

Sectoral implementation of nationally determined contributions (NDCs)

May 2017

OVERVIEW

This publication is the first of a series of NDC sectoral overviews, which provide information about current sectoral contributions to global greenhouse gas emissions and prospects for implementing NDCs in these sectors.

Each briefing paper presents concrete options for integrating sectoral measures in future NDCs, as well as more general cross-sectoral recommendations for moving forward with emissions-reductions measures.

Written primarily from the perspective of climate change experts, with input and suggestions from sector colleagues, the briefing series' intended target audience is twofold: first sectoral experts, who are facing the challenge of implementing the NDCs and related climate policies in their respective sectors; and second climate change experts, highlighting the relevance of the sector for NDC implementation.

This briefing paper serves as an introduction to a series of NDC briefing papers and addresses the overarching, cross-sectoral issues of NDC implementation. Sector-specific information can be found in the respective papers of the series.

Background on NDCs and the Paris Agreement

Overview of submissions

In the run-up to COP21 in Paris, and shortly thereafter, 190 Parties committed to global climate change efforts by submitting so-called Intended Nationally Determined Contributions (INDCs) to the UNFCCC. INDCs represent Parties' planned contributions to help achieve the objectives of the Paris Agreement, which include limiting global temperature increase to well below 2°C and to pursue efforts to limit the temperature increase to 1.5°C (Article 2.1 Paris Agreement). As all Parties were asked to submit INDCs, irrespective of their national circumstances, they represent a turning point in the international climate change regime, which previously had always sought to differentiate between developed and developing countries, and are at the core of the Agreement (Article 4 Paris Agreement).

The Paris Agreement was a pivotal moment for international climate change negotiations, marking the first global climate change agreement with almost universal participation and a record-breaking entry into force.

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By October 2016, more than 55 Parties responsible for more than 55% of global emissions had ratified the agreement, resulting in its entry into force in November 2016. The *intended* part of INDCs is dropped when Parties confirm their Nationally Determined Contributions (NDCs)¹ by ratifying or formally acceding to the Paris Agreement. By March 2017, the Paris Agreement had 194 signatories and 143 ratified Parties.²

The bottom-up nature of the NDC process allowed countries maximum flexibility in the preparation and presentation of their contributions. This resulted in the presentation of a wide array of approaches for reducing emissions (see UNFCCC 2015b for further details). Some NDCs are mainly outcome-based in the form of targets, others are action-based, and refer to specific activities to be implemented. Developed countries often proposed absolute targets, while most developing countries opted for targets relative to business as usual (BAU) scenarios, which may be subject to change. Most developing countries also included adaptation components in their NDCs, with considerable variation related to the actions they might take based on various conditions, such as the provision of support.³

While the diversity of NDC formats makes it challenging to compare and calculate the overall contributions, it is clear that the current level of ambition will be insufficient to achieve the long-term objective of the Paris Agreement. Although Parties responsible for 95% of global greenhouse gas emissions have submitted INDCs, the full implementation of all NDCs would still result in a temperature increase of between 2.9°C and 3.4°C by the end of this century, relative to pre-industrial levels (UNEP 2016). The implementation of just the unconditional NDCs would result in annual emissions in 2030 that are approximately 14 GtCO₂e higher than that required for a likely 2°C pathway, and approximately 17 GtCO₂e higher than the requirements for 1.5°C. The impact of implementing conditional NDC targets and measures would reduce this *emissions gap* by only 2 GtCO₂e (UNEP 2016). Nevertheless, the NDCs represent a positive start in a process in which ambition should be continuously raised.

Implications of the Paris Agreement for the ambition cycle

The ambition cycle is a central feature of the Paris Agreement. Figure 1 provides a schematic overview of NDC processes and related activities to raise the overall ambition level over time.

