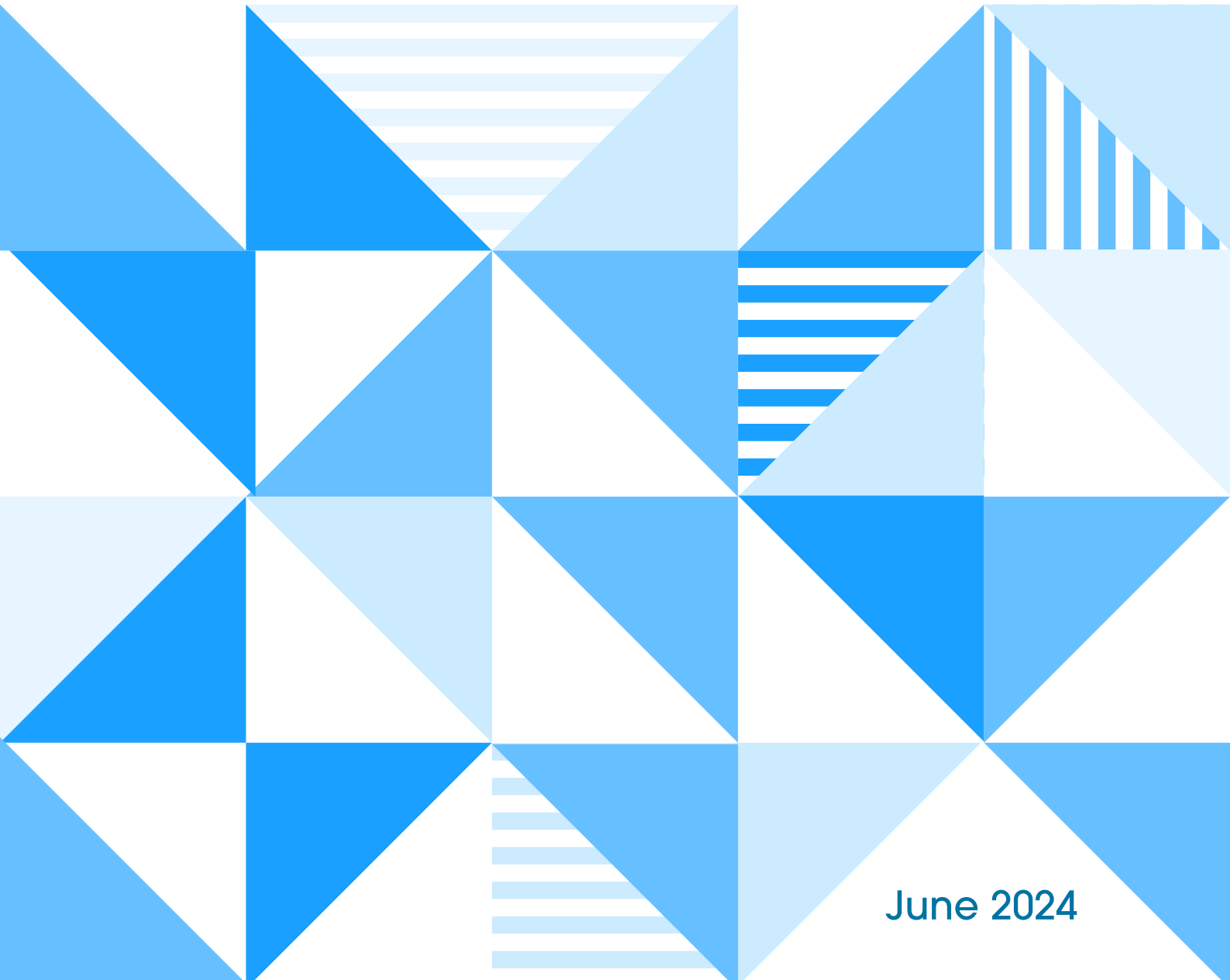
IRENA
International Renewable Energy Agency

Climate action and the energy transition

IRENA Members' survey on Nationally Determined Contributions



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About IRENA

The International Renewable Energy Agency (IRENA) serves as the principal platform for international co-operation, a centre of excellence, a repository of policy, technology, resource and financial knowledge, and a driver of action on the ground to advance the transformation of the global energy system. An intergovernmental organisation established in 2011, IRENA promotes the widespread adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar and wind energy, in the pursuit of sustainable development, energy access, energy security and low-carbon economic growth and prosperity.

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For further information or to provide feedback: **publications@irena.org**

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EXECUTIVE SUMMARY

The next submission of Nationally Determined Contributions (NDCs) to the Paris Agreement in 2025 must mark a turning point to bring the world back on track to meet the 2050 1.5 degrees Celsius (°C) pathway. As agreed in the First Global Stocktake at the 28th Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) (COP28), countries will need to translate the global target to triple renewables by 2030, adopted at COP28, into their national climate targets, while also reflecting their different starting points and national circumstances.

The International Renewable Energy Agency (IRENA) undertook a Members' survey in 2023 to gain a better understanding of the upcoming NDC submissions to the UNFCCC, specifically in the energy sector component. The survey outcome helps shed light on the climate action support needs of the countries in the coming years. The survey was conducted from 26 June to 31 October 2023. Through the survey, 51 IRENA Members shared their provisional plans, challenges and support needs regarding the enhancement and implementation of their energy sector NDCs. With an overall response rate of 44%, responses were received from 12 sub-Saharan African, 9 Asian, 7 Middle Eastern and North African, 7 Latin American and 3 South East European countries, and 13 small island developing states (SIDS).

This report provides an overview of the NDC process, and a review of the survey results, highlighting the challenges, priorities and opportunities for NDC enhancement and implementation, as well as the development of long-term low emissions development strategies (LT-LEDS), identified by Members.

The key findings include:

- **NDC enhancement:** A total of 35 IRENA Members intend to raise the ambition of their energy sector targets. Nearly all (97%) shared plans to specify the targeted share of renewables in their electricity mixes, while 77% indicated their intent to include targets for greenhouse gas (GHG) emissions reductions in the energy sector. Quantifiable absolute renewable targets are also important given the global goal of tripling renewables by 2030: of the respondent Members, 30% mention the planned reference to a quantifiable target of renewables deployment in either capacity or generation. Among the target measures, renewables, energy efficiency, and grid infrastructure and modernisation are most frequently mentioned for enhancement. More than 50% of the respondent Members anticipate challenges related to a lack of technical skills and human capacity, assessing just transition and socio-economic benefits, and obtaining sufficient data for developing targets and modelling scenarios to enhance NDCs.

- **NDC implementation:** For the areas necessary for improvement to drive NDC implementation, energy efficiency standards, energy storage and carbon finance are frequently mentioned, with the number of respondent countries totalling 38, 38 and 33, respectively. Physical infrastructure is also key, as highlighted by 42 countries in total: respondent countries also identified priorities on modernising infrastructure, including grid-forming technologies and utility-scale energy storage to shape renewables-based energy systems and optimise the integration of variable renewable electricity (VRE). Building and maintaining modern and resilient infrastructure is crucial to NDC implementation, given their significant roles in climate change mitigation, resilience and sustainable development. With an enabling regulatory setting, technologies and infrastructures, robust commercially-attractive project pipelines can be built for deploying energy transition projects.

- **LT-LEDS development:** In all, 68% of respondent Members are planning, or have developed, LT-LEDS, while 29% have no specific plans yet. More than 50% of respondents shared their expected challenges on the development of a robust monitoring/evaluation framework, socio-economic impact assessment and financial resources for developing LT-LEDS. The development of robust LT-LEDS is important because these strategies can guide countries in aligning with their NDCs by facilitating backcasting from ambitious emissions reduction goals to identify short-, mid- and long-term milestones as well as opportunities and barriers for national development that are compatible with Paris Agreement goals. To create such positive synergies, more countries are encouraged to develop their LT-LEDS.

NDCs and LT-LEDS present opportunities for countries to address the energy transition within their national climate planning processes. Reflecting on the survey results, it is clear that there is considerable room for development agencies to provide technical support in various areas of energy transition-relevant climate action. Many countries shared the challenges they face in relation to energy data availability and the development and assessment of scenarios. Countries also mentioned their support needs in assessing fair energy transitions tailored to their contexts, focusing on socio-economic priorities and impacts on existing energy systems and industries.

In addition, countries showed interest in broad and globally emerging energy transition technology options, such as utility-scale battery storage, green hydrogen and other options. Offering specific technology assessments supports countries in identifying available opportunities. Developing countries also need international support to devise policies, incentives and infrastructures to deploy energy transition technologies. Last but not least, support for project development and facilitation is also necessary. Supporting the development of project pipelines and matchmaking is essential for mobilising energy transition investment.

