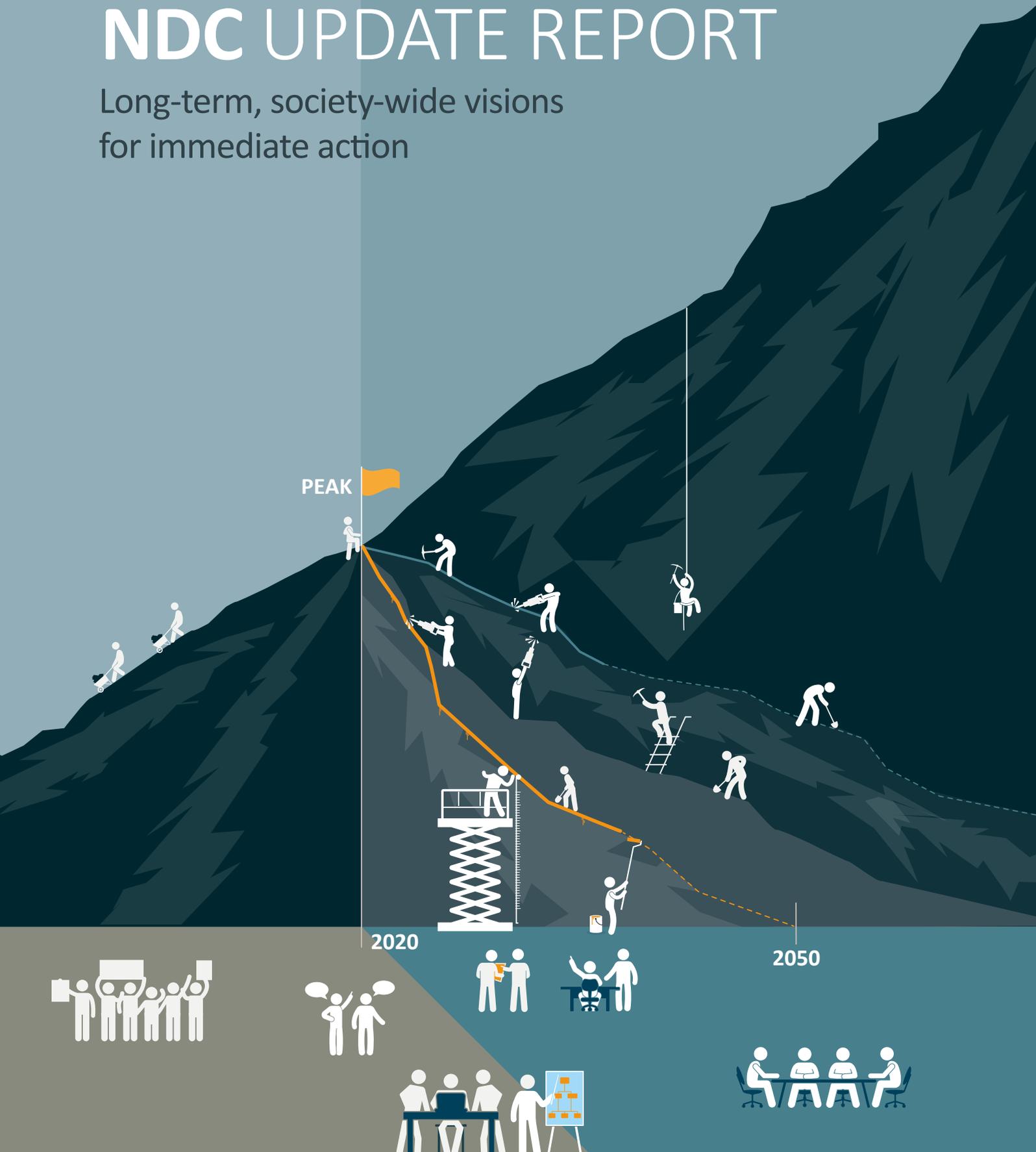


November 2019

NDC UPDATE REPORT

Long-term, society-wide visions
for immediate action



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Supported by



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

based on a decision of the German Bundestag

Executive summary

As the current decade draws to a close, we can safely say that climate change has arrived front and centre in policy debates around the world. Now, four years on from the 2015 landmark Paris Agreement, we are still trying to catch up with the reality of the task ahead. Last year's IPCC Special Report on Global Warming of 1.5°C concludes that the Paris Agreement's goals are still within reach, but that time is running out and very deep emission reductions are needed in the coming decades. This urgency, combined with massive cost reductions in clean technologies and the groundswell of focused civil society pressure, could lead optimists to think that governments must be making long-term sector plans, reasoning backwards from net-zero emissions in 2050 and optimising co-benefits of mitigation.

This is not the case for many countries and sectors: we receive mixed signals about progress and confidence in NDC planning and implementation, and while awareness and momentum seems to be building, we often don't see the kind of orchestrated effort needed to manage the sector transitions ahead.

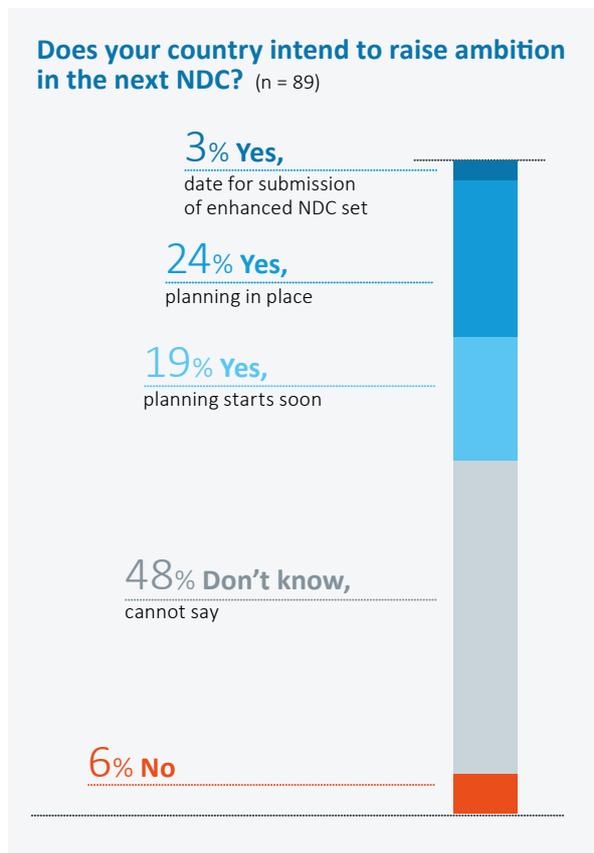
The theme of this report is the role of **long-term low greenhouse gas emission development strategies (LTSs)** in achieving the Paris Agreement goal. The report builds on our survey of 100 policy makers and experts involved in NDC planning and implementation, discussions with experts, own research and analysis. The report first looks at the current state of NDC planning and implementation, based on the survey results. Despite the fact that LTSs are mentioned in the Paris Agreement, and countries are expected to communicate one by the end of next year, there is little clarity on the concept. This report proposes a number of key ingredients of an LTS process and takes a closer look at what 'highest possible ambition' and 'Paris-compatibility' mean. The final part of the report includes contributions from a range of organisations involved in supporting NDCs, giving their view on the importance of LTSs to effectively address climate change.

This report argues for the importance of developing long-term (sector) strategies to determine the highest possible ambition for the coming NDC update (until 2030) and to signal a clear path for future NDC ambition raising (towards net-zero in 2050). The next round of NDCs, which are due in one year, need to be more ambitious in terms of targets, actions, and

process; and although it may not be feasible to commit to the highest possible ambition yet, governments can use the NDC update to signal that ambition raising is a continuous process in which a long-term strategy and vision guide subsequent NDC updates. Governments can use the NDC update to signal that indeed the highest possible ambition needs to lead to decarbonisation by 2050 or shortly thereafter.

THE NDC IMPLEMENTATION AND REVIEW CYCLE

A year before the first update of NDCs is due in 2020, there are several reasons to review and strengthen the current NDCs. We have a better understanding of what is required to reach the Paris Agreement goals, countries have had more time to prepare and consult stakeholders, spectacular advances in technologies and costs are taking place (e.g. solar photovoltaic), there is increasing clarity on the positive impacts clean technologies can have, and pressure from civil society calling on governments to take stronger action has never been so clear.



Based on the NDC survey undertaken during June - August 2019

DEVELOPMENT OF LTSs

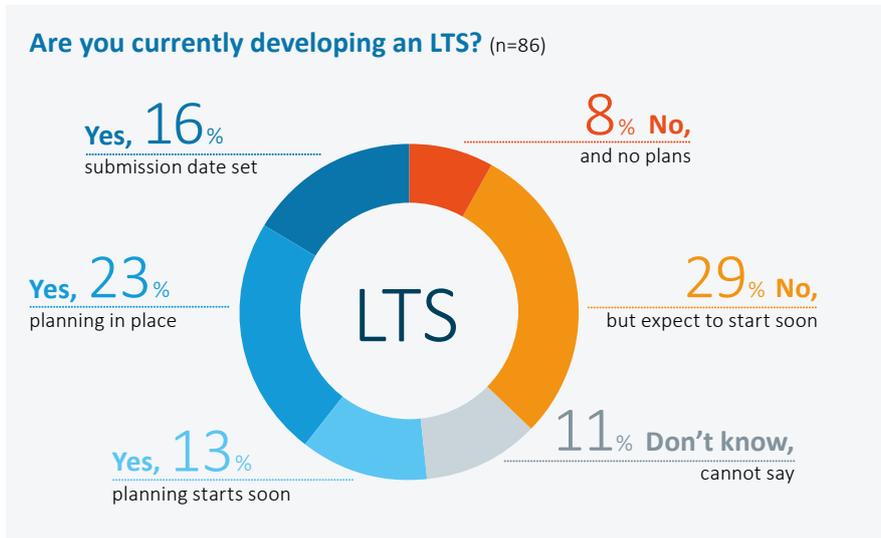
The Paris Agreement calls for “long-term low greenhouse gas emission development strategies” (LTSs) but gives little guidance beyond that. Few of these LTSs have been developed so far, and there seems to be a lack of common understanding of what the scope and format of an LTS should be. We propose eight key elements for LTS and LTS processes: 1) pay attention to the process more than the document; 2) include pathways for GHG emission until 2050 and beyond; 3) include all sectors of the economy; 4) treat process as ongoing visioning exercise; 5) expect extensive coordination efforts; 6) reflect on immediate next steps; 7) clarify how much financing and other support is required; 8) identify synergies and trade-offs with the 2030 Sustainable Development Goals and to adaptation.

We asked survey respondents about the progress their government has made towards developing an LTS, when they expect the LTS to be submitted, and whether this Strategy is (or will be) aligned with the goal of the Paris Agreement. More than half the respondents had not actually started the LTS process (though 13% expect to start soon) and some expect their country will not submit an LTS in 2020, as set out by the UNFCCC. Although LTSs are an integral part of the ambition mechanism, only 70% could confirm that their LTS is or will be consistent with the goal of the Paris Agreement.

When compared to earlier editions of the survey (this is the fourth) the results are remarkably consistent over time. Some of the answers are encouraging, such as the firm buy-in from the public sector, while other answers persistently show challenges such as with securing funding and getting buy-in from private sector stakeholders. Based on this year’s results, and in line with the November 2018 edition of this report, we draw the cautious conclusion that NDCs ambition raising is not yet established as a continuous process, and that LTS are still not a prominent feature of current NDC-related processes and their purpose and scope may not be well appreciated and understood. With the majority of respondents in early (planning) stages of LTS development timely delivery of robust, evidence based LTS looks difficult.

Looking at the survey results about implementing the **current NDC**, progress and confidence continue to be high for most topics, yet, ambitious NDCs still face challenges and will be hard to achieve without commitment and support from the private sector, and if government officials remain concerned about gaining such commitment and support, they may be more hesitant to put forward more ambitious plans.

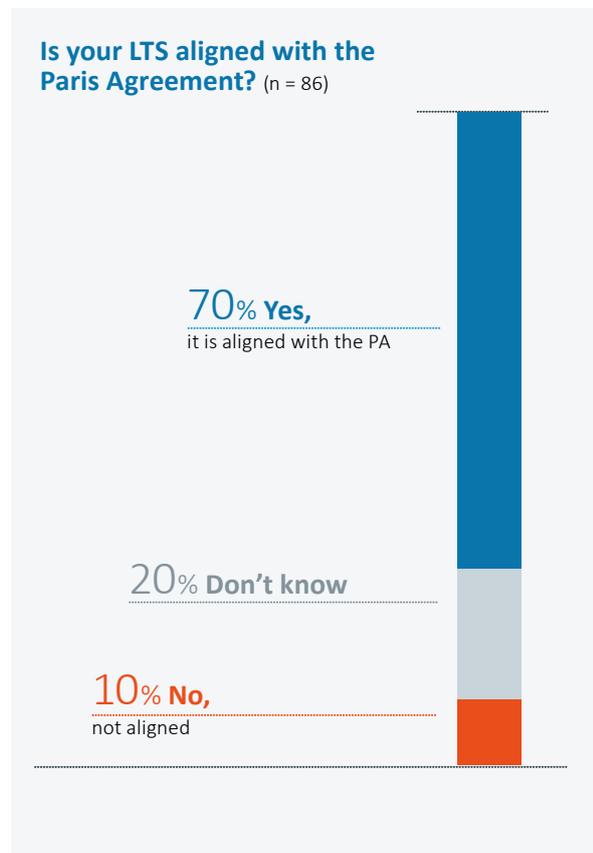
The survey results on the **next NDC** show that over half the respondents cannot (yet) provide clarity on whether their government intends to raise ambition in the update that is due next year. On the timing of submission, around 10% of respondents stated that their next NDC would be submitted within this year (2019), but the vast majority (almost 80%) stated they would submit it in 2020. When asked about the topics most pertinent in national discussions on ambition raising, this most often seems related to costs and economic consequences, while respondents indicate paying less attention to social and environmental benefits.



Based on the NDC survey undertaken during June - August 2019

ALIGNMENT OF LTSs IN THE CONTEXT OF THE PARIS AGREEMENT

In light of the IPCC findings, and the observation that not one sector or country is able to compensate for others, the common goal of net-zero in 2050 across countries and sectors should therefore determine what their 'highest possible ambition' could be. Here countries with lesser resources, capacities and historic responsibility need to be supported by others. As in previous editions of the report we argue that NDC strengthening and ambition raising should be seen as a continuous process. A continuous visioning exercise allows for technological changes and advances to be taken into account, thereby potentially lowering the overall resource efforts needed to achieve the long term goal. This makes sense for different reasons: Technologies that seemed out of reach yesterday may have reached sufficient market penetration or be available at accessible costs to make them realistic alternatives; change takes time for society to process and people to adjust, leading to confidence and higher ambition; early stage resource investments start to pay off.



Based on the NDC survey undertaken during June - August 2019



OVERVIEW OF SUBMITTED LTSS AND HIGHLIGHTS

At the time of writing, 13 LTSS had been submitted to the UNFCCC. While the content and process seems to vary greatly, common highlights can be seen for certain key elements. Stakeholder engagement and participatory processes are a key element of LTSS, most LTSS link to or plan the elaboration of national plans and regulations, a majority of countries present their LTS as “living documents” and although there are discrepancies in the understanding of Paris Aligned pathways, we see positive developments in countries aiming for net-zero emissions.

DEVELOPMENT AND IMPLEMENTATION OF LTSS FROM DIFFERENT PERSPECTIVES

We asked experts and organisations that are closely involved in supporting NDC and LTS planning and implementation to reflect on the role of LTSS in effective climate policy, and where they see challenges going forward.

Overall, seven organisations contributed to the debate from different angles on the development and implementation of LTSS. The first four contributions discuss 1) strengthening the link between the NDCs and LTSS with caution to take country context and -processes into account and not develop separate strategies (NDC Partnership); 2) early experiences of LTS development showing that NDC processes need to be carefully designed and executed, and that inclusiveness lends credibility (GIZ), 3) LTSS stand out for their long horizon and necessity for whole-of-government scope (UNDP) and that 4) transparency goes hand-in-hand with inclusiveness and governance of the LTS and the underlying process (WRI).

The following three contributions share the perspective of their respective sectors: 5) LTSS contribute in defining Paris Aligned investments and assess financial risks from adaptation, although the link between the two is often missing (AFD/IDFC), 6) the concept of Communities of Practice has proven to be useful in complementing conventional technical assistance in the energy sector (SD strategies/LEDS-GP) and the elaboration of four technology pathways is a useful tool to get stakeholders thinking and talking about transformations in the power sector (NREL/LEDS-GP) and 7) national governments are encouraged to consider the role of agriculture in their LTSS and consider the long-term interactions between agriculture, natural resources and sustainable development in light of the sector’s intricate links with food security and nutrition, poverty alleviation and rural development (FAO).

