UN environment programme

Strengthening transparency of non-state actors

How national experiences and new digital technologies can strengthen the Transparency efforts of non-state actors

ISBN: 978-92-807-4066-0
Job number: DTI/2565/NA

Suggested citation: United Nations Environment Programme (2023). Strengthening transparency of non-state actors - How national experiences and new digital technologies can strengthen the Transparency efforts of non-state actors.

Co-produced with: CONCITO – Denmark's green think tank and UNEP Copenhagen Climate Centre (UNEP-CCC).

Acknowledgements

The United Nations Environment Programme would like to thank:

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Design, lay-out and editorial assistance.
Lisa Mastny (UNEP Consultant), Simon Hirsborg (Graphic Design by UNKNOWN), Julia Rocha Romero (UNEP-CCC), Monna Hammershoy Blegvad (UNEP-CCC), Mette Annelie Rasmussen (UNEP-CCC), Sophie Loran (UNEP), Ghita Borring (CONCITO)

Thanks also to:
Miriam Hinostroza for facilitating the funding for the report and good discussion on transparency, and to Jarl Krausing and the International Team at CONCITO for many inspiring inputs and comments.

Front page: Photo by William Bossen on Unsplash

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List of Abbreviations

CAAT	Climate Action Aggregation Tool
CBIT	Capacity-Building Initiative for Transparency
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
COP	Conference of the Parties
CSR	Corporate social responsibility
ESG	Environmental, social and governance
FMCP	Facilitative Multilateral Consideration of Progress
GCoM	Global Covenant of Mayors
GFANZ	Glasgow Financial Alliance for Net Zero
GHG	Greenhouse gas
HLEG	High-Level Expert Group
IAR	International Assessment and Review
ICA	International Consultation and Analysis
ICAT	Initiative for Climate Action Transparency
ICM	Mechanism to Enhance Implementation and Promote Compliance
ISO	International Organization for Standardization
ITMO	Internationally Transferred Mitigation Outcomes
LTS	Long-Term Strategies
MRV	Monitoring, reporting and verification
NAZCA	Non-State Actor Zone for Climate Action
NDC	Nationally Determined Contribution
NGO	Non-governmental organization
NZAMI	Net Zero Asset Managers Initiative
NZAOA	Net-Zero Asset Owner Alliance
NZBA	Net-Zero Banking Alliance
NZIA	Net-Zero Insurance Alliance
SBTi	Science Based Targets initiative
TCFD	Task Force on Climate-related Financial Disclosures
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

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Executive Summary

Linking actions by Non-State Actors (NSAs) with the Enhanced Transparency Framework

Transparency is central for the implementation and promotion of accountability and effectiveness in the global climate regime and the foundation of its governance as outlined in the United Nations Framework Convention on Climate Change. It helps to build trust and confidence among Parties to the Convention by documenting that they are taking the necessary steps to fulfil their obligations and contribute to the Convention's overall objective.

The national plans of countries in a form of Nationally Determined Contributions (NDCs) in the Paris Agreement form the foundation for reducing emissions and adapting to the impacts of climate change. The credibility of the Agreement depends on the countries' ability to implement these pledges and document their progress in a credible and transparent manner. The Enhanced Transparency Framework (ETF) is the mechanism that facilitates this global process of documenting climate action and tracking progress of individual countries. The ETF provides an essential input to the mechanism to increase collective ambition under the Agreement that is known as the Global Stocktake.

It is increasingly recognized that Non-State Actors (NSAs) can play a crucial role in enhancing and directing national action. They engage in climate action both by responding to policies by the governments through the creation of their own climate plans, establishment of emission reduction goals, enhancement of technical proficiency and capacity, and assistance with the local implementation of national policy objectives. But there is currently no meaningful links between the ETF and the NSA engagements.

This report is aiming to contribute to the discussions of how best to strengthen such links and how this may help generate more credibility of NSA pledges. The expectation is that this will be facilitating more action and ambition both by governments and among NSAs, but this assumption can only be verified in the future and is not discussed in detail in the report.

Three key framing questions

The acceleration of NSA pledges raises several questions that will be addressed in this report:

1. How have national level reporting and transparency efforts evolved over the last decades and what learning does that provide for the NSA communities? (Chapters 2 & 3)

2. To what extent are NSA pledges and actions included in the NDCs and how can non-state and national level climate action and reporting become more integrated? (Chapters 4 & 5)

3. How credible are NSA pledges and how can current accounting systems be further strengthened and harmonized to provide improved transparency as a tool for enhanced mitigation ambitions? (Chapters 6 & 7)

In order to answer the **first question**, the report provides a historical analysis of how transparency efforts have evolved for parties to the UNFCCC and what experiences and learning from this process can offer to guide NSA transparency efforts. For example, the Kyoto Protocol gave rise to numerous monitoring, reporting and verification systems that are still used extensively in a number of carbon pricing mechanisms and trading schemes worldwide, including by Governments and NSAs. The Cancun agreement was a major step towards harmonising the MRV across developed and developing countries, and the ETF under the Paris Agreement is the final step in transparency development under the UNFCCC.

Some of the key lessons from the evolution of the transparency efforts include the need to build on a sound scientific foundation such as the IPCC inventory guidelines, which allow actors to improve over time, and the need to build capacity for actors that do not otherwise have the capability to participate.

The report then discusses how the NSAs can learn from these lessons to further strengthen and harmonise the accounting and reporting.

The **second question** is partly addressed through an analysis of the current level of engagement or integration of NSA actions in the new or updated NDCs submitted in the last couple of years. This analysis clearly shows that despite developing and developed countries' growing recognition of the role of NSAs, only vague references to how non-state action will be aligned with national objectives and implementation are made in national climate policy texts. It was found that NDC and LTS texts were broad and cursory concerning NSAs, making only passing reference in statements that referred to all relevant stakeholder groups involved in updating the NDCs but failing to clarify how to achieve better coordination.

The analysis is complemented by a discussion of the current small number of international initiatives that aim to improve the links between national and NSA action and reporting, such as the UNFCCC Global Climate Action Portal and the Initiative for Climate Action Transparency's (ICAT) development and testing of methodologies for integrating non-state actors' climate actions in national climate policy evaluation.

As a response to the **third question**, an overview of the major NSA climate initiatives is presented along with a discussion of the current MRV efforts and how these have slowly evolved over the same period, as the transparency system for governments has been negotiated and implemented.

When comparing the developments around NSA pledging and reporting with the process under the UNFCCC for country Parties, it is evident that the political negotiations combined with capacity building efforts for governments to be able to report have gradually facilitated a move towards a harmonized approach to reporting. From the review of NSA initiatives and MRV structures, it is equally clear that increased harmonization is needed, but also that the NSAs constitute a much larger and more heterogenous group.

Two areas where there seem to be more dedicated efforts towards harmonization, common reporting and protocols are:

- Cities where the movement is towards a common Global Protocol for Community-Scale Greenhouse Gas Inventories and common reporting platforms like GCOM & CDP/ICLEI.

- Finance sector with efforts to have common methodologies and protocols for assessing and reporting on net-zero targets and progress made.

One way of overcoming the fact that NSA climate actions are heterogeneous and dispersed across multiple platforms and domains could be through increased use of innovative approaches coupled with new digital opportunities. There is a need to create interoperability, defined as the open exchange of data between different data systems, types, and standards, in order to be able to better integrate new datasets and sources while maintaining traceability and trackability. Many countries are in the process of developing national data web-platforms and move gradually towards more automatic and systematic data collection and reporting processes, and it is clearly a direction many countries want to go. For many developing countries such a process would require support both for the digital infrastructure and for building the necessary capacity. But at the same time developing countries could potentially benefit the most from the creation of an integrated global climate data accounting architecture. It would significantly improve accounting capacities and thus make it easier to participate in global carbon markets and for receiving climate finance. The last part of question three relates to the credibility of NSA pledges and while the report does not attempt to do a detailed assessment of the many NSA pledges and what they achieve, it is clear that there is a rapidly growing interest in joining the pledge structures, but the actual underlying plans and results are not convincing. While some positive progress is seen there is limited evidence of ambitions being translated into credible roadmaps and even less realized impact.

Conclusions

With the Enhanced Transparency Framework in the Paris Agreement, the transparency efforts have now reached a level where almost all countries will take part and provide the first compressive Biennial Transparency Reports (BTRs) next year. This is a major achievement backed by consistent and long-term negotiations and capacity-building support, and it will be very interesting to observe the quality of the BTRs, when they are submitted.

The analysis presented in this report shows that there are still some outstanding issues with regards to states' action on NDCs and ETF that required political attention:

- The guidance for NDCs will need to be strengthened and aim to harmonize target setting, baselines and analytical approaches while maintaining full flexibility for integration in national planning. This is necessary in order to be able to better compare ambitions and achievements over time. The enhanced reporting requirements can provide a push for more details and clarity in the next round of NDCs, but with the tight timing of BTR submissions in 2024 and new NDCs in 2025 this may be difficult.

- The in-depth review of BTRs will be essential to distil the key findings and for the gradual improvement of the BTRs over time, as has been the case earlier on National Communications. The task of conducting so many reviews within the allocated one year will present a major challenge that does not seem to have been addressed yet in terms of allocating the necessary funds and linking that to build the sufficient pool of qualified reviewers.

- The links between NDCs and long-term strategies also will need to be strengthened quickly to establish higher credibility of the many LTS and net-zero pledges by governments. With the next NDCs likely aiming for 2035, the development path in the new NDCs does need to be aligned with 2050 (or later) plans to remain credible.

While these issues are in the process of being addressed in the Convention negotiating process and will likely be resolved in the coming years, the situation is not the same for NSAs. Quoting the *UN High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities* then pledges and net zero emissions commitments of NSAs must move towards (2023, p. 2):

- *Non-State Actors (NSAs) must annually disclose their greenhouse gas data, net zero targets and the plans for, and progress towards, meeting those targets, and other relevant information against their baseline along with comparable data to enable effective tracking of progress toward their net zero targets.*

- *Non-State Actors (NSAs) must report in a standardised, open format and via public platforms that feed into the UNFCCC Global Climate Action Portal to address data gaps, inconsistencies and inaccessibility that slow climate action.*

- *Non-State Actors (NSAs) must have their reported emissions reductions verified by independent third parties. Special attention will be needed to build sufficient capacity in developing countries to verify emission reductions.*

- *Disclosures ought to be accurate and reliable. Large financial and non-financial businesses should seek independent evaluation of their annual progress reporting and disclosures, including opinion on climate governance, as well as independent evaluation of metrics and targets, internal controls evaluation and verification on their greenhouse gas emissions reporting and reductions.*

The evolution of the country transparency process has shown how the large and more developed actors move first and with financial and technical support the smaller and less resourceful actors can gradually participate more fully. The main difference with the NSA is that the implementation will need to be much faster given the increased urgency of the climate challenges. But since there is plenty of experiences available on harmonizing transparency efforts, and NSA engagement in some areas already has started to move towards more comparable and harmonized approaches there is reason to believe that it will be possible to move quickly.

Recommendations

Recommendation 1: ensure good understanding among the states and NSAs of the benefits from more harmonised and integrated approaches for MRV and climate data management,

Recommendation 2: provide specific guidance for national governments to include and reference NSA actions in official communications and reports.

Recommendation 3: establish central clearinghouses for country-level and NSA actions, utilizing digital tools to facilitate interoperability between existing and future datasets.

Recommendation 4: international institutions like the UNFCCC Secretariat or UNEP could play a more active facilitation role in creating dialogues between NSAs and Parties to enhance mutual understanding of actual and planned efforts.

Recommendation 5: Support NSAs especially in developing countries in improving data collection and reporting through the use of digital technologies.

1 Background on National and Non-State Actor Transparency Efforts

1.1 Introduction and Purpose of the Report

The 27th Conference of the Parties (COP 27) to the United Nations Framework Convention on Climate Change (UNFCCC) in November 2022 highlighted the urgent need for action on all fronts to address the escalating climate crisis. This was further amplified in the 2023 Synthesis Report of the Sixth Assessment of the Intergovernmental Panel on Climate Change (IPCC 2023). The increasing variability and frequency of extreme weather events are clear indicators of the immediate impact that current levels of global warming, at around 1.1 degrees Celsius above pre-industrial levels, are having on food and water security, nature, safety and socio-economic development.

The latest Emissions Gap Report from the United Nations Environment Programme (UNEP 2022) shows that while growth in global emissions is slowly decreasing, the current emission levels are nowhere near being aligned with the goals of the Paris Agreement to limit global warming to well below 2 degrees Celsius by the end of the century, and to pursue efforts to limit warming to 1.5 degrees Celsius. The report also highlights a significant gap between stated ambitions to reduce emissions in countries' Nationally Determined Contributions (NDCs) and the actions needed to achieve the Paris Agreement goals by 2030. The Paris Agreement formally recognizes the importance of the contributions of all levels of government and various actors in global climate mitigation, adaptation and financing.

It is increasingly recognized that non-state actors – such as cities, states, regions, companies, investors and foundations – can play a crucial role in enhancing and directing national action to close the existing emissions gap. These actors engage in climate action through the creation of their own climate plans, establishment of emission reduction goals, enhancement of technical proficiency and capacity, and assistance with the local implementation of national policy objectives.

As highlighted in the 2018 UNEP Emissions Gap Report, non-state actors collaborate with national governments and other non-state actors in transnational climate initiatives and international cooperative efforts. However, while the Paris Agreement calls for increased action from non-state actors and for linking "transnational initiatives directly to the development of concrete policy options for countries under the technical process of the UNFCCC" (Hale 2016, p. 14), the exact mechanisms for this linking remain uncertain (Streck 2021).

NSA have been identified as potentially being catalysts, acting as drivers of ambition given their ability to experiment and to adapt solutions tailored to local conditions (Betsill et al. 2015; Chan et al. 2015; Hale 2020). This catalytic ability may position non-state actors to innovate climate policies locally where they have greater discretion to adopt policies for specific contexts (Sabel and Zeitlin 2012; Domorenok et al. 2020). Such experiments may generate learning, capacity-building and other positive outcomes that loop back in a "recursive process of provisional goal-setting and revision" (Sabel and Zeitlin 2012; Hermwille 2018).

Thus, non-state actors can create enabling political conditions (Hale and Roger 2014) and feedback mechanisms (Hermwille 2018) that could raise the ambition and rigor of the climate policies of other subnational and national actors (Urpelainen 2009; Bromley-Trujillo et al. 2016). In many cases, local actors may go beyond their national government's mitigation targets and policy efforts (Hsu, Weinfurter and Xu 2017; Kuramochi et al. 2020) and thereby push their peers or national governments to adopt more ambitious climate policies (Hale 2020).

Despite the global community's increasing recognition of the importance of non-state actors for achieving the global Paris Agreement goals, there is currently no generally accepted guidance on how to integrate their efforts into the national transparency process. This lack of guidance contributes to the general uncertainty around how exactly non-state actors can contribute to, complement or strengthen existing national efforts and the reporting thereof (Streck 2021). Already now, "current methods to report greenhouse gas emissions and validate or verify emission reductions can be costly, error-prone, and time-consuming, often relying on manual processes and in-person surveys" (Belenky et al. 2022).

As a result, climate data from many non-state actors are inconsistent and incomplete, preventing accurate assessments of climate actions and investments. The need for better data and increased transparency across the actions of both national and non-state actors is crucial for moving forward on addressing the climate crises. This report provides recommendations on how to achieve this in a more integrated and coherent manner, building on a description and analysis of the development of and experiences from the last three decades of continuously improved national transparency efforts.