INTRODUCTION

The world is far off track to limit global temperature rise to 1.5 degrees Celsius (°C) above pre-industrial levels, as clearly stated by the IPCC Sixth Assessment Report (AR6) (IPCC, 2023). The report affirms that a 43% reduction of global greenhouse gas (GHG) emissions by 2030 compared to 2019 will keep us on track to limit global warming to 1.5°C. Accordingly, short-term climate ambition needs to be enhanced to ratchet up the energy transition. Increasing renewable capacity will contribute to a global energy transition aligned with climate objectives. In line with the First Global Stocktake (GST) outcome,[1] as well as the 28th Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) (COP28) Global Pledge on Renewables and Energy Efficiency endorsed by 133 countries (COP28 Presidency, 2024), International Renewable Energy Agency (IRENA) analysis concludes that tripling the installed capacity of renewable power to more than 11 000 gigawatts (GW) and doubling the rate of energy efficiency globally by 2030 will lead to a 1.5°C compatible pathway (IRENA, 2023a).

The latest IRENA data indicate that 2023 set a new benchmark in renewable power deployment, with 473 GW added to the global energy mix (IRENA, 2024a). Despite these record renewable power capacity additions, progress in the energy transition is insufficient. Scaling up renewables is therefore the most important action that can be taken by 2030 if the world is to achieve net zero by 2050. This will require an increase in the share of renewables in the global energy mix from 16% in 2020 to 77% by 2050 (IRENA, 2023a). The years leading up to 2030 are critical for bringing the world back on track towards the 1.5°C pathway.

Key to returning to this pathway are the enhancement and implementation of Nationally Determined Contributions (NDCs). The parties to the Paris Agreement will submit new NDCs in 2025. As committed in the Global Pledge by its signatories and the outcome of the GST, countries should consider the tripling of renewables at the global level for their next submission of NDCs, while reflecting their different starting points and national circumstances.[2]

Against this background, IRENA undertook a Members' survey in 2023 to enhance understanding of climate action efforts, particularly in the energy sector, in preparation for the next NDCs. The survey helps development partners to understand countries' climate action support needs for the coming years. This paper examines the NDC process and analyses survey results to highlight challenges, priorities and opportunities in enhancing and implementing NDCs, as well as in developing long-term low emissions development strategies (LT-LEDS).

1 *First global stocktake, Para 28(a) of Decision 1/CMA.5, UNFCCC (FCCC/PA/CMA/2023/16/Add.1), accessed 26 April 2024.*

2 *The first NDCs are estimated to collectively result in a temperature rise of 2.9°C 3.4°C by 2100. The same estimate of the second and updated first NDCs is in the range of 2.1-2.9°C, according to the 2022 NDC Synthesis Report of the UNFCCC Secretariat. New pledges must be more ambitious if the world is to get on track for a 1.5°C future. The revision of NDCs is a critical opportunity to advance global efforts to meet the Paris Agreement goals.*

1. NATIONALLY DETERMINED CONTRIBUTIONS (NDCs)

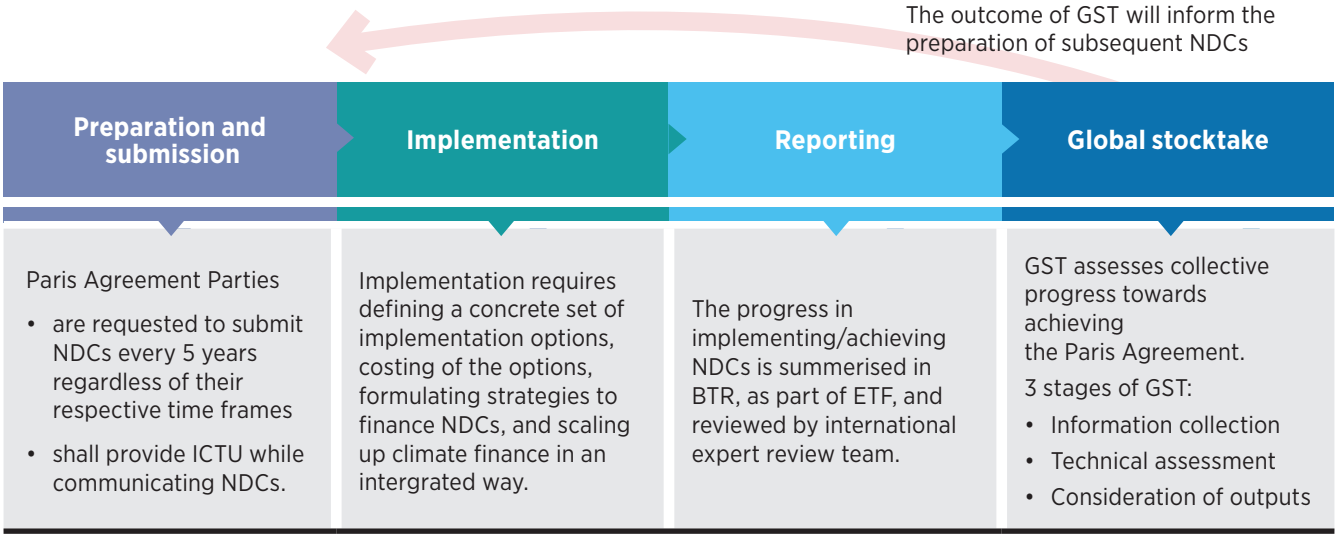
Under the Paris Agreement's Article 4, the UNFCCC parties are mandated to enhance their NDCs every five years. The next round of submissions is scheduled for 2025 and will provide the information necessary for clarity, transparency and understanding (ICTU)[3] as applicable from the second NDCs in line with the Katowice Climate Package.[4]

NDCs refer to the targets and actions that parties to the Paris Agreement commit to undertake in addressing climate change based on their national circumstances and priorities. The terminology underscores the bottom-up (nationally determined) nature of the contributions. A country's NDC serves as the primary means to articulate its plans for mitigating GHG emissions. The collective impact of NDCs determines global progress toward the long-term temperature goal of the Paris Agreement, aiming to limit the increase to well below 2°C above pre-industrial levels, with efforts to reduce this further to 1.5°C.

1.1. OVERVIEW OF THE NDC CYCLE

The NDC process operates in a comprehensive cycle involving preparation and submission, implementation, reporting and GST.

Figure 1 NDC cycle under the Paris Agreement



Notes: *BTR = Biennial Transparency Report; ETF = Enhanced Transparency Framework; GST = Global Stocktake.*

3 *Decision 4/CMA.1. Further guidance in relation to the mitigation section of decision 1/CP.21. UNFCCC, https://unfccc.int/sites/default/files/resource/4-CMA.1_English.pdf, accessed 26 April 2024.*

4 *Decision 3/CMA.1. Matters relating to the implementation of the Paris Agreement. UNFCCC, https://unfccc.int/sites/default/files/resource/cma2018_3_add1_advance.pdf#page=3, accessed 24 January 2024.*

Preparation and submission

Every five years, parties prepare new NDCs typically with a ten-year timeframe, with heightened ambition and without regression.[5]

To ensure the clarity of NDCs and their comparability and mutual understanding, all parties to the Paris Agreement provide ICTU in the second and subsequent NDCs, as emphasised in the Paris Rulebook as part of the Katowice Climate Package adopted at COP24 in 2018.[6] Key components of ICTU encompass quantifiable information on reference points, time frames for implementation, NDC scope, planning processes, assumptions and methodology approaches, the party's evaluation of the fairness and ambition of NDC, and its contribution to achieving the objective in the Paris Agreement Article 2. If a party's NDC includes mitigation co-benefits resulting from parties' adaptation actions and/or economic diversification plans, these should be described/specified.[7]

It is generally recommended that NDCs need to be developed in a bottom-up and inclusive process in consultation with different ministries and multi-stakeholders (GIZ, 2022). In the previous cycle of NDC preparation, many countries formulated working groups or task forces hosted at an NDC focal ministry (typically the ministry of environment), which co-ordinated the contribution from different ministries, other government bodies and non-state actors. A participatory and transparent process is also essential to ensure national ownership for advancing NDC implementation.

Implementation

The NDC targets will need to be translated into implementation on the ground. Doing so requires defining a concrete set of implementation options, costing the options, formulating strategies to finance NDCs and scaling up climate finance in an integrated way (UNDP *et al.*, 2020). While NDCs are backed at the highest level of government in most countries, implementing NDCs requires a whole-government approach that must engage sector-specific ministries such as energy, transport and others, as well as finance ministries and subnational governments. To that end, integrating NDCs into national development planning and budgetary processes is essential to drive the implementation of targets and action committed in NDCs. In addition, current NDCs are not designed as portfolios of commercially attractive projects but rather drafted to identify national climate priorities (UNEP, 2018). Hence, there is still a considerable need for countries to develop specific investment plans that translate NDCs into bankable projects. Moreover, capacity building is a key to enhance the capability of project developers including the local private sector to develop bankable projects. To mobilise the private sector for NDC implementation, it is important to ensure the consistency between NDCs and relevant laws/regulations and existing national strategies[8] as well as the deployment of incentive mechanisms for NDC priorities through financial and fiscal policies. Policy coherence leads to more clarity and helps reduce many perceived risks for investors to develop commercially viable and attractive projects.