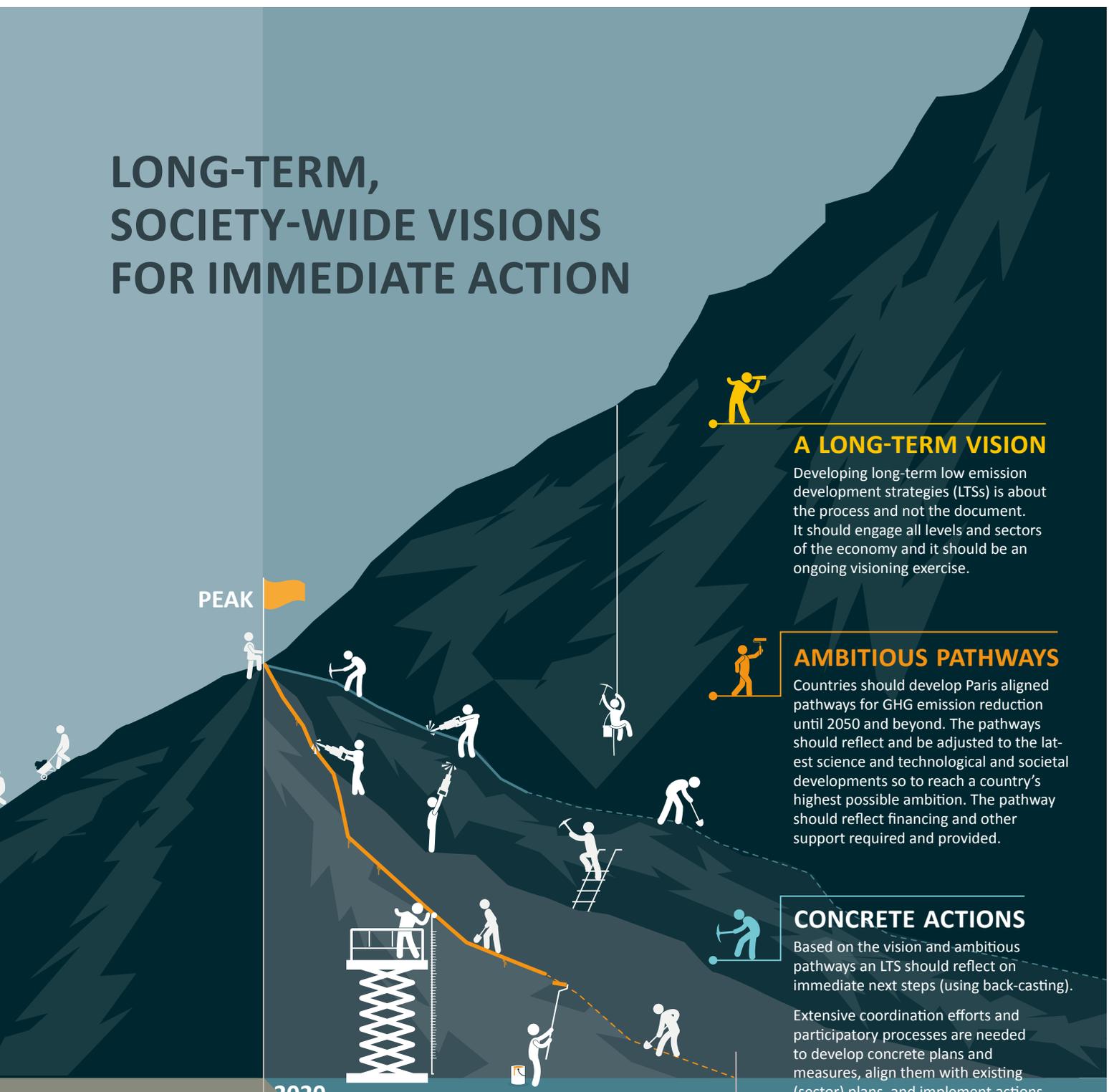


LTS

long-term low greenhouse gas emission development strategy



LONG-TERM, SOCIETY-WIDE VISIONS FOR IMMEDIATE ACTION



A LONG-TERM VISION

Developing long-term low emission development strategies (LTSs) is about the process and not the document. It should engage all levels and sectors of the economy and it should be an ongoing visioning exercise.

AMBITIOUS PATHWAYS

Countries should develop Paris aligned pathways for GHG emission reduction until 2050 and beyond. The pathways should reflect and be adjusted to the latest science and technological and societal developments so to reach a country's highest possible ambition. The pathway should reflect financing and other support required and provided.

CONCRETE ACTIONS

Based on the vision and ambitious pathways an LTS should reflect on immediate next steps (using back-casting).

Extensive coordination efforts and participatory processes are needed to develop concrete plans and measures, align them with existing (sector) plans, and implement actions.



LTSs are about the process and not the document

Include emission pathways until 2050 reflecting the (adjusted) highest possible ambition

Encompass all sectors of the economy

An LTS is an ongoing visioning exercise

Extensive coordination efforts and participatory processes

Reflect on immediate next steps

Clarify required financing and other support (if applicable)

Incorporate 2030 Sustainable Development Goals and reflect on adaptation challenges

ABBREVIATIONS

A2A	Ambition2Action
AFD	Agence Française de Développement
AFOLU	Agriculture, Forestry and Other Land Use
BECCS	Bio-Energy with Carbon Capture and Storage
CO₂	Carbon Dioxide
CoP	Communities of Practice
COP	Conference of Parties
DER	Distributed Energy Resources
DFI	Development finance institution
FAO	Food and Agriculture Organization of the United Nations
IAM	Integrated Assessment Model
IDFC	International Development Finance Club
IEA	International Energy Agency
INDC	Intended Nationally Determined Contributions
IPCC	The Intergovernmental Panel on Climate Change
G20	Group of Twenty
GHG	Greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
LEDS-GP	Low Emission Development Strategies Global Partnership
LTS	Long-term low greenhouse gas emission development strategy
LULUCF	Land Use, Land Use Change and Forestry
MRV	Measurement, Reporting and Verification
NDC	Nationally Determined Contribution
PA	Paris Agreement
SDGs	Sustainable Development Goals
T&D	Transmission and Distribution
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WRI	World Resource Institute

ABOUT THIS REPORT

This report is part of a series of biannual NDC Update Reports, published ahead of international climate change negotiations, presenting recent developments, analysis, opinion, and discussion pieces. Drawing on the Ambition to Action (A2A) project and insights from a wide range of climate change experts and practitioners, the reports aim to be a platform for learning, sharing insights, and discussing topics around the implementation of the Paris Agreement. The NDC Update Reports focus on mitigation ambition and action in developing countries and emerging economies (with an occasional look at industrialised countries for contrast or comparison). The reports offer a podium for the four working groups under the NDC Cluster to reflect on the topics covered in it from their perspective (sectors, financing, governance, and transparency).

ABOUT THE AMBITION TO ACTION PROJECT

This report is an output of the Ambition to Action project, which supports NDC implementation through technical assistance and thought leadership. The first phase of the project is implemented collaboratively by the Energy research Centre of the Netherlands (ECN part of TNO) and NewClimate Institute, over a three-year period until the end of 2019. Project funding is provided by the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU).

Ambition to Action’s technical assistance aims to support the mainstreaming of climate and development goals at the sector level, through the development of evidence on social, economic and environmental benefits of mitigation actions and pathways. This benefits evidence, for example detailing employment, energy security, and air pollution impacts, will show how sector planning decisions can support NDC implementation as well as national development priorities and can help reduce policy costs, identify trade-offs, and build stakeholder support for ambitious mitigation approaches at the sector level. Through a series of biannual reports (of which this is the sixth edition) and additional research papers, the project provides a platform for discussion, analysis, and sharing of lessons learned about NDC implementation in developing countries and emerging economies.

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1. INTRODUCTION

Last year’s IPCC Special Report on Global Warming of 1.5 °C concludes that the Paris Agreement’s goal of staying well below two degrees, pursuing efforts to keep 1.5°C, is still within reach, but that time is running out and very deep emission reductions are needed in the coming decades. This urgency, combined with massive cost reductions in clean technologies and the groundswell of focused civil society pressure, should be enough reason for strong action by all countries and in all sectors. At the Climate Action Summit in New York, earlier this year, 70 countries committed to more ambitious national climate plans, and although their governments may lead by example, they cover less than 10% of global emissions. With one year to COP26 in Glasgow, none of the large emitters have thus far committed to raising ambition.

Taking a closer look at NDC planning and implementation around the world reveals mixed signals about progress and confidence, and while awareness and momentum seem to be building, we don’t often see the kind of orchestrated effort needed to manage the sector transitions ahead; at the time of writing this report, only 13 Parties had submitted their long-term low greenhouse gas emission development strategies (LTSs) to the UNFCCC while every country is invited to communicate their long-term plans by the end of next year.

The theme of this report is the role of long-term strategies in achieving the Paris Agreement goal. Developing long-term (sector) strategies on national and sector level can help determine the highest possible ambition for the coming NDC update (until 2030) and signal a clear path for future NDC ambition raising (towards net-zero in 2050). Although it may not be feasible to commit to the highest possible ambition yet, governments can use the NDC update to signal that they treat ambition raising as a continuous process in which a long-term strategy and vision will guide subsequent NDC updates. Now is the time to determine what the highest possible mitigation ambition would be, what would enable that, and which challenges will need to be addressed.

The report builds on our survey of 100 policy makers and experts involved in NDC planning and implementation, discussions with experts, own research and analysis. The report first looks at the current state of NDC planning and implementation, based on the survey results (Chapter 2). Despite the fact that long-term strategies are mentioned in the Paris Agreement, and countries are expected to communicate one by the end of next year, there is little clarity on the concept. We propose a number of key ingredients of an LTS process (Chapter 3) and take a closer look at what ‘highest possible ambition’ and Paris-compatibility mean (Chapter 4). Based on the discussions in Chapter 3 and 4, we screen through the 13 submitted LTSs to the UNFCCC and describe noticeable highlights for different elements (Chapter 5). The final part of the report includes contributions from a range of organisations involved in supporting NDCs, giving their view on the importance of long-term strategies to effectively address climate change (Chapter 6).



2. THE NDC IMPLEMENTATION AND REVIEW CYCLE

Nationally Determined Contributions (NDCs) are at the centre of the Paris Agreement: as a bottom-up framework the Agreement depends on the sum of national commitments to put us on a path to prevent irreversible climate change.

The concept of bottom-up ‘nationally determined’ contributions was introduced in 2013, at COP19 in Warsaw, calling on all Parties to “initiate or intensify domestic preparation for the intended nationally determined contributions ... in the context of adopting a protocol, another legal instrument or an agreed outcome with legal force” (UNFCCC, 2013). This call was reiterated in 2014, at COP20 in Lima, where it was decided that Intended NDCs should represent a progression of its current mitigation efforts. By October of 2015, a total of 119 INDCs were submitted and although this was an impressive feat in a short timeframe, providing a real impetus to reaching a global agreement, it was already clear then that the sum of contributions would be insufficient to “keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius”(UNFCCC, 2015).

reduction targets can include economy-wide and sector-wide goals, but also non-GHG targets such as an increased share of renewables or a reduction in deforestation. In addition to targets, many NDCs also include actions, which are typically defined as policies or projects (see WRI (2017) and UNEP DTU (2015).

Most countries converted their INDCs, which were submitted prior to COP21, into NDCs without much (or any) adjustment. As a result, these first NDCs display a great variety in ambition, coverage, and detail. This is not surprising given that the COP decisions prior to the Paris Agreement gave little guidance, and most INDCs were prepared in a relatively short time, with limited capacity, and without in-depth and inclusive processes (and without much scrutiny).

Fast forward to the present, a year before the first update of NDCs is due in 2020, we find several reasons to strengthen NDCs. First, there is a better understanding of what is required to reach the Paris Agreement goals: the 2018 IPCC Special Report 1.5 shows that all countries need to reach net-zero by 2050 and not ‘sometime in the second half of the century’ as was the common assumption thus far. This gives a solid

In order to drive ambition over time, the Paris Agreement contains an ‘ambition mechanism’ or ‘ratcheting mechanism’. This requires countries to submit an updated NDC every five years, with every iteration a progression from previous submissions (i.e. no backsliding), reflecting the highest possible ambition given their national circumstances.

These updates will be communicated every five years and informed by the outcomes of the global stocktake (Article 3 and 4 of the Paris Agreement). The 2018 Talanoa Dialogue started off the first iteration of the ambition mechanism, and by next year (2020) Parties are expected to submit their updated NDCs.

Existing NDCs cover both targets and actions to reduce emissions, and although not mandatory most countries also include adaptation and means of implementation (i.e. capacity building, technology, and finance). Emissions

marker for the 2050 long-term strategies and a benchmark to plan towards. Second, countries have had more time to prepare and consult stakeholders domestically and have international dialogues such as the facilitative Talanoa Dialogue in 2018. Third, spectacular advances in technologies and costs are taking place (e.g. solar photovoltaic) and there is increasing clarity on the positive impacts clean technologies can have on for example health, employment, and energy security. Lastly, pressure from civil society is building, which is increasing public awareness and encouraging governments to take action in line with scientific guidance.

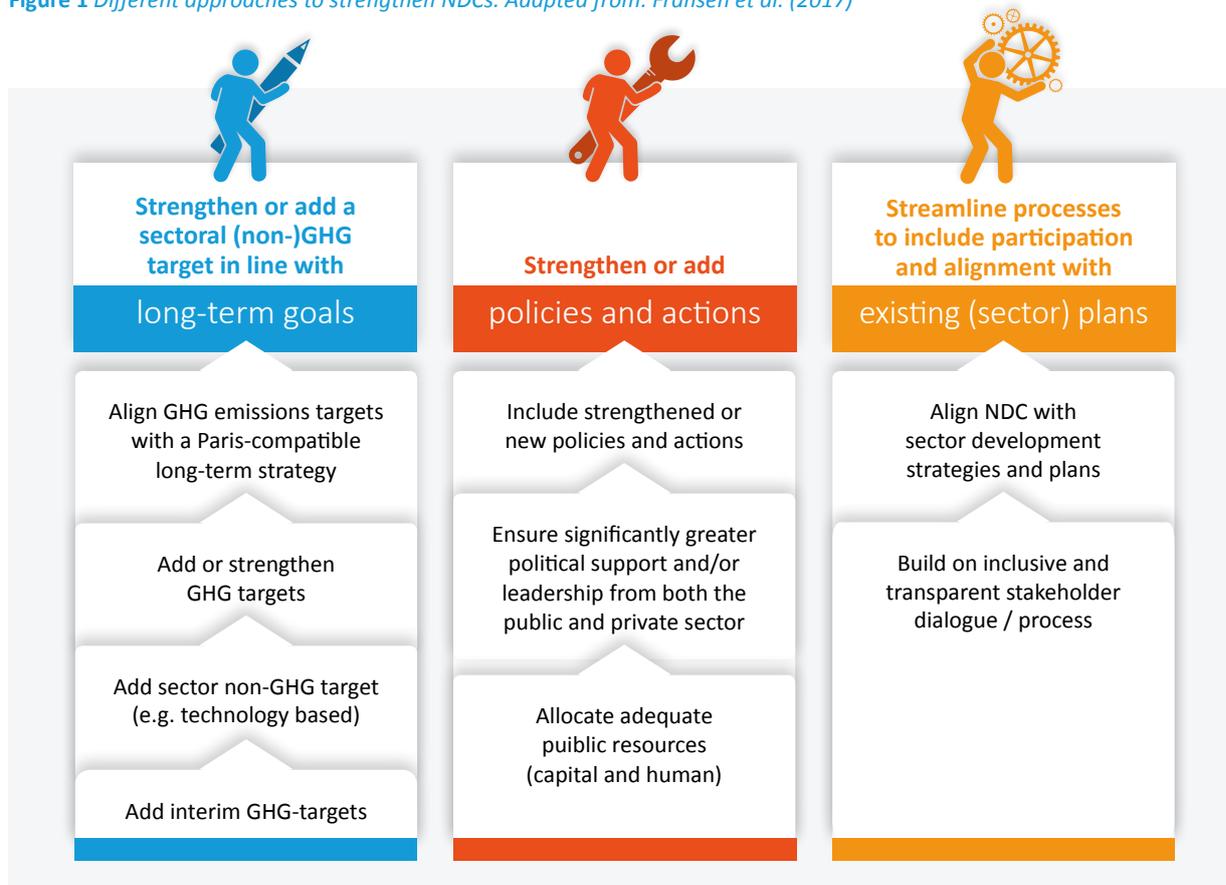
There are various ways in which NDCs can be improved: countries can strengthen or add (non-)GHG targets and bring them in line with a Paris-compatible long-term strategy, countries can strengthen or add policies and actions to implement the targets set in the NDC, and countries can streamline processes to include participation and alignment with existing (sector) plans (see Figure 1). Perhaps most importantly, the NDC gains in strength when it has significantly greater support from both public and private stakeholders and when adequate resources are committed to its implementation.

Between June and August 2019 we invited UNFCCC Focal Points and other experts to complete our survey on NDC and long-term low greenhouse gas emission development strategy (LTS) development and implementation. This year (this is

the fourth survey undertaken for this project, since the first NDC Update Report in May 2017) we simplified the survey to reduce the burden on participants and to focus on the most relevant topics for this issue. In total there were 100 responses, representing 66 countries. 84% of respondents identified themselves as country government representatives, with national or international consultants making up the remainder. The regions with most responses were Sub-Saharan Africa (with 32%) and Latin America and the Caribbean (23%). 66% of the responses were for middle income countries, with 17% each from high and low income countries.

This Chapter presents the results of the questions related to NDCs; the questions about LTSs are covered in the following Chapter.