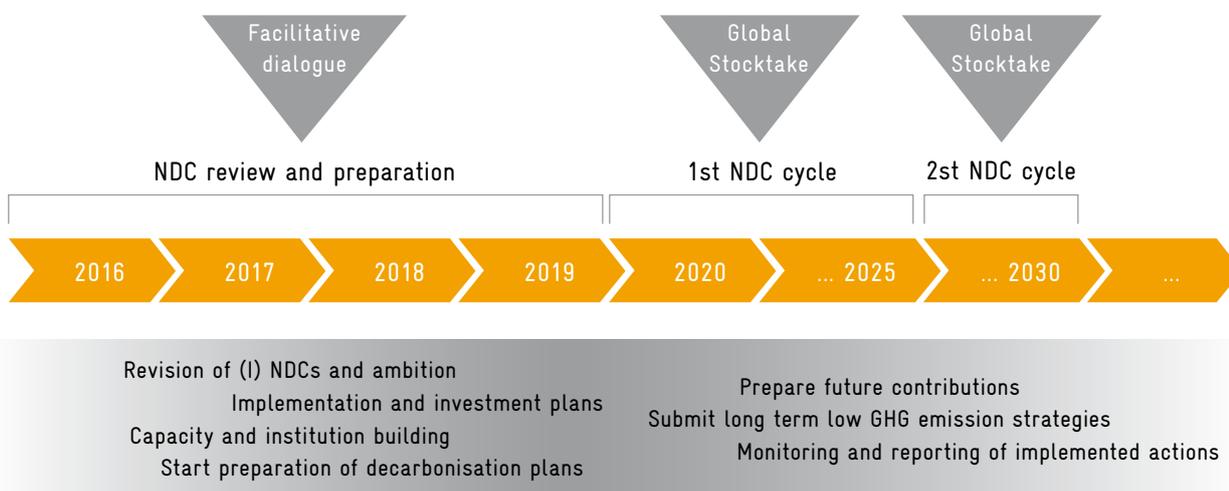


FIGURE 1: Schematic overview of ambition cycle, based on Röser et al. (2016).

1 INDCs and NDCs are referred to collectively as NDCs throughout the briefing paper. The collective reference and associated analysis makes the assumption that remaining INDCs will be converted to NDCs without significant changes upon ratification.

2 See UNFCCC NDC portal website for the latest information on NDC submissions and ratification: http://unfccc.int/focus/ndc_registry/items/9433.php

3 For further information on NDC typologies, targets, and other features, see the WRI CAIT tool (2015) or World Bank (2016) for databases on NDC features and Röser et al (2016) for further discussion.

The following list contains the key elements of the Paris agreement related to raising the ambition of the NDCs.

- » ***The Paris Agreement includes an ambition mechanism.*** The Paris Agreement indicates that Parties should revise their NDCs at least every five years to increase the ambition of mitigation contributions (Article 4.3 and 4.9). As such, countries should be continuously engaged with identifying options for raising their mitigation ambition, as well as with the implementation of their current contributions. Countries are expected to submit their revised NDCs by 2020.
- » ***All countries should move towards economy-wide targets.*** While the current NDCs present various approaches to target-setting, based on countries' capacities, Article 4.4 of the Paris Agreement requires all countries to move towards the use of economy-wide targets in their NDC over time.
- » ***Transparency framework.*** In order to enhance transparency and clarity of action, the Paris Agreement establishes an *Enhanced Transparency Framework* (see Article 13 of the Paris Agreement, UNFCCC 2015a). This framework requires Parties not only to regularly submit greenhouse gas (GHG) inventories, but also to regularly provide information about their progress on NDC implementation, support provided and received and their adaptation efforts. A technical expert review will be conducted for all Parties. The review will, inter alia, analyse the consistency of information, identify areas for improvement, as well as for capacity building. Each Party will also participate in a facilitative, multilateral consideration of progress with a view to its NDC implementation and support provided (see Article 13.11 and 13.12).
- » ***Long-term goals require full decarbonisation.*** To achieve the long-term temperature objective of the Paris Agreement, Parties must aim to reach net-zero global emissions before the end of the century (Article 4.1) which will necessarily impact emissions in all sectors. This requires that global GHGs be net-zero between 2060-2080 for a 1.5°C pathway and between 2080-2090 for a 2°C pathway (UNEP 2016). Energy-related GHG emissions should be net-zero about 20 years earlier, with devel-