5 *While parties agreed to apply common time frames to their NDCs from 2031 onwards at COP24 (Decision 6/CMA.1), no clear consensus have been made with respect to the duration and applicability of the common time frame.*

6 *Decision 4/CMA.1 Further guidance in relation to the mitigation section of Decision 1/CP.21.*

7 *It is also up to the Parties to include Adaptation Communications within or in conjunction with their NDCs.*

8 *In IRENA's analysis of current NDCs, among the Least Developing Countries (LDCs) only 11 have fully aligned their renewable targets in NDCs with targets in their national plans and policies. Meanwhile, among SIDS, 33 UNFCCC parties have NDC targets of at least partial or full alignment with national policy documents (IRENA, 2023b).*

Reporting

In accordance with Article 13 of the Paris Agreement, the Enhanced Transparency Framework (ETF) aims to provide a clear understanding of climate change action, including the tracking of progress toward achieving parties' individual NDCs. The ETF builds on and refines the existing measurement, reporting and verification (MRV) arrangements with flexibility for SIDS and least developed countries (LDCs), allowing adjustments based on their capacities.

Under the ETF, all parties are mandated to submit biennial transparency reports (BTRs) every two years, with the first submission by 31 December 2024. As a part of reporting that tracks progress of NDCs in BTRs, countries shall elaborate on national circumstances, institutional arrangements, and indicators such as net GHG emissions and removals. This will facilitate a better understanding of countries' NDC achievement stages. The first BTRs due by the end of 2024 will track the implementation progress of the NDCs submitted by that time.

The Global Stocktake

To assess the global response to the climate crisis, a GST occurs every five years from 2023 onwards. The GST assesses collective progress towards the goals of the Paris Agreement, informing subsequent NDCs. The Paris Agreement designed a mechanism for parties to enhance their mitigation ambition informed by the outcomes of the GST. Through a three-stage process involving information collection, technical assessment and consideration of outputs, the GST produces key political messages and opportunities for enhancing action, support and international co-operation.

GST standing in terms of mitigation, adaptation, and means of implementation and support is intended to inform national efforts in preparing their next NDCs – for instance, the 2023 Stocktake informs the NDCs to be submitted in 2025.

1.2. ENERGY SECTOR AND NDCs

Given that the energy sector accounts for over three-quarters of global GHG emissions globally (UNFCCC, 2023a), renewables alongside energy efficiency, electrification and other energy transition measures are key to achieving Paris Agreement goals. It is therefore important for countries to integrate ambitious energy sector targets and implementation measures into NDCs. The NDCs also need to be aligned with national and subnational energy targets, policies and plans to increase the effectiveness and credibility of both, which is also important to reinforce clear signals to investors, project developers and other players across the renewables supply chain (IRENA, 2023b).

According to the UNFCCC Secretariat's latest NDC synthesis report, all the submitted NDCs mention the energy sector as a key area for reducing emissions, while renewable energy generation was referred to in 90% of NDCs. Further, as of 31 October 2023, the energy sector coverage in the current NDCs are as follows (IRENA, 2023b, 2023c; UNFCCC, 2023a):

- A total of 184 parties had included renewable energy components in their NDCs, of which 148 had a quantifiable target. Only 12 parties had committed to a percentage of renewables in their overall energy mixes.
- Of the UNFCCC parties, 23% included quantitative targets for the total share of renewable energy in electricity generation by 2030.
- Quantitative targets for increasing total renewable energy capacity by 2030 were indicated by 15% of parties.
- Grid improvement (36%), energy efficiency improvement (33%) and shifting to low- or zero-carbon fuels including biofuels and hydrogen (28%) were frequently indicated mitigation options in NDCs.

To accelerate an energy transition aligned with climate objectives, the first GST - part of the UAE Consensus as an output of COP28 - offered a new specific global goal of tripling renewable energy capacity and doubling energy efficiency by 2030 in line with the Global Renewables and Energy Efficiency Pledge announced during COP28. The Pledge was endorsed by 133 countries (COP28 Presidency, 2024) that committed to tripling renewables and doubling annual energy efficiency improvements by 2030 at the global level.

The signatory countries also committed to reflecting this global target of tripling renewables in their next NDC submissions and taking domestic actions with relevant enablers in consideration of the different national circumstances. As IRENA assessed, in a joint report for COP28, the following enablers would be essential for the implementation of the Global Pledge (COP28 Presidency *et al.*, 2023):

- building electricity infrastructure and investing in modernisation of grids at scale;
- policies and regulations facilitating and incentivising scaled-up deployment of renewables and energy efficiency measures;
- facilitating targeted public and private investment in renewables and energy efficiency by advancing policy and regulatory frameworks;
- enabling strategic realignment for resilient supply chains as well as institutional capacities ensuring skills and capabilities to build desired energy system by 2030; and
- expediting stronger international collaboration for urgently fostering a just transition through collective action on governance, investment and innovation.

However, the commitments made as of October 2023 in NDCs are less than half of that required to triple renewable power capacity (IRENA, 2024a). IRENA's NDC survey facilitates further ambitious climate action and contributes to a better understanding of the challenges and opportunities of IRENA Members' energy sector NDCs, part of which may need to be addressed through international co-operation. While the survey outcome may not shed in-depth knowledge of these aspects – due to the questionnaire-based survey methodology's limitations in understanding the contextual aspects of the responses – it can still serve as a starting point for development partners to consider their international co-operation with developing countries.

2. METHODOLOGY OF THE SURVEY

The NDC survey was conducted from 26 June to 31 October 2023. IRENA Members were able to clarify the provisional plans, challenges and support needs on their energy sector NDC revision and implementation. In all, 117 IRENA Members with developing country status per the OECD Development Assistance Committee (DAC) classification were invited to complete the survey. A questionnaire was sent to these Members (see the questionnaire in the annex). The Members were initially allotted two weeks to respond to the survey, with an option to extend the amount of time they had to prepare their responses. Forty-two Members responded through their energy ministry/agency representative, four Members corresponded through their environmental ministry/agency representative and five Members replied through another ministries' representative, such as foreign affairs or infrastructure. Table 1 gives the details of the survey methodology.

Table 1 Methodology of the NDC survey

Category	Description
Survey period	26 June to 31 October 2023
Modality	Questionnaire survey, including single and multiple choice questions with branching questions, Likert questions and free text questions.
Language	English, French and Spanish
Data collection process	• A questionnaire was sent via e-mail to each IRENA Member state that included a URL to online Microsoft Forms and a Microsoft Word document attachment. The Forms and Word document included the same questions. The Members were invited to respond through either the Forms or Word document, based on their preference. • One or multiple respondents from government ministries and departments responsible for energy and climate change portfolios were able to respond to the survey.
The number of invited Members	117 (IRENA Members with developing country status)

3. RESULTS AND DISCUSSION

3.1 OVERVIEW

As of 31 October 2023, a total of 56 responses had been received, covering 51 IRENA Members.

Table 2 Response overview

Category	Description
Overall	
Toal number of responses	56 responses
Number of IRENA Members that responded to survey	51 Members
Response rate	44%
The number of responses from IRENA Members per region	
Sub-Saharan Africa	12 of 31 invited Members
Asia	9 of 21 invited Members
Middle East and North Africa	7 of 16 invited Members
Latin America	7 of 15 invited Members
South East Europe	3 of 6 invited Members
Small Island Developing States (SIDS)	13 of 28 invited Members

Notes: *If a country received multiple responses, a response from the country's IRENA focal ministry was counted as the formal response in the absence of other instructions.*

3.2 NDC ENHANCEMENT

Will your country enhance the mitigation ambition of energy sector targets in the next NDC update in 2025? (Q1)[9]

A total of 35 Members positively responded to raising the ambition of energy sector targets of their 2025 NDC submissions, while only 2 countries negatively responded.

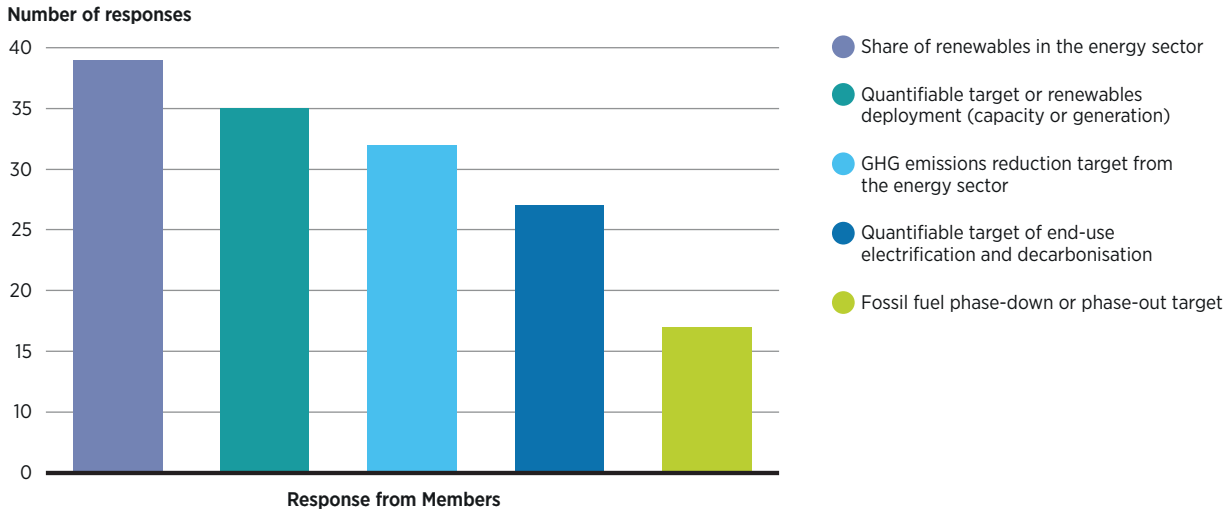
Table 3 Enhancement of ambition on energy sector target

Response	Number of countries
Yes	35
No	2
Not sure yet	14

Which energy sector targets does your country intend to update in the next NDC? (Q1.2)

The survey results show that most respondent countries are planning to specify quantified targets for the energy sector. Of 35 Members planning an NDC enhancement, 34 intend to specify relative targets for the share of renewables in the energy sector. Absolute targets are also intended in some countries: 30 countries plan quantifiable targets for renewables deployment in either electricity capacity or generation format, and 27 countries intend to include GHG emission reductions contributed by the energy sector.