Figure 1 Different approaches to strengthen NDCs. Adapted from: Fransen et al. (2017)



Adapted from: Fransen et al. (2017)

NDC IMPLEMENTATION PROGRESS AND CONFIDENCE

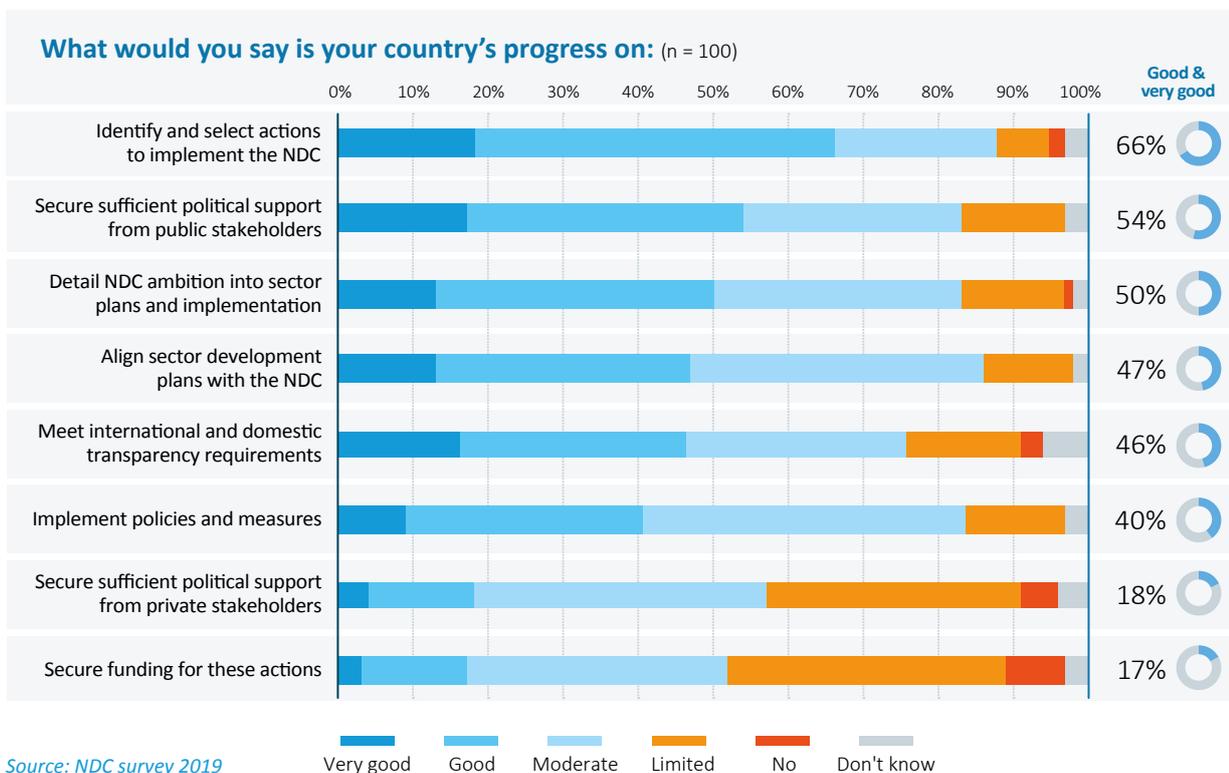
The first set of NDC questions in this year’s survey asked respondents to describe their country’s progress in key NDC activities, and then to assess their level of confidence to achieve those activities in the future. Similar questions have been included in all four of this project’s NDC surveys. The results for progress are shown in Figure 2 below, which ranks the activities from top to bottom by the percentage of respondents who rated progress as ‘very good’ or ‘good’.

Greatest progress was reported on ‘identify and select actions to implement the NDC’, with 66% rating progress as ‘very good’ or ‘good’. The second to fifth ranked activities, which include securing support from public stakeholders, further detailing of the NDC and alignment with sector plans, and meeting international and domestic transparency require-

ments, received similar progress assessments (between 54% and 46% ‘very good’ and ‘good’). ‘Implement policies and measures’ was the sixth ranked activity in terms of good and very good progress (40%), and unsurprisingly indicates that while countries feel they have made good progress in the top-ranked activity of identifying NDC actions, there has been less progress on actual implementation.

The bottom two activities, gaining political support from private stakeholders, and securing funding for NDC actions, received significantly lower scores for progress achieved (18% and 17% very good/good). These two activities also received significantly more responses rating progress as ‘limited’ or ‘none’ than the other six (39% and 45%, compared to an average of 14% for the rest), as can be seen clearly in the chart. Another noteworthy observation is that respondents clearly feel they have made more progress in securing support from public stakeholders (54% good/very good) than from private stakeholders (18% good/very good).

Figure 2 Countries’ perceived progress on key NDC activities



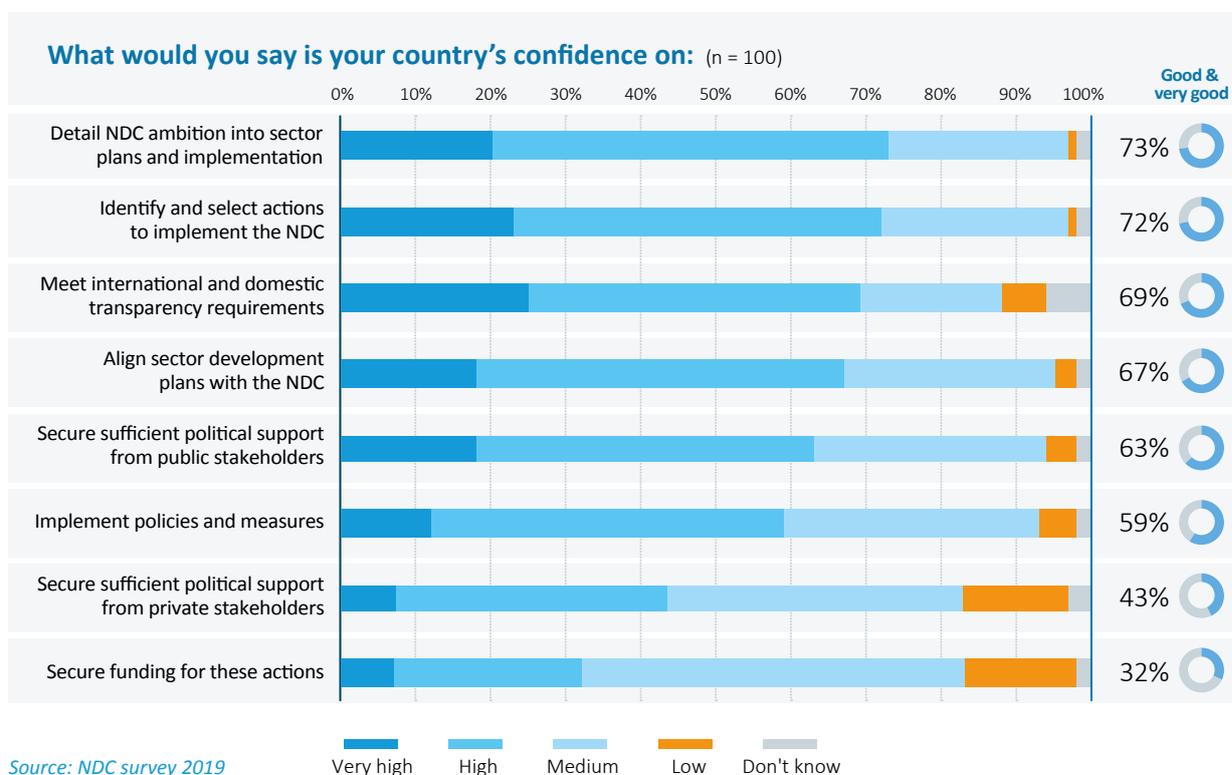
Source: NDC survey 2019

Turning to the future, Figure 3 shows the results for the question asking respondents to assess their confidence about making future progress in the same set of eight NDC activities. Across the board, the level of confidence is higher than the perception of progress achieved (average of 60% 'high' and 'very high' compared to 44% for progress), and there were relatively few 'negative' responses (assessing confidence as 'low'), with only 14-15% of responses for the two lowest scored activities. The activities with highest confidence included detailing the NDC ambition into sector plans (top ranked; 73% high/very high confidence) and the related activities of identifying and selecting NDC actions, and aligning sector plans with the NDC, as well as meeting international and domestic transparency requirements.

Comparing the ordering of activities by progress and confidence, the greatest consistency is found at the bottom of the rankings, with the same three activities ranked lowest for both progress and confidence (implementation of policies and measures; private stakeholder support; and securing funding). Among the remaining activities, there are some differences between the progress and confidence results that seem hard to explain, for example it is not clear why securing political support from public stakeholders should be ranked second for progress to date, and fifth for confidence.

We have now asked about progress and confidence in key NDC activities in surveys for four NDC Update Reports over two and a half years (May 2017; Nov 2017; Nov 2018 and this one), and can compare the results over the period. In general, the results have been strikingly consistent¹.

Figure 3: Countries' level of confidence about key NDC activities.



Source: NDC survey 2019

¹ NB although the survey has been sent to broadly the same group of country contacts in each survey (based on the UNFCCC focal point list), the group who actually complete the survey is not the same each year, so different countries are represented each year. For example, of the 81 countries represented in this year's survey, 35 also responded in the 2018 survey.

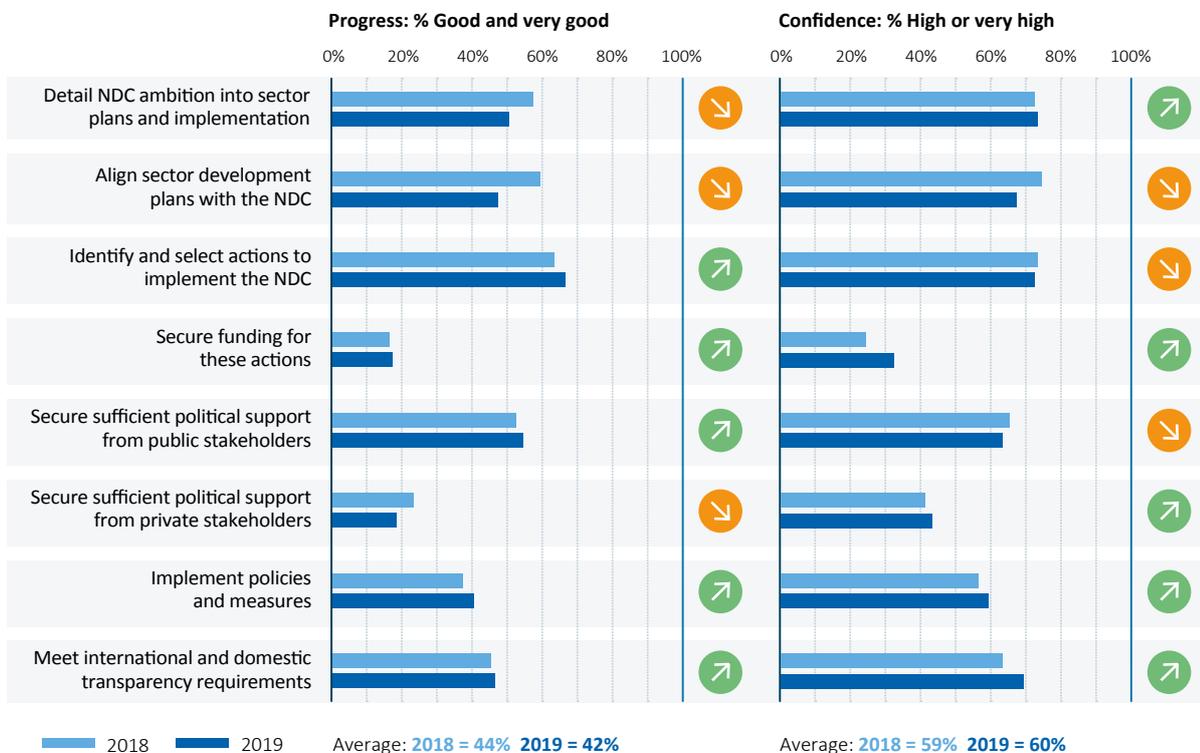
Figure 4 shows the percentage reporting good and very good progress for each activity, over the four surveys. Excluding the survey for the May 2017 report (because we did not ask exactly the same eight questions), across the last three surveys, the bottom four activities have been the same, and in the same order, with ‘securing funding’ consistently the lowest ranked activity for progress. At the top end, there has been some movement between surveys, with slightly different ordering in each year (though ‘identify and select actions’ has been ranked top in the last two years). Also of interest is the change from year to year within each activity: for five of the eight activities there has been a clear trend of increasing positivity about progress achieved (though as the responding countries are not the same each year, this needs to be interpreted cautiously).

The same overall consistency over the years is seen in the responses about confidence (Figure 5), though with slightly more movement in the ordering; for example only the three lowest ranked activities are consistent across the three surveys, and not always in the same order. As with progress, there has been a general trend towards increased confidence in the majority of activities.

The consistently lower levels of confidence seen by respondents about securing private stakeholder support, and about securing funding, indicate that these are areas of activity where countries could benefit from concentrated international support. For funding, the concern may be about the absolute level of funding available, as much as the difficulty in accessing it (and support programmes helping countries increase their ‘readiness’ for funding sources such as the Green

Figure 4: Percentage of respondents rating progress as good or very good.

Figure 5: Percentage of respondents rating confidence as high or very high.



Source: NDC surveys 2018-2019

Source: NDC surveys 2018-2019

Climate Fund already exist). For private stakeholder support, this could be an interesting area for further assistance (for example through helping countries set up programmes which aim to increase private sector engagement by explaining the scientific rationale and outlining the attractive business opportunities available from energy cost savings and development of new products and services); ambitious NDCs will be hard to achieve without commitment and support from the private sector, and if government officials remain concerned about gaining such support from the private sector, they may be more hesitant to put forward more ambitious plans.

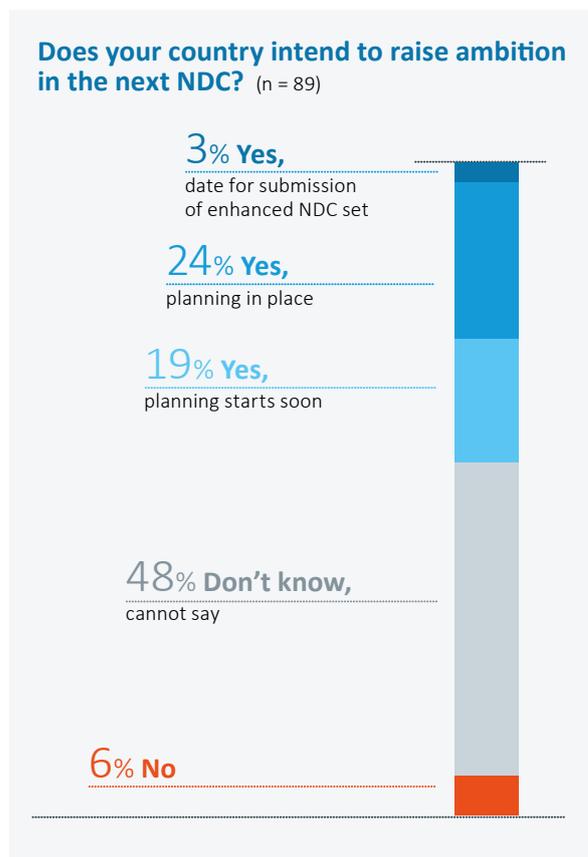
LOOKING TO THE NEXT NDC

The survey asked a number of questions related to countries' next NDC, covering timing of submission, ambition raising, and areas of potential improvement. As noted earlier in this Chapter, the Paris Agreement asks all parties to submit updated NDCs by 2020 (and every five years thereafter), and the 'ratcheting mechanism' requires that all NDCs represent a 'progression' compared to previous NDCs and that they reflect the highest possible ambition.

On the timing of submission, around 10% of respondents stated that their next NDC would be submitted within this year (2019), but the vast majority (almost 80%) stated they would submit it in 2020. 12% said their next NDCs would be submitted during the period 2021-2025. Of those who expect to submit during 2020, a little over a quarter planned to submit in December, with the remainder spread across the year.

Regarding ambition raising, only 3% of respondents stated that they had a firm date for submission of an enhanced NDC, while 43% stated that planning for raised ambition had begun or would soon start. 6% answered that their country did not plan to raise ambition, and 48% responded that they either did not know, or could not say, whether they would raise ambition. The responses are shown in Figure 6 below. Given their answers on timing (with almost 90% stating they would submit their next NDC in 2019 or 2020), it is potentially concerning that such a small proportion of respondents were able to give a clear positive statement about their intention to increase mitigation ambition. However, it is possible that respondents were hesitant, or felt unable to answer clearly, given that NDC upgrading processes are ongoing in most countries and final decisions on ambition levels may only be taken at the very end of the process.

Figure 6: Intention to raise ambition in the next NDC.

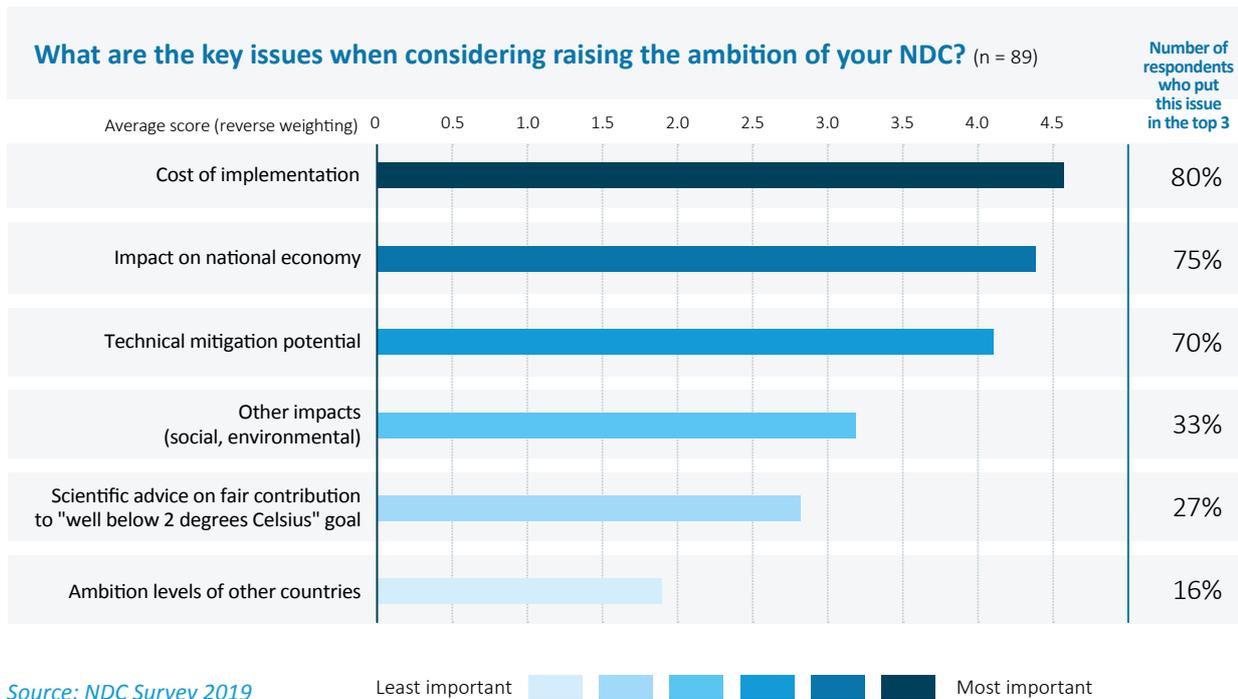


Source: NDC Survey 2019

Comparing the responses about ambition raising to last year's survey, it is also concerning to note that while the overall spread of responses is broadly similar, the proportion who responded either 'no' or 'don't know' has increased (from 43% to 54%), when we are now much closer to the time when enhanced NDCs should be submitted according to the Paris Agreement.

