme, which aims to provide practical advice to climate change planning and policy makers, related to various aspects of the climate change planning process at the national level.

Figure 6 provides an overview of the series of guidance documents and tools for climate change planning processes, which this document relates to.

Guidance outputs for national climate planning processes

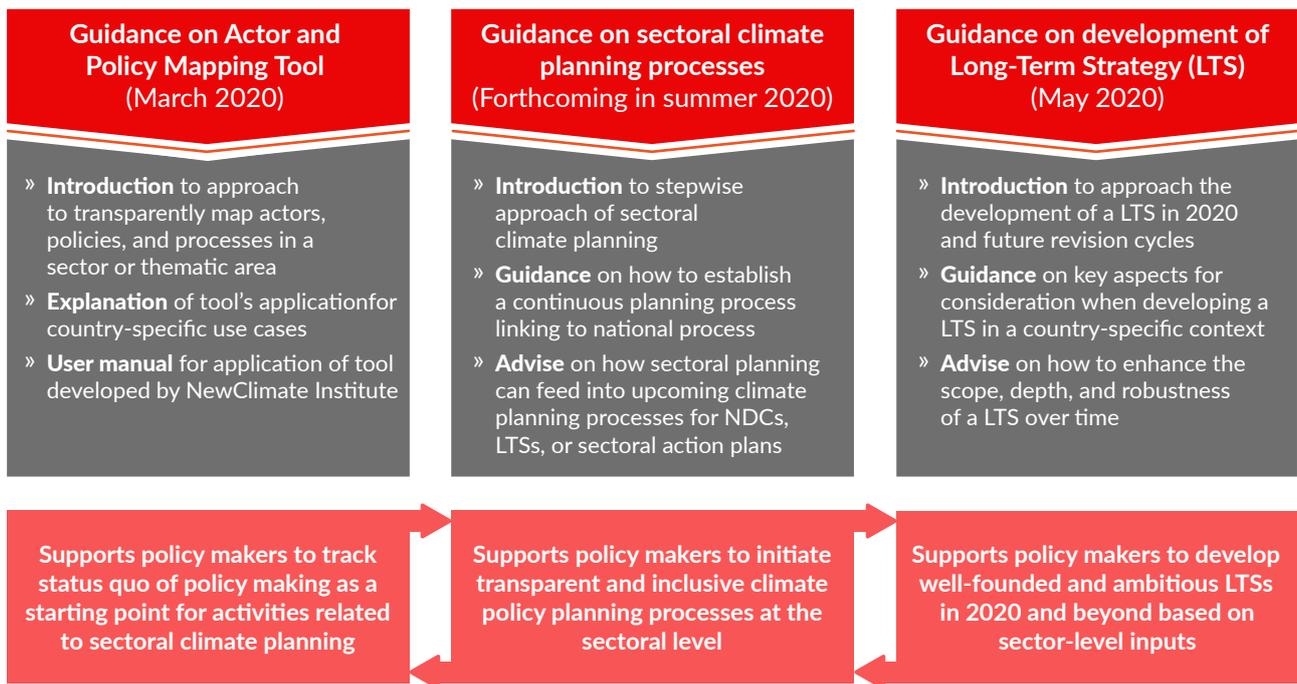


Figure 6
Overview of CDCP guidance for national climate change planning processes

Further information related to the other outputs in this guidance document series, and the broader activities of the Capacity Development for Climate Policy (CDCP) programme, can be found on the following webpages:

- » Project webpage on the homepage of the International Climate Initiative (IKI): [here](#)
- » Project webpage on the homepage of GIZ: [here](#)
- » Project webpage on the homepage of NewClimate Institute: [here](#)

On behalf of:



of the Federal Republic of Germany