Figure 2 Expected form of energy sector targets in the next NDC



Quantification of the targets is an important first step for countries undertaking the NDC process. This informs the NDC implementation plans and also becomes a reference for tracking the national progress of the implementation. For this reason, targets should be set in credible, comprehensive, robust and implementable forms (NDC Partnership, 2022a).

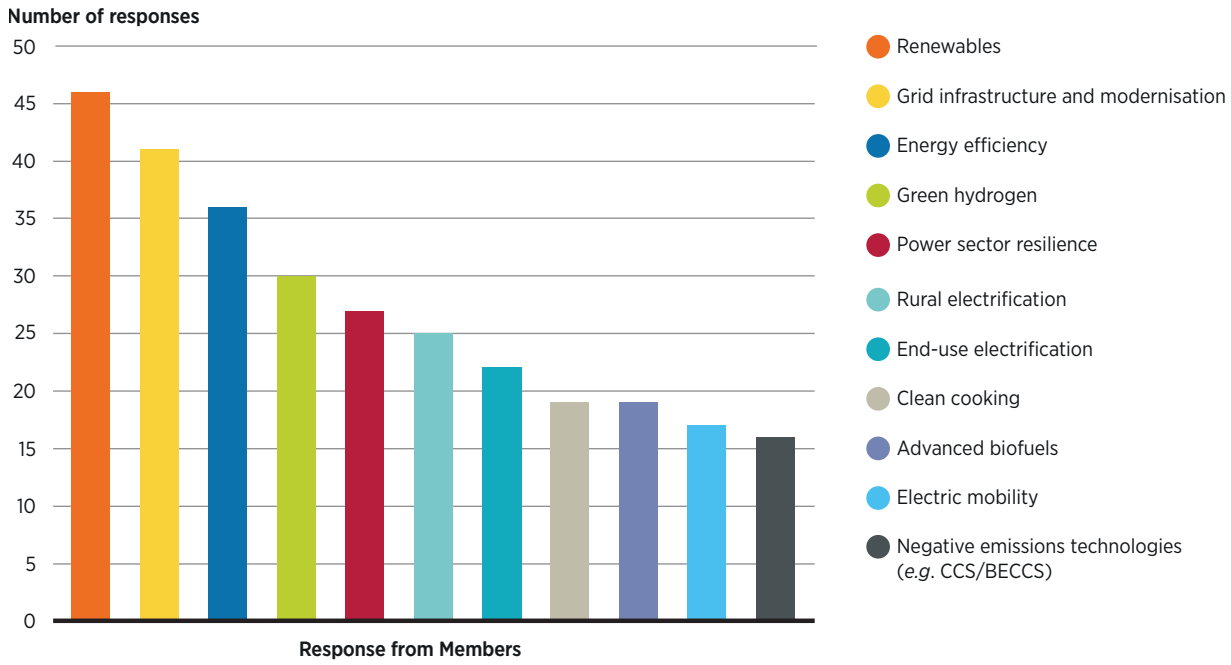
9 See question details in the annex.

A transparent national consultation process for setting targets is also essential for building national ownership. In practice, 100% of countries specified energy sector targets in their NDCs. It is generally recommended that countries specify the targets for priority sectors since it clearly signals countries' intentions to relevant stakeholders. As IRENA has discussed (IRENA, 2022a), the quantified energy sector NDC targets in the form of electricity mix share can clearly display the expected roles of renewables in the power sector while absolute targets, such as a capacity based targets, send clearer signals to project developers and investors and enable more efficient planning and monitoring.

Which measures does your country need to enhance the ambition of the NDC energy sector targets? (Q2)

Of 51 respondent Members, 46 intend to enhance the ambition of renewables-related targets in their next NDC. Moreover, grid infrastructure and modernisation are mentioned often among the areas for improvement. Energy efficiency and green hydrogen are also highlighted in the responses from over 30 Members, followed by power sector resilience in 27 Members' responses.

Figure 3 Measures necessary for enhancing ambition of the NDC energy sector targets



Enhanced ambitions for renewables[10] are supported by the ongoing cost reductions for renewable energy. Between 2021 and 2022, the global weighted average levelised cost of electricity from renewable power generation fell 5% for onshore wind, 3% for solar photovoltaic (PV), 13% for bioenergy and 22% for geothermal (IRENA, 2023d).

10 Within renewables, the responses to Q1.3, "Which form of renewables does your country need to increase deployment?", show that many IRENA Members intend to increase the deployment of solar and wind (41 respondent countries for solar and 35 respondent countries for wind). These forms are followed by bioenergy (25), hydro (17), geothermal (12) and ocean (4). Thirty respondent countries also highlighted their interest in other forms of renewables, such as green hydrogen, waste-to-energy and batteries.

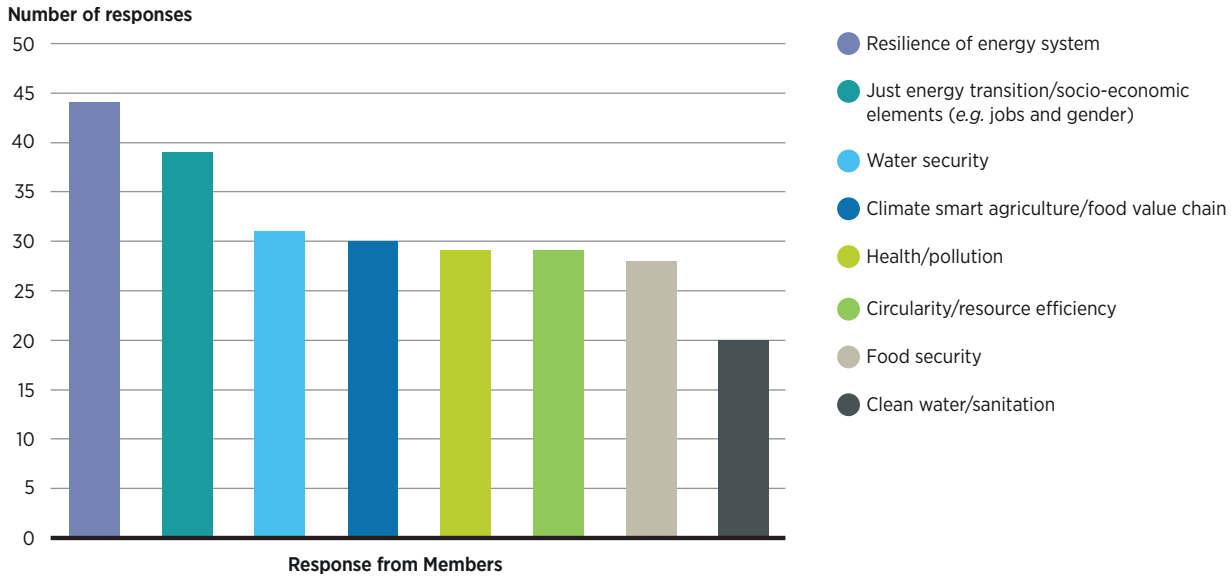
Modernisation of physical infrastructure would involve various grid-forming technologies, such as transmission, distribution networks, interconnection and utility-scale energy storage, as well as other infrastructure necessary for energy transition, such as transport and hydrogen infrastructures. Upgraded physical infrastructure is essential for shaping renewables-based energy systems and linking up to optimise variable renewable electricity (IRENA, 2023a). Some sources suggest that global power grid investment has gradually increased since 2020: according to analysis by Bloomberg New Energy Finance, for instance, power grid investment jumped 5% in 2023 from the previous year to USD 310 billion (United States dollars) (BNEF, 2024). While this positive trend in recent years has been led by China, the United States and several other countries, power grid investment will need to scale up in Global South as well. More efficient and resilient energy and power systems need to be ensured for upgrading infrastructures. Consideration of cross-sector infrastructure for the energy transition needs to be integrated into NDCs and their implementation.