To explore the debates countries are having about NDC ambition, the survey asked respondents to rank the importance of six key issues when consider raising their ambition levels. The results are shown in Figure 7. Three issues clearly stand out as more important to respondents: the cost of implementation; the impact on the national economy; and the technical mitigation potential. These three were ranked among the top three by 70-80% of respondents; whereas the lower ranked

Figure 7: Level of importance of different issues when considering ambition raising.



three (other social and environmental impacts; scientific advice about a fair contribution; ambition levels of other countries) only featured in the top three of 16-33% of respondents.

As with the previous questions, the ranking of issues by importance was very similar in 2018: the top three were the same, with cost of implementation ranked most important in both years; though mitigation potential and overall economic impact swapped second and third places between 2018 and 2019. The bottom three were the same, and in the same order, in both years, with the ambition levels of other countries clearly being ranked as least important in both 2018 and 2019.

Lastly on NDCs, the survey asked respondents to identify ways in which their new NDC would be an improvement from the current one. Respondents were given a list of twelve areas for possible improvement, including addition of new or more specific targets; alignment with sector plans or an LTS; improved stakeholder engagement; and increased transparency

(see section 2.1 for background information). The majority (67%) of respondents selected between three and eight areas where they expected improvement; three optimistic respondents even selected all twelve areas. The results are shown in Figure 8 below.

The three areas selected by most respondents were alignment with sector strategies and plans (selected by 70% of respondents); that the new NDC will build on inclusive and transparent stakeholder dialogues (63%); and that it would include strengthened or new policies and actions (61%). The least selected area was the addition of interim GHG targets (13%).

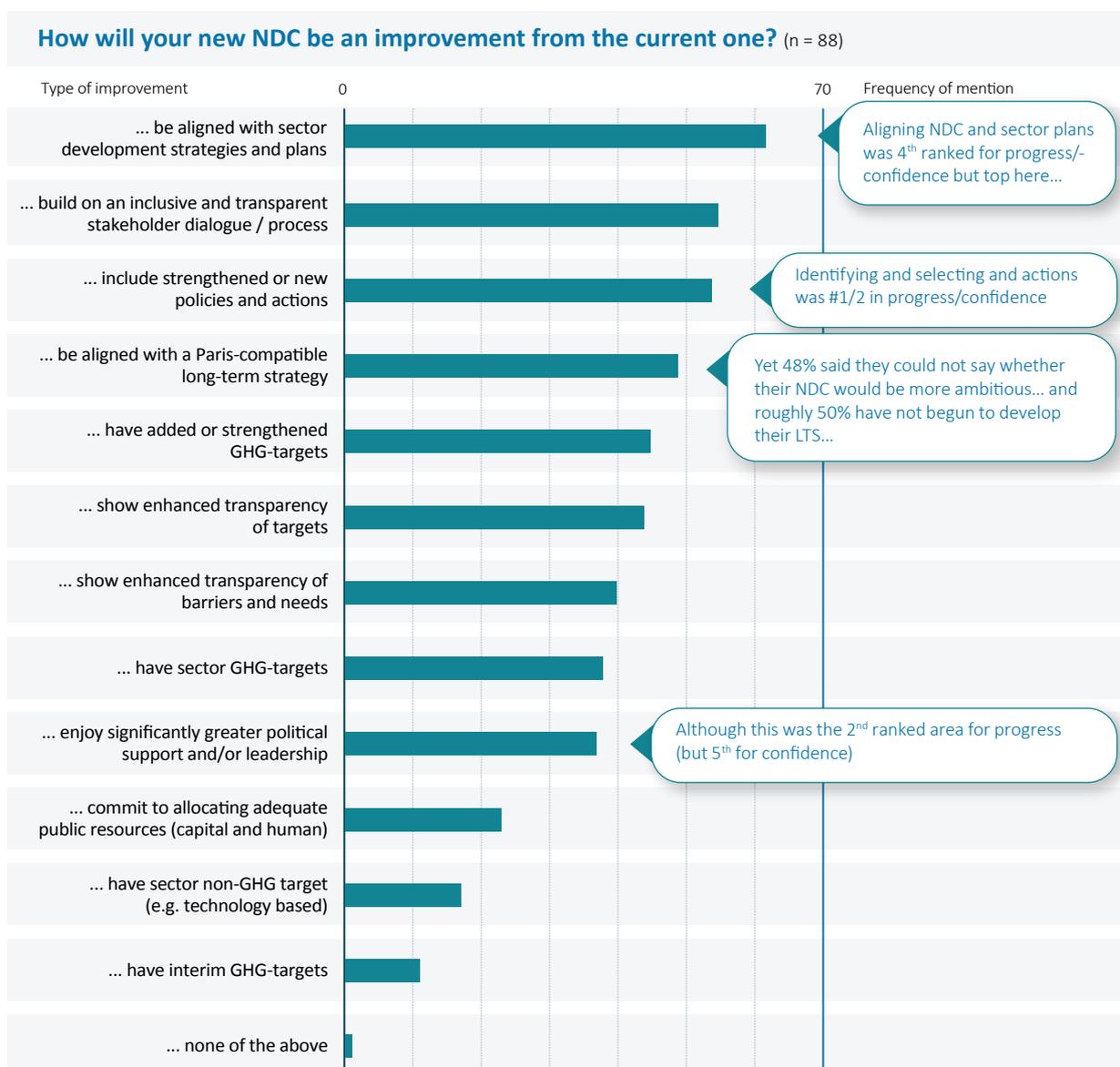
If the results to this question seem perhaps rather optimistic (six of the twelve options were selected by at least 50% of respondents), it may be that these are intended areas of potential improvement rather than firm decisions already taken by countries. For example it seems unlikely that 70% of new

2 This question about areas of NDC improvement was not asked in previous surveys, so comparison with other years is not possible.

NDCs will really be aligned with sector development plans and strategies or, alas, that 56% will be aligned with a long-term strategy that is compatible with the goals of the Paris Agreement, given the substantial improvement in the quality and ambition of NDCs that this would entail. But both may well be - and hopefully are - aspirations that countries have regarding

their new NDCs. On the other hand, some improvements are more easily within reach; it does seem very plausible that the majority of new NDCs would include strengthened or new policies or actions (indeed identifying actions to implement the NDC was ranked as the area where most progress had been made), or feature enhanced transparency.²

Figure 8: Expected areas of improvement in new NDCs.



Source: NDC Survey 2019

3. DEVELOPMENT OF LTSs

Under the Paris Agreement the world has 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.

Article 4 furthermore 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 Rulebook brought more clarity and operationalised the Paris Agreement. For LTSs however, the Rulebook only reiterates the invitation to communicate an LTS by 2020, without calling for later updates.

Few of these LTSs have been developed so far, and there seems to be a lack of common understanding of what the scope and format of an LTS should be, reflecting the typically vague nature of UNFCCC documents, in recognition of individual Parties’ self-determination and the need for flexibility. Drawing together ideas and observations from previously published research and analysis, we propose that a number of aspects should be considered when developing an LTS.

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 around 2070, with carbon emissions to reach net zero around mid-century and with negative emissions thereafter (IPCC, 2018a).



KEY ELEMENTS OF AN LTS AND LTS PROCESS

We propose that LTS encompass eight key elements relating to both the content, and the process of developing an LTS. The eight elements are identified and discussed based on the following literature: CAN Europe (2018), Cox (2019), Ecologic Institute (2017), Levin *et al.* (2018), Waisman *et al.* (2019), Williams and Waisman (2017), the World Bank and Ecofys (2019) and WRI (2019).



LTSs are about the process and not the document.

The LTS submission itself can be a concise, strategic document well aligned with other processes and strategies to avoid duplication. The process of developing an LTS, however, should build on robust analysis and extensive public and private stakeholder engagement.



LTSs should include pathways for GHG emission until 2050 and beyond.

Ideally this should include national pathways that are in line with the long-term temperature goal of the Paris Agreement. Including quantified pathways provides a clear indication of where each sector is heading and allows stakeholders to develop a common vision. The inclusion of Paris compatible pathways is an important element needed to trigger the radical rethink that is required across the economy. In Chapter 4, we propose an approach to align LTSs with the temperature goal of the Paris Agreement.



LTSs should encompass all sectors of the economy,

ideally also providing sectoral pathways and including international aviation and shipping. Sector pathways are interdependent: reducing emissions more (or less) in one sector will require a smaller (or larger) effort from others, and some sectors are coupled in their decarbonisation efforts. Ultimately all sectors must go to zero in the second half of this century.



LTSs should be considered as an ongoing visioning exercise

which needs to align with policy and implementation 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 an ongoing process to ensure that the

latest knowledge is always accounted for. In line with the Global Stocktake for the NDCs, LTSs should include a process to revise and update “the vision”, along the lines of a ratcheting-up mechanism.



LTSs require **extensive coordination efforts** (i.e. inter-ministerial) and participatory processes including the private sector and civil society.

The magnitude of the challenge demands a comprehensive approach that involves all of society. Implementation will need to be coordinated and delivered by line ministries, which in turn requires alignment across responsible entities.



Beyond providing a long-term perspective, LTSs should **reflect on immediate next steps**

in the short term and strategic enablers to decarbonise the economy. Without defining concrete actions (for example in the form of sectoral commitments) LTSs run the risk of becoming yet another visioning exercise that is not mainstreamed into policy and implementation planning.



LTSs should clarify how much **financing and other support is required (if applicable)** in

addition to the required contribution of national resources. The Paris Agreement foresees that all countries pursue an ambitious low-emissions development path. However, given differences in country circumstances, equity considerations set out in the UNFCCC principle of “common but differentiated responsibilities” need to be observed. This means that countries with higher capacities and historical responsibility need to support those with less means to achieve accelerated decarbonisation. At the same time, all countries need to redirect their fiscal revenues and spending towards low emissions development.



LTSs need to consider and be developed in line with the **2030 Sustainable Development Goals** as well as with other national long-term

objectives, policies and measures. Whilst emphasis should be put on long-term decarbonisation pathways, these need to **reflect adaptation** challenges and ensure development objectives can be met and potential trade-offs be minimised or managed accordingly.

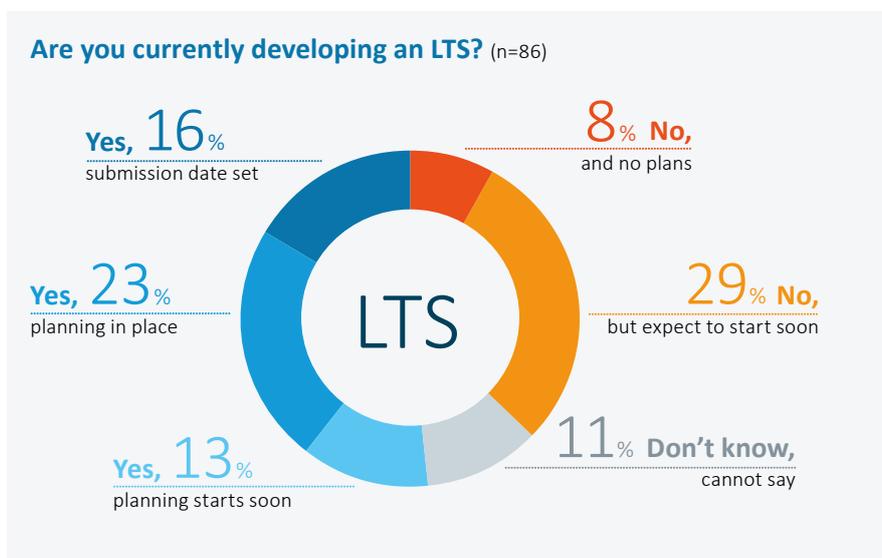
WHEN TO EXPECT LTS AND ARE THEY PARIS ALIGNED?

A long-term low greenhouse gas emission development strategy (LTS) is one of the pillars of the Paris ambition mechanism, without which achievement of the global climate goals is much less likely. The Paris Agreement invites all Parties to submit an LTS by 2020. As well as covering NDCs, the survey undertaken in mid-2019 for this report asked respondents about the progress their government has made towards developing an LTS, when they expect the LTS to be submitted, and whether this strategy is (or will be) aligned with the goal of the Paris Agreement.

Out of 86 respondents, 14 (16%) state that their government has set a submission date, 31 (36%) answered their government is working on it, while 25 (29%) respondents indicated that their country has not begun developing a long-term strategy but expect to start soon, and 9 (11%) said they do not know (see Figure 9). These results are broadly in line with the 2018 survey results, suggesting that the state of play has barely changed in the last year. Although 58% of respondents answered that their country's LTS was either under development or had already been officially approved in last year's survey, only three additional LTSs were submitted to the UNFCCC since November 2018.

The survey next asked respondents when they expect their country to submit an LTS. At the time of writing, the UNFCCC portal listed only 13 countries who had submitted their strategies (UNFCCC, 2019). Canada, Germany, Mexico, United States, Benin and France submitted before November 2017. The Czech Republic, the UK, Ukraine and the Republic of Marshall Islands submitted between November 2017 and November 2018, and three additional LTSs were submitted between November 2018 and the November 2019 edition of this report: Fiji, Japan and Portugal. While only two additional LTSs submissions can be expected before the end of 2019, 38 out of 62 respondents (61%) expect their country to submit an LTS within 2020, of which 22 are expected after August 2020. 13 respondents expect their countries' LTS in the following years (2021-2022) and three respondent expect it after 2022 (see Figure 10).

Figure 9 Developing an LTS— This question considers whether the country of the respondent is developing an LTS.



Source: NDC survey 2019

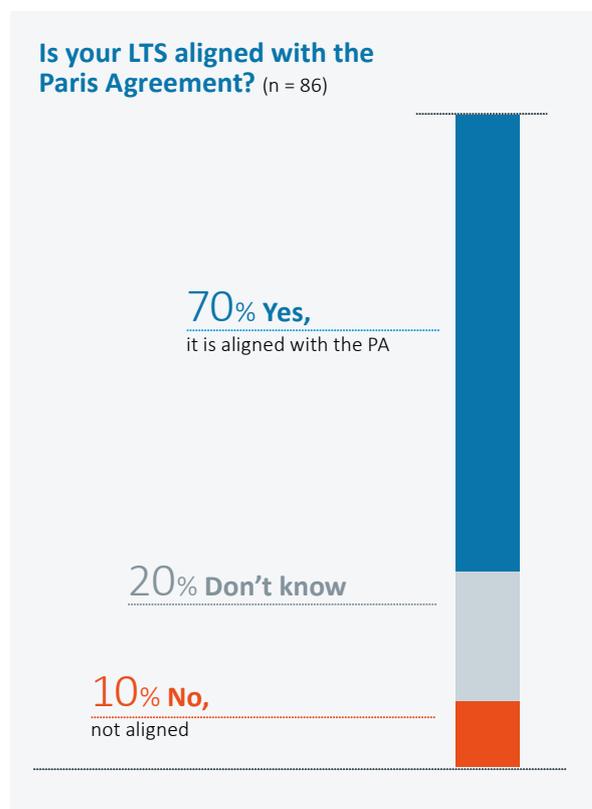
Figure 10 Expected LTS submission.



Source: NDC survey 2019

As discussed in Sections 3.1 and 3.2, it is essential that countries include long-term GHG reduction pathways in line with the Paris Agreement goals, thus we asked respondents whether their LTS is (or will be) aligned to the goals of the Paris Agreement. This would imply that each country’s strategy sets targets that would make an equitable contribution to keeping global temperature rise to well below 2°C, pursuing efforts to keeping it below 1.5°C, and it would require an objective of full decarbonisation for most sectors by or shortly after 2050. 60 out of 86 respondents indicate that their LTS is or will be aligned with the Paris goals, showing a 8% point decrease from the 2018 survey results (see Figure 11). . Considering these responses and in line with the November 2018 edition of this report, we draw the cautious conclusion that LTS are still not a prominent feature of current NDC-related processes and their purpose and scope may not be well appreciated and understood.

Figure 11 LTSs alignment with PA goals.



Source: NDC survey 2019

4. ALIGNMENT OF LTSs IN THE CONTEXT OF THE PARIS AGREEMENT

One of the noteworthy findings of section 3.3 was that the large majority of national stakeholders surveyed responded that their countries' long-term low greenhouse gas emission development strategy (LTS) are or would be aligned with the requirements of the Paris Agreement. In this section, we examine what compatibility with the Paris Agreement means, and what would be required for countries' LTS to be aligned with the Paris goal. The analysis focusses on the temperature goal of the Paris Agreement of maintaining global temperature increase to 2°C, aiming for 1.5°C, and its implications for LTS development.