1.2 Nationally Determined Contributions and the Enhanced Transparency Framework

Credible information and data are essential for effective coordination of climate action across all levels, and transparency is a key obligation in the Paris Agreement to ensure the integrity of national pledges and to build trust among countries and all other actors. The Nationally Determined Contributions form the Paris Agreement's foundation for reducing emissions and adapting to the impacts of climate change. The credibility of the Agreement depends on countries' ability to implement these pledges and to document their progress in a credible and transparent manner.

The Enhanced Transparency Framework is the mechanism that facilitates this global process of documenting climate action. As is discussed later, currently no meaningful links exist between the Enhanced Transparency Framework and the non-state actor engagements, but several non-state actor initiatives operate with the same target timing that is used by most countries, i.e., 2025 and 2030.

With the finalization of the Enhanced Transparency Framework negotiations at COP 26 in Glasgow in 2021, countries are now preparing to provide input to the Global Stocktake, which will be completed at COP 28 in December 2023, and subsequently to prepare their first Biennial Transparency Reports by 2024. Both efforts will provide important inputs to the preparation and submission of new and more ambitious Nationally Determined Contributions, which should be submitted at the latest in 2025.

Importantly, the Enhanced Transparency Framework builds on existing reporting structures that have evolved since the early days of the implementation of the UNFCCC, including the National Communications, Biennial Reviews and Biennial Update Reports. The Enhanced Transparency Framework reflects the evolving nature of the international climate change regime, the experiences and lessons learned, and the most recent scientific knowledge on emissions, their sources, and policies and actions to mitigate climate change and adapt to it.

With the Enhanced Transparency Framework and the agreed underlying modalities, procedures and guidelines, all countries now in principle have the same formal requirements and common reporting and review structures. Developing countries have some flexibility regarding several mandatory requirements, and the least developed countries and small island states have even more flexibility, if they so choose. The significant differences in institutional capacity, data and expertise among many Annex I and non-Annex I countries are elaborated further in chapter 2.

The Enhanced Transparency Framework decisions (UNFCCC, 2018) the so-called Katowice Rulebook contain an elaborate rule set for transitioning from the existing monitoring, reporting and verification system – which includes National Communications, Biennial Reports and Biennial Update Reports – to the new Enhanced Transparency Framework. The main purpose of the transition is for countries that have ratified the Paris Agreement to follow the Biennial Transparency Reports structure consistent with a set of modalities, procedures and guidelines that apply for both developed and developing countries. Since reporting is mandatory only for mitigation efforts and is voluntary for adaptation, this report focuses more on mitigation, reflecting also that the methodological foundation for assessing adaptation actions, in terms of impacts and relative cost effectiveness, still requires more research and consensus-building.

Reaching agreement on the Enhanced Transparency Framework was a major step towards better global climate data management; however, basic problems remain related to the lack of common and agreed methodologies in several areas. One exception is the methodology for greenhouse gas inventory assessment, where there is a common mandatory methodological foundation for assessment and reporting developed by the Intergovernmental Panel on Climate Change (IPCC 1994), with a first version issued in 1994 that was the foundation for most of the first National Communications. A new set of guidelines was issued in 2006 (IPCC 2006) reflecting the improved scientific understanding of the various greenhouse gases and related sources and sinks.

These guidelines were further supplemented by a Refinement Report in 2019 (IPCC 2019) that addresses identified gaps in the earlier science, plus reflects that new technologies and production processes have emerged. The Refinement Report also provides updated values of some emission factors used to link the emission of a greenhouse gas for a particular source to the amount of economic activity causing the emission. The report also starts to discuss the use of atmospheric observations as a way of verifying the bottom-up data but does not make it a requirement. The use of the refined approaches of the Intergovernmental Panel on Climate Change is voluntary and not all countries are fully able to apply them, but this will gradually change.

Traditionally the data for national inventories are derived from a bottom-up process where government entities collect data at the emitter level (statistical or reported data if relevant supplemented by measurements) on a sectoral basis, and then aggregate these to the national level. However, in most countries, there is very limited consideration or engagement of subnational (such as regions and cities) or other non-state actors in the collection of emissions data.

With emerging digital measurement and remote sensing technologies (such as satellite or aerial data) there is a rapidly developing capacity to complement such bottom-up approaches with more top-down measurement-based approaches. New observational capabilities are revealing granular emission hotspots at the facility or city level, through measurements from cars, drones and aircraft, and satellite remote sensing, especially. For methane emission detection, there is rapid progress on the ability to verify point sources either at the facility level or, for example, major leaks in pipelines or intentional release of methane at production sites. These new developments and the likely impact on both greenhouse gas inventory processes and related mitigation actions are further discussed in chapter 6.

There is, unfortunately, no generally agreed methodological foundation available for assessing the effects of mitigation policies and actions. Instead, countries use a wide variety of methodologies and analytical tools to assess impacts arising from their policies and actions. The situation is the same or likely worse when examining methodologies used to assess the impacts of non-state actors. The possibilities for developing more standardized approaches are limited due to national differences in both the sectoral structures and emission sources and reduction potentials. At the same time, all support programmes for the Nationally Determined Contributions show that it is essential to build on the existing national planning and modelling. Hopefully more comparable preparation approaches for the Nationally Determined Contributions will gradually be developed including baselines, common target formats and others. This harmonization would improve transparency and comparability and make it easier to use market mechanisms in a credible manner.

Significant challenges will still exist regarding implementation of the Enhanced Transparency Framework at both the national and international levels. The main challenges at the national level relate to the limited human and institutional capacity and poor data collection infrastructure in many developing countries, while at the international level, a major challenge will be finding the financial and expert resources that are needed to run the Biennial Transparency Report review process for all 196 countries as signatories to the Paris Agreement on a biennial and periodic basis. These points are further elaborated in chapter 2.

1.3 Non-State Actor Pledges and Reporting Structures

In parallel with formal negotiation processes and national transparency efforts, there have been many efforts over time to engage with the various communities of non-state actors. The participation of non-state actors in climate action has been ongoing for a couple of decades but gained significant momentum after the United Nations Secretary-General convened the Climate Action Summit in 2014 to engage business leaders and civil society more actively in actions towards a low-carbon emissions world. The Summit's momentum was carried forward into COP 20 in Lima, Peru a few weeks later, where the so-called Lima-Paris Action Agenda was adopted as the framework for enhanced action by non-state actors and as the main convening mechanism for integrating them into the government-led convention process.

What role this strengthened engagement of non-state actors played in the successful negotiation of the Paris Agreement at COP 21 in 2015 is hard to assess. However, the role of these actors was specifically highlighted in the Paris Agreement (UNFCCC 2015), which recognizes "the results of the Lima-Paris Action Agenda, which build on the climate summit convened on 23 September 2014 by the Secretary-General of the United Nations."

The continued process of strengthening non-state actor pledges and engagement was further institutionalized in the Paris Agreement with the creation of the COP presidency-appointed High-Level Climate Champions to ensure a durable connection between the Convention and the many voluntary and collaborative actors and actions. The climate champions are charged with connecting non-state actor initiatives to national action plans detailed in Nationally Determined Contributions. The role of the climate champions has evolved since COP 21 in Paris, and at COP 26 in Glasgow in 2021 several new initiatives were launched including three campaigns: Race to Zero, Race to Resilience and the Glasgow breakthroughs. The most relevant for this report is the Race to Zero campaign, described in chapter 3.

Since the adoption of the Paris Agreement, global climate action engaging both governments and non-state actors has been encouraged and facilitated under the banner of the Marrakech Partnership for Global Climate Action, which was launched in Morocco at COP 22 in 2016 and acknowledged at subsequent COPs. The Partnership brings together stakeholders working in key sectors and themes to spur enhanced climate ambition and action.

To strengthen reporting by non-state actors, the United Nations Secretary-General convened a High-Level Expert Group (HLEG) to develop stronger and clearer standards for net zero emission pledges by non-state actors – including businesses, investors, cities and regions – and speed up their implementation. The Expert Group was launched at COP 26 in 2021 and presented its recommendations at COP 27 (HLEG 2022). This initiative is further discussed in chapter 3 of this report, and relevant recommendations are reflected in the conclusions and recommendations. Chapter 3 also presents a detailed review of some of the main initiatives and the associated measuring, reporting and verification structures (MRV). A brief explanation on the principles of MRV is provided in Box 1.1.

So far, most initiatives have focused on getting organized, engaging new members and only gradually building a credible MRV structure.

Overview of the components of the MRV

Measure or monitor (M) data and information on HG emissions, mitigation actions, and support. This may entail direct physical measurement of GHG emissions, estimating emissions or emissions reductions utilizing activity data and emission factors, e.g. following the IPCC guidelines for national GHG inventories, calculating changes relevant to sustainable development, and collecting information about support for climate change mitigation.

Report (R) by compiling this information in inventories and other standardized formats to make it accessible to a range of users and facilitate public disclosure of information.

Verify (V) by periodically subjecting the reported information to some form of review or analysis or independent assessment to establish completeness and reliability. Verification helps to ensure accuracy and conformance with any established procedures, and can provide meaningful feedback for future improvement.

Source: (Dagnet, Y. et al. 2014)

The acceleration of non-state actor pledges raises several questions that are addressed in this report:

1) How have national-level reporting and transparency efforts evolved over the last decades, and what learning does that provide for the non-state actor communities? (Chapters 2 and 3)

2) To what extent are non-state actor pledges and actions included in the current national plans (Nationally Determined Contributions), and how can non-state and national-level climate action and reporting become more integrated? (Chapters 4 and 5)

3) How credible are non-state actor pledges, and how can current accounting systems be further strengthened and harmonized to provide improved transparency as a tool for enhanced mitigation ambitions? (Chapters 6 and 7)

The first question is addressed in chapter 2 with a detailed presentation and assessment of how the transparency efforts have evolved in the UNFCCC process and a discussion of the challenges that will need to be addressed to ensure successful implementation of the Enhanced Transparency Framework.

The second question has been researched extensively and the relevant studies have been assessed in the context of the UNEP Emissions Gap Report (UNEP 2017; UNEP 2018). However, with the current heterogeneity of non-state actor reporting structures and often limited detail in the Nationally Determined Contributions on non-state action, it has been difficult to conduct credible assessments of the additionality of non-state actor pledges and action. The Initiative for Climate Action Transparency (ICAT), discussed later in the report, has developed specific guidance material on this topic, but it is yet to be applied more widely.

The Global Stocktake under the UNFCCC process, which was initiated at COP 26 in Glasgow in 2021 and will be completed at COP 28 in Dubai, provides an opportunity to strengthen the assessment of collective progress towards the goals of the Paris Agreement. As part of the Global Stocktake process, the UNFCCC has convened several technical dialogues and has communicated a dedicated interest in trying to integrate non-state actors, and a number of non-state actors have been making formal submissions (UNFCCC). However, as CDP – the manager of the largest global disclosure platform for investors, companies, cities, states and regions – has noted, many of its members are largely unaware of how to engage with the Global Stocktake process.

CDP (2022) has presented two pathways to better integrating actions by non-state actors in the Global Stocktake: 1) through direct submissions to the UNFCCC process and 2) nationally through the Nationally Determined Contribution process and the upcoming Enhanced Transparency Framework reporting structures. These logical but relatively trivial recommendations reflect the issues that are the focus of this report – the essential lack of integration between state and non-state actions and associated transparency measures.

While the Global Stocktake is focusing on assessment of collective progress, several initiatives have started to explore how digital technologies can facilitate improved and more credible climate and activity data. This is discussed in chapter 6.

The third question has also been analysed extensively (CDP 2021; NewClimate Institute and Carbon Market Watch 2022), and the analyses reveal large differences between various initiatives and actors in terms of the credibility of their pledges – for example, does a net zero strategy really present a credible path to achieve this end goal, and are interim targets aligned with the needed reductions by 2030 according to the Intergovernmental Panel on Climate Change? Similar differences are evident when examining the actual level and pace of implementation of pledged actions.

This report aims to address these three questions by documenting the current status of both national and non-state efforts in terms of systematic reporting and verification of plans and actions. It also aims to discuss options for how to move towards more comparable and interoperable reporting systems across the different administrative levels of actors, with a special focus on how new digital technologies can facilitate and strengthen this integration process.

The report is focused on mitigation actions for two reasons. The first is because there are no mandatory requirements for countries to include adaptation plans and actions in the Nationally Determined Contributions, and while there is detailed guidance on reporting on adaptation in the Biennial Transparency Reports, it is not a formal requirement. Secondly, the number of non-state actor initiatives focusing on adaptation is still very small compared with the mitigation engagement. But it is expected that most of the findings and recommendations would also apply to adaptation, if it were to become a formal commitment in the Paris Agreement context.

Finally, the report discusses how to use this integration of non-state actors to strengthen individual and global ambitions, with the hope that commitments by non-state actors can facilitate higher government ambitions while not losing the momentum created through the non-state actor bottom-up peer pressure pledge and reporting processes.

2 National Reporting and the New Enhanced Transparency Framework

2.1 Transparency Is Central to the Credibility of the Climate Change Regime

Transparency is central for the implementation and promotion of accountability and effectiveness in the global climate regime and its governance, as outlined in the Convention[1]. It helps to build trust and confidence among Parties to the Convention by documenting that they are taking the necessary steps to fulfil their obligations and to contribute to the Convention's overall objective. Transparency is essential, as the UNFCCC and later the Paris Agreement are broadly understood as "soft law," which relies primarily on facilitation rather than on strong enforcement and compliance (Aykut et al. 2021).

Transparency in the climate change regime has evolved through a slow, top-down process since the early days of UNFCCC negotiations. This process is considered a crucial driver for action and a facilitator for ambition in the bottom-up governance structure of the Paris Agreement (see, for example, Gupta and Mason 2016; Ciplet and Roberts 2017; Ciplet et al. 2018). Transparency allows for the sharing of information on countries' efforts towards mitigation, adaptation, and support, and enables countries to learn from each other's experiences to stimulate countries to implement pledges and increase the ambition of their future Nationally Determined Contributions.

The transparency or national monitoring, reporting and verification systems related to the Convention are the most elaborate among environmental agreements, and the process of implementation and gradual strengthening has generally been successful from a policy process perspective (Gupta 2010; Bodansky 2019; Kinley et al. 2020), even if there are still a number of challenges and the actual implementation remains insufficient for the aim of "holding actors accountable." This is further discussed later in this chapter. Articles 4 and 12 of the Convention set the foundation for the transparency system of the climate change regime and specify the obligations for each Party. These articles require Parties to communicate information on a national greenhouse gas inventory and a general description of steps taken or envisaged by a Party to implement the Convention.

Specifically, Article 12 introduces specific reporting obligations for each Party to submit National Communications to demonstrate that it is taking responsibility for the fulfilment or non-fulfilment of the substantive obligations under the Convention. This allows Parties to the Convention and its supreme decision-making body, the Conference of the Parties, to have reliable, transparent and comprehensive information on emissions, policies and actions, and support, thereby forming an essential basis for understanding current emission levels, the effectiveness and ambition of existing efforts, and the progress at both the national and international levels. Submission of the National Communications in the 1990s

[1] According to Kinley et al. (2020), transparency, and related data sharing and accountability, is among the key functions of climate governance, the other key functions being: developing international law and setting rules and standards, establishing globally agreed goals and sending signals; promoting awareness and learning; facilitating the provision of means of implementation and support; building engagement of stakeholders; and contributing to raising global ambition.

was the first building block of the evolving transparency system under the Convention, under which the modalities, procedures and guidelines have been revised multiple times to reflect experience, knowledge and learning from reporting and review, and scientific understanding of greenhouse gas emissions and measures to reduce them. National monitoring, reporting and verification systems, in particular on greenhouse gas emissions reporting, were considered from the outset of the implementation of the Convention in the light of the best available scientific knowledge. The evolution of the monitoring, reporting and verification system over time reflected differences in the nature and scope of the Convention, the Kyoto Protocol and the Paris Agreement (World Resources Institute [WRI] 2021).