Do you consider adaptation and sustainable development co-benefits of the energy transition? (Q3)

Which adaptation and sustainable development co-benefits of the energy transition does your country consider in the next NDC update? (Q3.1)

Of the respondent Members, 94% stated that they consider pursuing adaptation and sustainable development to be co-benefits of the energy transition. Energy system resilience was rated by 44 Members as the co-benefit garnering the highest level of interest, followed by socio-economic elements (39), water security (31) and a climate-smart agriculture/food value chain (30).

Figure 4 Adaptation and sustainable development co-benefits considered for the next NDC



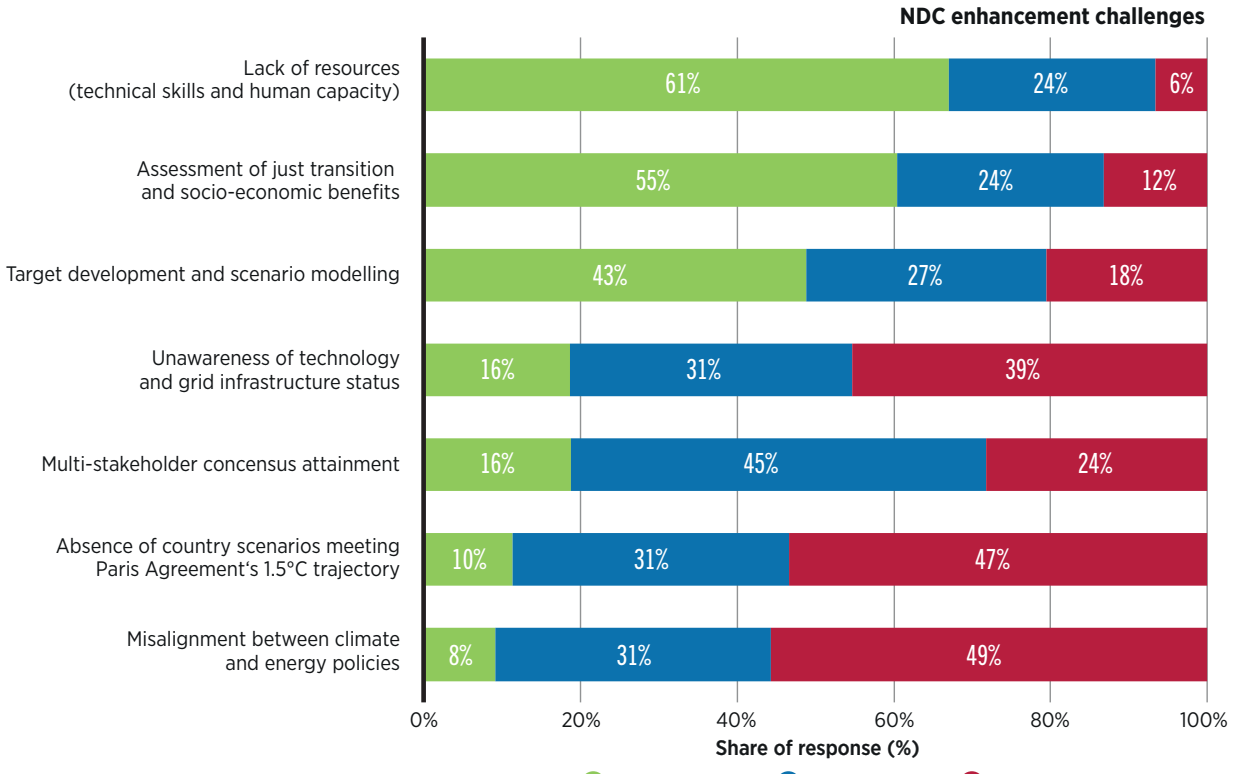
Resilient energy systems are essential when considering the impacts of climate change. Changing climate patterns and extreme weather events, including precipitation patterns, frequency of floods, heat and others, may damage energy systems' infrastructure. Climate change may also affect the sustained operation of infrastructure, which becomes a risk for energy security (IRENA, 2024b). To accommodate climate change-related risks and to cope with changing demand and supply patterns (increased capacity needs and bi-directional flows of power), energy infrastructure must become more resilient, flexible and sustainable.

The UAE Framework for Global Climate Resilience, as decided at COP28, urged countries to strengthen climate change adaptation efforts towards 2030. The framework includes the priorities of climate-resilient food production and supply, health services, and water supply and management, among other elements.[11] Renewables, including decentralised renewables energy solutions, can support the adaptation action on agri-food, water, health and others by providing clean electricity to relevant facilities and equipment, strengthening the lives and livelihood of people (WHO *et al.*, 2023; IRENA and SELCO Foundation, 2022).

What are the expected challenges associated with the revision of the NDC energy sector targets? (Q1.4)

IRENA Members also shared their expected challenges when enhancing NDCs. More than 50% of respondent countries shared their likely challenges on lack of technical skills and human capacity as well as assessment of just transition and socio-economic benefits. More than 40% of respondent countries mentioned the challenge of data availability for developing targets and modelling scenarios.

Figure 5 NDC enhancement challenges



While many Members intend to specify GHG emission reduction targets from the energy sector, as discussed above, some also shared the challenges involved in estimating them due to the absence of national data. The lack of locally available data leads to a reliance on international/regional proxy data, which risks the credibility of targets due to the uncertain reliability of the baselines, modelling and projections (GIZ, 2022). Support in building national data repositories will be necessary for these countries.

11 *CMA5 Decision 8a as part of UAE Consensus, https://unfccc.int/sites/default/files/resource/cma5_auv_8a_gga.pdf (advanced version).*

Interestingly, few Members mentioned the challenge of arriving at a consensus between multi-stakeholders or the issue of misalignment between climate and energy policies. Stakeholder engagement, such as inter-ministerial co-ordination and consultation with in-country stakeholders, was a typical area for which Members requested support for NDC enhancement, such as through NDC Partnership's Climate Action Enhancement Package (NDC Partnership, 2022b). One country noted that it is essential to increase the involvement of its ministry of economy and finance when beginning NDC updates so that budgetary needs can be taken into consideration in the national budgeting process.

3.3 NDC IMPLEMENTATION

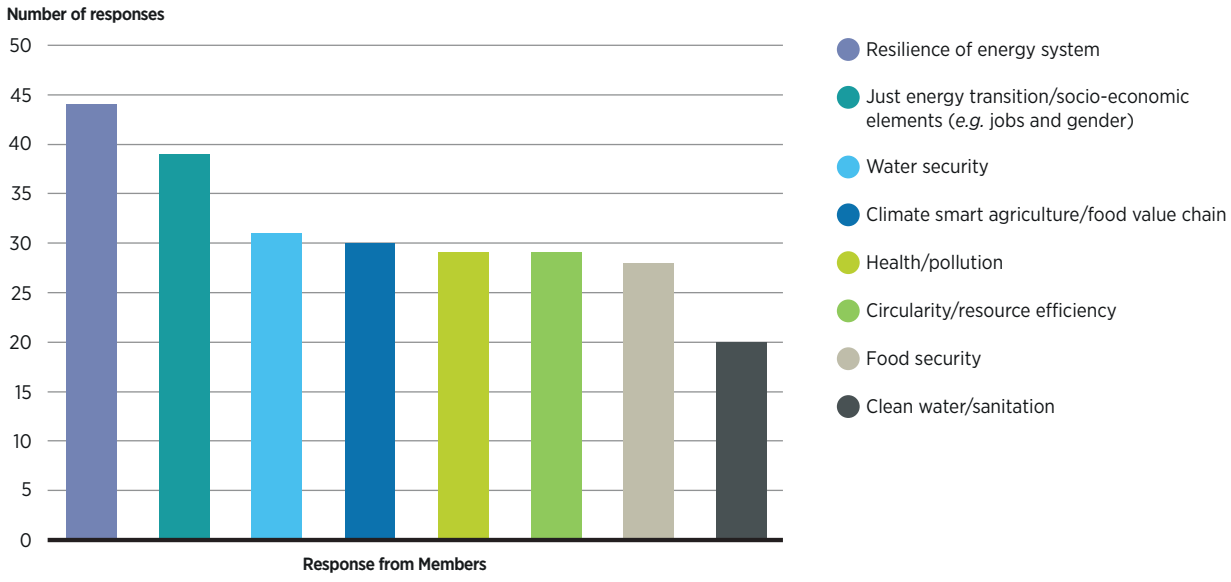
Regarding the priorities for accelerating energy sector NDC implementation (Q4), IRENA Members shared various viewpoints. Frequent responses included the need for long-term energy sector planning, long-term low-cost finance, skills and human capacities improvement, modernisation of the grid infrastructure, deployment of technology, and innovations to accelerate the energy transition (electric mobility, heating, cooling and others).

What policies and regulations are necessary to advance the energy transition in your country for NDC implementation? (Q5.1)

The necessity of improving policies and regulations to support the implementation of NDCs was mentioned by 41 respondent Members. Eight countries responded that it is "to be assessed", while two countries mentioned there being no necessity to improve policies and regulations (Q5[12]).