PATHWAYS TO ACHIEVING THE PARIS AGREEMENT GOAL

In order to identify the necessary degree of climate action at the national level and to develop appropriate policy frameworks, global emission development pathways need to be broken down to the national and sector level. Downscaling pathways from the global to the national level is not a straight-forward task and there are numerous approaches to distribute global mitigation effort to the national level. However, the strengthening of the temperature targets in the Paris Agreement, paralleled by continued growth in global emissions, have together narrowed the options (see Figure 12).

In particular, the insights in the recently published IPCC special report on 1.5°C are helpful to frame the difficulty of determining national pathways. The IPCC special report on 1.5°C shows that global GHG emissions need to decrease rapidly (IPCC, 2018a). Those sectors where full decarbonisation is possible with technologies available today are foreseen to reach zero CO₂ emissions by 2050 globally (e.g. energy supply). Other sectors where full decarbonisation by 2050 is not possible (such as emissions from aviation or methane and nitrous oxide emissions from agriculture) need to be compensated for, in order to reach net zero emissions overall (Germanwatch & NewClimate Institute, 2018; Climate Analytics, 2019). The scenarios of the IPCC special report on 1.5°C expect negative emissions in some sectors, although the suitability of these solutions in some sectors remains uncertain. Figure 12 visualises these aspects to reflect a potential Paris aligned global emission trajectory.

While in the past the key issue for downscaling pathways from the global to the national level might have been to determine who reduces how much, this has now shifted to a situation where all countries must achieve the highest possible levels of ambition (Roeser, 2018). Especially given the fact that most countries' current NDCs are far from being compatible with the long term targets of the Paris Agreement, it is unlikely that one country (or sector) is able to significantly compensate for the emissions of another country (or sector), hence all countries (and sectors) should aim to decarbonise as deep and as fast as possible (Climate Action Tracker, 2019).

As such, we consider that to be aligned with the Paris Agreement, an LTS has to set out a trajectory that represents the highest possible levels of ambition, along with the required level of support that would be needed to achieve that trajectory, given the level of unilateral investment that is deemed fair and realistic for each country.

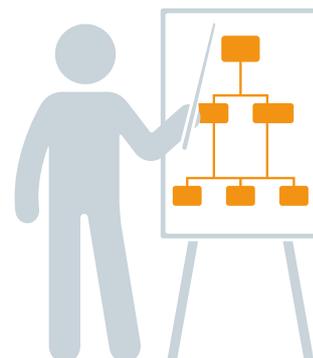
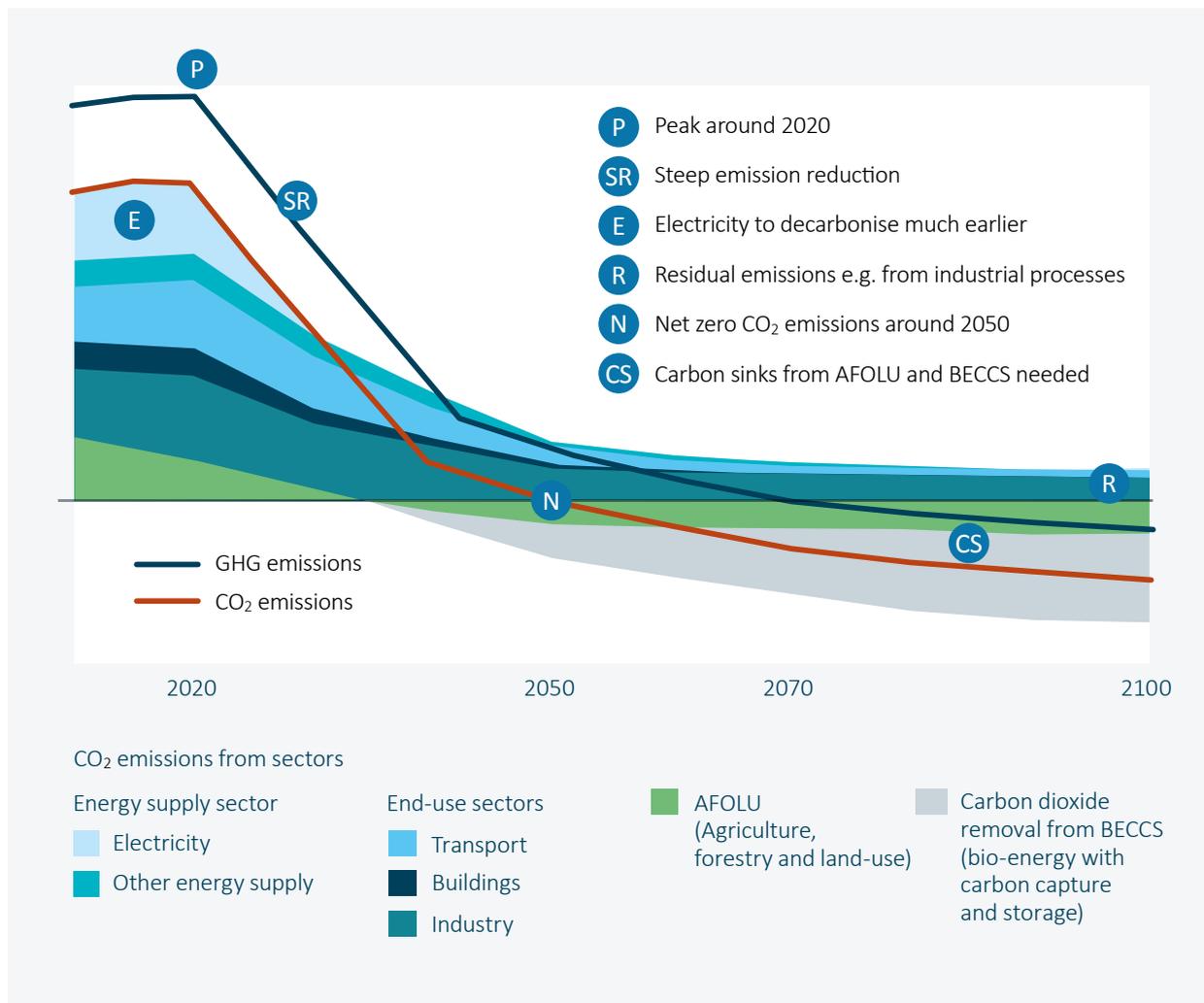


Figure 12 Visualisation of a Paris Agreement (1.5°C) compatible pathway adapted from the IPCC special report on 1.5°C (2018a). The figure is conceptual, proportions (e.g. emissions from each sector) are country specific.

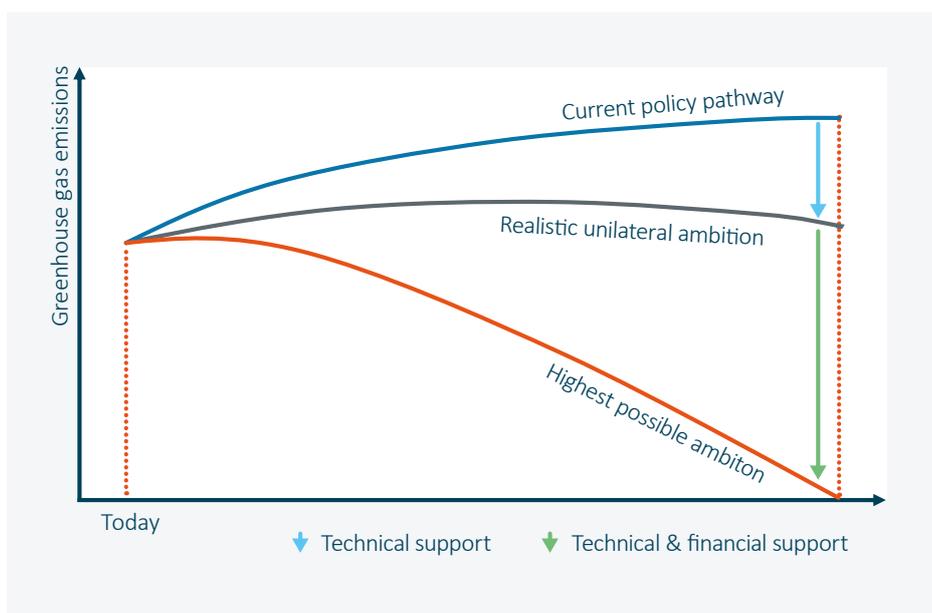


SUPPORTING A SHIFT TO HIGHEST POSSIBLE AMBITION AS A COMMON DESTINATION FOR ALL COUNTRIES

According to the principle of “common but differentiated responsibilities”, a developing country’s target that does not match the highest technically possible ambition might still be considered under some effort sharing methodologies to be a “fair” contribution. However, the realisation of the long-term objectives of the Paris Agreement requires that countries are supported to move from a trajectory they interpret to be a fair contribution, towards a trajectory that represents the highest technically possible ambition, as indicated in Figure 13. The destination with regards to the required GHG emission trajectories for all countries is common, but developing countries will need to receive financial and technical support from developed countries in order to initiate or accelerate that shift.

Taking the next NDC update round as an opportunity, countries should identify realistic domestic ambition levels, in order to be able to determine and communicate what additional technical and financial support they require to move towards a trajectory that represents the highest technically possible ambition. There is strong evidence to suggest that the current collection of NDCs and policies in implementation do not represent the maximum potential domestic ambition in most countries: in particular, a relative lack or unreliability of information for some sectors, compounded by a shortage of resources to invest in a thorough planning process, may entail risks that lead to over-cautious or incomplete target setting. New information on the broader sustainable development impacts and benefits associated with potential measures, as well as information on new technological developments, could help to increase confidence in enhanced domestic ambition. In this regard, technical support can help to fill some of these information and resource gaps, to support countries to identify and communicate a realistic domestic ambition. Taking a thorough approach to determine a realistic domestic ambition level not only has the benefit of setting a country on a transformative path early on, but also of making that country more attractive for international support.

Figure 13 *Filling the gap in developing countries – technical and financial support from developed countries is needed.*



CYCLICAL LONG-TERM PLANNING TO SIGNIFICANTLY REDUCE RESOURCES NEEDED TO ACHIEVE NET ZERO

Comparing trajectories that represent the highest possible ambition with current policy or commitment pathways, reveals a gap that can only be closed with additional technical and financial resources. Comparing Figure 14 and Figure 15 shows that, while this gap may seem daunting if viewed as a one-off exercise, more can be done with a more efficient use of resources, if long term-planning is approached as a recurring iterative process. A long-term planning process can include regular short-term planning cycles, informed by long-term objectives. For example, regular NDC or national climate action planning cycles could provide an opportunity to regularly reassess current policy pathways, and new developments which may affect the range of possible ambition.

Figure 15 shows that the regular reassessment of these pathways may reveal that it is possible to achieve deeper emission reductions than what might have been previously anticipated from the resources invested in the previous

period. This can occur, for example, when tipping points for mass diffusion of transformational technologies and practices are reached, and through the resulting spill-over effects of progress between countries. Technology development is a largely global process; while technological spill-over is context dependent, most solutions are relevant beyond the contexts in which they were originally designed. In turn this means that a few actors can initiate change well beyond their original jurisdiction. This can be observed for renewable energy development, where a few countries have initiated a global trend, but also recently for electric vehicles, where the support of a few jurisdictions such as Norway, China or California have reduced the technical and financial resources needed in second mover countries such as Germany (Hagemann *et al.*, 2017).

At the national level, resource investments at early stages can also lead to sector transitions. Transformative processes will be set in motion in each sector, setting countries on new pathways where what was previously considered new, additional and costly suddenly becomes the new normal. Such processes take time, but over time the effort needed will reduce. The initial efforts will thereby be the largest, but

Figure 14: Conceptualisation of the gap between the current development path and the highest possible ambition path.

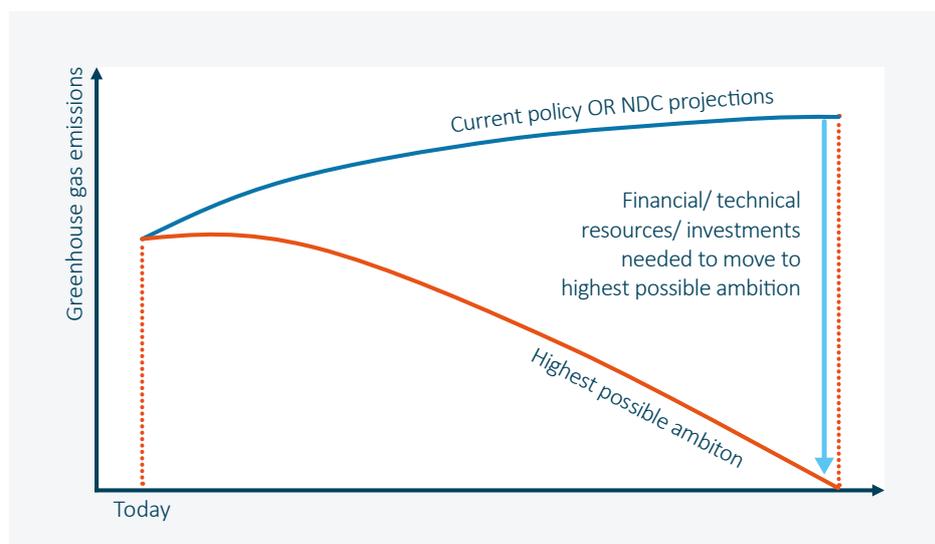
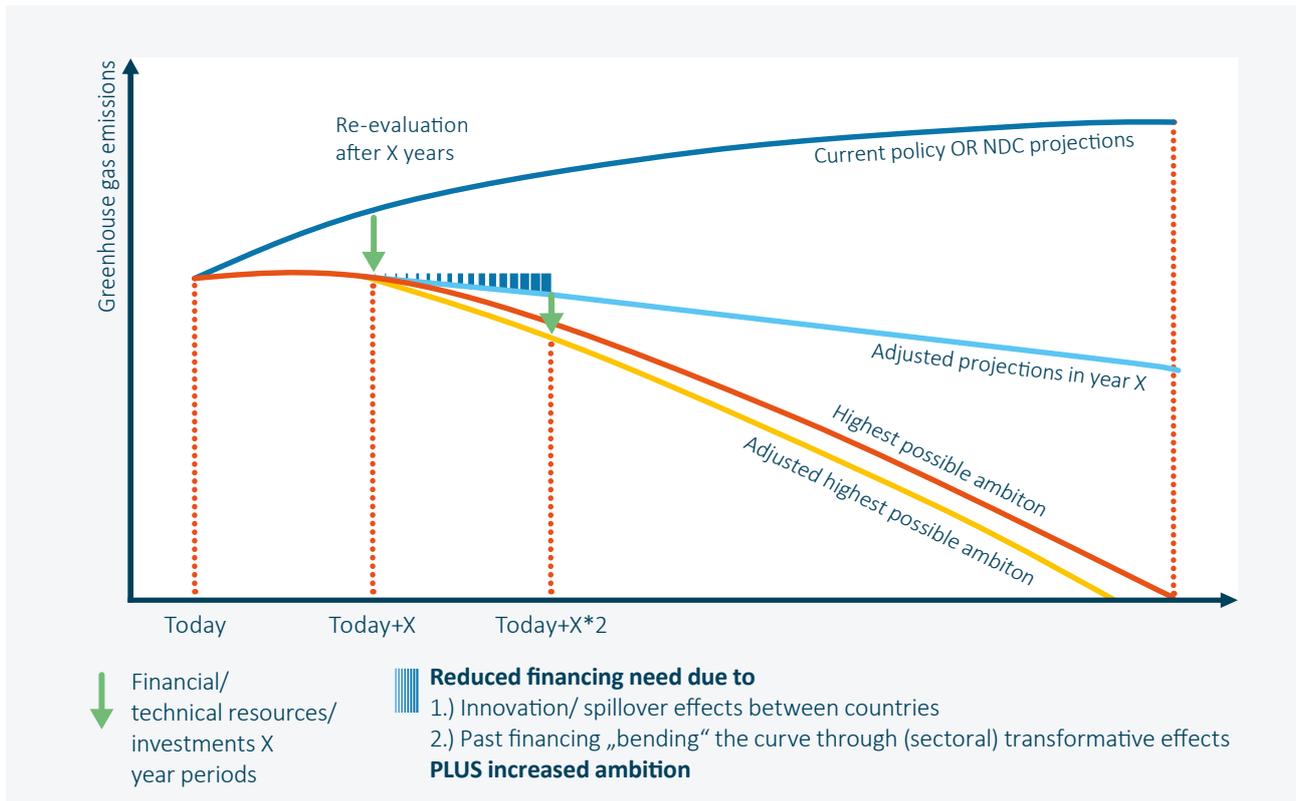


Figure 15: Periodical review of short and long term planning and its effect on financial and technical resources needed.



once the transformation is set in motion it can eventually become self-sustaining (Jacobsson and Bergek, 2004). Hence the perceived effort today will likely be different from that needed as the transformation is actually underway.

For these reasons, an ongoing iterative process to climate change mitigation planning can help ensure improved alignment with the long-term goals under the Paris Agreement. While there is considerable risk that the trajectories most countries initially identify as their highest possible ambition pathways are not fully Paris compatible, consecutive adjustments of the pathway can close this gap. This logic also demonstrates the importance and attractiveness of early action, since increasing the level of resources invested at an early stage can allow for readjustment of trajectories in a way that significantly reduces resource requirements to move towards the long-term objectives in the future.