oped countries expected to decarbonise faster than developing countries. NDC revisions should consider not only medium-term planning for emission reductions, but also long-term planning for full decarbonisation. Article 4.19 of the Paris Agreement explicitly calls for Parties to “strive to formulate and communicate long-term low greenhouse gas emission development strategies” (UNFCCC 2015a). The inclusion of long-term decarbonisation targets in NDCs may have positive impacts for sector-driven implementation by providing sectoral stakeholders with a long-term view on emissions pathways. Increased awareness among stakeholders could help them contribute to formulating more ambitious targets for future NDCs.

Sector-driven approaches to NDC implementation

Translating NDCs into concrete and bankable measures will be done primarily on a sectoral level. This process can be further supported by aligning development and climate policy, thereby capitalizing on significant potential synergies.

Cross-sectoral cooperation will be decisive for successful NDC implementation on a country level. It has been shown that countries, which involved line ministries in the development of their NDCs, or in earlier mitigation planning processes, generally reported fewer challenges than countries where processes remain centralised in a single responsible ministry or agency (NewClimate Institute 2015). This is mainly due to the enhanced availability of information and expertise on specific sectoral options, greater ease of aligning the NDC with sectoral strategies, and greater awareness and political will of sector-level decision-makers and stakeholders.

While NDCs provide orientation for sectoral activities, greater sectoral expertise and involvement will be critical to accomplishing development and climate goals. Questions including, how sectors can contribute to achieving these goals, how sectoral policies and measures can be prioritized, and how more ambitious contributions can be achieved over time, are just some of the considerations for sectoral engagement going forward. Just as Parties to the UNFCCC formulated their own NDCs, it is also up to them to decide how to engage sectors and implement sectoral mitigation measures.