The initial transparency system under the Convention comprised only a few elements for reporting and technical review. For all countries, it comprised preparation and submission of the National Communications with information on greenhouse gas emission inventories and action taken to implement the Convention. However, the information to be submitted by developed and developing countries was subject to different requirements. Specifically, developed countries were requested to submit separate reports with detailed national greenhouse gas inventory information in an electronic format for processing in a database by the secretariat. Once submitted, National Communications and greenhouse gas emissions reports by developed countries were subject to detailed technical examination by review teams comprising certified experts nominated by their governments.

Reviews of the National Communications of developed countries were conducted almost exclusively through in-country visits. This enabled better understanding of the reported information, its verification, identification of problems and bringing experiences back home, but at the same time posing scalability limitations regarding the substantially higher (and growing) number of actors involved. Reviews of the submitted national greenhouse gas inventories were conducted using three modalities: in-country visits, centralised reviews and desk reviews. Since large parts of the greenhouse gas inventory information were submitted using electronic formats, this enabled gradual automation of a significant part of the reported information, for example, conducting an outlier analysis. Parties did not establish any review or other requirements for the National Communication submissions by developing countries, and reporting guidelines provided only a general framework.

2.2 Evolution of the Transparency Framework from the Convention to the Kyoto Protocol

Negotiations under the Convention on "targets and time tables" for developed countries resulted in the adoption of the Kyoto Protocol in 1997. Under its Article 3, the Protocol provides for obligations for industrialized countries and economies in transition , referred to herewith as developed countries, to limit and reduce greenhouse gas emissions in accordance with agreed individual targets, which are inscribed in the Protocol. The Protocol also contains, under its Article 2, provisions on mitigation policies and measures to achieve these targets, but these are not mandatory.

Parties further decided that there would not be any reporting obligations for developing countries under the Protocol, in accordance with the principles and provisions of the Convention of "common but differentiated responsibility and respective capabilities." This reflects that Parties generally recognized that developed countries are largely responsible for the current high levels of greenhouse gas emissions in the atmosphere and resulting global warming.

The Kyoto Protocol introduced innovative new market mechanisms, known as the Kyoto mechanisms, which were based on the trade of emission permits in the framework of the newly created carbon market. These mechanisms offered countries additional means to meet their targets, with the understanding that they must meet their targets primarily through domestic measures. The Kyoto mechanisms included 1) International Emissions Trading, 2) the Clean Development Mechanism and 3) Joint Implementation.

In contrast to International Emissions Trading, which represents trading of emission permits in the carbon market, the Clean Development Mechanism and Joint Implementation are two project-based mechanisms that created emission units that could also feed the carbon market. The Clean Development Mechanism involved investment in emission reduction or removal enhancement projects in developing countries that contributed to their sustainable development, while Joint Implementation enabled developed countries to carry out emission reduction or removal enhancement projects in other developed countries. Businesses, non-governmental organizations and other legal entities could participate in the three mechanisms under the authority and responsibility of governments.[4]

[2] For the purposes of the UNFCCC, countries with economies in transition are those that undertook in the 1990s a transition from a centrally planned to market economy. Initially, these included Belarus, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Monaco, Poland, Romania, the Russian Federation, Slovakia, Slovenia and Ukraine.
[3] The initial targets for developed countries under the Kyoto Protocol are inscribed in Annex B to the Protocol. These targets have been subsequently strengthened and membership of the Protocol updated through the Doha Amendment that was adopted in 2013 and ratified in 2020.
[4] See https://unfccc.int/process/the-kyoto-protocol/mechanisms.

To ensure transparency and hold Annex I countries accountable for meeting their obligations, the Kyoto Protocol established a rigorous monitoring, reporting and verification system under Articles 5, 7 and 8, as well as a compliance system under Article 18. Under the Protocol, countries' actual emissions have to be monitored, and precise records have to be kept on the use of the Kyoto mechanisms. A registry system was developed to record transactions by Parties under the mechanisms and to enable reporting thereof. The registry system is linked to another system called the Compilation and Accounting Database, which keeps track of countries' emissions that are reported and verified annually and enables comparison of cumulative emissions with the allowable quantity calculated in accordance with the emission targets for the purposes of compliance at the end of each compliance period.

Under the Protocol, Annex I countries were required to submit annual greenhouse gas emission inventories and information on the use of the Kyoto mechanisms and to submit regularly their National Communications. All reported information, including greenhouse gas emissions and use of the Kyoto mechanisms, is subject to rigorous technical expert review. In case of problems with assessment of greenhouse gas emissions with regard to the guidelines of the Intergovernmental Panel on Climate Change, or with accounting of the allowable level of emissions (known as an assigned amount), the review teams can apply adjustments to emissions or corrections of the assigned amounts.

For the first time under the evolving climate change regime, a compliance system was introduced that was meant to ensure that Parties meet their emission targets and obligations with regard to monitoring, reporting and verification. The experience suggests that almost all considerations by the Compliance Committee were triggered by problems related to reporting (WRI 2021).

The operation of the Kyoto project-based mechanisms was underpinned by development of standardized methodologies and baselines for robust assessment of emission reductions from projects. Since the launch of these mechanisms, more than 10,000 projects have been implemented worldwide or are under implementation (CDM pipeline 2023). Together with data and information available in a UNFCCC database, this provides valuable lessons for operating the new co-operative approaches under Article 6 of the Paris Agreement.

These lessons informed the approach to the two market mechanisms under Article 6, namely Article 6.2 and 6.4, as reflected in the Glasgow Climate Pact, and set the foundation for the development of the relevant parts of the Rulebook to implement the Paris Agreement.

The requirements for the National Communications under the Kyoto Protocol for developed countries expanded to cover (in addition to the information required under the Convention) information to demonstrate compliance with the provisions of the Protocol. This mostly included updates related to the national system for greenhouse gas emission inventories, establishment of a national registry to hold units from the Kyoto mechanisms and track their transactions, and elaboration by countries on why they consider the use of the Kyoto mechanisms – for the purposes of achieving its targets – to be supplemental to domestic action.

The rigorous monitoring, reporting and verification requirements under the Kyoto Protocol led to huge improvements in the accuracy, completeness, consistency, comparability and transparency of data and information on greenhouse gas emissions and to a lesser extent on policies and actions to reduce them. A database maintained by the UNFCCC Secretariat contains full time-series data on greenhouse gas emissions from developed countries since 1990.[5] In contrast, until the operationalization of the Cancun MRV framework (see section 2.3 below), only very general reporting requirements applied to developing countries. Combined with irregular submissions of National Communications and no mandatory technical review of the submitted information, the early reporting requirements did not create any incentive for improvement of information from developing countries.

Importantly, the Kyoto Protocol gave rise to numerous monitoring, reporting and verification systems that are used extensively in a number of carbon pricing mechanisms and trading schemes worldwide. Such systems helped entities engaged in the Kyoto mechanisms and other emission trading systems to better understand their emission sources and reduce emissions, for example by increasing their energy efficiency and use of renewable power.

2.3 From the Cancun MRV Framework to the Enhanced Transparency Framework Under the Paris Agreement

After the failed attempt at COP 15 in 2009 to get consensus on a new top-down agreement with national targets, the final outcome the Copenhagen Accord framed the beginning of a new approach for the negotiations. At COP 16 in Cancun in 2010, the climate regime evolved further, and the contours of a new bottom-up "pledge-and-review" system that was later enshrined in the Paris Agreement started to emerge. This system maintained a dual-track framework, with different types of mitigation actions or commitments for developed and developing countries. For the first time under the UNFCCC, developed countries were requested to submit economy-wide emission reduction targets for 2020, while developing countries were requested to submit Nationally Appropriate Mitigation Actions for the same year. This dual-track framework regarding substantive obligations has been reflected accordingly in the Cancun MRV framework.

[5] To access the greenhouse gas database, see https://unfccc.int/process-and-meetings/transparency-and-reporting/greenhouse-gas-data/ghg-data-unfccc/ghg-data-from-unfccc.

Yet, Cancun made a remarkable political step forward in advancing the national and international monitoring, reporting and verification framework process, as it introduced a technical analysis of submitted information by developing countries that in a way resembles the expert review of submissions by developed countries that was in place from the outset of the Convention. It also introduced, for the first time, a formal peer assessment of progress in climate action and goals for both developed and developing countries. This process fully aligned the steps in the monitoring, reporting and verification process for developed and developed countries that, following this decision, consisted of reporting, technical expert review and peer review. At same time, the content of these steps remained different, in particular for reporting, which maintained the dual-track or bifurcated nature of the monitoring, reporting and verification framework (see Figure 2.1).

Figure 2.1 Cancun MRV framework for developed and developing countries

Reporting		Verification	
		Technical review / Analysis	**Peer review**
Developed countries	National communications National greenhouse gas inventory Biennial Report	Review by expert review teams	Multilateral Assessment at Working Group Session of the Subsidiary Body for Implementation
International assessment and review			
Developing countries	National communication that includes greenhouse gas inventory Biennial Update Report	Technical analysis by team of technical experts	Facilitative sharing of views at a workshop under the Subsidiary Body for Implementation
International consultation and analysis			

Adapted from UNFCCC 2023

The Cancun MRV framework maintained the key elements of reporting under the Convention, namely periodic reporting in the form of National Communications for both developing and developed countries, and annual reporting of national greenhouse gas inventories for developed countries. Relevant guidelines were updated.[6] Importantly, an innovation of the Cancun MRV framework was the introduction of Biennial Reports for developed countries and Biennial Update Reports for developing countries that contain information on national greenhouse gas emissions, including national greenhouse gas inventory reports and emission projections[7], and policies and actions to reduce emissions. Finance, technology and capacity-building support provided by developed countries, constraints and gaps, and support needed and received by developing countries were also included. For the first time the Cancun MRV framework introduced the concept of electronic reporting for developed countries on mitigation policies, emission projections, and financial, capacity-building and technology support that evolved into a standard tabular format for reported information that was adopted by COP 18 in 2012.

Regarding national communications, the Cancun MRV framework clarified the relationship between the developed country Biennial Reports and National Communications and established that in the years when the National Communications are due, the Biennial Reports could be submitted as a stand-alone document or as an annex to the National Communications. As the guidelines for the Biennial Reports were more detailed and updated compared to those for the National Communications, a mandate was provided to develop updated guidelines for National Communications for developed countries with relevant common tabular format for reported information. These were elaborated and adopted at COP 25[8] in 2019, while the guidelines for National Communications for developing countries remained intact.

[6] See decision 2/CP.17, at https://unfccc.int/sites/default/files/resource/docs/2011/cop17/eng/09a01.pdf.
[7] Reporting on projections in the Biennial Report is explicitly required for developed countries only. For developing countries, the requirement is to report on "mitigation actions and their effects, including associated methodologies and assumptions." Reporting on effects of mitigation actions in a number of cases is done by reporting on emission projections.
[8] See decision 6/CP.25, at https://unfccc.int/sites/default/files/resource/cp2019_13a01_adv.pdf.

Two processes for verification were established for the first time under the Cancun MRV framework, sometimes referred to as "reviews": International Assessment and Review (IAR) for developed countries and International Consultation and Analysis (ICA) for developing countries.[9] The aim of IAR was to promote the comparability of efforts among all developed country Parties; build confidence with regard to developed countries meeting their 2020 quantified economy-wide emission limitation and reduction targets; and enable Parties to discuss the technical review results of individual Parties. The IAR process was conducted under the Subsidiary Body of Implementation in two steps, which follow mandatory submission of the Biennial Reports. These steps consist of a technical review of the national reports of each developed country, by expert review teams, followed by multilateral assessment of the progress towards achieving the economy-wide target by developed country Parties.

The ICA process for developing countries aimed to increase the transparency of mitigation actions and their effects, in a manner that was non-intrusive, non-punitive and respectful of national sovereignty. The process also contributed towards capacity-building of developing country Parties, which was reflected in the improved reporting of subsequent Biennial Update Reports. Similarly to the IAR, the ICA process was conducted under the Subsidiary Body of Implementation and consisted of two steps, which were triggered by the submission of Biennial Update Reports: a technical analysis of Biennial Update Reports by a team of technical experts and a facilitative sharing of views in the form of workshop under the Subsidiary Body of Implementation.

The team of technical experts conducts a technical analysis of the Biennial Update Reports submitted by developing country Parties and of any additional technical information that may be provided by the Party concerned. An increasing number of developing country Parties are submitting National Inventory Reports as additional information, as well as submitting REDD+ data as a technical annex to their Biennial Update Reports.

The Cancun MRV framework is currently in place and will remain in place until the Enhanced Transparency Framework under the Paris Agreement is phased in no later than at the end of 2024. Continuous engagement in the Cancun MRV framework and fulfilment of the obligations that are contained therein is a critical component for the preparation by all countries for participation in the Enhanced Transparency Framework.

The significant experience that has been accumulated by both national institutions and individual experts with monitoring, reporting and verification activities under the UNFCCC is recognized as an important basis for the development and implementation of the new Enhanced Transparency Framework for action and support under the Paris Agreement. Also, experience with monitoring, reporting and verification of the Kyoto mechanisms has been recognized as a basis for reporting and review for those countries that engage in the Paris Agreement Article 6 on co-operation activities, considering the complexity of Article 6 and the diversity of mitigation goals enshrined in the Nationally Determined Contributions.[10]

An important facilitating feature of the entire monitoring, reporting and verification process under the Convention has been the financial support for developing country engagement in National Communications, Biennial Update Reports and the review processes. This has been provided by the Global Environment Facility, as a financial mechanism of the UNFCCC. Since 1995, this so-called enabling activity programme has supported 150 countries with more than US$ 300 million to deliver a total of nearly 500 National Communications. The Global Environment Facility was also specifically requested in the Paris Agreement to provide support to developing countries to implement the Enhanced Transparency Framework. Subsequently, the Capacity-building Initiative for Transparency (CBIT) was established at COP 21 and started operating by COP 22, where the Paris Agreement entered into force after record speed ratification.

From a governance perspective, in 2001, the first body, the Consultative Group of Experts on non-Annex I National Communications, was constituted under the UNFCCC to provide technical support to developing countries for such preparation.[11] The scope of operations of the Consultative Group of Experts has expanded over time. According to the most recent mandate adopted by COP 26 in Glasgow, it now covers, in addition to assisting how developing country Parties fulfil their reporting requirements under the Convention, also support for their implementation of the Enhanced Transparency Framework under Article 13 of the Paris Agreement. This includes financial and technical support; preparation of guidelines, manuals, tools and toolboxes on institutional arrangements; and training for countries and technical experts that participate in the technical analysis under the International Consultation and Analysis (ICA).

[9] See https://unfccc.int/process-and-meetings#:0c4d2d14-7742-48fd-982e-d52b41b85bb0:f666393f-34f5-45d6-a44e-8d03be236927.

[10] While under the Kyoto Protocol and the Paris Agreement developed countries have assumed economy-wide emission reduction targets, under the Paris Agreement, developing countries have assumed different types of targets, such as reductions below a baseline, emission intensity improvements, etc. This complicates reporting and accounting under Article 6 compared to reporting and accounting under the Kyoto Protocol.

[11] See https://unfccc.int/CGE.