Respondent Members also highlighted it is necessary to have various policy and regulatory options. Of 49 Members that responded "yes" or "to be assessed" to Q5, 78% indicated five or more options in their responses. Energy efficiency standards and energy storage policies were the most frequent categories shared by 38 countries. Following these, 33 countries mentioned carbon pricing instruments and/or Paris Agreement Article 6 market mechanisms, while 32 included electric mobility policies and regulations.

Figure 6 Policies and regulations necessary for advancing the energy transition



12 See annex for each question.

Policies and regulations play an essential role in facilitating NDC implementation. They shape the framework for countries in navigating the energy transition as well as offer incentives to invest in renewables. Expanding the share of renewables in the energy mix combined with energy efficiency measures can support the decarbonisation of countries.

- For power systems, utility-scale energy storage helps the grid increase flexibility in power supply, providing peak demand management, renewable integration and ancillary services. This enables the optimised use of variable renewable energies (VREs) such as solar PV and wind energy. Setting regulations with a clear framework for the ownership and operating models is necessary to support the storage providers in building robust business models. Regulations would also need to make clear and consistent requirements regarding participation in wholesale electricity markets, the sales of frequency response and ramping services to system operators (IRENA, 2019).
- Energy efficiency standards can regulate the level of energy efficiency on the demand side if it is properly set. In IRENA's 1.5°C Scenario, global energy consumption will need to drop by 6% by 2050 from 2020 levels through substantial improvements in energy efficiency. In the medium term towards 2030, it is important to double the global average annual rate of energy efficiency improvements from around 2% to over 4% every year until 2030, as stated in the COP28 Global Renewables and Energy Efficiency Pledge, which was endorsed by 133 countries. A range of energy efficiency technologies, including appliances, buildings, electric vehicles and others, are needed to boost energy efficiency together with structural and behavioural changes (IRENA, 2023a).
- Establishing policies, regulations and institutional arrangements relating to carbon finance will also accelerate the energy transition by incentivising the use of cleaner technologies. It is possible that the conclusion of the methodology guidance on the Paris Agreement Article 6 market mechanisms may occur at COP29 in 2024. If this comes to pass, countries will need to make progress on the preparation for operationalising market mechanisms. These in turn require technical and institutional setup with regard to NDC accounting, corresponding adjustments of the internationally transferred mitigation outcomes (ITMOs), and carbon finance strategy. One respondent Member state among the LDCs highlighted the importance of collaborations with multilateral and bilateral development agencies on the assessment for scaling up the practice of carbon finance.

What improvement is necessary for the power system in your country to increase the share of electricity generated by renewables? (Q5.2)

Looking further into power systems, of 49 respondent Members that responded "yes" or "to be assessed" to Q5, 59% indicated five or more options in their responses. This implies that these Members see room for improvement in broader aspects of the integration of renewables into the power system. More than 30 respondent countries highlighted the necessity of improvement in grid infrastructure modernisation (42 Members), grid stability and flexibility (42), utility-scale battery energy storage systems (37), and grid expansion/reinforcement (35). Thirty countries also mentioned demand-side management/demand response.

Table 4 Improvement necessary for power systems

Area	Number of members
Grid infrastructure modernisation	42
Grid stability and flexibility	42
Utility-scale battery energy storage systems	37
Grid expansion/reinforcement	35
Demand-side management/demand response	30
Bilateral interconnection/regional power pool	20

The power sector is pivotal in mitigating climate change. The sector is the largest source of energy-related carbon dioxide (CO_2) emissions, accounting for two-thirds of global emissions growth in 2018. Moreover, the Global Pledge of Tripling Renewables by 2030 can be achieved by the rapid scale-up of renewable power capacity. Swift deployment of the measures to improve the integration of renewables into power systems and infrastructure is essential.

In IRENA's analysis, 12 parties had committed to a percentage of renewables in their overall energy mixes (IRENA, 2023b). However, NDCs so far have limitations in drawing on the range of solutions available to move the sector toward the integration of renewables into power systems (WRI and UNDP, 2019). When countries plan the implementation of the energy sector part of their NDCs, one possible recommendation is to specify the measures necessary to improve the power system to increase the share of renewable power. From the countries' responses to Q5.2 it can be inferred that it would be necessary to prioritise the improvement of physical grid infrastructures, including modernisation, flexibility and expansion. These improvements require time, capacity and resources to plan and implement the measures to improve grids. The survey responses implied that upgrading the grid infrastructure for modernisation and ensuring stable electricity supply through grid flexibility arrangement are the highest priorities within the respondent Members, followed by expansion of grid coverage. It is important for countries to consider their grid infrastructure's gaps and needs when proposing improvements to infrastructure to integrate more renewables, including VREs, into their power systems.

Adopting measures such as batteries and demand-side resources is also important to offer flexibility for a stable power supply from the grid (IRENA, 2022b). Utility-scale storage systems are a potential solution given the decreasing cost and innovation of these storage solutions. As mentioned above, regulatory frameworks and incentive mechanisms need to be properly set to enable business models to offer flexibility from storage solutions and demand-side management measures.

What capacity building needs does your country have for accelerating energy transition? (Q5.3)

Similar to the previous questions, respondent Members shared their broader interest in capacity building needs. Of 49 countries that responded "yes" or "to be assessed" to Q5, 57% indicated five or more options in their responses. The development of investment-ready renewable energy project proposals/project development was most frequently mentioned by Members (39 Members), followed by enhancement of national capacities on renewable technology and related infrastructure solutions (35) and long-term energy planning (34). Development agencies' opportunities in this area include providing technical support to strengthen various and specific capacities, enhancing the fundraising capacities of local public and private sectors, providing data analysis for planning and evaluation, and improving enabling frameworks and institutional arrangements.

Table 5 Capacity building needs

Area	Number of members
Development of investment-ready renewable energy project proposals/project development	39
Enhancement of national capacities on renewable technology and related infrastructure solutions	35
Long-term energy planning	34
Strengthening the capacity to assess enabling frameworks and conditions for the energy transition	32
MRV framework development/implementation	32
Alignment of energy policies with NDC	31

According to the Paris Committee on Capacity Building (PCCB) Toolkit (UNFCCC, 2022), the comprehensive assessment of capacity assets, gaps and needs is important to address the specific challenges countries are facing. For such assessments, participatory stakeholder engagement helps ensure local knowledge and capacities are considered and captured in the assessment. Once the assessment is completed, it becomes the basis for designing and programming the capacity building activities.

3.4 LT-LEDS

In accordance with Article 4 of the Paris Agreement and subsequent Decisions of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement (CMA), including the GST outcome, parties are urged to formulate and communicate LT-LEDS towards a just transition to net-zero emissions by or around mid-century. Parties should take into account national circumstances and consider their common but differentiated responsibilities and respective capabilities (CBDR-RC). LT-LEDS serves as a long-term vision of a country's plan that can inform medium-term national climate targets in its NDC. Countries can enhance and raise the ambition of NDCs by providing guidelines to evaluate and demonstrate ways to strengthen and achieve the targets (IRENA, 2023c).

Does your country plan to develop the Long-Term Low Greenhouse Gas Emissions Development Strategy or net-zero strategy? (Q6)

As of 10 January 2024, 70 LT-LEDS have been communicated to the UNFCCC Secretariat, representing 75 parties to the Paris Agreement. The survey result indicates an increasing interest in the development of LT-LEDS: 35% of respondent Members are planning to build their LT-LEDS, while another 33% have already developed their strategy.

Table 6 Enhancement of ambition on energy sector target

Response	Number of members
Yes	18
No	2
Already developed	17
Unknown	13

Does your country plan to include emissions peaking and net-zero emissions targets? (Q6.1)

Of 51 respondent Members, 15 intend to include an emission peak year and/or net-zero emission year target, while 7 countries mentioned in their response that they have already done so. There is a growing need to escalate the inclusion of specific timeframes, as providing detailed information on the emission pathways will guide parties in formulating more detailed subsequent NDCs.