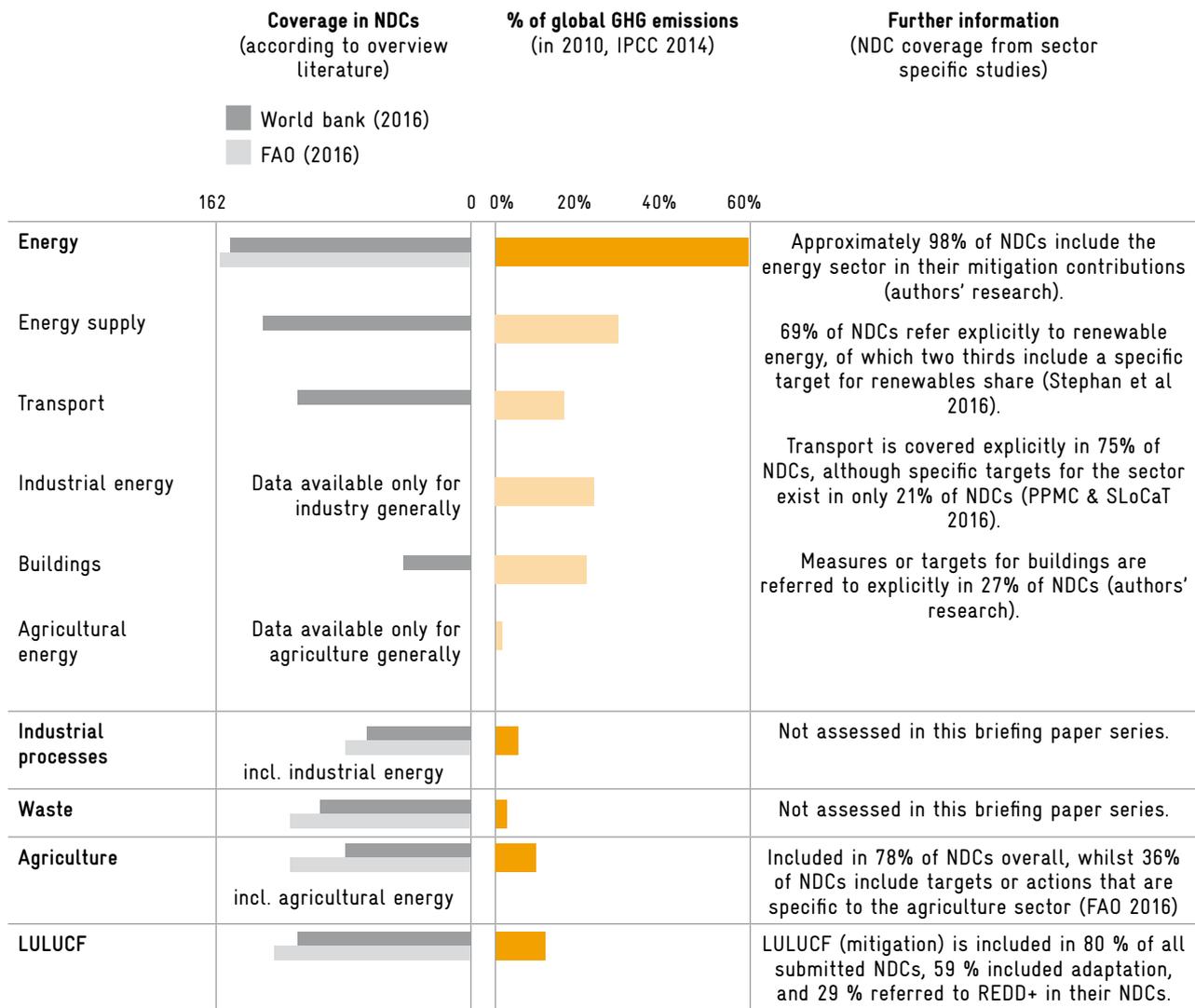


FIGURE 2: Overview of mitigation contributions of (I)NDCs⁴ by sector.

Figure 2 presents an overview of the sectoral coverage of mitigation contributions based on analyses from the World Bank (2016) and the FAO (2016), split according to the sector categorisation of UNFCCC emission accounting standards for inventories (Common Reporting Format (CRF), see UNFCCC 2011). The Figure depicts energy as the most prominently included sector, appearing explicitly in almost all NDCs. This reflects the importance of the energy sector, given that it is the source of nearly 60% of global GHG emissions. Aside from the energy sector and associated sub-sectors, other major UNFCCC accounting sectors – including industrial processes, waste, agriculture and LULUCF – all appear frequently in NDCs. However, these sectors are

often included only as part of overarching economy-wide targets and the rate at which specific measures or actions are identified for these sectors is lower than for the energy supply sector.

Figure 2 also indicates the methodological challenges in terms of accounting emissions, showing that the currently available literature and databases on sector coverage of NDCs is at times inconsistent and incomparable. The most accurate information is available from sector-specific studies, but these are not always comparable across sectors due to variations in approaches to sector classification and definitions.

⁴ Data in Figure 2 refers to sector coverage as a proportion of the 162 INDCs, rather than the 190 Parties represented (28 EU countries submitted a single INDC) (World Bank 2016; FAO 2016; Stephan et al. 2016; PPMC & SLoCaT 2016). Where authors' research is noted, this refers to new analysis on the part of the authors of this briefing paper.



Parties to the UNFCCC formulated their own NDCs. They also have to decide how to implement sectoral mitigation measures.

The inclusion of sectoral information in the NDCs, which is in line with the UNFCCC CRF is, on the one hand, advantageous for aggregated emission accounting and forecasting, and comparability of efforts. On the other hand, this approach has limitations for facilitating sector-driven implementation and ambition review if specific targets and measures for sub-sectors are not included. For example, many NDCs refer to *energy* interchangeably with the energy supply industries sub-sector (in particular, electricity generation). Although emissions from energy use in buildings, agriculture and industries may be implicitly included in targets for the energy sector, the less frequent explicit reference to targets and measures for these emission sources is not conducive to the development of NDC implementation plans at the sectoral level.