2.4 The Paris Agreement and Its Enhanced Transparency Framework

As mentioned earlier, the "pledge and review" system that was established for the Cancun pledges for 2020 evolved into a "new pledge and review" system that is at the core of the 2015 Paris Agreement. The new system consists of voluntary pledges by countries around the globe through their Nationally Determined Contributions to reduce greenhouse gas emissions and pursue low-carbon and climate-resilient development pathways. After the initial submission of Nationally Determined Contributions in the lead-up to or shortly after COP 21 in Paris, the Nationally Determined Contributions are to be submitted periodically every five years in line with requirements from the Katowice Rulebook. To assess whether countries are living up to the promises, transparency in the form of reporting and review of information on progress made was deemed critical.

The Enhanced Transparency Framework for action and support introduced in Article 13 of the Paris Agreement is applicable to all countries, developed and developing. It takes into account different capacities by countries and collective experiences by providing flexibility to those countries that need it in view of their national circumstances. The Enhanced Transparency Framework is underpinned by common modalities, procedures and guidelines (which were adopted in Katowice and are collectively known as the Katowice Rulebook). These modalities, procedures and guidelines provide common requirements and are not "differentiated" between developing and developed countries, except for the requirements in relation to support for implementation of the Paris Agreement[12].

The Paris Agreement establishes mandatory requirements for Parties to report regularly on greenhouse gas inventories and to provide information to track progress on implementing and achieving the Nationally Determined Contributions. Information on both mitigation and support is subject to technical expert review, while information on adaptation is not[13] (Winkler, Mantlana and Letete 2017). Countries that choose to participate in voluntary co-operation in the implementation of their Nationally Determined Contributions under Article 6 to allow for higher ambition of mitigation and adaptation actions are required to report further information in relation to their Internationally Transferred Mitigation Outcomes (ITMOs) that is subject to technical review (OECD 2021).

Building on the experiences from the Cancun MRV framework, the Enhanced Transparency Framework under the Paris Agreement consists of three building blocks – namely, reporting, technical expert review and peer review – called the Facilitative Multilateral Consideration of Progress (FMCP) (see Figure 2.2). Importantly, in contrast to the Cancun MRV framework, the Enhanced Transparency Framework has moved away from the dual-track approach and is now applicable to all countries.

A key issue for reaching agreement on the Enhanced Transparency Framework was the recognition of the different capacities of countries and their collective experiences, as well as providing flexibility that is reflected in the modalities, procedures and guidelines to those countries that need it in view of their national circumstances. The modalities, procedures and guidelines specify instances regarding mandatory requirements for reporting where developing countries can use discretion and exercise flexibility, if they need it. There was also a recognition of the support that developing countries need in order to put in place the institutional arrangements and build human capacity to fulfil rigorous requirements of the Enhanced Transparency Framework and its modalities, procedures and guidelines. This resulted in the Global Environment Facility's Capacity-building Initiative for Transparency (CBIT) programme mentioned above.

The Enhanced Transparency Framework will provide information about emission sources and trends and allow tracking progress towards climate change-related targets and steer mitigation actions so that the targets can be achieved. The design of the Enhanced Transparency Framework allows it to perform four main functions: 1) to understand the contribution of each Party towards the collective temperature goal of the Paris Agreement; 2) to provide an opportunity for the sharing of experiences and for mutual learning; 3) to create peer pressure among Parties to facilitate the improvement of their performance; and 4) to enable the public to engage in decision-making that will contribute to the implementation and achievement of Nationally Determined Contributions (Gao and Voigt 2020).

Central to the Enhanced Transparency Framework is mandatory submission by Parties of a Biennial Transparency Report that triggers the other elements of the Framework. The Biennial Transparency Report comprises information on: 1) national greenhouse gas inventory, 2) tracking progress towards implementation of the Nationally Determined Contribution, 3) climate change impacts and adaptation, 4) support provided and mobilized by developed countries and 5) support needed and received by developing countries.

The national greenhouse gas inventory submission consists of two parts: a National Inventory Report and the Common Reporting Tables that are to be submitted using electronic formats. The National Inventory Report may be submitted as a standalone document or as part of the Biennial Transparency Report. To maintain the rigor of reporting under the UNFCCC, developed countries will continue to submit greenhouse gas inventories annually. For the same reason, all countries will continue to submit periodically their National Communications.

Specific requirements apply to the first Biennial Transparency Report that contains information on the end year or end of the period of its Nationally Determined Contribution under Article 4. Countries must provide an assessment of whether

[12] See decision 18/CMP.1 that was adopted in Katowice in 2018 during CMA1.
[13] CMA4 adopted a decision for voluntary review of information on adaptation that is reported in the Biennial Transparency Reports under the Paris Agreement.

they have achieved the target(s) of their Nationally Determined Contributions together with the most recent information for each of the indicators relevant to tracking progress towards the implementation and achievement of the Nationally Determined Contributions, as selected by each country.

Reporting and review under Article 13 of the Paris Agreement is closely linked to reporting and review of the use of cooperative approaches under Article 6. The high-level overview of the linkages between the Enhanced Transparency Framework and Article 6 was provided as part of the Katowice Rulebook on the Enhanced Transparency Framework in 2018.[14] Further details of these linkages are provided in the package of decisions on Article 6 that were adopted at COP 26 in Glasgow in 2021.[15]

Countries that engage on a voluntary basis in Article 6 co-operative efforts must submit initial reports, regular information on Article 6 as an annex to the Biennial Transparency Report on Internationally Transferred Mitigation Outcomes (ITMOs) transfers and corresponding adjustments to the greenhouse gas inventories and annual information on ITMOs for recording in the Article 6 registry. The timing of submission of the Biennial Transparency Report, National Inventory Report, and Article 6 reports and information, and links to the electronic systems, are shown in Figure 2.3. For greenhouse gas emission inventory, these electronic systems include the Common Reporting Tables reporter and related database. For Article 6, these electronic systems include national and international registries, the Article 6 database and the Centralized Accounting and Reporting Platform (CARP).

Figure 2.2 Overview of reporting, technical review and facilitative multilateral consideration of progress under Article 13

Article 13 of the Paris Agreement: transparency of action and support

Reporting

All Parties (shall)
- National greenhouse gas (GHG) inventory report (Article 13.7(a))
- Progress made in implementing and achieving nationally determined contribution (NDC) (Article 13.7(b))

All Parties (should, as appropriate)
- Climate change impacts and adaptation (Article 13.8)

+

Developed country Parties (shall) and other Parties that provided support (should)
- Financial, technology transfer and capacity-building support provided to developing country Parties under Article 9, 10 and 11 (Article 13.9)

Developing country Parties (should)
- Financial, technology transfer and capacity-building support needed and received under Articles 9, 10 and 11 (Article 13.10)

Technical expert review

All Parties (shall)
- Undergo technical expert review of information submitted under Articles 13.7 and 13.9 (Article 13.11)

Technical review for all Parties (shall)
- Identify areas of improvement for the Party, Consistency of the information with the modalities, procedures and guidelines referred to in paragraph 13 of this Article (Article 13.12)

+

Developing country Parties (shall)
- Also avail assistance in identifying capacity-building needs (Article 13.11)

Multilateral facilitative consideration

All Parties (shall)
- Multilateral facilitative consideration of progress with respect to efforts under Article 9, and its respective implementation and achievement of its NDCs (Article 13.11)

Source: UNFCCC 2023

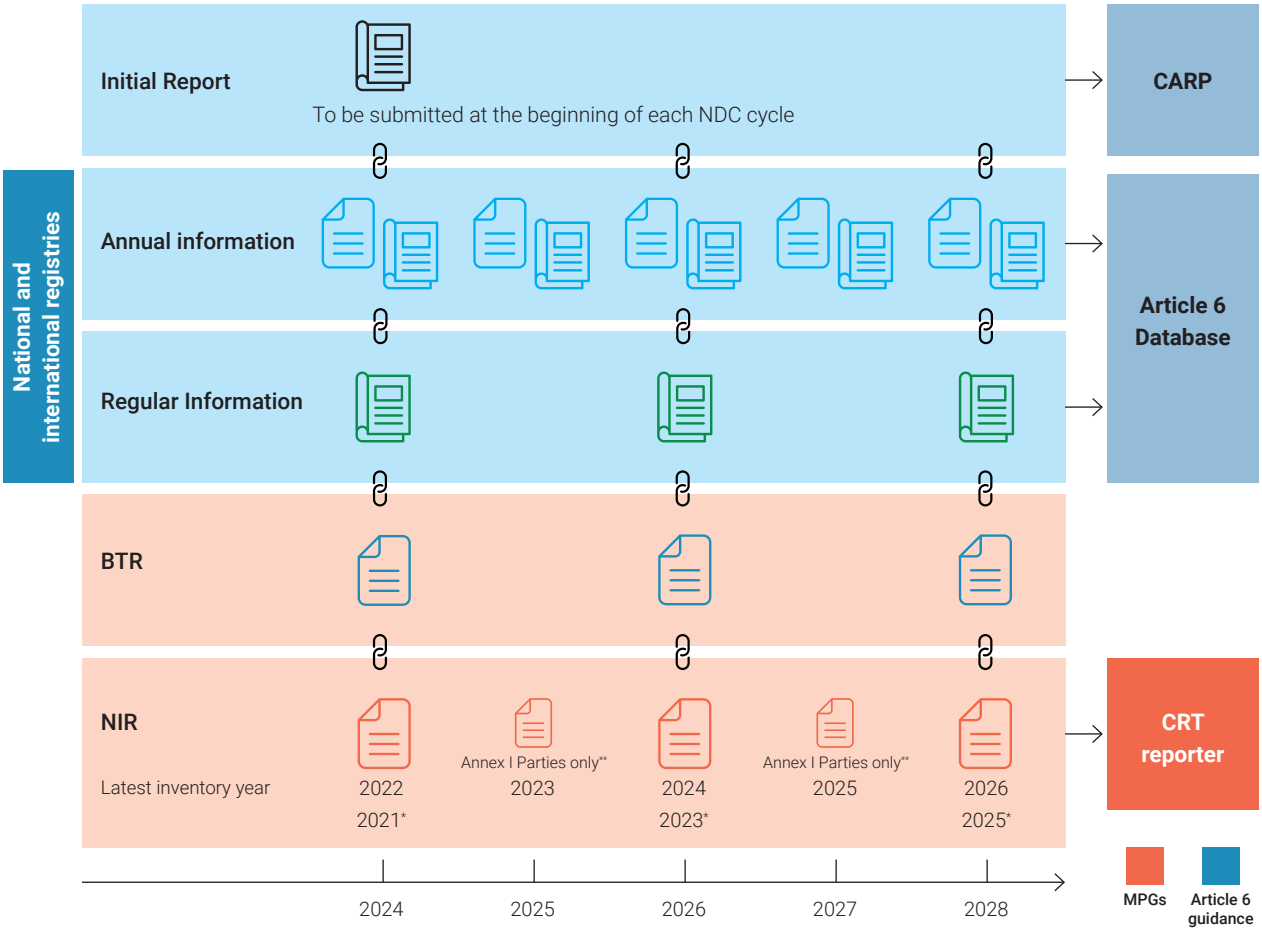
[14] See in particular para 77(d) of decision 18/CMA.1, https://unfccc.int/sites/default/files/resource/CMA2018_03a02E.pdf.
[15] See decisions 2/CMA.2, 3/CMA.2 and 4/CMA.2, https://unfccc.int/documents/460950.

Initial Article 6 reports must be submitted no later than a country engages in a cooperative approach under Article 6 and authorizes relevant Internationally Transferred Mitigation Outcomes (ITMOs), or in conjunction with the next Biennial Transparency Report due pursuant to decision 18/CMA.1 for the period of implementation of the Nationally Determined Contribution. The main purpose of the initial report is to demonstrate that the submitting country meets the requirements (called "responsibilities") for participation in Article 6; to communicate metrics and methods for adjustment of inventory for the use and transfer of ITMOs; to quantify its mitigation information in the Nationally Determined Contribution in tons of carbon dioxide equivalent, or to quantify the Nationally Determined Contribution, or the portion thereof in the relevant non-greenhouse gas indicator, in a non-greenhouse gas metric determined by each participating Party; and to describe each co-operative approach.

The annual information under Article 6, which is submitted electronically and recorded in an Article 6 database, comprises data on the transfer and use of ITMOs with regards to Nationally Determined Contributions and other mitigation outcomes, principally the International Maritime Organization and the International Civil Aviation Authority. In addition, the annual information that needs to be reported biennially in conjunction with the Biennial Transparency Report includes information necessary for accounting for the use of Article 6 approaches. This comprises: annual greenhouse gas emissions covered by the Nationally Determined Contributions; annual quantity of the ITMOs that are transferred and used, and net annual ITMO quantity; corresponding adjustments to the greenhouse gas inventory; and annual level of the relevant non-greenhouse gas indicator in case such indicator is being used by the Party to track progress towards the implementation and achievement of its Nationally Determined Contribution.

The regular information under Article 6, which is submitted biennially as an annex to the Biennial Transparency Report, includes updates of the information provided in the initial report, annual information on the use and transfer of ITMOs, and annual information on corresponding adjustments to the greenhouse gas inventory and how corresponding adjustments ensure that the double counting is avoided. It also includes, for each cooperative approach, information on how it contributes to the mitigation of greenhouse gases and the implementation of the Nationally Determined Contributions, how it ensures environmental integrity, and that there is no net increase in global emissions within and between implementation periods of the Nationally Determined Contributions.

Figure 2.3 Steps in the Article 13 and Article 6 reporting

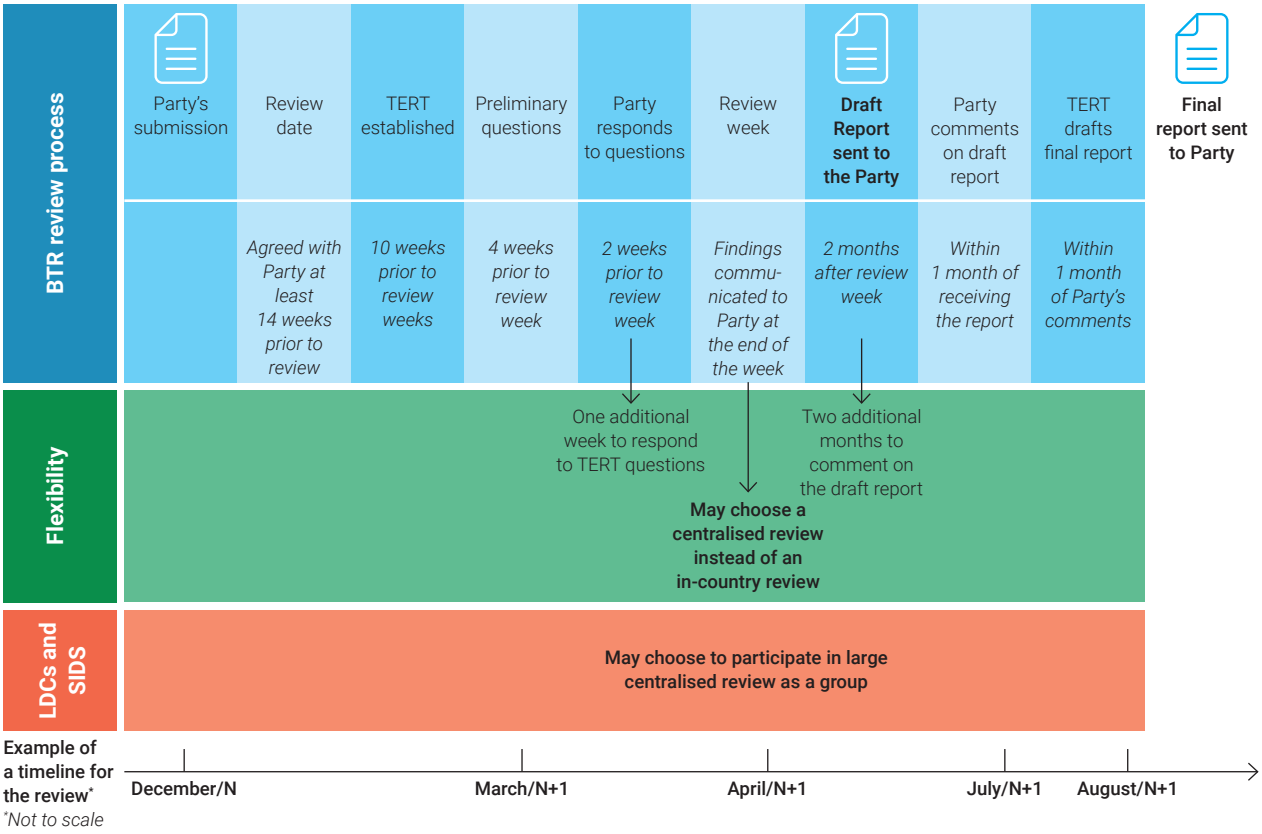


Source: OECD 2021

Note: * if flexibility is applied by those developing countries that need it in the light of their capacity; ** Parties in Annex I to the Convention.