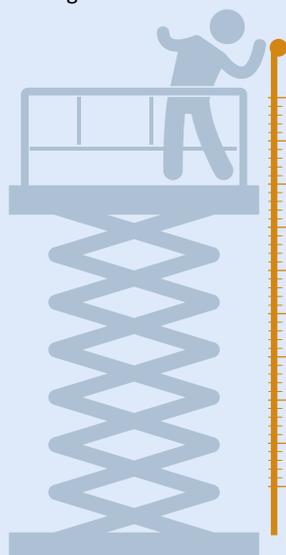


TECHNICAL RESOURCES AND METHODOLOGIES FOR LONG-TERM PLANNING

When considering the suitability of different approaches as analytical inputs, it should be considered that the determination of a country's highest possible ambition level will depend on global as well as national considerations. As no country functions in isolation, global technology trends play an important role in determining what is possible. These technology trends need to be considered in the national context. This can play out very differently in countries depending on the extent of lock-in to existing infrastructure, domestic market readiness, cultural norms and institutional capacities. This underlines the importance of a broad participatory national process, as suggested in Section 3.2.

While transformative technologies may be more mature and available in some sectors than others, it is important that the planning process includes a sufficiently broad sector coverage to ensure that the highest possible ambition can be achieved with the most efficient use of resources. The oversight of potential levers in some sectors could lead to higher overall costs.

Determining the highest possible level of ambition is therefore a carefully designed process in which national processes make best possible use of the latest available insights from both bottom-up and top-down analytical approaches, such as the following:



→ **Scaled down global least-cost pathways** are the output of models that distribute global pathways or carbon budgets across countries and sectors using the assumption that emissions are best mitigated where it is cheapest to do so. Such pathways are produced in particular by Integrated Assessment Models (IAMs) as they are for instance agglomerated in the IPCC special report on 1.5 (IPCC, 2018b). The main advantage of IAMs is their comprehensiveness, as they take a broad view of the economy and simulate interactions between economic sectors. Their disadvantage is however their limited resolution at the sectoral and national level. The lack in sectoral resolution leads to a reliance on negative emission technologies in the latter half of this century in these models, and underestimates what can be done at the sectoral level. Since most models only provide results at the regional level, assumptions have to be made to downscale these to the country level (Sferra *et al.*, 2019). Most importantly, IAMs produce a range of potential pathways from which it is not always straightforward to identify the most appropriate one.

→ **Bottom-up sector-level scenarios** that focus on technologies can be more granular at the sectoral level than top-down models. Depending on their setup, they can often also be useful for quantifying the impact of policies in specific sectors (DEA, OECD, 2013; Krey *et al.*, 2019). Examples of such scenarios are the IEA ETP, IEA WEO model, the Ecofys Energy report, Greenpeace's Energy [R] evolution scenarios and the CAT scaling up series (Jeffries *et al.*, 2011; Teske, Sawyer and Ash, 2012; IEA, 2017, 2018; CAT, 2018; Climate Action Tracker, 2018). Some of these scenarios go beyond cost optimized pathways and consider other aspects, such as how easy it is to implement policies from an institutional perspective. While providing more detailed resolution at the sector level, such scenarios are often at the regional level, and often lack transparency in their assumptions, which can make it difficult to translate regional results to the national level.

→ **A simple interpretation of the goal to achieve zero emissions by a target year (e.g. 2050)** can be built on the findings of the IPCC special report on 1.5 °C warming: the need to achieve net-zero CO₂ emissions by 2050 and net zero GHG emissions by 2070. The strength of this approach is that it contrasts the model-based approaches by providing a simple and transparent manner to derive pathways. It requires the definition of only two elements –a target year for net-zero emissions and a trajectory to get there – and could be differentiated by sector. In a simplified representation, these pathways could be linear, exponential or follow an S-curve. They should reflect how a country thinks it can best reach net-zero by the target year. Its relative simplicity makes it easier to communicate across a wide set of actors in an economy.

→ **(Paris compatible) sectoral benchmarks** summarise the insights from different approaches to derive benchmarks (often expressed as ranges) that are in line with the required long-term global low-carbon transition. The benchmarking project of the Climate Action Tracker and the paper on “Ten key short-term sectoral benchmarks to limit warming to 1.5°C” are examples of developing benchmarks (Climate Action Tracker, 2016; Kuramochi *et al.*, 2017).

The relative strengths and weaknesses of these approaches as an analytical input to a national-driven process for determining highest possible ambition are summarised in Table 1.

Table 1 Comparison of different modelling approaches to take as an analytical input for determining a country’s highest possible ambition for domestic GHG emission reduction

	Global least-cost pathways scaled down (IAM models)	Bottom-up sector-level cost optimisation scenarios	Simple: “zero by target year”	Sector benchmarks
<i>Complexity of analysis</i>	Medium to high	Medium to high	Medium to high	Medium to high
<i>Consideration of national circumstances</i>	No	Partly	No	Partly
<i>Sectoral Coverage</i>	All	Available for some sectors	All	Available for some sectors
<i>Paris Agreement compatibility</i>	Ensured	Not necessarily ensured	Dependent on definition of target year and pathway	Ensured

Source: Authors

5. OVERVIEW OF SUBMITTED LTS AND HIGHLIGHTS

This chapter presents an overview of similarities and differences among the first batch of long-term strategies submitted to the UNFCCC.

In Chapter 3 we outlined the relevance of long-term low greenhouse gas emission development strategies (LTSs) within NDC-processes, and proposed eight key elements of an LTS and LTS process. Reflecting on these aspects and the importance of LTSs being aligned with the Paris Agreement, as discussed in Chapter 4, here we examine the thirteen “official” LTSs submitted to the UNFCCC. Beyond officially submitted LTSs, California, the European Union, Spain, Costa Rica, New Zealand, Iceland, Norway, Sweden, and Denmark are developing or have developed long-term emission development strategies. It is also noteworthy

that an additional 10 countries and 30 cities and regions have committed to developing long-term development strategies, with low emissions and climate resilience through the “2050 Pathways” platform (2050 Pathways Platform, no date).

Table 2 compiles the thirteen submitted LTSs, their name and submission date, and provides links to the submitted documents. Analysis of other long-term strategies is outside the scope of this report.

Based on the eight key elements proposed in Section 3.2, we analyse the submitted LTSs along the following questions:

- **Is there a formal process behind the development of the LTS?**
 - *Does the LTS include public and private stakeholder engagement?*
 - *Does it rely on analysis and modelling?*
 - *Does it link the LTS to existing and/or planned national plans?*
- **Does it provide quantified pathways for greenhouse gas (GHG) emissions until 2050 and beyond in line with the long-term temperature goal of the Paris Agreement?**
 - *What is the long-term goal?*
 - *Does the LTS refer to the Paris Agreement temperature goal and/or the IPCC special report on 1.5°C?*
 - *Does it include information on finance support available and/or needed?*
 - *Does it acknowledge the need for negative emissions?*
 - *Does it include fossil fuel phase-outs?*
- **Does it encompass all sectors of the economy?**
- **Does it suggest an ongoing visioning exercise?**
- **Does it rely on, and plan for, inter-ministerial coordination?**
- **Does it perform back-casting exercises (to inform NDC target setting)?**
- **Does it refer to the 2030 Sustainable Development Goals?**
- **Does it encompass or refer to climate adaptation?**

The results of the analysis are summarised in Table 3.

Table 2 Overview of submitted LTS to the UNFCCC as of 22.11.2019.

Country	Document name	Date of submission	Link (main document)
Portugal	<i>Portugal's National Long Term GHG Development Strategy</i>	20/09/2019	https://unfccc.int/sites/default/files/resource/RNC2050_EN_PT%20Long%20Term%20Strategy.pdf
Japan	<i>The Long-term Strategy under the Paris Agreement</i>	26/06/2019	https://unfccc.int/sites/default/files/resource/The%20Long-term%20Strategy%20under%20the%20Paris%20Agreement.pdf
Fiji	<i>Fiji's Low Emission Development Strategy 2018-2050</i>	25/02/2019	https://unfccc.int/node/193323
Republic of the Marshall Islands	<i>Tile Til Eo - 2050 Climate Strategy "Lighting the way"</i>	25/09/2018	https://unfccc.int/node/182635
Ukraine	<i>Ukraine 2050 - Low Emission Development Strategy</i>	30/07/2018	https://unfccc.int/node/181275/
United Kingdom	<i>The Clean Growth Strategy</i>	17/04/2018	https://unfccc.int/node/65798
Czechia	<i>Climate Protection Policy Summary</i>	15/01/2018	https://unfccc.int/files/na/application/pdf/cze_climate_protection_policy_summary.pdf
France	<i>French national low-carbon strategy</i>	28/12/2016 (resubmission 18/04/2017)	https://unfccc.int/node/181284/
Benin	<i>Stratégie de développement à faible intensité de carbone et résilient aux changements climatiques 2016-2025</i>	12/12/2016	https://unfccc.int/files/focus/long-term_strategies/application/pdf/benin_long-term_strategy.pdf
United States	<i>Mid-Century Strategy for Deep Decarbonization</i>	16/11/2016	https://unfccc.int/files/focus/long-term_strategies/application/pdf/mid_century_strategy_report-final_red.pdf
Mexico	<i>Mexico's Climate Change Mid-Term Strategy</i>	16/11/2016	https://unfccc.int/files/focus/long-term_strategies/application/pdf/mexico_mcs_final_cop22nov16_red.pdf
Germany	<i>Climate Action Plan 2050</i>	17/11/2016 (resubmission 26/04/2017 and 04/05/2017)	https://unfccc.int/node/181390
Canada	<i>Canada's Mid-Century Long-Term Strategy</i>	17/11/2016	https://unfccc.int/node/181391

Source: UNFCCC, (2019)

Table 3 Review of submitted LTSs.

Country	Is there a formal process behind the document?			Pathways for GHG emissions until 2050 and beyond in line with the long-term temperature goal of the Paris Agreement				
	Engage-ment	Analysis & modelling	Link to or elaboration of national plans and regulations	Target	Target year	Reference to PA and/or IPCC 1.5°C	Finance needs and provision (domestic and internationally)	Acknowledges the need of negative emissions
Portugal	Yes	Yes	Yes	Net zero GHG emissions	2050	Reference to PA and IPCC 1.5°C	Quantifies finance needs and qualitatively describes domestic funding	Included with care. Funding for research is allocated.
Japan	Yes	Unclear	Yes	80% reduction in GHG emissions	2050	Reference to PA and IPCC 1.5°C	Qualitatively describes domestic funding	Yes
Fiji	Yes	Yes	Yes	Net zero GHG emissions	2050 (2041)	Reference to PA and IPCC 1.5°C	Quantifies finance needs, allocates domestic funding and entails the need or provision of international support	Yes
Republic of the Marshall Islands	Yes	Yes	Yes	Net zero GHG emissions	2050	Reference to PA	Not included	Yes
Ukraine	Yes	Yes	Yes	31-34% GHG emissions (compared to 1990)	2050	Reference to PA	Not included	Yes
United Kingdom	Yes	Yes	Yes	80% decrease at least*	2050	Reference to PA	Quantifies finance needs, allocates domestic funding and entails the need or provision of international support	Yes
Czechia	Yes	Yes	Yes	39 Mt CO ₂ -eq (80% reduction compared to 1990 levels)	2050	Reference to PA	Allocates domestic funding and entails the need or provision of international support	Yes
France	Yes	Yes	Yes	75% reduction of GHG emissions by 2050, compared to 1990**	2050	No	Quantifies finance needs, allocates domestic funding and entails the need or provision of international support	Yes
Benin	Yes	No	Yes	-16.17% (-3.62%)	2025	No	Allocates domestic funding and entails the need or provision of international support	Yes
United States	Yes	Yes	Yes	-80% below 2005 levels	2050	Reference to PA	Qualitatively describes domestic funding	Yes
Mexico	Yes	Yes	Yes	50% below 2000 levels	2050	Reference to PA and specifically the 1.5°C goal	Quantifies finance needs and qualitatively describes domestic funding	Yes
Germany	Yes	Yes	Yes	Net zero GHG emissions	2050	Reference to PA and specifically the 1.5°C goal	Quantifies finance needs, allocates domestic funding and entails the need or provision of international support	No quantitative targets but included in strategy.
Canada	No	Yes	No	-80% below 2005 levels, excl. LULUCF	2050	Reference to PA and specifically the 1.5°C goal	Qualitatively describes domestic funding	Addressed but not modelled

Fossil fuel phase out	Sectoral coverage	Ongoing visioning exercise	Inter-ministerial coordination	Back-casting exercises (link to NDC or national targets)	Reference to 2030 Sustainable Development Goals	Coverage of adaptation	Country
Coal phase-out	All sectors	Visioning exercise but no review cycle	Refers to the need of a domestic Climate Change Law for inter-ministerial coordination	Includes intermediary GHG targets across all sectors	Yes	Yes	Portugal
No	Not all sectors	Visioning exercise but no review cycle	No	No	Yes	Yes	Japan
No use of the word "phase-out"	All sectors	Visioning exercise and ratcheting up process planned	Yes	Yes	Yes	Yes	Fiji
Kerosene phase out for cooking and lighting	Not all sectors	Visioning exercise and ratcheting up process planned	No	Yes	Yes	Yes	Republic of the Marshall Islands
No	Not all sectors	Visioning exercise and ratcheting up process planned	Yes	Yes	Yes	Yes	Ukraine
Coal phase-out	All sectors	Visioning exercise and ratcheting up process planned	Yes	Yes	Yes	Yes	United Kingdom
No	Not all sectors	Visioning exercise and ratcheting up process planned	Yes	Yes	No	Yes	Czechia
No	All sectors	Visioning exercise and ratcheting up process planned	Yes	Yes	Yes	Yes	France
No	Not all sectors	Visioning exercise but no review cycle	Yes	No	Yes	Yes	Benin
No	All sectors	Visioning exercise but no review cycle	No	No	Barely	Yes	United States
No	All sectors	Visioning exercise and ratcheting up process planned	Yes	Yes	Yes, although not explicitly UN SDG	Yes	Mexico
Yes, although no "hard" targets	All sectors	Visioning exercise and ratcheting up process planned	No, only allocation of responsibility to individual ministries/ sectors	Yes	Yes	LULUCF and coastal areas (German Strategy for Adaptation to Climate Change)	Germany
Coal phase out	All sectors	Visioning exercise and ratcheting up process planned	No	No, although back-casting is planned	No	No	Canada

* In June 2019, the UK amended its Climate Change Act to reach net zero GHG emissions by 2050.

** In June 2019, France passed a climate and energy law to reach net zero CO₂ emissions by 2050.



Based on our review of the 13 submitted LTSs, we identify noticeable highlights in one or several countries per key element.

Engaging stakeholders: All countries engaged stakeholders in the development of their LTS. The level and scope of engagement varies greatly between the countries. Canada is the exception, where the current submission is seen as first step of the LTS process: the iterative process “will allow the Canadian public, experts, and stakeholder communities, to provide substance to this framework”.

Link to or elaboration of national plans and regulations: LTSs can draw on existing plans and laws to ensure effective implementation and/or initiate the elaboration of new plans and laws to reach long-term climate commitments as committed to in the LTS. Noticeably, the UK’s Climate Change Act (2008) and Mexico’s General Law on Climate Change (2012) provide a legal foundation to their LTS. Similarly, Portugal, Fiji, France and the Ukraine have a comprehensive set of national and sectoral plans and laws they draw from. Furthermore, the UK designed the “25 Year Environment Plan” as a sister document to its LTS and published both documents in 2018. France’s LTS comprehensively lists existing and upcoming plans and legislations such as the Energy Transition for Green Growth Act (2015) or Grenelle II (2010), the country’s Climate Act, of which Article 224 amends fiscal regulations and obliges asset managers to provide non-financial (Environmental, Social and Governance) reports.

Paris aligned GHG reduction pathways: Out of 13, four countries’ LTSs aim to reach net zero GHG emissions by 2050 (Portugal, 2019, Fiji, 2019, Republic of the Marshall Islands, 2018, Germany, 2017), in line with the temperature goal of the Paris Agreement, with most referring to the 1.5°C target. Furthermore, the UK (2018) and France (2017) have retroactively adjusted their 2050 target to net-zero GHG emissions, although they did not resubmit an LTS. Fiji explicitly considers reaching GHG neutrality by 2041. Canada, the US and Mexico refer to the 1.5°C goal, although following the pathway with a lower than 50% chance of keeping global warming within 1.5°C.

Fossil fuel phase-out: Three countries plan a coal phase-out (Portugal, France and the UK), and the Republic of Marshall Islands plans a phase-out of the use of kerosene for cooking and lighting. Germany plans a total phase-out of fossil fuels and fossil fuel subsidies, but does not provide a specific timeline.

Ongoing visioning exercise: Taking into account uncertainties related to advances in research, technological innovations, as well as societal, economic and political developments, a majority of countries present their LTS as “living documents”, underlining the necessity to assess and update scenarios and pathways according to available data. Some countries indicate that revisions should take place regularly, with for example Ukraine, the Republic of Marshall Islands and France advocating a review at least every five years. The Czech Republic distinguishes itself by announcing within the LTS its intention to evaluate it by the end of 2021, and update it by the end of 2023. Germany puts in place a monitoring and evaluation process, which should be the foundation for future revision cycles.

Back-casting exercises (link to NDC or national targets): The elaboration of Portugal’s LTS (RNC2050) was carried out in parallel with the preparatory work for the National Energy and Climate Plan (PNEC), designed to be the main energy and climate policy instrument for 2021-2030. The back-casting exercise is visualised in a technical roadmap that provides a vision (including sectoral intermediate goals) to reach carbon

6. DEVELOPMENT AND IMPLEMENTATION OF LTSs FROM DIFFERENT PERSPECTIVES

This chapter presents contributions from a number of expert organisations, reflecting on the scope, concept and challenges of long-term low greenhouse gas emission development strategies (LTSs) from seven thematic perspectives. We asked each contributor the following question:

“From your perspective, what do you see as the role of national long-term low greenhouse gas emission development strategies (LTSs), what do you expect from them and where do you (fore)see challenges (e.g. in your specific sector)?”