Table 7 Emissions peaking year and net-zero emission targets

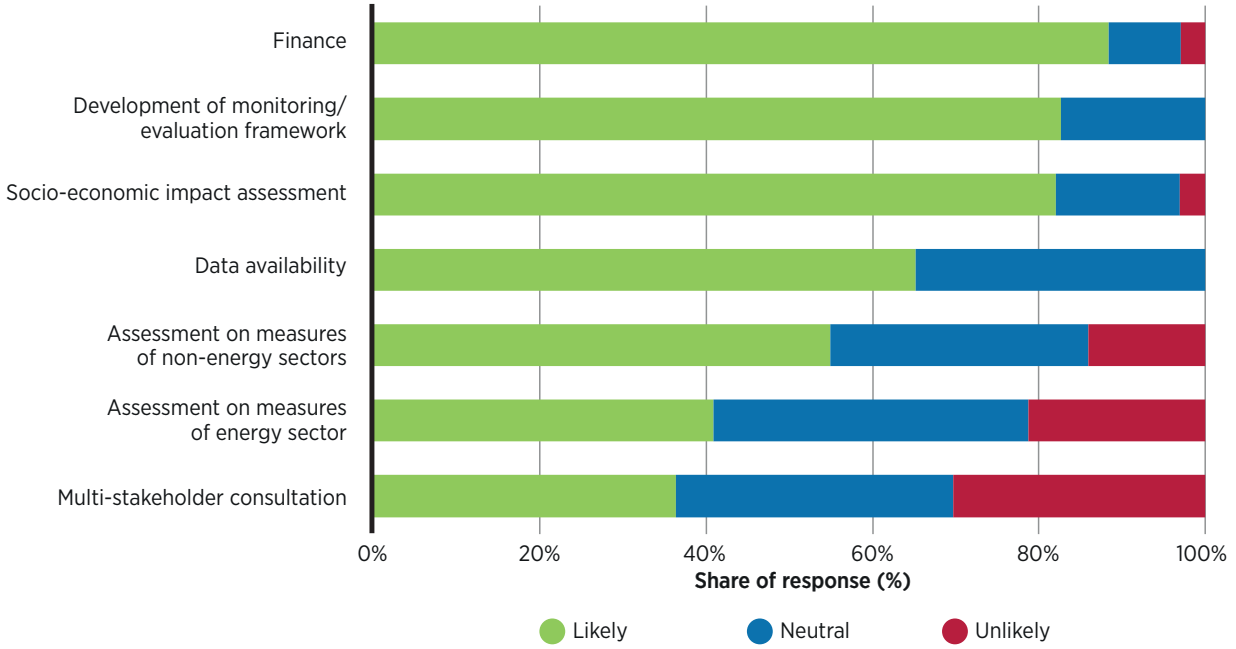
Response	Number of members
Yes	15
No	1
Not sure yet	18
Already included	7
No response	10

According to the UNFCCC Secretariat (UNFCCC, 2023b), all submitted LT-LEDS included a long-term mitigation goal, with 93% of the LT-LEDS specifying quantifiable information. Of the submitted LT-LEDS, 28% elaborated on the level of interim emissions level between 2030 and the long-term target year. Moreover, 16% of LT-LEDS referred to the anticipated peak year of the GHG emissions of the UNFCCC parties, ranging between 2020 and 2030.

Which challenges did or does your country face to develop the LT-LEDS or net-zero strategy? (Q6.2)

More than 50% of respondent Members shared their expected challenges to the development of a robust monitoring and evaluation framework, socio-economic impact assessment and financial resource for developing robust LT-LEDS.

Figure 7 Challenges in developing LT-LEDS or net-zero strategies



Financial constraints are the foremost concern raised by respondents. During the Africa Climate Summit and the Climate Week 2023 (UNFCCC, n.d.), sub-Saharan Africa countries emphasised the main gaps and challenges in LT-LEDS development, highlighting insufficient financial resources. LT-LEDS development cycle and modelling includes stakeholder mapping, policy co-ordination, developing long-term visions and financing low-emission development. This intricated process can burden developing countries by requiring considerable time and financial resources.

The development of a robust monitoring and evaluation framework was mentioned by 57% of respondents as the second most significant challenge to LT-LEDS. In cases where the government lacks sufficient resources and institutional capacities to ensure an adequate MRV or monitoring and evaluation (M&E) framework, it is useful to plan in advance and seek the technical assistance of external national or international agencies and organisations. This approach can help to form a solid monitoring framework facilitating implementation and continuous progress over time (OECD, 2019).

According to the 2023 Synthesis report from the UNFCCC Secretariat (UNFCCC, 2023b), most LT-LEDS - a total of 74% - elaborated on formal co-ordination arrangements for monitoring and reporting on the implementation progress of LT-LEDS. Indicators and reporting elements included quantified data such as GHG emissions, current energy data as well as data for mid-term and long-term targets, and qualitative information per sector to specify domestic policies and measures. Such specific, measurable, achievable, relevant and timebound (SMART) indicators would need to be applied to measure the overall progress of the strategy and track progress towards individual targets and actual transformation achieved.

A clear and forward-looking vision from LT-LEDS can assist countries in planning national action for a just transition by pinpointing the impacts on employment and specific requirements for socio-economic protection, particularly for job losses. Thus, evaluating and estimating the socio-economic impacts of the transition is one of the crucial elements for the successful development of LT-LEDS. However, the survey results indicate that over half of the respondent Members of IRENA face difficulties in the impact assessment. According to the IRENA publication, *Long-term energy scenarios and low-emission development strategies: Stocktaking and alignment*, LT-LEDS mostly overlooked the assessment of the socio-economic impacts of the energy transition, possibly due to technical limitations in commonly used analytical tools and models (IRENA, 2023e). To address this challenge, it is imperative to build and strengthen international co-operation, overcoming technical obstacles by accurately modelling indicators and frameworks through knowledge sharing. Quantitatively assessing the increase in renewable energy jobs and the effect of clean air on public health and other sustainable development impacts can support identifying potential advantages and risks generated from the energy transition, helping to guide short- and medium-term policy making. Moreover, it would contribute to generating social buy-in for the transition towards a low-emission economy, reinforcing the implementation of near-term action.

4. RECOMMENDATIONS

The next set of NDC submissions by parties in 2025 represents an important opportunity to enhance the ambition of national climate commitments aligned with the 2050 1.5°C pathway, as the current NDCs still lag behind that pathway. The IRENA Members' survey on NDCs gives a better understanding of the efforts underway in preparation for these updated or new NDCs, specifically in the energy sector.

Countries have different priorities for the energy sector aspect of the NDC enhancement and implementation depending on their national circumstances. Based on the results and findings from the survey, the recommendations for countries and development partners to plan and mobilise NDC support include:

NDC enhancement

- Many IRENA Members shared the challenges they encounter around energy data availability and their support needs related to the development and assessment of scenarios. They indicated that they lack available national and local data for developing targets and modelling scenarios for NDC enhancement. In addition to data itself, human capacity challenges also exist when developing long-term energy-related GHG emission plans and developing/implemeting MRV frameworks. Some Members provided further detail regarding specific support needs, detailing emission factor development, GHG emission reduction assessments from the energy sector and industry, and carbon budgeting and data modelling tools for developing precise scenarios and targets. For example, one of the respondent countries shared the challenge of quantifying GHG emission reduction targets from the energy sector in the absence of sufficient energy sector data at the national level. The development of a national energy data registry and emission factors is important for setting national targets backed by a reliable baseline and projections. Also important is the monitoring and evaluation process, including the biennial transparency report (BTR) to the UNFCCC, because sector-level reporting is required.
- Sixty-one percent of respondent Members highlighted potential challenges in elaborating on necessary technology and related infrastructure (Q1.4) in their NDCs, while the other parts of the survey response implied that countries have an interest in broad and globally emerging technology options such as green hydrogen, utility-scale battery storage, ocean energy and others. Assessments of specific energy technologies are also highlighted in some Members' responses. Some Members need assistance to carry out country-level assessment of technologies, including the financing and means to transfer such technologies to developing countries.
- Socio-economic considerations, such as jobs and gender, were highlighted by 39 Members as an area for inclusion in NDCs (Q.1.4). NDCs as well as LT-LEDS development can be an opportunity for countries to engage in deciding on their approach to a just transition as it relates to ongoing national planning processes (GIZ, 2022). Several IRENA Members also highlighted their support needs in connection with assessing the just and fair energy transition from their national context. As the just and equitable transition requires addressing diverse challenges and needs depending on national circumstances, the first step is to assess socio-economic priorities and the impacts on existing energy systems and industries. Then, adaptive measures, such as providing financial assistance to specific groups, could be considered.

- One observation from the previous NDC update process is that there were many countries that created an NDC working group or task force as a co-ordination entity across different ministries, government bodies and non-state actors. Since the NDC focal ministry (typically the ministry of environment) is responsible for updating the NDC, meaningful contribution from energy ministries and agencies to the co-ordinating entity is important to align the NDCs with energy policies and plans. Stocktaking exercises at an energy ministry would help provide reliable inputs for developing NDCs so that they are able to be implemented in collaboration with energy and NDC focal ministries as well as non-state actors.