Once submitted, the Biennial Transparency Reports will be subject to a technical review by an expert review team with a view to consider the Party implementation and achievement of its Nationally Determined Contributions and support provided. The scope of the review is similar to that of the Biennial Reports / Biennial Update Reports under the Cancun Framework, except for information related to climate change impacts and adaptation that is not subject to review unless a Party opts for a voluntary review. Review findings will be reflected in a report that is to be prepared under the collective responsibility of the expert review team. Similar to the Cancun MRV framework, the review process under the expert review team has as one of its objectives to assist developing country Parties that need it in view of their capacity, to identify its capacity-building needs. Steps and timeline of technical review of reported Article 6 information are consistent with those for the review of Article 13 information.

Figure 2.4 Steps in the Article 13 review process and application of flexibility



Source: UNFCCC 2023

Note: The first three rows of the chart illustrate the provisions of Article 13 modalities, procedures and guidelines. The line on the bottom of the chart provides an example of a minimal duration of Article 13 review process of 8 months. Following the existing practices, the reviews are expected to be staggered and the maximum duration in accordance with the Article 13 modalities, procedures and guidelines will be 12 months.

Developing countries may use built-in options for review flexibility, depending on their capacity:

- A country may request to undergo a centralized instead of an in-country review in instances where such in-country review would otherwise be mandatory; this could, for example, be requested for the review of the first Biennial Transparency Report. Developing countries are, however, encouraged to undergo an in-country review as it provides a possibility for more interaction with the review team and building capacity for future engagement under the Enhanced Transparency Framework.

- A country may choose to use more time for some of the steps in the review process, for example when responding to the comments by the review team or when reviewing the draft revie reports (see Figure 2.3).

The Facilitative Multilateral Consideration of Progress (FMCP) is the third and last element of the Enhanced Transparency Framework. The FMCP covers Parties' implementation and achievement of Nationally Determined Contributions and efforts under Article 9 of the Agreement and will use as inputs information in the Biennial Transparency Report and National Inventory Report, submitted by each Party (except the adaptation-related information), and any additional information that was deemed essential by the Party for the purpose of FMCP. The FMCP is a premier forum to allow Parties to engage in discussion on the progress in implementation and achievement of their Nationally Determined Contributions and create peer pressure in order to facilitate the improvement of their performance in terms of progress and achievement of Nationally Determined Contributions.

2.5 The Enhanced Transparency Framework as Key Part of Accountability and Ambition Under the Paris Agreement

The Enhanced Transparency Framework is designed to operate together with two other key mechanisms of the architecture of the Paris Agreement: the Global Stocktake under Article 14, and the Mechanism to Enhance Implementation and Promote Compliance (ICM) under Article 15. The Enhanced Transparency Framework, Global Stocktake and ICM are interrelated and mutually reinforcing, and enable the accountability and ambition of the Paris Agreement (see Figure 2.5).

The Enhanced Transparency Framework, Global Stocktake and ICM with their different purposes and formats collectively form the review mechanism under the Paris Agreement, and each covers specific aspects of the implementation of the Agreement. The Enhanced Transparency Framework covers review of progress in implementation and achievement by the individual countries of their Nationally Determined Contributions, as reported in the Biennial Transparency Reports. The Global Stocktake covers review of the collective ambition and implementation of the Nationally Determined Contributions and global progress made towards achieving the Paris Agreement's goals. The ICM covers review of countries' compliance with the procedural provisions of the Paris Agreement, such as whether a country submits its Nationally Determined Contributions and relevant Biennial Transparency Reports on time (Raiser et al. 2022).

The input from the Enhanced Transparency Framework, in terms of tracking progress and the achievements of the Nationally Determined Contributions of individual countries, feeds into the Global Stocktake. Thus, it is critical that such inputs be aggregated to enable assessment under the Global Stocktake of the collective progress in the implementation and achievements of the shared global goals of the Paris Agreement. Such inputs from the Enhanced Transparency Framework are also critical for other Global Stocktake functions, to put pressure on countries to live up to their promises and increasing ambition over time until the global goals are met. The role of non-state actors and their engagement in the national reporting and the Global Stocktake is generally recognized, but the specific modalities to facilitate this integration remain unclear. The topic is addressed further in the next chapter and in the conclusions and recommendations.

With regard to the ICM, inputs from the Enhanced Transparency Framework in terms of countries' submissions, and reports and documents resulting from the reviews under the Framework may trigger consideration by the ICM with the consent of the country concerned. Lack of submission of information under Article 13 and Article 9, paragraphs 5 and 9, may also trigger such consideration. Then, such ICM consideration may include "significant and persistent inconsistencies of the information submitted by a Party pursuant to Article 13, paragraphs 7 and 9." [16]

Conversely, outputs and outcomes from the Global Stocktake and ICM have the potential to influence the Enhanced Transparency Framework and how it operates. For example, the Global Stocktake may identify gaps with completeness and quality of the reported information under Article 13 that prevent outputs from the Enhanced Transparency Framework to be aggregated. The ICM can focus in its annual or special reports on significant and persistent inconsistencies of the information submitted by a number of Parties with regard to Article 13, paragraphs 7 and 9, or issues of a systemic nature with respect to the implementation of and compliance with the provisions of the Paris Agreement faced by a number of Parties. It can then offer guidance and advice through the CMA on such issues, including issues with regard to operations of the Enhanced Transparency Framework. Therefore, outputs and outcomes from the Global Stocktake and the ICM can contribute to strengthening of the Enhanced Transparency Framework[17] over time.

[16] See para 22 of decision 19/CMA.1, https://unfccc.int/documents/193408.

[17] In accordance with decision 19/CMA.1, "In addressing systemic issues, the Committee shall not address matters that relate to the implementation of and compliance with the provisions of the Paris Agreement by an individual Party"; see https://unfccc.int/sites/default/files/resource/CMA2018_03a02E.pdf.

Figure 2.5 Linkages among the three main mechanisms and processes under the Paris Agreement: the Enhanced Transparency Framework under Article 13, the Global Stocktake under Article 14 and the Mechanism to Enhance Implementation and Promote Compliance under Article 15

ETF / Article 13

Inputs/reporting:	National greenhouse gas inventory, Information necessary to track progress, Information on climate change impacts and adaptation, Information on support needed and received
Action/Review:	Conduct technical expert review and facilitative multilateral consideration of progress
Outputs:	Technical expert review reports, Summary Notes, Improvement plans

Global Stock Take / Article 14

Inputs:	Information from the Enhanced Transparency Framework; Information by developed country Parties and Agreement bodies on efforts related to climate finance; Information on efforts related to support on technology development and transfer; Other information and reports, such as the IPCC reports
Action/Review:	Take stock of the implementation of the Paris Agreement; Assess the collective progress towards achieving the purpose of the Agreement and its long-term goal; Review the overall progress made towards the global goal on adaptation; Recognise the adaptation effort of developing countries; Review the adequacy and effectiveness of adaptation and support for adaptation
Outcomes:	Inform successful NDCs; Update and enhance action and support for mitigation and adaptation; Enhance international co-operation on climate action.

Implementation and compliance mechanism / Article 15

Inputs:	Sources of information from processes, bodies, arrangements and forums of the Paris Agreement, including submissions or lack thereof under Articles 4, 9 and 13, and significant and persistent inconsistency in submissions under Article 13.
Action/measures:	Consider issues related to a Party's implementation of or compliance with the provisions of the Paris Agreement; engage in dialogue with, assists and make recommendations to a Party, including request to develop and action plan; issues findings of facts.
Outputs:	Annual reports; Special reports on systematic issues

Article 6

Output:	For Parties participating in Article 6 which use internationally transferred mitigation outcomes towards an NDC under Article 4 or authorise the use of such outcomes for other purposes: The annual level of GHG emissions covered by the NDC; An emissions balance with GHG emissions covered by its NDC being adjusted to reflect transactions of the internationally transferred mitigation outcomes; Information on how each cooperative approach promotes sustainable development and ensures environmental integrity and transparency, and applies robust accounting.

2.6 Challenges and Opportunities for Effective Implementation of the Enhanced Transparency Framework

This section first describes how the transparency efforts have evolved and then discusses some of the challenges and opportunities on the way to fully operationalizing the Enhanced Transparency Framework.

This includes challenges in the scaling of operation, moving from the existing Cancun framework to the Enhanced Transparency Framework that covers mandatory participation of around 200 Parties.

There also are some methodological challenges relating to tracking progress and achievement of Nationally Determined Contributions, reflecting the diversity among countries' pledges (with different target types and base years, etc.) and the absence of common and agreed indicators for tracking progress. The challenges also include capacity constraints in developing countries to meet the requirements of the Enhanced Transparency Framework with the delivery of reports of reasonable quality, with the understanding that it might be difficult to ensure such quality from the outset and that quality is to be enhanced over time.

A separate challenge, related to the scale of operation of the Enhanced Transparency Framework, is the likely lack of resources and staff expertise for the required review processes. Experience from other multilateral agreements shows that periodic reviews require extensive staff and financial resources. For example, the International Monetary Fund has been acknowledged for its considerable use of staff resources for review, while treaty bodies like the International Labour Organization and the World Trade Organization are criticised as being under-resourced and thus unable to keep up with the arduous task of reviewing all the states in their remit. Research has indicated that resource constraints in carrying out a complex and arduous review process are likely to become a major deficiency of the Paris Agreement (Raiser et al. 2020).

Review outputs are frequently criticized as being too broad and lacking actionable recommendations for countries. In the case of the treaty bodies, the lack of political expertise of the staff engaged in the reviews is identified as contributing to vague recommendations. In the World Trade Organization, the tight schedules and limited capacity to review all countries lead to short individual reviews, restricting the possible depth of the interaction between the country under review and the review bodies. This reinforces the importance of sufficient resources and staff expertise (Killian et al. 2022).

Under the UNFCCC, in the last two decades, there has been substantial growth in the number of reports submitted by countries and in the number of reviews or technical analysis reports prepared by teams of international technical experts that were nominated by their respective governments under the overall coordination of the UNFCCC Secretariat. The scale of operations associated with the Enhanced Transparency Framework is expected to be much larger than for the Cancun MRV framework and will require substantially more human and financial resources than are currently available. The UNFCCC Secretariat estimates that it may need to coordinate reviews of 136 to 185 countries following the first submission of the Biennial Transparency Reports under the Enhanced Transparency Framework, requiring participation from around 1,500 experts (UNFCCC 2022a).

One proposal for dealing with the resource constraints related to transparency, which was discussed in the lead-up to COP 16 in Cancun, was to outsource the technical reviews to private consultancies and follow a private business model. However, the assessment at that time was that such "commercialization" of reviews may not necessarily be a less-expensive option. More importantly, there was concern that it would eliminate one of the key functions of the review process, namely the interaction during the review between the government representatives and review experts that contributes to mutual learning and capacity building. Also, it will eliminate the possibility for the review experts to bring the review experiences back home, helping to enhance both their domestic climate change policymaking and collective capacity, knowledge and understanding of emissions, and policies and actions on mitigation and adaptation.

As this avenue was deemed unrealistic, there is a need to advance the collective understanding that the benefits from implementing the Enhanced Transparency Framework (in terms of advancing climate policies and contributing to effective implementation of the Paris Agreement) outweigh by far the cost of operating this Framework. Thus, there is a need to ensure that adequate financial resources are allocated for this purpose.

Some efficiency gains could be achieved by learning from the recent experience during the COVID-19 pandemic. During the pandemic, desk reviews – in which experts worked from their home offices and connected via video conferences – became the most widely used form of technical reviews. The experience suggests that such desk reviews could be more widely used, and new digital technologies may also facilitate both data collection and review, as discussed in chapter 6. While such reviews could significantly lower the total cost, they cannot fully replace the in-country in-depth reviews, which offer much more opportunities for interaction with officials from the country under review and help to build national capacity for the Enhanced Transparency Framework.

The identification of the indicators for tracking Nationally Determined Contributions is also at each Party's discretion. This means an absence of common and agreed indicators for tracking progress across countries, as well as difficulties in aggregating results from the reports from countries for the purposes of assessing the collective progress under the Global Stocktake. In the longer term, this challenge can be addressed based on the provisions of the Paris Agreement that encourage developing countries to move over time towards economy-wide emission reduction targets.

For robust implementation of the Enhanced Transparency Framework, an ongoing challenge is the provision of support for enhancing the capacity and ability of developing countries to put in place national inventory arrangements as well as institutional arrangements to track progress made in implementing and achieving the Nationally Determined Contributions (under Article 4, including those used for tracking Internationally Transferred Mitigation Outcomes (ITMOs) under Article 6, if applicable). A related issue is how to facilitate improved data quality, reporting, and transparency over time, while respecting flexibility in implementing the Enhanced Transparency Framework that is accorded to those developing country Parties that need it in the light of their capacities.

To try to ensure that countries can provide all information required by the Enhanced Transparency Framework, support will be provided to building the significant reporting capacities required in developing and least-developed countries. Even if such support has been provided for the earlier monitoring, reporting and verification efforts, the focus has been on supporting each specific report. Meanwhile, the Paris Agreement's enhanced information requirements require building the institutional capacity for both ongoing reporting and support to national policymaking.

The Paris Agreement review mechanisms explicitly refer to the need to consider national capacities, and the Agreement established the Capacity-building Initiative for Transparency (CBIT) to support this effort (UNFCCC 2015, p. 12). The extent to which the CBIT will be able to meet the needs of developing countries remains to be seen, as existing literature has been somewhat critical of past capacity-building initiatives. This literature suggests that shortfalls in capacity-building in the past can be largely attributed to their short-term, ad hoc, supply-driven and project-based nature. It also suggests that capacity-building needs identified by developing countries in their Nationally Determined Contributions fall short of learning from previous efforts, including that capacity-building must be process - rather than product-driven and reflect national priorities in order to ensure country ownership.

The CBIT was designed to address at least some of these shortfalls, in particular the supply-driven nature of the support provided, as it allows countries to tailor the support provided to their actual needs. In November 2022, slightly more than two years before the deadline for the submission of the first Biennial Transparency Report under the Paris Agreement, the CBIT portfolio comprised 88 projects from developing countries that were at different stage of implementation. Encouragingly, 74 of the projects have been approved or endorsed and have begun implementation.