Furthermore, the way that the CRF categorises sectors and accounting of emissions does not necessarily line up with common institutional setups for decision-making and action. As such, it would be helpful if sector-driven implementation of NDCs were based on the translation of high-level targets into their implications for sectors and sub-sectors. This “translation” could be provided, for example, through NDC revisions or the development of sector-level NDC implementation plans.

The coverage of sectors in NDCs is provided in greater detail in the sector-specific papers of this briefing series. The sectors and sub-sectors analysed are five of the most important in terms of their emissions and mitigation potential. The following sectors and sub-sectors are addressed in the briefing series:

- » **Energy supply:** Power supply industries make up the sub-sector with the greatest emissions and the greatest mitigation potential. Significant developments in the quality and affordability of new technologies in recent years have improved the feasibility for decarbonisation of the sector in all regions. Electricity, in particular renewable electricity, is also the most frequently cited in NDCs for mitigation potential, however, the concept of fossil fuel phase out is rarely addressed.
- » **Energy efficiency with a focus on buildings:** Energy consumption in buildings and industry account for nearly 40% of global GHG emissions, although the energy demand sub-sectors themselves, buildings in particular, are not frequently mentioned in NDCs. Energy efficiency improvements present significant potential to reduce energy demand and emissions, particularly in the short term.
- » **Transport:** Accounting for over 14% of global GHGs in 2010, the transport sector is one of the largest sources of emissions, and one of the most frequently included sub-sectors in NDCs.
- » **Forestry and land use change:** The LULUCF sector accounted for over 12% of global GHG emissions in 2010. The sector is particularly important for its potential to switch from a source of carbon emissions to a carbon sink. Forest management is also of key importance for human livelihoods in many regions.
- » **Agriculture:** The agriculture sector is also a major source of global emissions and one for which there remains a considerable gap in knowledge and experience with low-carbon pathways. As such, specific measures for the sector are infrequent in NDCs. There is a great need for improved information and enhanced planning in the sector.



NDC revisions and implementation planning are essential for all countries.

Towards sector-driven implementation and raising ambition

NDC revisions and implementation planning are essential for all countries in the short-term in order to avoid losing momentum gained during the NDC preparation and the ratification process of the Paris Agreement. Some countries have already started the process of NDC revision and the development of implementation plans, although clear results of these efforts are not yet available. The NDC Partnership launched at COP22, is one vehicle

to support the implementation of NDCs and related SDG commitments. It aims at enhancing cooperation so that countries have more effective access to the technical knowledge and financial support necessary to deliver on their NDCs and to increase synergies between climate and development policy.

Figure 3 presents an overview of next steps for sector-driven implementation of NDCs, including an overview of actions for enhanced planning and policy interventions, as well as requirements for NDC revisions.