As in previous editions, we include contributions from the Thematic Working Group leads of the NDC Support Cluster: UNDP builds on existing coordination mechanisms to facilitate the convening of state and non-state actors at all levels; WRI supports the development of MRV and GHG systems, data collection and processing and scenario development. Overall, seven organisations contributed to the debate from a different angle on the development and implementation of LTSs.

The NDC Partnership argues for strengthening the link between the NDCs and LTSs but cautions to take country context and -processes into account and not develop separate strategies. GIZ observes that while (I)NDCs were looking back, the new NDCs are looking forward. Early experiences show that NDC processes need to be carefully designed and executed, and that inclusiveness lends credibility. UNDP discusses governance and observes that LTS stands out for its long horizon and necessary whole-of-government scope. This comes with some challenges, but it also presents opportunities, for example to dismantle silos, include non-public stakeholders, and think out of the box. Transparency, the focus of the WRI contribution, goes hand-in-hand with inclusiveness and governance of the LTS and the underlying process. Communicating a vision is one of the functions of an LTS: settings targets, identifying ac-tions, creating attractive investment opportunities, raising finance, and guiding support. The International Development Finance Club sees an important role for long-term strategies and a role for its members to support governments with their low-carbon economic transformations.

The LEDSGP Global Partnership showcases two initiatives that can support long-term strategic NDC planning in the energy sector. First, the concept of Communities of Practice has proven to be useful in complementing conventional technical assistance in areas such as mini-grid development, integration of variable renewables, and issues around use of biomass. Second, LEDSGP offers four technology pathways to get stakeholders thinking and talking about transformations in the power sector: distributed energy, bulk renewables, transmission and distribution, and changes in the producer/consumer relationship.

The final contribution is from FAO and makes a strong case for agriculture to be at the centre of the global climate change agenda in light of its intricate links with food security and nutrition, poverty alleviation and rural development. National governments are encouraged to develop long-term agricultural visions and consider the long-term interactions between agriculture, natural resources and sustainable development. These sectoral visions can then guide and inform NDC and LTS planning, as well as leverage synergies with the Sustainable Development Goals (SDGs) of the 2030 Agenda.



NDCs AND LTSs – DIFFERENT POLICY TOOLS TO MAINSTREAM CLIMATE ACTIONS AND SUSTAINABLE DEVELOPMENT

The NDC Partnership is a coalition of more than 150 countries, international institutions and non-governmental actors. The Partnership is actively responding to formal requests for support from over 60 of its member countries, covering both NDC implementation and enhancement activities. The Partnership helps to align members around a single, country-owned plan developed by the government. These plans contain prioritized activities, some of which touch on the development or application of long-term low greenhouse gas emission development strategies (LTSs).

A contribution from Thibaud Voïta representing the NDC Partnership.

The NDC Partnership is working with several of its members on the articulation of their NDCs and LTSs, including Chile, Mali, Mexico, Namibia, Nigeria, Panamá, the Republic of the Marshall Islands, Rwanda, São Tomé and Príncipe, and Zimbabwe³. For instance, Mali is working on a 2050-low carbon development plan that will include both its NDC and national sustainable development agenda. Another example comes from Zimbabwe: its NDC implementation plan looks at short-term priority areas that will enable further actions for its LTS.

Some countries are working with the Partnership to strengthen the link between their LTS and enhanced NDC. As of October 2019, eleven countries⁴ have requested support to link their enhanced NDCs with a national long-term strategy. Many of these requests emphasize the integration of sustainable development into climate action. For instance, Colombia's and Chile's requests both include direct work on a long-term strategy, with a focus on the integration of the Sustainable Development Goals (SDGs) and alignment of these with their NDC and LTS.

In addition, some countries are using their NDC as a first step toward ambitious longer-term goals. For example, Costa Rica is aiming for a net-zero emissions economy by 2050 through a transformative action agenda, supported among others by an NDC investment plan. The implementation of the NDC is used to turn a bold climate plan into action⁵.

One of the most important lessons to emerge is that long-term planning can take very different forms in different countries. A long-term strategy is not always for 2050, nor is it necessarily only about climate change. Countries often have long-term strategies for critical sectors that are very powerful drivers of development decisions. For instance, Uganda has used its NDC to integrate climate action into broader medium and long-term development planning cycles. Similarly, Somalia is working on the enhancement of its NDC in the agriculture, livestock, ports, transport, energy, forestry, food security and water sectors through alignment with its National Vision 2040. As part of its work with the NDC Partnership, Jordan has also set goals in the agriculture sector for 2040, for instance in terms of deployment of renewable energy systems for small-scale poultry and cattle farmers.

Many countries are working to align long-term strategies with their NDCs. In some cases this means using long-term strategies to inform actions in the NDC. In others the NDC process itself is a means to developing longer-term plans. In all cases, it is essential to work within the structures that each country uses, in order to bring a whole of government approach that links the development and climate agendas through the budgeting or planning cycles. This can drive the mainstreaming of climate action that is so essential to success.

³ Out of these, Mexico and the Republic of the Marshall Islands (RMI) submitted their LTSs to the UNFCCC.

⁴ Antigua and Barbuda, Argentina, Chile, the Dominican Republic, Grenada, Guatemala, Jamaica, Mongolia, Nepal, Niger and Nigeria.

⁵ More information on most of the examples listed here can be found in NDC Partnership (2019) Partnership in Action – to be published in December 2019.

FIRST COUNTRY EXPERIENCES IN THE PROCESS OF DEVELOPING LTSs

GIZ supports 20 countries worldwide in developing or refining their long-term low greenhouse gas emission development strategies (LTSS). This includes economies at all levels of development, from least developed countries to members of the G20. While the countries GIZ supports are diverse in their environmental, economic, social, cultural and political conditions, the benefits of elaborating a long-term strategy are largely common to all.

A contribution from Eva Huebner and Pauline Probst (GIZ).

Developing an LTS involves ‘backcasting’, a powerful method that requires planners to start from the final goal and work backwards to understand how and when transformative changes need to happen. Most countries used an incremental approach to develop their first round of NDCs. With past climate action as a starting point, they aimed primarily for adjustments within existing systems. It is no surprise that the sum of this effort falls short of the global goal, even when the actions seemed ambitious in comparison to a business-as-usual scenario. Long-term strategies, in contrast, allow countries to first translate the global goal into a national target and vision. With this established, they can then understand the radical shifts required to achieve carbon neutrality and anticipate the required steps to implement them.

The challenge is clear: bringing about the transformative change that is required to limit climate change to an acceptable level inevitably raises hard questions. How can affordable and reliable energy be provided? What are viable economic alternatives to extracting and burning fossil fuel resources? How can the process of transformation be designed to include all actors – both potential winners and losers from the transition? And how can it be communicated in a way that motivates change and overcomes resistance?

This year, Germany⁶ stepped up ambition on its 2050 goal, moving from a target of 80-95% emissions reduction to carbon neutrality by mid-century. The country is now in the middle of a whole-of-society debate about transition pathways, a necessary step in understanding how to achieve

this new target, and also about a date for phasing-out coal-fired power generation. LTS processes offer the chance for an honest discussion about the challenges and trade-offs involved in transitions. In this way, South Africa is using its LTS process to discuss pathways that can allow for a just transition during the phasing-out of coal mining.

Experiences from our partner countries demonstrate that the process itself is the key: citizens, private sector and government at all levels need to be involved. Including a group of sectoral actors, ministries and scientists in developing the foundations provides flexibility and structural continuity at the same time. In Algeria, an expert group comprising representatives of ministries, national energy agencies, and research institutes is guiding the development of a macroeconomic model for defining low-emission development strategies.

To make sure that we are moving in the right direction, those discussions need to be held in all their complexity. This means they should not focus solely on deviation from high-carbon pathways – instead, the climate resilience of potential pathways is crucial to assure sustainable development in the long-term. Acknowledging that the climate is already changing, by including up-to-date climate information, and including adaptation in the conversation, are key steps in this regard. For example, Thailand is working towards setting targets on long-term adaptation actions.⁷ Planning for an uncertain future is complex and challenging – but we believe that together we can move forward and shape a future worth living around the world.

⁶ As its implementing agency for technical cooperation, GIZ supports the vision and mission of the Federal Government of the Republic of Germany.

⁷ Technical and political economy aspects of this discussion around adaptation and resilience are outlined in detail in a recent GIZ study (Watkiss and Klein, 2019)



GOVERNANCE FOR LONG-TERM STRATEGIES

A contribution from Michael Comstock (UNDP), on behalf of the Governance Thematic Working Group.

Long-term low greenhouse gas emission development strategies (LTSs) offer countries the opportunity to articulate their national vision for sustainable development in the context of transitioning toward carbon neutrality by 2050. They can also serve as a framework for moving beyond traditional development paradigms to achieve needed transformations. Because the LTS development and implementation process is inherently multi-sectoral and affects all levels of society, it requires an integrated governance approach. Effective institutional arrangements are needed to ensure: coordination among relevant ministries (including establishing a lead institution and clear roles and responsibilities); stakeholder participation and ownership; and mainstreaming of climate change in institutional and legal frameworks. High-level political leadership is also needed to launch and give weight to the process; to ensure that sufficient public resources are available; and to raise awareness of the transformations needed.

The development and implementation of LTSs presents a number of challenges and opportunities for rethinking climate governance. First, undertaking long-term planning requires considerable government coordination and new ways of working. Climate policy is often considered squarely within the purview of environment ministries. But because LTSs are, in effect, roadmaps for sustainable development, other national ministries such as planning and finance play central roles, as do ministries from key NDC sectors. In specific sectors (e.g. transport and waste), local and regional governments must be integrally involved in implementing transformations. The LTS process is therefore a chance to dismantle silos that may exist between ministries and to enhance coordination among national ministries and sub-national governments (e.g. for articulating decarbonization pathways, implementing transformations, sharing data, and tracking progress). Colombia’s “2050 Strategy,” for instance, is being led by the Intersectoral Climate Change Commission and builds on work with sub-national governments to develop regional climate change plans.

Second, the development and implementation of LTSs require a truly whole-of-society approach, given the scale of transformation needed. Positive cases are emerging: Costa Rica, for example, is addressing civil society demand for decarbonization and, in particular, electric mobility in its LTS (Elliott *et al.*, 2019). A whole-of-society approach requires innovative mechanisms for bringing diverse stakeholders fully into planning efforts. Having these voices at the table will better equip countries for a “just transition” that minimizes the impacts on people connected to high-emitting sectors.

Finally, government ministries and entities involved in developing LTSs face the task of developing new institutional capacities. The process requires countries to think far beyond traditional planning timeframes (e.g. government administrations or five-year plans) and offers the possibility of reconsidering development goals and pathways in a more comprehensive manner. For example, improving mobility can be achieved through investments in sustainable public transportation instead of more incremental measures like adding freeway traffic lanes. Understanding these opportunities requires a number of analytical capacities, for example, for undertaking cost-benefit analyses and long-term modeling.

LTSs offer tremendous opportunities for mainstreaming climate resilience and decarbonisation into national planning; informing shorter-term Nationally Determined Contributions; and achieving long-term sustainable development objectives. They can also guide investment decisions – especially for costly infrastructure – in order to avoid stranded assets and a “locking in” of future emissions. But only by rethinking a number of governance aspects – including government coordination, engagement of society, and institutional capacities – will countries be able to fully take advantage of these opportunities.

ENHANCING TRANSPARENCY OF LONG-TERM STRATEGIES

A contribution from Cynthia Elliott and Kelly Levin (WRI), on behalf of the Transparency Thematic Working Group

Long-term low greenhouse gas emission development strategies (LTSs) contain important elements, including long-term targets and goals, that require transparency if they are to be effectively implemented and communicated to domestic and international audiences. Aspects of transparency that countries should keep in mind when designing their LTS include: transparency of the LTS content; effective communication to a broad range of stakeholders; review of the LTS; and capacity building and support.

TRANSPARENCY OF THE LTS CONTENT

There are several key elements of a long-term strategy, which should be communicated clearly so that stakeholders understand and can help implement it. A transparent LTS will clearly communicate the:

- Long-term vision, including development objectives, mitigation elements, and adaptation elements;
- Sectoral strategies to achieve the long-term vision;
- Engagement and consultation process;
- Implementation approaches for the strategy;
- Monitoring, review and revision processes;

Given the central role of decarbonization goals, long-term strategies should transparently communicate quantified emissions reductions targets, their timeframe, sectoral and greenhouse gas coverage, intended emissions trajectory, and other assumptions.⁸

COMMUNICATION

Effective domestic and international communication of the long-term strategy is critical to ensure the narrative is compelling and represents the priorities and values of a broad range of stakeholders, and is comprehensible for non-experts (Elliott *et al.*, 2019). Transparent communication of the strategy need not create significant burden as relevant

information is collected during the design process anyway. However, one challenge countries may face in this regard is processing and synthesizing large quantities of information and distilling the key messages to include in the strategy document itself. Countries may also wish to consider when and how the final strategy is officially presented to the public, for example, through a national event or during international conferences such as during the COP, as this may encourage domestic actors and other countries to enhance their climate effort.

REVIEW

Another integral part of transparency is review. Deciding on a process at the outset to review the LTS in the future can help ensure the LTS remains a living document. A review provides the opportunity to reflect on progress and challenges and identify areas for improvement or course correction. The review of the LTS could contribute to updating at regular intervals to ensure that the strategies remain up to date in response to any political or technical changes, new science or information, and the evolving cost of technologies, among other possible factors (Elliott *et al.*, 2019).

PUBLIC ENGAGEMENT AND SUPPORT

Transparency is also important during the development of the LTS, to ensure stakeholders have the opportunity to engage and contribute. Engagement will enhance the quality of the LTS itself, and informed and engaged stakeholders will be more likely to support the LTS during implementation. For some countries, support may be needed to ensure that the design process for the LTS is participatory and transparent for domestic stakeholders. Countries can learn from others' experiences to understand how to effectively engage stakeholders, and some countries may require international support to conduct stakeholder engagement, develop an outreach and public awareness campaign, and develop communication materials.

⁸ For a detailed list of information that can be considered when communicating an LTS, see (Levin *et al.*, 2018).

LTSS AND THE ROLE OF DEVELOPMENT FINANCE INSTITUTIONS (DFIs)

The Agence Française de Développement (AFD) is the French development bank. It currently chairs the International Development Finance Club (IDFC). The AFD implements France's policy in the areas of development and international solidarity. This mission is carried out by providing loans, grants, expertise or technical assistance to States, local authorities, companies, foundations or NGOs, which are used to complete projects in many different fields, with a cross-cutting objective that at least 50% of its annual commitments finance projects with climate co-benefits. The AFD closely works with other development banks and research institutions to move forward Paris Agreement aligned finance.

A contribution from Serge Perrin, representing AFD, chairing the IDFC

The Paris Agreement sets out an unprecedented mandate to make all financial flows consistent with a low greenhouse gas emissions pathway and climate resilient development. As providers of long-term concessional finance, development finance institutions (DFIs) have a major role to play in catalysing and redirecting global public and private investment in support of transitions towards low-carbon and climate-resilient development. For this purpose, establishing long-term low emissions development strategies (LTSS) with ambitious mitigation targets, consistent climate-related policies and the identification of clear investment priorities including climate-resilient activities, can be a useful tool to mobilize increased and sustained financial flows.

In response to this challenge, and following the statement by major DFIs during the One Planet Summit in Paris (December 2017) to align their financial flows with the Paris Agreement, AFD committed to provide further support to countries by contributing to the development of LTSS through the establishment of the "2050 Facility", which aims at supporting around 20 countries in Africa, Asia and Latin America. One example of supported activities includes the development of "Deep Decarbonization Pathways"⁹, to help inform the development of national low emissions development strategies which integrate economic development and climate-change planning in a coherent national strategy. Another relevant line of work, as evidenced by the case of South Africa¹⁰, is to support countries in better anticipating climate transition risks, and to help reduce the costs associated with the decarbonization of economies, which is

of specific importance for the finance sector.

In the LTSS process, ensuring that country-relevant assumptions underlying the development of pathways are defined in a transparent manner, and widely shared among national stakeholders – including government, local authorities, private sector and civil society – is key for the ownership of these strategies, but can be challenging in some countries lacking resources or capacities. Development banks are used to working with a wide range of stakeholders in the countries they operate in, including finance, development, environment and sectoral ministries, and can therefore support a whole-of-government approach to design LTSS with concrete planning and development objectives. Perhaps even more important than the LTSS itself is the policy dialogue and the underlying dynamics around the definition of potential pathways, which can help reveal key enabling conditions, such as technology development, institutional reform, and finance for climate investment.

We are just at the beginning of the Paris Agreement alignment agenda, and the development of LTSS will require increased mobilisation of the climate finance community to support countries actively seeking to implement low-emissions and climate-resilient development pathways. The International Development Finance Club (IDFC)¹¹ can play a key role in supporting the economic transformations of countries, notably by providing direct input on policy design and influencing project development, and ensuring that future investments do not lead to lock-in or low climate resilience¹². The road towards the long-term goals of the Paris Agreement is likely to be long and bumpy, therefore we should get started right away.

9 Coordinated by the Institute for Sustainable Development and International Relations (IDDRI).

10 Understanding the impact of a low carbon transition on South Africa, Climate Policy Initiative (CPI), March 2019.

11 IDFC, created in 2011, is the largest provider of public development and climate finance globally, representing 24 national (including AFD who is currently Chair of the IDFC) and regional DFIs with over USD 4 trillion in combined assets and annual financial commitments above USD 850 billion (including USD 200 billion of climate finance).