According to the 2022 progress report of the Global Environment Facility, the CBIT portfolio is maturing as a majority of projects have completed the design and approval phase and have transitioned to the implementation phase (Global Environment Facility [GEF] 2022a; GEF 2022b).

Other multilateral or bilateral initiatives have been launched to complement the CBIT effort, such as the ICAT, which unifies efforts by governments and philanthropic organizations towards capacity-building for transformative climate action and transparency.[18] ICAT is also the only initiative so far that specifically supports countries to build monitoring, reporting and verification for their non-state actors and to help them integrate subnational and non-state actions into Nationally Determined Contributions.

There is, however, a high risk that many developing countries that are not engaged in the CBIT or similar initiatives may not be able to meet the mandatory 2024 deadline for the submission of their first Biennial Transparency Report. To address this problem, the Global Environment Facility has been requested to provide dedicated funding for Biennial Transparency Report preparation and has developed a funding structure that reflects the fact that countries are at different stages of finalizing their outstanding National Communications and Biennial Update Reports. This addition of a "product-related" funding window seems to reflect that the institution-building effort through the CBIT simply takes time and the delivery of the Biennial Transparency Report is only two years away.

Another challenge linked to the focus of the upcoming reports is the fact that while the Paris Agreement provides a strong framework for tracking and reviewing climate action by countries, it offers few incentives for states to significantly change their behaviour. It also lacks the requirement for direct participation of non-state actors in both the reporting and the review processes, potentially inhibiting the extent to which non-state actors could mobilize domestic pressure.

It can be argued that the challenges discussed above merely reflect the political context and constraints that gave rise to the Paris Agreement. However, it will be absolutely essential for the success of the Agreement that solutions be found for these challenges related to the Enhanced Transparency Framework, with a view to maintaining the underlying credibility of the Paris Agreement during the full implementation in the future.

With the finalization of the technical aspects of the Enhanced Transparency Framework at COP 26 in Glasgow in 2021 and the submission of new and updated Nationally Determined Contributions in 2020 and 2021, the attention of governments is now shifting away from evidence-based policy development, in the transition from designing their Nationally Determined Contributions to implementing them. In such transition, data and robust frameworks are essential for tracking the progress that is envisaged in the Enhanced Transparency Framework; for evaluating policy effectiveness that can underpi the strengthening of policies and action and increasing ambition of targets in the subsequent Nationally Determined Contribution submissions; and, importantly, for mobilizing finance and engaging stakeholders to ensure on-the-ground results.

[18] See https://climateactiontransparency.org.

2.7 Transparency and Ambition

Countries that have actively engaged in the reporting and review processes under the UNFCCC have generally built their capacities for preparing and reporting their national greenhouse gas inventories and mitigation actions. In this way, they have created a foundation for future, more data-driven national climate policy. Looking ahead towards full implementation of the Paris Agreement, the built-in rationale is that displaying information on efforts towards mitigation, adaptation and provision of support by each country under the Enhanced Transparency Framework will help stimulate countries to increase the ambition of their Nationally Determined Contributions – either simply by having a better understanding of the possibilities and impacts or through peer pressure from other countries.

Studies indicate that greater clarity on a country's performance – through greenhouse gas emissions monitoring and reporting and progress towards climate targets – could directly incentivise a country to do more (Weikmans, van Asselt and Roberts 2020). However, research on past experiences points to significant challenges with regard to transparency as an enabler of ambition. Firstly, heterogeneous and qualitative information on Nationally Determined Contributions, lack of agreed indicators, and part of the Nationally Determined Contributions being conditional create obstacles for an effective monitoring of progress. Secondly, there is no mechanism or mandate for Parties to consider within the UNFCCC framework the ambition of individual states (Weikmans, van Asselt and Roberts 2020). Instead, the Katowice Rulebook requires countries to explain how a Party considers that its Nationally Determined Contribution is fair and ambitious in light of its national circumstances, without providing a methodology or indicators on how to do this.

The absence of procedures to assess the adequacy of individual national pledges and actions taken to implement them with regard to the agreed common goals is clearly one of the major deficiencies of the Paris Agreement, reflecting the political compromises required to reach the agreement. The negotiations of the Paris Agreement and its Katowice Rulebook deliberately avoided any kind of mechanisms, procedures or provisions for consideration of ambition of the Nationally Determined Contributions of individual countries with regard to the global temperature goals. Also, while the Global Stocktake looks at the collective ambition, it does not have the mandate to look at the level of ambition of individual countries. It is up to the national governments to translate outcomes from the assessment of the collective ambition under the Global Stocktake at the national level with a view to inform the preparation of their individual Nationally Determined Contributions.

Yet, opportunities exist to consider enhancing the ambition of Nationally Determined Contributions of individual states within the existing frameworks under the Paris Agreement. In 2022, the ongoing discussions at the technical dialogues under the Global Stocktake suggested that there is a demand by countries to move beyond mere assessment of the collective progress in implementation and to offer solutions to address any gaps. Such solutions could be found, for example, through identification of best practices in climate policies on the basis of what was reported by countries through the Enhanced Transparency Framework or presented at the technical dialogues under the Global Stocktake. The Stocktake is only every 5 years, but the future FMCP process, which will be an on-going multilateral policy dialogue to share best practice offer opportunities for countries discuss and replicate best with a view to inform the preparation of their next Nationally Determined Contributions and to increase ambition.

The information provided to the Global Stocktake through the Enhanced Transparency Framework can provide evidence that, collectively, countries are off track in achieving the temperature goals of the Paris Agreement. This is expected to result in a call for greater ambition by the CMA, keeping in mind the central role of large emitters – developed countries in particular – that are expected to lead in taking action on climate change.

In addition to the formal processes and mechanisms under the Paris Agreement, information that is presented through the Enhanced Transparency Framework is essential for the non-state actors and relevant organizations to prepare an analysis of the ambition level of Nationally Determined Contributions using a consistent set of indicators – for example, the UNEP Emissions Gap Report, the Climate Action Tracker, etc. Results from such analyses help to strengthen the argument that greater ambition is urgently needed to reach the goals of the Paris Agreement and to show areas and sectors where this is possible on a basis of comparative analysis (Milkoreit and Haapala 2019; the annual UNEP 2017; UNEP 2018; UNEP 2022).

The aftermath of COP 27 in Sharm El-Sheik, Egypt in 2022 clearly demonstrated that the pressure remains for countries to enhance the ambition of their Nationally Determined Contributions in view of the urgency for climate action, without necessarily waiting for the next date of submissions in 2025.

2.8 Long-Term Strategies and Net Zero Pledges

Outside the Enhanced Transparency Framework structure, the Paris Agreement in its Article 4 calls on all Parties to formulate and communicate long-term low greenhouse gas emission development strategies (Long-Term Strategies or LTS), taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances. This call was repeated during recent COPs, and both the Glasgow Climate Pact of 2021 and the Sharm-el-Sheikh Implementation Plan of 2022 invite Parties to submit or update their strategies regularly, as appropriate, in line with the best available science. The relevant decisions requested the UNFCCC Secretariat to prepare a synthesis report on Long-Term Strategies to be made available for consideration at relevant subsequent COPs. These decision also notes the importance of aligning Nationally Determined Contributions with Long-Term Strategies and formally introduces the notion that the strategies should aim at just transitions to net zero emissions by or around mid-century.

With this political call, a first step has been taken towards a more integrated view of short- and long-term emission reduction goals. The reflects the statements in the Intergovernmental Panel on Climate Change's Sixth Assessment Report (2023) and the UNEP Emissions Gap Report (2022) that to stay on track with the 1.5-degree Celsius goal in the Paris Agreement, global greenhouse gas emissions need to be reduced by around 45 per cent by 2030 and to reach net zero carbon dioxide emissions by around 2050.

As of November 2022, a total of 57 countries had formally submitted Long-Term Strategies to the UNFCCC. Some of these include net zero targets, even though this is not a formal requirement. Outside the UNFCCC submissions, a total of 93 countries had some form of net zero target, representing just under 80 per cent of global greenhouse gas emissions, as of November 2022. The nature of these targets varies significantly, from public announcements, to policy documents, to being embedded in national law.

How the Long-Term Strategies and net zero targets will be included in the future UNFCCC process remains to be seen. It is not likely that the Enhanced Transparency Framework will in any formal way include these or engage in any kind of formal process beyond the already agreed compilation reports by the Secretariat.

Figure 2.6, as excerpted from the UNEP Emissions Gap Report 2022, illustrates that, with a few exceptions, the G20 countries provide very limited detail in their long-term pledges, and that links to the Nationally Determined Contributions are generally vague, with unclear roadmaps for how to reach the net zero goal. The main reason for discussing Long-Term Strategies and net zero targets here is that these have become a new focus area for many pledges by non-state actors, and a flurry of announcements and convening platforms have emerged over the last couple of years. This is discussed further in the next chapter.

Figure 2.6 The nature and coverage of net zero targets for G20 countries

G20 member	Annex	Fundamentals			Scope and coverage				Carbon removal		Planning, review, reporting		
		Source	Target year	Reference to fairness	Covers all sectors	Covers all gases	Covers int'l shipping and aviation	Excludes int'l offsets	Separate removals targets	Removals transparency	Published plan	Review process	Annual reporting
Argentina	Non-Annex I	announcement	2050	✗	?	?	?	?	✗	✗	✗	?	✗
Australia	Annex I	law	2050	[inconclusive]	✓	✓	?	✗	✗	[inconclusive]	[inconclusive]	✓	✓
Brazil	Non-Annex I	policy	2050	✗	✓	?	?	?	✗	✗	✗	?	✗
Canada	Annex I	law	2050	[inconclusive]	✓	✓	?	?	✗	[inconclusive]	✓	✓	✓
China	Non-Annex I	policy	2060	✓	?	✗	?	?	✗	[inconclusive]	✓	✓	✗
European Union	Annex I	law	2050	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓
France	Annex I	law	2050	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
Germany	Annex I	law	2045	✓	✓	✓	✗	✗	✗	[inconclusive]	[inconclusive]	✓	✓
India	Non-Annex I	policy	2070	✗	?	?	?	?	✗	✗	✗	?	✗
Indonesia	Non-Annex I	policy	2060	✗	✓	?	?	?	✗	[inconclusive]	[inconclusive]	?	✗
Italy	Annex I	policy	2050	✓	?	?	?	✗	✗	✓	✓	[no data]	✓
Japan	Annex I	law	2050	✗	✓	✓	?	?	✗	[inconclusive]	[inconclusive]	✓	✓
Mexico	Non-Annex I	[no net-zero target]											
Russian Federation	Annex I	law	2060	✗	?	?	?	✗	✗	[inconclusive]	[inconclusive]	✓	✗
Saudi Arabia	Non-Annex I	announcement	2060	✗	?	?	?	?	✗	✗	[inconclusive]	✓	✗
South Africa	Non-Annex I	policy	2050	[inconclusive]	✓	✗	?	?	✗	✗	✗	?	✗
Republic of Korea	Non-Annex I	law	2050	✗	✓	✓	?	?	✗	✗	[inconclusive]	?	✓
Türkiye	Annex I	announcement	2053	✗	?	✓	?	?	✗	✗	✗	?	✓
United Kingdom	Annex I	law	2050	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
United States of America	Annex I	policy	2050	✗	✓	✓	✗	✓	✗	✓	✓	✓	✓

Not fulfilled Partially fulfilled Fulfilled No information

Source: UNEP 2022

Sources: All indicators are based on a reconciliation of data from Climate Action Tracker (2022), Climate Watch (2022) and Net Zero Tracker (2022) with the following exceptions: "Covers all sectors" is based on Climate Watch (2022); "Review process" is based on Climate Action Tracker (2022); "Annual reporting" is based on Net Zero Tracker (2022); "Removals transparency" and "Reference to fairness" are based on Climate Action Tracker (2022) and Net Zero Tracker (2022).
Notes: Green checkmarks indicate the criterion is fulfilled; yellow checkmarks indicate the criterion is partially fulfilled or fulfilled to a lower level of robustness; red "X" indicates the criterion is not fulfilled; "?" indicates the member has not provided information on the criterion (where relevant); "[inconclusive]" indicates inconsistency across data sources consulted; "[no data]" indicates the data sources consulted do not track data on the member. See appendix B.5 and the respective trackers for further explanations of indicators and coding criteria.

3 Non-State Actor Pledges and Reporting Systems

3.1 Status on Non-State Actor Reporting Efforts

In contrast to the Convention process, the development of monitoring, reporting and verification for non-state actor pledges and commitments has evolved as a bottom-up undertaking. Here, initiatives initially tended to create their own reporting platform and methodological approaches, whereby the non-state actors used different and diverse methods and approaches for reporting that made them not directly comparable. This problem of fragmentation and heterogeneity is still the prevailing situation. However, as discussed in this chapter, there is an emerging political push from some governments and the United Nations Secretary-General for enhancing the credibility, transparency and accountability of non-state actor initiatives, although there is still a long way to go to realize this ambition.

"Naturally, it is easier to analyse the progress and results of the 193 States who signed the Paris Agreement together than of the countless local and subnational governments that make them up. This balancing act between the global viewpoint of assessing progress and the local origin of actions therefore invites us to turn to aggregation tools: voluntary reporting platforms, to which cities and regions communicate their [greenhouse gas] emission results. The indicators highlight that, despite progress in reporting practices, the aggregate impact of cities and regions on greenhouse gas emissions remains very difficult to quantify, due in particular to the great heterogeneity of inventory methods and practices. Moreover, individual monitoring of emissions at local level still falls short of data and robustness to provide a clear picture of emissions on the territory over time."

(Climate Chance 2021)

More harmonized and transparent reporting by non-state actors would increase the credibility, and it could potentially contribute to stronger peer pressure to raise ambitions of the individual entities. At the same time, a better understanding of the current and potential additional emission reductions from non-state actors could contribute to building confidence among governments that more ambitious Nationally Determined Contributions are possible.

A first step in such a process was taken at COP 26 in 2021 with the launch by United Nations Secretary-General António Guterres of an Expert Group on the Net Zero Emissions Commitments of Non-State Entities. The aim was to develop stronger and clearer guidance for net zero emission pledges by non-state entities – including businesses, investors, cities and regions – and to speed up their implementation. The creation of the Expert Group reflects the strong shift of non-state actor pledges to focus on net zero emissions by mid-century, either substituting or building on earlier, broader decarbonization goals or 2030 targets. It also reflects the desire by the United Nations to push for more transparency, comparability and links with the formal UNFCCC process.

The Expert Group launched its report at COP 27 in Egypt in 2022 with ten broad recommendations (HLEG 2022), some of which go way beyond the focus of this report. However, some are directly relevant and are discussed in the final chapter. The recommended five core principles for non-state actor actions, as listed by the Expert Group, are presented in Figure 2.7.

Figure 2.7 Figure 2.7 UN Secretary-General's Expert Group and its five principles on the Net Zero Emissions Commitments of Non-State Entities

Source: HLEG 2022

3.2 Overview of the Main Non-State Actor Climate Initiatives

To better understand the diverse nature of non-state actor initiatives, this section presents an overview of some of the major engagement and pledge initiatives. It then examines how their engagement, pledges and reporting has evolved around the same broad categories (cities, states and regions, financial institutions and private companies) mentioned by the Secretary-General's Expert Group (HLEG 2022). Since review and verification structures are generally weak, they are not discussed in detail but are noted in the recommendations.