NDC implementation

- Energy efficiency, carbon finance, electric mobility and energy storage are often mentioned as areas for improving, updating or developing new policies. Considering the importance of doubling energy efficiency improvement towards 2030 – as countries pledged to do at COP28 – developing energy efficiency standards for buildings, appliances and other end-use sectors is important for countries to regulate the efficiency of demand-side energy use. Also, countries need to develop their strategies and policies to use carbon finance for mobilising investment in the energy transition. Planning and operationalisation of Paris Agreement Article 6 are also an important step for countries to apply the carbon market mechanisms of the Article 6.2, Cooperative Approaches, and Article 6.4, Paris Agreement Crediting Mechanism (PACM). In addition, as the economic competitiveness of electric mobility has increasingly improved, many Members also shared their interest in looking into policies and regulations on electric mobility, which could be linked to vehicle energy efficiency standards to promote the adoption of electrification in the transport sector.
- As the capital invested in global power grids has increased, it has become clear that physical infrastructure is key to the energy transition (IRENA, 2023a). The modernisation of physical infrastructure consists of various grid-forming technologies, such as transmission, distribution networks, interconnection and utility-scale energy storage, as well as other infrastructure such as transport and hydrogen infrastructures. Upgrading electrical and gas/liquid transport infrastructures is essential for shaping renewables-based energy systems and linking up to optimise variable renewable electricity. To that end, infrastructure for the energy transition would need to be a key consideration in the development of NDCs as well as the planning of NDC implementation and investment.
- Fifteen Members shared their support needs in relation to the facilitation of financing for energy transition projects (as free-text responses to open-ended Q7). These included the development of project pipelines and proposals, and financial mobilisation and matchmaking with external financial sources. In practice, many countries have been developing NDC investment plans to seek international finance. To translate investment plans, there is a need for developing bankable project pipelines meeting the investment criteria of targeted financing sources. Development partners and banks need to support the feasibility analysis of projects, the creation of business models for specific projects and the development of concept notes. As IRENA Members also highlighted their capacity challenges (Q5.3), technical assistance is also necessary for local project developers to improve their skills in analysing and drafting project proposals to meet international standards.

LT-LEDS

- Sixty-eight percent of respondent Members are planning to develop - or are in the process of developing - LT-LEDS, but others responded that they have no specific plans or are unclear about the plan (Q6). Given the strong interdependencies across short-, mid- and long-term emissions development planning and net-zero commitments, LT-LEDS effectively provide a framework, and generates momentum, for commitments within NDCs and subsequent actions.

- Providing a long-term perspective for implementing low emission development and achieving net zero, LT-LEDS enable backcasting from ambitious emissions goals to identify milestones and barriers in the short-, mid- and long-term. This assists policy makers in understanding the conditions and time frames, and appropriate types of action, which can inform the process of NDC formulation and implementation (OECD, 2019). To create such positive synergies, more countries are encouraged to develop their LT-LEDS swiftly, aligning with NDCs and key national and international objectives.

International co-operation

- International co-operation and financing are important for many countries to drive NDC implementation. Some IRENA Members highlighted the importance of collaboration with international partners. For example, as mentioned earlier, one country shared the effort with multilateral and bilateral development agencies on the operationalisation of Article 6 market mechanisms. In another example, some countries reported that non-governmental organisations (NGOs) and the private sector play key roles in developing and implementing climate action projects, especially renewables, clean cooking and the development of climate resilient infrastructures.

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ANNEX

The questions asked through the IRENA Members Survey on Nationally Determined Contributions (NDCs) are as follows.

Questions on NDC enhancement

Q1. Will your country enhance the mitigation ambition of energy sector targets in the next NDC update?
(Please select one option)
- ☐ Yes
- ☐ No
- ☐ To be assessed

Q1.1 [If you chose "Yes" or "To be assessed" in Question 1] When does your country plan to communicate the next updated NDC?
(Please select one option)
- ☐ 2023
- ☐ 2024
- ☐ 2025
- ☐ 2026 onwards
- ☐ To be assessed

Q1.2 [If you chose "Yes" or "To be assessed" in Question 1] Which energy sector targets does your country intend to update in the next NDC?
(You can choose multiple choices)
- ☐ Share of renewables in the energy sector
- ☐ Quantifiable target of renewables deployment (either capacity or generation)
- ☐ Quantifiable target of end-use electrification and decarbonisation (cooking, transport, cooling and heating, etc.)
- ☐ GHG emissions reduction target from the energy sector (absolute target, relative target (*e.g.* emission intensity))
- ☐ Fossil fuel phase-down or phase-out target
- ☐ Others (specify)

Q1.3 [If you chose "Yes" or "To be assessed" in Question 1] Which form of renewables does your country need to increase deployment?
(You can choose multiple choices)
- ☐ Bioenergy
- ☐ Geothermal
- ☐ Hydropower
- ☐ Ocean
- ☐ Solar
- ☐ Wind
- ☐ Others (_____)

Q1.4 [If you chose "Yes" or "To be assessed" in Question 1] What are the expected challenges to revising the energy sector targets of NDC?

Options	Unlikely	Neutral	Likely
Lack of data for developing targets and modelling scenario			
Difficulties in arriving at a consensus between multi-stakeholders			
Lack of the enabling framework for the energy transitio			
Misalignment between climate and energy policies			
Lack of skills and human capacity			
Assessment of just transition and socio-economic benefits			
Low-cost finance			
Climate finance			
Technology transfer			

Q2. Which measures does your country need to strengthen?

(You can choose multiple choices)

☐ Renewables
☐ Rural electrification /clean cooking
☐ Energy efficiency
☐ End-use electrification
☐ Electric mobility
☐ Advanced Biofuels
☐ On grid solutions/grid modernization
☐ Green Hydrogen
☐ Negative emissions technologies such as CCS / BECCS
☐ Others (_____)

Q3. Do you consider adaptation and sustainable development co-benefits of the energy transition?

(Please select one option)

☐ Yes
☐ No
☐ To be assessed

Q3.1 [If you chose Yes in the previous question] Which adaptation and sustainable development co-benefits of energy transition does your country consider in the next NDC update?

(You can choose multiple choices)

☐ Resilience of energy system
☐ Climate smart agriculture/food value chain
☐ Health/pollution
☐ Clean water/sanitation
☐ Circularity/resource efficiency
☐ Food security
☐ Water Security
☐ Just energy transition/socio-economic elements (*e.g.* jobs and gender)
☐ Others (_____)

Questions on NDC implementation

Q4. What are your priorities to accelerate implementing the energy sector part of NDC?
(You can choose multiple choices)
☐ Long-term energy sector planning
☐ Improving enabling frameworks
☐ Improve access to long-term low-cost finance
☐ Fostering innovations to deploy energy transition technologies
☐ Improving skills and human capacities
☐ Establishing new institutions
☐ Creating incentives for final energy consumers
☐ Raising public awareness

Q5. Does your country think it is necessary to improve or adopt new policies and regulations to advance energy transition?
(Please select one option)
☐ Yes
☐ No
☐ To be assessed

Q5.1 [If you chose "Yes" or "To be assessed" in Question 5] What policies and regulations are necessary to advance the energy transition in your country?
(You can choose multiple choices)
☐ Feed-in Tariffs
☐ Electricity pricing regulation
☐ Auction/ competitive tendering
☐ Renewable Portfolio Standard
☐ Energy efficiency standards
☐ Energy storage policies and regulation
☐ Electric mobility policies and regulation
☐ Digital transformation of the energy sector
☐ Emission regulations for thermal power plants
☐ Carbon pricing instruments / Paris Agreement Article 6 market mechanisms
☐ Fossil fuel phase-down or phase-out plan
☐ Others (_____)

Q5.2 [If you chose "Yes" or "To be assessed" in Question 5] What improvement is necessary for the power system in your country to increase the share of electricity generated by renewables?
(You can choose multiple choices)
☐ Grid code development
☐ Grid flexibility
☐ Grid expansion/reinforcement
☐ Enhanced forecasting of energy supply/demand
☐ Demand side management/demand response
☐ Bilateral interconnection/regional power pool
☐ Battery Energy Storage Systems

Q5.3 [If you chose "Yes" or "To be assessed" in Question 5] What capacity building needs does your country have?

(You can choose multiple choices)

- ☐ Development of investment-ready renewable energy project proposals/project development
- ☐ MRV framework development/implementation
- ☐ Integration of adaptation into energy policies planning
- ☐ Strengthening the capacity to assess enabling frameworks /conditions for energy transition
- ☐ Power system design/planning
- ☐ Enhancement of national capacities on renewable technology and related infrastructure solutions
- ☐ Strengthening capacities to operate power systems with higher shares of renewables
- ☐ Alignment of energy policies with NDC
- ☐ Long-term energy planning
- ☐ Others (_____)

Questions on LT-LEDS

Q6. Does your country plan to develop the Long-Term Low Greenhouse Gas Emissions Development Strategy or a net-zero strategy?

- ☐ Already developed
- ☐ Yes (to be developed in 2023)
- ☐ Yes (to be developed in 2024)
- ☐ Yes (to be developed in 2025 or later)
- ☐ No
- ☐ Unknown

Q6.1 [If you chose "Already developed" or "Yes" in Question 6] Does your country plan to include emissions peaking and net-zero emissions targets?

(Please select one option)

- ☐ Yes
- ☐ No
- ☐ To be assessed

Q6.2 [If you chose Already developed or Yes in Question 5] Which challenges did or does your country face to develop the LT-LEDS or net-zero strategy?

Options	Unlikely	Neutral	Likely
Multi-stakeholders consultation			
Assessment of priority measures of energy sector			
Assessment of priority measures of non-energy sectors			
Data availability			
Development of a robust monitoring evaluation framework			
Socio-economic impact assessment			
Finance			

Optional questions

Q7. What support do you need from IRENA to advance your country's NDC process?

Q8. We would appreciate your country's good practices or lessons learnt from the NDC enhancement and implementation process and LT-LEDS / Net-zero strategy. Please share your experience.

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