12 For more details on the conceptual basis for alignment and its implications for the financial community and members of the IDFC, see the recent papers by I4CE (Institute for Climate Economics) and CPI, Aligning with the Paris Agreement, September 2019. https://www.i4ce.org/go_project/aligning-with-the-paris-agreement/

TRANSFORMING THE ENERGY SECTOR THROUGH COMMUNITIES OF PRACTICE AND LONG-TERM PATHWAYS

The Energy Working Group (EWG) of the Low-Emissions Development Strategies Global Partnership (LEDS GP) supports practitioners planning and implementing climate-compatible development strategies in the energy sector. The first contribution below focuses on a new technical assistance approach implemented successfully by the EWG in close cooperation with the LEDS GP's regional chapters: "Communities of Practice" (CoPs). This approach enables countries to learn from one another, including both best practices as well as experienced failures. The second contribution focuses on the LEDS GP's exploration of four different long-term energy pathways.

A contribution from Alexander Ochs (SD Strategies), representing the LEDS-GP Energy Working Group

Transforming the energy sector through regional Communities of Practice

The current climate crisis demands both fast and disruptive as well as deep and sustained transitions in our energy systems. Energy is the sector with the highest GHG emissions, and the way we generate, transmit, distribute, consume and store energy will be decisive not just for embarking on a climate-compatible development pathway – but for achieving the broader agenda of Sustainable Development Goals (SDGs). The overall objective must be to create energy and transport systems that provide electricity, heating, cooling and mobility services to all human beings worldwide in an affordable, reliable and sustainable manner. This can only be accomplished if the selected strategies, policies and measures can advance other development targets as well.

The design of sectoral transformation plans comes with a broad range of analytical questions and challenges and results in significant economic, social and environmental consequences well beyond the energy sector. Thus, steering a quick, effective, and sustained energy transition requires a holistic approach, including the evaluation of technological potentials and bottlenecks; cost-benefit analyses of alternative development pathways; assessment of the investment environment; and exploration of the toolbox of feasible and ambitious policies and measures.

CoPs are networks of engaged experts from a shared sector or working area who form a group to regularly engage in peer-to-peer learning to improve their personal and collective group knowledge. A CoP promotes exchange both inside and outside formal communication channels. By providing an inclusive, member-driven, and interactive experience, it offers an alternative to conventional development assistance. CoPs sit in the sweet spot between the progress made in individual countries – which they aim to accelerate and which they absorb and present as experiences to regional partner countries in the CoP – and the worldwide community of practitioners to whom major findings are reported, usually in the form of advisory papers, trainings or webinars. The LEDS GP Energy CoPs assist in the design of concrete country-specific policies and goals; provide free-of-charge support services for community debate and learning; and establish new partnerships with world-leading organisations, often targeting financial or further technical assistance for the roll-out of concrete projects and actions.

To this date, three energy COPs are in place:

- 1) **THE AFRICAN MINI-GRIDS COP:** With a focus on accelerated development through mini-grids, this CoP addresses issues around human resource needs and capacity building; innovative business and financing models; stakeholder engagement, community outreach, empowerment of women, and demand creation; as well as effective institutions, targets, policies, regulations, and standards. The main challenge is to “derisk” private investment in the sector, including through operational tariffs, state guarantees, and efficient public interventions.
- 2) **THE ASIAN GRID-INTEGRATED RENEWABLE ENERGY COP:** This initiative focuses on data and analysis needs, incentives and market design, competitive procurement,

financing, and technical solutions for the integration of renewables into the grid. It draws on regional best practices, particularly the most cost-effective approaches. One key challenge is the assessment of financial, technical and human resources needed to reach up to 100% renewables in Asian grids in the longer term.

→ **3) THE LATIN AMERICAN & CARIBBEAN BIOENERGY COP** : With a focus on the design and implementation of bioenergy policies and programs, this CoP investigates investment risks and de-risking measures for a broad set of technical applications, ranging from the off-grid use of crop residues to the production of biogas as baseload back-up to intermittent renewables. One main challenge is to make sure that the use of biomass for energy generation is not an obstacle to but rather an enabler of other important SDGs such as food security, intact forests, and maintained soil quality.

CoPs can be successful instruments to support climate-compatible development within the three conceptual time frames that are all equally important to avoiding dangerous climate change. They can help to 1) accelerate NDC implementation in the immediate present; 2) raise ambition in the medium term; and 3) inform the formulation of long-term low greenhouse gas emission development strategies (LTSs).

Sub-sectoral strategy development, as undertaken in the energy CoPs on mini grids, bioenergy and grid integration, is an important pillar of designing and implementing energy-sector reform, which is a central component of any ambitious climate-proof development plan. The contribution of individual technical solutions to the sustainable development aspirations of a specific country needs to be weighed against time requirements: What quick advances are realistic? What can be achieved by 2030? And how important are they as a component of a climate-proof, sustainable energy system in 2050? Transitioning to a sustainable energy sector and climate-proof development requires immediate sectoral action, ambitious mid-term commitments as well as effective long-term strategies. The LEDS GP Energy CoPs have enabled progress within all three timeframes.

A contribution from Sadie Cox (NREL), representing the LEDS Global Partnership

Exploring long-term power sector transformation pathways

The power and heating sectors are responsible for around 30% of global CO₂ emissions and this share is likely to grow as countries move towards electrification of the transport and building sectors. Therefore, enabling forward-thinking, long term strategies in the power sector is a crucial area for international collaboration and support. Many countries are well-poised for power sector transformation, however, further support is needed to identify pathways and implement critical near and long-term actions. To address this need, LEDS GP and several international partners propose four key pathways, which can be connected and complementary based on unique country and jurisdictional settings.

Under the **Distributed Energy Resources (DER) Revolution Pathway**, distributed energy technologies, particularly solar PV, distributed storage, energy efficiency, plug-in electric vehicles (EVs) and other grid-edge and digital technologies are significantly scaled up by 2050. Once simultaneously optimized, these technologies can reshape energy demand and supply and store energy as part of the power system. Aggregation, consumer empowerment, and digitalization are key aspects of this pathway.

The **Bulk Power Transformation Pathway** focuses on integrating utility-scale renewables, improving bulk power system stability and reliability, and promoting power system flexibility. This pathway could either be adaptive, with slight changes to the current power market, or be reconstructive, with larger power market reforms aligned with renewable integration. While this Pathway may emphasize available and proven technologies and thus have lower risk, it requires a steady stream of financing to support large-scale infrastructure investments and could lead to reduced consumer engagement, relative to other pathways. Understanding the scope, impact and cost of various measures to support utility-scale renewable energy grid integration and power system flexibility are key aspects of this pathway.

Under the **Transmission and Distribution (T&D) Interactivity Pathway**, a highly flexible and operationally optimized transmission grid is linked with the optimized distribution grid, grid-level storage, dispatchable distributed generation, real time monitoring and analytics, and consumer demand interactivity. This requires modernising of, and enabling streamlined communication between the T&D systems. Both planning and operations are flexible and optimized, and grid components are increasingly able to “self-heal”¹³. Utilities remain the center-point of energy systems, although new business-models allow for increased customer ownership and utilities play a more complex role in operations, communications, and coordination across neighboring regions/systems and the integration of distributed energy resources. Similar key aspects as in the previous pathways apply.

Under the **Distributed Transactional Future Pathway** there is a critical two-fold shift from system operators managing only a couple of dozen control points on the electricity supply side to:

- More nodes and control points – Systems are moving from having dozens of power injection nodes and related grid services, to having potentially millions of control points—each one linked to distinct distributed energy resources.
- Changing nature of control points – What had formerly been strictly passive demand nodes interacting in a unidirectional way with the grid will now double as supply nodes needing to interact bi-directionally with the grid.

In order to unlock technical advances made in the pathways above, the way energy services are planned for, characterized, valued, priced, procured and transacted will need to change. Thus the “Distributed Transactional Future” Pathway can be understood as a critical complementary pathway to the three pathways described above.

To use such pathways in decision-making, country decision-makers can come together under stakeholder driven processes to discuss factors related to renewable energy resources, land availability, key economic sectors, market and institutional structures, grid characteristics and vulnerabilities, as well as broader objectives for the power sector, to inform long term low carbon power sector visions. These visionary pathways could then inform back-casting of near-, and medium-term actions to be scaled up. The LEDS Global Partnership has developed a spreadsheet tool to support these stakeholder efforts and pathway decisions that will be made available in the near future. Importantly, countries at early stages of renewable energy development can design and implement policies or other actions that are universally supportive across all pathways¹⁴.

Technological and manufacturing-related innovations, as well as key market factors, are driving down costs and improving performance characteristics for a range of energy technologies critical for power sector transformation. Such trends will also play a key role in informing decisions to emphasize certain pathways. Particularly as countries reach higher penetrations of renewables and, in some cases, 100% renewables, the nuances and related technologies and actions across these pathways will become increasingly important to reach these futures.



13 Grid components automatically remove faults or operate in a fashion that allows faults to be isolated following grid disturbances, so that power continues to be supplied to as many customers as possible until the fault can be corrected.

14 More information at: <https://greeningthegrid.org/>.

WHY AGRICULTURAL LONG-TERM VISIONS ARE NEEDED

The Food and Agriculture Organization of the United Nations (FAO) supports developing countries to identify and integrate climate adaptation and mitigation measures into their national planning in the agriculture sectors in support of the SDGs. In its country level policy support, and in international arenas, FAO emphasizes the importance of having a long-term vision for the agricultural sector and sustainable food systems¹⁵.

A contribution from Julia Wolf, Krystal Crumpler and Antonio Mele, representing FAO

INTRODUCTION

Climate change and agriculture are intricately connected, affecting food security and livelihoods across the globe in a number of direct and indirect ways. Climate change impacts agriculture through increased temperatures, changes in rainfall patterns and water availability, and changes in extreme weather events. Resulting productivity declines can have implications for food security, lead to increases in food prices, and climate variability can accentuate price volatility (FAO, 2016). Existing agricultural practices also contribute to the onset of climate change: agriculture, together with forestry and land-use change, is responsible for an estimated 23 percent of total GHG emissions (FAO, 2017b). As a result, the agricultural sector (including crops, livestock, forestry, fisheries and aquaculture) has a central role to play in addressing the ways in which climate change affects ecosystems and people, as well as in the design of better climate change adaptation and mitigation solutions.

Global transformations towards sustainable food and agriculture are urgently needed: the impacts of the increasing frequency, intensity and variability of extreme weather events are expected to worsen over time (FAO, 2016), while the IPCC calls for rapid and far-reaching transitions in all major sectors (including land use), in order to keep within the Paris Agreement’s long-term temperature goal (IPCC, 2018a).

Art. 4.19 of the Paris Agreement states that all Parties “should strive to formulate and communicate long-term low greenhouse gas emission development strategies (LTSs) mindful of the long-term goals of the Paris Agreement”. Long-term strategies are therefore considered very important for achieving the objectives set by the Paris Agreement. The IPCC (2019b) also strongly points out the enabling influences of taking long-term perspectives when making short-term decisions, explicitly accounting for uncertainty of context-specific risks beyond 2050.

This contribution explores the role of LTSs for the agricultural sector, identifies challenges and expectations, and synthesises the experience of six countries who have already developed (or are in the process of developing) an LTS.

THE IMPORTANCE OF AGRICULTURE IN LONG-TERM STRATEGIES

Climate change is one of several ‘megatrends’ that will (re)shape the future of food production, processing, and distribution. Fast urbanization, population growth, increasing demand, increasing mega-cities, and land competition will all influence the sustainability of agriculture. In order to be prepared, countries will need to consider the long-term interactions between agriculture, natural resources and sustainable development in order to guide decision making towards a more sustainable food and agriculture pathway.

Developing a long-term strategic approach to agriculture can offer a platform for visioning exercises and an opportunity to discuss short- and medium-term priorities, including NDC targets, and trade-offs within a broader framework that includes other national and sectoral development priorities. Long-term visions for agriculture are an important input to comprehensive national NDC planning, and for the identification of efficient strategies for achieving the Sustainable Development Goals (SDGs). FAO analysis of NDCs shows that 88 percent of countries refer to agriculture and/or land use in their mitigation contributions, while up to 96 percent refer to agriculture as part of their adaptation strategies; and over one-third explicitly reference the social, economic and environmental co-benefits of climate action in agriculture sectors, including human health, employment and income gains and gender equality (FAO, 2019a). Moreover, climate action in agriculture is found to help achieve the SDGs (FAO, 2019b).

¹⁵ E.g. *Africa Sustainable Livestock 2050*: <http://www.fao.org/in-action/asl2050/en/>

Notwithstanding the clear link between NDCs and long-term visions, agriculture only features marginally in the limited number of LTSs that have been submitted to the UNFCCC. Analysis done by UNEP DTU Partnership (2018) shows that agricultural solutions are considered least frequently amongst mitigation measures, with fewer than 20 percent of medium to long-term Technology Needs Assessments including agricultural actions to mitigate emissions or enhance sinks. On the contrary, countries prioritise agriculture-related solutions for adaptation measures.

Only a few countries and regions have developed a long-term vision for agriculture, while many have not. African Agenda 2063¹⁶ and EU's 2050 long-term strategy¹⁷ are both examples on how significant climate mitigation and adaptation actions in the agriculture sector can be.

AGRICULTURAL STRATEGIES AND SOLUTIONS EXIST – FOR ADAPTATION AND MITIGATION

Climate-smart agriculture and nature-based solutions have proven to offer opportunities for enhanced mitigation and adaptation. The principles of circular agriculture, agroforestry, and agroecology have the potential to reduce emissions, build resilience, and protect biodiversity and safeguard ecosystems services – the value of which is approximately equal to global annual gross domestic product (IPCC, 2019a). A variety of agricultural actions is available: better feeding and manure strategies, for example, can reduce livestock emissions by 33 percent on average (FAO, 2017a)¹⁸. Moreover, agriculture is the only sector that holds the capacity to sequester GHG emissions from the atmosphere without reducing productivity (when sustainably managed).

Natural resource use and competition, particularly for land, represent one of the many challenges we face. However, the IPCC finds that win-win solutions between ecosystem conservation and development are available when trade-offs with food security and poverty are addressed (IPCC, 2014).

EVIDENCE FROM COUNTRIES IN LONG-TERM AGRICULTURAL PLANNING

In the context of the 3rd Dialogue on *Koronivia Joint Work on Agriculture (KJWA)*, hosted by FAO in September 2019, the authors interviewed country representatives to get their position on “if and how” agriculture and land-use policies and plans can support efforts to achieve the goals of the Paris Agreement, and the extent to which agriculture and land-use are included within NDC targets and LTSs. Based on the responses, we observe that the agricultural sector faces many challenges in playing a role within a country's long-term climate and development strategy.

Firstly, respondents acknowledge that agricultural solutions, such as agroforestry, climate-smart agriculture, nature-based solutions, and circular agriculture can provide great opportunities for mitigation and adaptation simultaneously, and even for sequestering carbon. A challenge with these solutions is that **better metrics** are needed. Quantification of potential output of agroecological practices – an important element for countries expecting growing population – is often lacking. Moreover, the scientific monitoring of agricultural mitigation potentials is very difficult to prove scientifically. Without robust estimates of long-term mitigation potentials, there is a risk that agriculture is left behind in favour of sectors such as energy and transportation where mitigation impacts are easier to measure.

Secondly, additional **technology investments and communication strategies** are needed as enablers for the transition. This point is relevant for developed countries, where emissions in other sectors exceed agricultural emissions by far (e.g. Japan), but also for developing countries where the challenges are a combination of low levels of investment in technology, and resistance to change in behavioural practices (e.g. Benin).

Thirdly, **targeted incentive** mechanisms can play an enabling role in supporting the transition to long-term sustainable agricultural planning. Agroecological practices require high labour input in the first five to ten years, before showing an exponential increase in output (so-called ‘lag time’). Specific incentives are therefore needed in support of business

16 <https://au.int/en/agenda2063/overview>

17 https://ec.europa.eu/clima/policies/strategies/2050_en#tab-0-1

18 *The total technical mitigation potential from crop, livestock activities, and agroforestry is estimated as 2.3-9.6 Gt by 2050 (IPCC, 2019a).*

models, allowing for this delayed revenue. Policy support is also needed to facilitate those behavioural changes, particularly in the short-term, that are typically difficult to accomplish (e.g. Fiji). Last but not least, institutional frameworks – including law and regional agreements – are considered key to guide long-term agricultural sustainability (e.g. Peru).

FAO RECOGNIZES

FAO recognizes the fundamental role sustainable agriculture and food systems can play in LTSs. Addressing the technical and institutional barriers to the uptake of low-emission and climate-resilient agricultural practices is necessary to enable system transformations and paradigm shifts in the way that institutions safeguard ecosystems and vulnerable livelihoods in a changing climate. Agriculture must be at the centre of the global climate change agenda in light of its intricate links with food security and nutrition, poverty alleviation and rural development. For this reason, FAO encourages national governments to develop long-term agricultural visions, which can guide and inform NDC and LTS planning, and leverage synergies with the Sustainable Development Goals (SDGs) of the 2030 Agenda.

Looking ahead, FAO is building improved foresight capacity through analyses about the future of food and agriculture, exploring different scenarios for the future development of global food and agriculture systems. These projections are based on different sets of assumptions regarding key drivers such as income growth and distribution, population growth, technical progress, and climate change. FAO is directly working on innovative technical solutions and projects in the field of sustainable agriculture experimenting with approaches that simultaneously seek to ensure productivity, resilience and inclusiveness (FAO, 2018b, 2018a, 2019c).



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