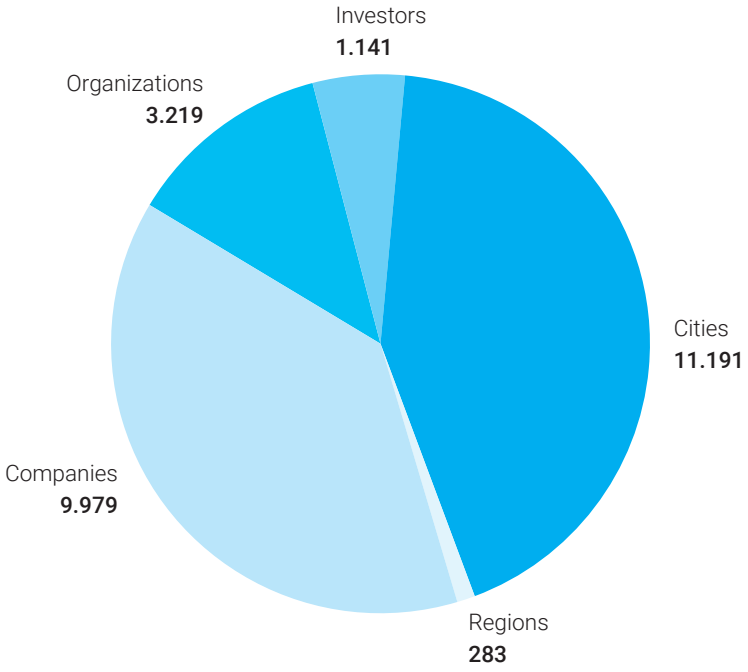
The section also looks at how some of these actors come together in what is broadly termed international cooperative initiatives, where countries and other stakeholders often partner on specific initiatives. The overview does not attempt to be exhaustive, as the landscape is very dynamic and often overlapping. The intent here is to present the major initiatives in the different categories and, where relevant, to describe the gradual combination or aggregation of initiatives.

The best overview of the wide engagement in climate action pledges and initiatives is provided by the UNFCCC Secretariat on the website of the Global Climate Action Portal[19], also known as the Non-State Actor Zone for Climate Action (NAZCA). As of March 2023, the platform had registered more than 30,000 actors in a large number of groupings and over 150 international cooperative initiatives. This was up from around 26,000 actors in March 2022. The distribution by category is shown in Figure 3.1.

[19] See https://climateaction.unfccc.int.

Figure 3.1 Distribution of non-state actors by type on the Global Climate Action Portal

Distribution of non-Party stakeholders by actor type

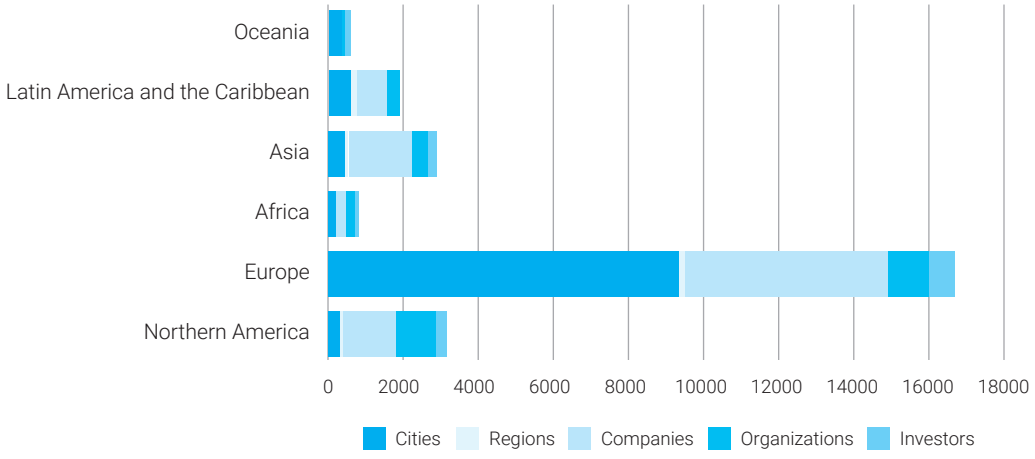


Source: UNFCCC 2022

It is not clear to what extent initiatives and groupings overlap, but it is clear that the interest and willingness to engage in climate action is large. However, the regional distribution is quite uneven, with nearly 80 per cent of all initiatives located or headquartered in the European Union and North America (see Figure 3.2). This likely reflects both different levels of climate change awareness and differences in capacity and capabilities.

Figure 3.2 Regional distribution of non-state actor engagement on the Global Climate Action Portal

Distribution of non-Party stakeholders by world region



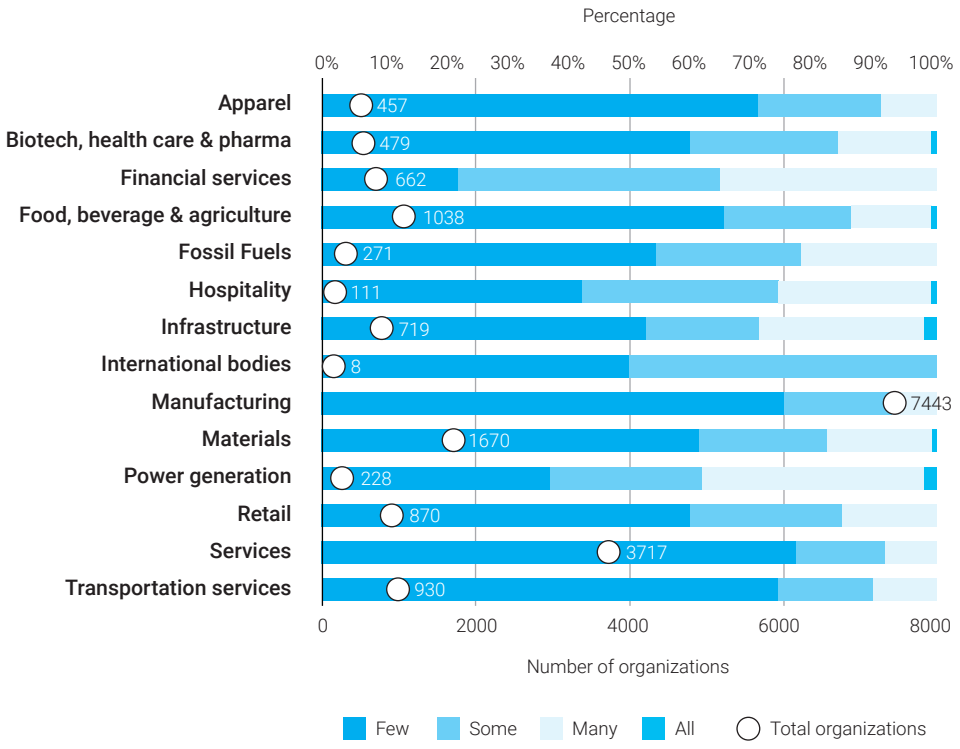
Source: UNFCCC 2022

Pledges and engagement are the first steps, but as data from CDP (the largest global disclosure system) indicate, a wide gap exists between entities announcing ambitious plans to help tackle climate change, and their follow-up with the detailed planning that is required for them to have any chance of meeting these targets. CDP analysed submissions from 18,600 companies; among these, 4,100 companies (22 per cent) disclosed that they had already developed a climate transition plan aligned with the 1.5 degrees Celsius goal; however, only 81 companies (0.4 percent) met the grade of disclosing information for 24 key indicators that CDP has judged as vital for a credible climate plan (CDP 2023). Figure 3.3 shows the distribution by sector and reveals that finance institutions and power companies are delivering on most indicators. Notably, CDP has strengthened is criteria since 2021, when a larger number of companies were seen as credible.

The Corporate Climate Responsibility Monitor 2022 (New-Climate Institute and Carbon Market Watch 2022) presents a similar picture when assessing the implementation of the climate strategies of 25 major global companies, based on publicly available information. The results show that while all 25 companies have made some form of net zero or carbon neutrality pledge, only 3 have clear plans for the necessary reductions, and a few are even on a path to make their goals compatible with the Paris Agreement. However, the average reduction by the assessed companies is only around half of what is required, with around 23 per cent emission reductions for their full value chains.

This suggests that a big gap remains between announced ambitions for carbon neutrality or net zero targets and what has actually been put in place to make these announcements credible. It is also not clear to what extent actions are additional to what would have occurred anyway as a result of new national policies and other actions under countries' Nationally Determined Contributions. This credibility deficit is discussed further in section 3.5.

Figure 3.3 Status of climate transition plan indicators



Source: CDP 2023

3.3 Current Pledge and Disclosure Efforts by Non-State Actors

To better understand the current pledge and reporting structures, the following sections provide brief overviews of some of the main initiatives for the different categories of non-state actors used by the UNFCCC.

Global Initiatives

The landscape of global initiatives is characterized by high heterogeneity and overlap. Initiatives range from pure campaigns to structured partnerships with rules and regulations. Many actors are members of several initiatives, and many of these interlink. As such, it is virtually impossible to present a complete picture, and the aim here is to provide an overview of some of the major initiatives and how they relate to each other.

The international cooperative initiatives that engage non-state and subnational actors and/or national governments collaborate across borders to achieve certain climate goals. The non-state and subnational actors may include cities, regions, businesses, investors and other organizations such as academic institutions and research bodies.

As mentioned, the Global Climate Action Portal has registered more than 150 international cooperative initiatives with nearly 24,000 participants, including efforts in 194 countries. The initiatives range from a few participants to 10,000 in one initiative. Only half of the initiatives report regularly to the Global Climate Action Portal, so it is hard to judge exactly how many are actually operational. The UNEP Copenhagen Climate Centre manages a Climate Initiatives Platform[20] that feeds into the Global Climate Action Portal. This Platform has 286 international cooperative initiatives and provides more detailed analysis of the various initiatives.

Before providing a more detailed description of initiatives in the various categories of actors, two dominant and direction-setting international cooperative initiatives with the largest memberships – Race to Zero and the Science Based Targets initiative – are briefly introduced, as they are often referenced or used by many of the individual non-state actor initiatives discussed later.

Race to Zero

Race to Zero, launched in 2020, is a global campaign to rally leadership and support from businesses, cities, regions and investors for a healthy, resilient, zero-carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive, sustainable growth.

Race to Zero mobilizes a coalition of leading net zero initiatives, representing 1,049 cities, 67 regions, 5,235 businesses, 441 of the biggest investors and 1,039 higher education institutions as of mid-July 2022. These non-state actors join 120 countries in an alliance committed to achieving net zero carbon emissions by 2050 at the latest. Collectively, these actors now cover nearly 25 per cent of global carbon dioxide emissions and more than 50 per cent of gross domestic product.

The political lead of the campaign is the High-Level Climate Champions for Climate Action – currently Mahmoud Mohieldin (Egypt) and Razan Al Mubarak (United Arab Emirates). The objective is to build momentum around the shift to a decarbonized economy. Race to Zero can only be joined by application, and participants must sign off on a set of minimum criteria. Individual entities join as members, and other initiatives and networks join as partners.

Science Based Targets initiative (SBTi)

The SBTi[21] is a partnership between CDP, the United Nations Global Compact, the World Resources Institute and the World Wide Fund for Nature (WWF), with the ambition to show companies and financial institutions how much and how quickly they need to reduce their greenhouse gas emissions to prevent the worst effects of climate change.

The SBTi works to:

- define and promote best practices in emission reductions and net zero targets in line with climate science;
- provide target-setting methods and guidance to companies to set science-based targets in line with the latest climate science;
- include a team of experts to provide companies with independent assessment and validation of targets.

SBTi works directly with many of the other major initiatives, such as CDP, giving them an opportunity to use their guidance.

City Initiatives

Cities are the category with the most actors engaged, as indicated in the UNFCCC list, and cities have increasingly become an important driver for local climate action. Through the various global city organizations, there is a very visible engagement on both the national and the global climate policy scene. The discussion here focuses on six larger global city efforts as well as two smaller initiatives (Climate Alliance and Carbon Neutral Cities Alliance), which are included for illustration of how smaller groups come together on specific joint interest areas. The list here does not aim to be exhaustive.

C40

One of the leading global city networks, C40, is engaging mayors from nearly 100 capitals and major cities around the world to collaborate on climate pledges and action. C40 has a large set of activities and concretely supports a Climate Action Planning programme for cities around the world to create and implement climate action plans in line with the 1.5 degree Celsius goal of the Paris Agreement. As of 2022, 41 cities had published plans, and 169 cities (member and non-members) were involved in the programme. Guidance material on the approach is publicly available and is, for example, used in adapted form in the Danish DK2020 programme, which engages almost all Danish municipalities in climate planning.

[20] See https://climateinitiativesplatform.org/index.php/Welcome.
[21] See https://www.wri.org/initiatives/science-based-targets.

ICLEI

ICLEI–Local Governments for Sustainability is another leading global network of more than 2,500 local and regional governments committed to sustainable urban development. ICLEI is active in more than 125 countries, aiming to influence sustainability policy and drive local action for low-emission development. ICLEI is broadly focused on urban sustainability, with key areas of work being energy, transport and climate. For example, activities include training programmes for city climate planners and numerous other programmes.

United Cities and Local Governments

United Cities and Local Governments is a global network that convenes a large number of local and regional authorities in a global movement to influence the international political community broadly on key development issues, including climate change and broader resilient development. The network members engage in policy, advocacy and peer-to-peer learning among members around the world.

Compact of Mayors

The Compact of Mayors was launched in 2014 to bring together the three initiatives described above around a common set of principles with which participating cities must comply. In 2016, the Compact was formally merged with the European Union's Covenant of Mayors and became the Global Covenant of Mayors for Climate and Energy (described below) to advance the city-level transition to a low-emission and climate-resilient economy, and to demonstrate the global impact of local action.

Global Covenant of Mayors for Climate and Energy (GCoM)

GCoM is the global alliance for city climate leadership, building on the commitment of more than 10,000 cities and local governments. These cities span six continents and 140 countries. GCoM has a number of initiatives, focusing on 1) data and reporting; 2) implementation and finance and 3) joint innovation programmes. GCoM functions like a cooperation framework for the other initiatives, where C40 and ICLEI continue their own programmes, and the EU Covenant of Mayors functions as a regional entity of GCoM.

Cities Race to Zero

The Cities Race to Zero is a subset of the global Race to Zero discussed above and covers cities only. Partners include all the other city initiatives (C40, ICLEI, the Global Covenant of Mayors), which here come together on the long-term net zero target, which was not part of their original mandates. Other institutions that are also engaged in the Cities Race to Zero include CDP, the World Resources Institute and WWF.
The collaboration aims to ensure that cities are aligned on the science-based targets required to achieve a net zero future and provides support to cities signing on to the campaign.

Climate Alliance

The Climate Alliance city network represents a holistic approach to climate action, linking concrete local solutions with global responsibility. It has some 1,700 members spread across more than 25 European countries. The Alliance is more of a membership and advocacy structure that feeds into the Global Covenant of Mayors, at both the global and European Union levels. It has a special feature on supporting indigenous populations, for example in the Amazon region, and linking these with partners in the European Union.

Carbon Neutral Cities Alliance

The Carbon Neutral Cities Alliance is a collaboration of around 25 cities around the world working to achieve carbon neutrality. The Alliance has links with C40, and many member cities are also C40 members. The Alliance is more of a peer learning and influencing network of ambitious cities, and by focusing on carbon neutrality in the next few decades, members go further than the large alliance.

City planning processes

There are different planning process descriptions for each initiative, but the basic steps are the same (see Figure 3.4). Over time, the reporting frameworks have evolved from individual guidance for members towards a gradual convergence taking place both on the organizational side and subsequently on the methodological side and on associated registries.