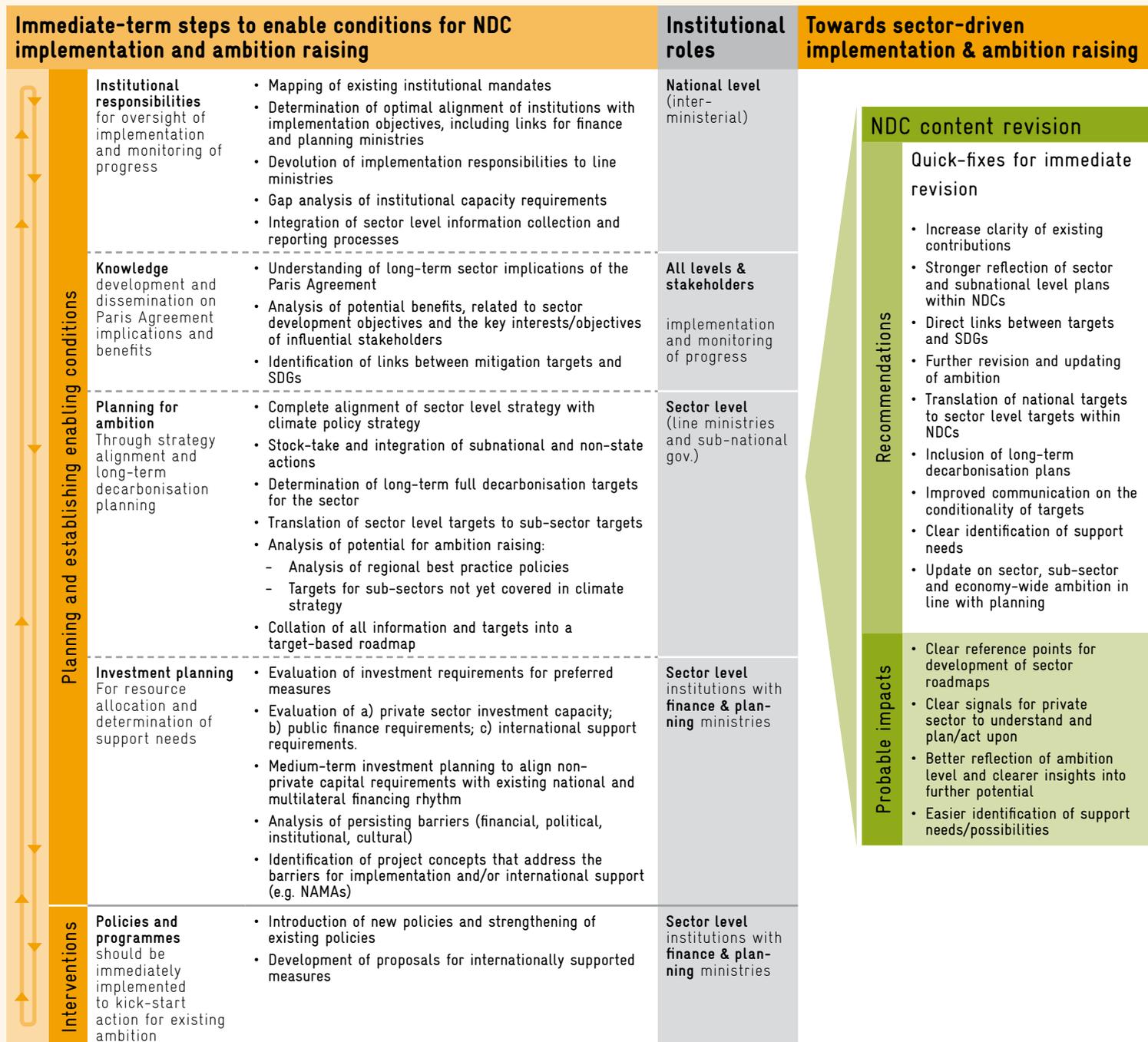


FIGURE 3: Key steps towards sector-driven implementation and ambition raising. Authors' own elaboration.

Next steps for sector integration, implementation and raising ambition

National climate policymakers and sector-level strategists could consider the steps summarised in Figure 3 to enhance the enabling conditions for NDC implementation and raise ambition at the sectoral level. The following illustrates possible steps towards completing the shift from planning to implementation before 2020. Many of the steps described below refer to optimising planning processes and enabling conditions. As many countries have already undertaken advanced planning, these processes should build on existing activities, with a view towards catalysing action as soon as possible.

Institutional responsibilities

- » *Maintain and enhance inter-institutional communication and processes to encourage line ministries to mainstream climate change within their sectors.* The NDCs should be integrated into national and sector-level development planning. Ministries and agencies that have the greatest influence over specific sectors should be tasked with greater responsibility with regard to NDC implementation.
- » *Capacities of key institutions should be maintained and further strengthened in order to effectively contribute to NDC implementation.* In order to ensure coherence between NDC implementation and national development plans and planned investments, it may be helpful to directly engage relevant members of finance and planning ministries, who are involved with inter-ministerial bodies or committees, in order to facilitate NDC implementation.
- » *Information collection and reporting processes at the sectoral level should be synergetic with national level MRV systems* in order to fulfill requirements under the transparency framework and may be enhanced through inter-ministerial cooperation (see the separate briefing paper on transparency of this briefing series).

Knowledge dissemination for implementation and ambition

- » *Knowledge and awareness about the implications of the Paris Agreement targets should be improved for all relevant stakeholders, including in the targeted sectors.* As all sectors gain awareness of the need to decarbonise in the medium- to long-term — including fossil fuel phase out and reducing emissions in the land-use sectors — signals to investors and the private sector will clearly point toward low-emission business planning. These signals may not yet be clear from short- to medium- term economy-wide emission reduction targets.
- » *The wider economic and social impacts and benefits of mitigation measures at the sectoral level should be closely analysed with involvement from sectoral stakeholders and communicated to other key stakeholders.* By doing so, political and cultural barriers to implementation may be removed, while reducing concerns about perceived costs and risks associated with low-carbon transformation.



Underlining co-benefits can increase national ownership and public acceptance of mitigation actions.

Planning for raising ambition and implementation

- » *NDC targets could be translated to sector-specific targets and plans — if these do not exist already — leading to the development of implementable actions.* Such plans should be based on careful, sector-level policy planning — a process that may also highlight additional mitigation potential for increasing ambition. Plans should be regularly updated to reflect implementation progress and ambition-raising potential brought about by, inter alia, technological advances. The development of modeling capacity within responsible planning institutions would reduce reliance on international technical assistance, ensuring that planning cycles are not static and one-off processes. Sector-specific plans could also include investment planning linked to national budgeting processes, as well as the identification of support needs.
- » *Potential for raising ambition should be thoroughly assessed at regular intervals for interim target years (e.g. 2025 or 2030) as well as for full decarbonisation in the context of long-term strategies.* 2050 pathways could provide valuable orientation in this regard. The regular analysis could take as a starting point the review of best practice policies from the region that might be replicated, and the development of plans and targets for sub-sectors not yet well covered in a climate strategy or the NDC.



The ambition of national action has to be enhanced continuously, supported by international cooperation.

- » *Investment planning should be conducted to evaluate the investment requirements of planned and potential NDC targets and measures.* Investment plans can inform finance strategies, based on an assessment of public and private finance sources, and requirements for international support.

Introduction of policies and programmes for immediate implementation

- » *Policy packages that can support low-carbon development in sectors should be introduced immediately to jumpstart action for the achievement of NDC targets.* More stringent policy packages, for instance, to phase out fossil fuels and sustain growth of renewable energy are needed in order to meet the commitments of NDCs in most countries (UNEP 2016; Climate Action Tracker 2016). However, there remains significant potential for the increased uptake of existing regional best practice policy instruments (Healy et al. 2016; Höhne et al. 2015). As such, subnational and national governments could benefit from sharing experiences on policy implementation and effectiveness.
- » *Proposals for international support could be developed to kick-start action where domestic actions alone are not sufficient.* Many countries have gained experiences in recent years with the development of Nationally Appropriate Mitigation Actions (NAMAs) and Reducing emissions from deforestation and forest degradation (REDD+), which could be effective mechanisms for soliciting and channeling international support. As such, NAMAs could play a significant role as the building blocks of enhanced ambition for developing countries in the Paris Agreement's ambition mechanism. While international finance commitments to support climate change mitigation and adaptation measures need to be scaled up, challenges also remain for the allocation of existing funds. Countries with clear financial strategies and projects that reflect their NDCs and national development plans will be well positioned to access existing and new climate finance.



The momentum gained during the Paris Agreement should be used for a quick implementation of NDCs to limit the damaging effects of climate change.

Recommendations for NDC revisions

The right-hand side of Figure 3 presents some key recommendations for NDC revisions. These revisions refer to increasing the clarity and transparency of NDCs, as well as to revision processes that could lead to immediate options for raising ambition. While some of these recommended steps should be achieved through more advanced planning processes, other revisions could lead to immediate benefits.

Countries could consider the following steps for revising NDCs and raising ambition at regular intervals.

- » *Sharpen scenarios and targets for specific sectors* in order to improve comparability of actions on a global scale, as well as to help national stakeholders develop sectoral pathways.
- » *Ensure that national and sector-level strategies are aligned with measures set forth in the NDCs to ensure coherence of the proposed actions and that ambitions are correctly represented.* At the same time, countries should apply processes for raising ambition that are compatible with national processes.
- » *Ensure that NDCs are compatible with national development plans, including the sustainable development goals (SDGs).* Identifying synergies between climate and development goals will help to increase the political and public will for implementation and for raising ambition. The identification of synergies also helps international cooperation agencies to better understand how climate-related measures relate to other planned ODA activities.



Integrated mitigation and adaptation strategies should involve all relevant sectoral and local stakeholders in the planning process.

- » *Advance on mid-term emission reduction targets and actions by providing details on long-term plans for full decarbonisation and fossil fuel phase out, including at the sectoral level where possible.*

The inclusion of long-term targets will help in the development of sectoral roadmaps, as well as provide clear signals to relevant public and private stakeholders within the sectors.

- » *Clarify financial requirements, including information about support needs for conditional and unconditional actions and targets.* This would assist with the development of investment plans and finance strategies, and would help to bridge the gap between sources of international climate finance and a strong pipeline of bankable projects (see the separate briefing paper on finance of this briefing series.

- » *Update sector, sub-sector and economy-wide ambition regularly,* based on the availability of information, the feasibility of local technological developments and changes to planning processes.

Turning climate momentum into national implementation

The integration of NDCs into sector development plans will require more consideration and guidance, as the selectively presented targets and measures in the NDCs are not immediately translatable into sectoral actions. This is particularly true for those sectors that are not well represented in the current NDC documents. Implementing NDCs at the sectoral and sub-sectoral levels may require improved information and processes, but in many cases the information and processes already exist and just need to be communicated and harmonised with NDC implementation efforts.

This briefing paper has shown that relatively straightforward steps can be taken in many countries to improve the external communication of NDCs, facilitate sector-driven implementation and begin processes for raising ambition — largely through building upon the existing momentum and planning processes at the national and sectoral levels. While planning processes should periodically be reviewed in order to identify the potential for raising ambition and to ensure that synergies with development objectives are being pursued, countries are encouraged to build on existing and completed planning activities. By doing so, countries improve their chances of completing the shift from planning to implementation at the sectoral level, as soon as possible.

FURTHER READING

Further details on the topics discussed in this briefing paper may be found in the following sources, amongst others:

- Climate Action Tracker, 2016 → [10 most important steps to limit warming to 1.5°C](#) (requirements and feasibility of options for 1.5°C compatibility in light road transportation and aviation).
- Day, T. et al., 2015 → [Preparation of Intended Nationally Determined Contributions \(INDCs\) as a catalyst for national climate action](#).
- Höhne, N. et al., 2015 → [Progress towards good practice policies for reducing greenhouse gas emissions. Initial results from an analysis of the status of Progress towards good practice policies for reducing greenhouse gas emissions](#).
- UNEP, 2016 → [Emissions Gap Report 2016](#) (indication of timeline for full decarbonisation from energy and non-energy sectors).
- UNFCCC, 2015b → [Synthesis report on the aggregate effect of the intended nationally determined contributions](#).
- → [World Bank NDC Platform](#) (searchable database of sector and sub-sector specific details in all NDCs).

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About the GIZ Climate Policy Support Programme

GIZ Climate Policy Support Programme aims at developing and mainstreaming innovative approaches to tackle the challenges of climate change in the context of German Development Cooperation. On behalf of the Federal Ministry for Economic Cooperation and Development (BMZ), it supports developing countries in their efforts to mitigate climate change and to adapt efficiently to its impacts. Through conceptual and practical activities, the Climate Policy Support Programme actively contributes to the implementation of the Paris Agreement and the UN Sustainable Development Goals.

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