Figure 3.4 Illustration of the city climate planning and implementation process

Source: Global Covenant of Mayors, "Journey"

For example, the Global Covenant of Mayors has created a Data Portal for Cities and a Common Reporting Framework[22] that allows signatory cities to quantify and compare their data with others. Reporting is done through one of the two officially recognized reporting platforms: the CDP and ICLEI's unified reporting system[23] or the SECAP reporting platform by the EU Covenant.[24] ICLEI originally had its own Carbonn registry, but since 2019 it has joined forces with CDP to provide a joint CDP reporting platform for cities[25]. The information provided by these portals complements similar inventory calculation and reporting platforms such as the ICLEI ClearPath and C40 CIRIS. With increasing interest and competition among cities, emerging private companies are also offering support and data management platforms.

One major example of the various initiatives coming together to harmonize approaches is the Global Protocol for Community-Scale Greenhouse Gas Inventories[26] produced jointly by the World Resources Institute, C40 and ICLEI and last updated in 2021 (WRI 2021). It is used as inventory guidance by all the mentioned city initiatives and builds on the WRI Greenhouse Gas (GHG) Protocol, discussed in more detail in section 3.4.

When looking at the number of cities actually reporting (such as to CDP), there is clearly still a long way to go before all of the member cities of these initiatives show reliable engagement. In 2021, a total of 1,224 cities had submitted reports to CDP, but only a little over half of these had full inventories, and only a quarter had submitted mitigation targets and plans that are compatible with the Paris Agreement. This does not mean that other cities are not actively engaged, but part of the credibility is embedded in the transparency process.

Analytical approaches and the various protocols, guidelines and tools that have been developed to support non-state actor accounting and reporting are discussed in more detail in section 3.4.

Regional Initiatives

The roles of states and regional governments differ greatly among countries, but in many cases states and regional governments form an important part of the national governance structure, with responsibilities relevant for climate action. Often states and regional governments come together as groups at the country level, but so far there are few global initiatives for these groups. This may be because in most states and regions, the larger cities often become the dominant entity.

Under2Coalition

The Under2Coalition has 270 governments as members committed to keeping global temperature rise well below 2 degrees Celsius, with efforts to stay below 1.5 degrees Celsius. More than 40 of these states and regions have committed to reaching net zero emissions by 2050 or earlier. The Coalition secretariat provides support to members on climate planning and action steps similar to those illustrated above for cities. Reporting is mainly done to CDP, and as of 2021 a total of 96 states and regional governments had disclosed their climate data to CDP.

Regions4

Regions4 is an advocacy network of regional governments (states, regions and provinces) focused on providing members with a collective voice within United Nations negotiations, European Union initiatives and global discussions in the fields of climate change, biodiversity and sustainable development. It currently represents 41 regional governments from 21 countries in 4 continents. There are no reporting requirements associated with the network.

Finance Sector Initiatives

Many parts of the finance sector have come together in alliances, reflecting different types of institutions such as banks, asset owners, investors and insurance. Some of the main initiatives are presented below. While several other smaller national, regional and global initiatives are engaging the finance sector, the ones listed below are the dominant ones and often include smaller initiatives as members.

Glasgow Financial Alliance for Net Zero (GFANZ)

Building on the already described global Race to Zero initiative led by the Climate Champions, a new sector-wide coalition, the Glasgow Financial Alliance for Net Zero (GFANZ), was launched at COP 26 with the aim to broaden, deepen and raise the net zero ambitions across the financial system. The Alliance is mainly focusing on raising commitments and engaging members, with a requirement to develop credible roadmaps for a net zero transition. It is bringing together the alliances already established by different groups of financial actors, as discussed below.

Net-Zero Banking Alliance (NZBA)

The Net-Zero Banking Alliance is industry led and is convened by the United Nations Environment Programme's Finance Initiative. It brings together banks from a broad set of countries that have signed a formal commitment statement to align their lending and investment portfolios with net zero emissions by 2050. Combining near-term action with accountability, this ambitious commitment sees banks setting an intermediate target for 2030 or sooner, using robust, science-based guidelines.

The NZBA was launched in April 2021 and after one year had more than 100 banks as members. It works to reinforce, accelerate and support the implementation of members' decarbonization strategies and has published a set of Guidelines for Climate Target Setting for Banks.

In addition to its links to the GFANZ, the NZBA constitutes the climate part of the wider UNEP initiative on Principles for Responsible Banking, which focuses on engaging banks in a

[22] See https://www.globalcovenantofmayors.org/our-initiatives/data4cities/common-global-reporting-framework.
[23] See https://www.cdp.net/en/articles/cities/cdp-and-iclei-introducing-streamlined-climate-reporting.
[24] See https://eumayors.eu/support/reporting.html.
[25] See https://www.cdp.net/en/cities.
[26] See https://www.wri.org/research/global-protocol-community-scale-greenhouse-gas-emission-inventories.

commitment to the wider Sustainable Development Goals. As of 2022, the initiative had around 129 signatories from 41 countries representing almost half of global banking assets.

Net-Zero Asset Owner Alliance (NZAOA)
The Net-Zero Asset Owner Alliance, launched in September 2019, is organized in a similar manner as the NZBA, with the UNEP Finance Initiative as the convener and secretariat. Members sign up to a common commitment statement, including transitioning investment portfolios to net zero greenhouse gas emissions by 2050, and regularly report on progress, including establishing intermediate targets every five years in line with Article 4.9 of the Paris Agreement.

As of 2023, the NZAOA had 86 members with more than $10 trillion in assets. The NZAOA has had a dedicated monitoring, reporting and verification function since its establishment in 2019 and requires annual target, progress and emissions reporting for its members, selected from across more than 100 metrics or key performance indicators. All key performance indicators of the Alliance have now been integrated across the Principles for Responsible Investment reporting framework, and more than 5,000 investors now have the option to report against the same metrics and key performance indicators. The banking and insurance initiatives presented below will move towards a similar approach modelled on the AOA work.

Net Zero Asset Managers Initiative (NZAMI)
The Net Zero Asset Managers Initiative is also a partner of the GFANZ. It functions as an umbrella structure for six investor network partners that cover different regional grouping of investors: 1) the Investor Group on Climate, with members in Australia and New Zealand and the supporting organization for 2) a wider Asia Investor Group on Climate Change covering investors active in China, Hong Kong, India, Indonesia, Japan, Malaysia, the Republic of Korea, Singapore, Taiwan, Thailand, the Philippines, Viet Nam and the Pacific; 3) the Institutional Investors Group on Climate Change, which is a European membership body for investor collaboration on climate change; 4) the Principles for Responsible Investment initiative with its more than 5,000 signatories, 5) CERES as a knowledge and engagement partner, bringing the CERES Investor Network, and 6) CDP as the disclosure partner.

In total, the NZAMI has 273 signatories with a total asset management portfolio of over $60 trillion. The same members also come together in the Climate Action100+ initiative, which has a similar mandate but a longer history and wider reach, with around 700 companies engaged.

Net-Zero Insurance Alliance (NZIA)
The Net-Zero Insurance Alliance is a group of over 20 leading insurers representing more than 11 per cent of the world insurance premium volume globally. The Alliance currently represents the insurance business in the GFANZ, and members have committed to transitioning their insurance and reinsurance underwriting portfolios to net zero greenhouse gas emissions by 2050.

The NZIA is collaborating with the Partnership for Carbon Accounting Financials to develop the first global standard to measure and disclose emissions attributable to insurance underwriting portfolios – or "insurance-associated emissions." This pioneering global standard is scheduled to be launched later in 2023. NZIA members are required to publish their respective first interim science-based targets within six months after the publication of an NZIA Target-Setting Protocol, which will build on the NZIA's work with the Partnership for Carbon Accounting Financials to develop a global standard to measure insured emissions.

Methodologies and protocols
While the finance sector initiatives are all very new, there has been a rapid and much-needed effort to develop and agree on methodologies and protocols for assessing and reporting on net zero targets and progress. The Partnership for Carbon Accounting Financials was instrumental in working with the Net-Zero Asset Owner Alliance to develop a Global GHG Accounting and Reporting Standard for the Financial Industry and is currently engaging with the net zero insurance alliance to produce a first Standard to Measure Insured Emissions. The NZAOA has also developed a Target Setting Protocol that is now in its second edition.

As part of a move towards a set of common standards and metrics, the International Accounting Standards Board, an independent, private sector body that develops and approves International Financial Reporting Standards used in more than 140 countries, announced the creation of a new standard-setting board – the International Sustainability Standards Board – to help meet this demand.

The Financial Stability Board set up by the G20 countries has similarly set up a Task Force on Climate-related Financial Disclosures (TCFD) to improve and increase reporting of climate-related financial information. The TCFD has similarly developed guidance on Metrics, Targets and Transition Plans Time will show if these initiatives will be successful, but they do represent the shift towards a more harmonized approach to climate reporting and disclosures.

Industry Sector Initiatives

For the industry sector, the picture is very similar, with a number of global convening partnerships and a large number of sub-sector specific partnerships and engagement initiatives. The Global Race to Zero campaign mobilizes more than 5,000 private companies through a number of these partnerships and initiatives. The main ones are briefly introduced below, again without trying to be exhaustive.

We Mean Business Coalition
We Mean Business is a partnership of several non-profit organizations coming together to promote engagement of the private sector in climate action towards net zero emissions. Partners include some of the groups mentioned earlier, such as CERES and CDP, as well as the World Business Council for Sustainable Development, the B-Team, Corporate Leaders Group Europe and BSR, all representing different engagement networks and bringing them together in the wider coalition.

Climate Group
The Climate Group is a major convener of private sector engagement and also the secretariat for the Under2Coalition described earlier under regional initiatives. The Climate Group organizes New York Climate Week, a major event for showcasing private sector engagement in climate change, linked with the regional climate weeks organized by the UNFCCC Secretariat. The Climate Group has a strong focus on energy and transport sector opportunities and runs a number of projects and initiatives to further action by its members. Being mainly a convener of action, it does not have its own pledge and review system.

A number of other engagement platforms are operating at the global, regional, and national levels, such as the Climate Pledge, the B-Team, the SME Climate Hub, B Corp and the Chambers Climate Coalition. These have all joined the Race to Zero as partners and together promote the common goal of getting private sector companies to commit to net zero strategies.

Science Based Targets Initiative (SBTi)
The SBTi, described earlier, provides target-setting and activity tracking guidance to private sector members. SBTi runs its own Business Ambition for 1.5°C campaign but is mainly the provider of guidance and analytical tools to various other groups like the We Mean Business Coalition. For example, it provides guidance on net zero target-setting, including key sectors (as of July 2022 only net zero targets are accepted by the Initiative), and is developing a new progress framework with guidance on monitoring, reporting and verification.

Sub-sectoral initiatives
At the sub-sector level, more narrowly focused examples include:

- **Global Cement and Concrete Association** announced a net zero pledge and roadmap before COP 26 in 2021, with 40 major companies around the world coming together to pledge a 25 per cent reduction in greenhouse gas emissions by 2030 and net zero emissions by 2050.

- **Responsible Steel** is a not-for-profit organization that provides a sustainability certification scheme for the steel industry worldwide. Together with the Climate Group, Responsible Steel has established SteelZero as a convener of the steel industry with an aim to accelerate a transition to net zero emissions in 2050. The initiative also engages steel users in, for example, the auto and shipping industry to create a demand requirement for net zero steel in the future.

- **International Wineries for Climate Action (IWCA)** is a collaboration among environmentally committed wineries taking a science-based approach to reducing carbon emissions across the wine industry. The initiative develops methodologies to measure greenhouse gas emissions specifically targeted to the wine industry, building on the GHG Protocol (discussed later). IWCA membership requires that members regularly carry out greenhouse gas emissions inventories covering scopes 1-3 of their operations and have those inventories verified to the ISO-14064-1 standard.

- **Pledge to Net Zero** similarly engages the wider environment industry in a pledge and reporting initiative, providing guidance material that builds on the GHG Protocol and is adapted to specific needs in the sub-sector.

- **The Oil & Gas Methane Partnership 2.0 (OGMP 2.0)** is a multi-stakeholder initiative launched in 2020 by UNEP and the Climate and Clean Air Coalition. The OGMP 2.0 provides a comprehensive, measurement-based reporting framework for the oil and gas industry to help improve the accuracy and transparency of reporting on methane emissions. More than 100 companies with assets on five continents, representing a significant share of the world's oil and gas production, have joined the Partnership. OGMP 2.0 members also include operators of natural gas transmission and distribution pipelines, gas storage capacity and liquefied natural gas terminals. The OGMP 2.0 Reporting Framework provides a standard for methane reporting, requiring companies to report methane emissions from all sources at both operated and non-operated ventures across the oil and gas value chain. With the Global Methane Pledge launched at COP 26 in Glasgow in 2021, more than 150 countries have agreed to collectively reduce methane emissions 30 per cent by 2030, and in this way provide a strong focus on private sector methane reductions in key sectors like oil and gas, waste handling and agriculture.

Finally, the UNFCCC Secretariat has supported the engagement of the fashion Industry in a joint charter for climate action, where companies signed the charter with a vision to reach net zero emissions in 2050. A similar United Nations-supported initiative, Sports for Climate Action Framework, was launched for organizations and companies involved in sports. It provides the engagement framework and includes a large number of national and international sporting organizations and clubs that pledge to reach net zero emissions by 2050.

Food, Agriculture and Forestry Sector Initiatives

The food sector has been characterized by major global companies making individual net zero pledges, and the number of joint efforts has been limited. However, many of the actors within the global agricultural commodity chain use disclosure frameworks and standards and/or reporting frameworks to measure and manage the risks and opportunities of their carbon footprints. Examples include the GHG Protocol, the Science Based Targets initiative's Forest, Land, and Agriculture project, and CDP, which all allow companies to account for impacts related to emissions from land-use change in a standardized way.

- Ceres, in its **Food Emissions 50**, is convening an investor-led initiative to accelerate progress towards a net zero future in the food sector. Engaging 50 of the highest-emitting public food companies in North America, investors seek to move companies to improve their greenhouse gas emission disclosures, set ambitious emission reduction targets, and implement ambitious climate transition plans in line with the Paris Agreement.

- On the forestry side the **Alliance for Responsible Forest Management** supports green initiatives in forestry along with other institutions, such as WWF and Conservation International. The alliance has a vision to accelerate responsible forest management across the commercial tropical world and contribute to reducing greenhouse gas emissions from entering the atmosphere from the forest sector. This is done by developing best practice training manuals at the regional level and providing localized training in Africa, the Asia-Pacific region and Latin America.

- The **Forests Solutions Group** under the World Business Council for Sustainable Development developed a Forest Sector Net-Zero Roadmap to guide members. It does not involve any pledges but aims to initiate a dialogue that can lead to concrete pledges.

- Especially forests are, by many of the various initiatives in other constituencies, part of the net zero solution space either directly by supporting forest expansion or by using voluntary credits as part of their pledges. There may also be lessons from process governing the Reducing Emissions from Deforestation and forest Degradation, plus the sustainable management of forests, and the conservation and enhancement of forest carbon stocks so-called REDD+ where reporting structures were agreed, before the ETF was in place, and therefore has gathered significant experience.

Engaging Smaller Actors Such as Small and Medium-Sized Enterprises

Most of the initiatives mentioned above have memberships dominated by large entities, mainly in industrialized countries where members have the corporate resources and expertise to engage and likely also the public profiling or pressure to show corporate climate responsibility.

Engaging smaller entities likely requires a different approach, including capacity-building and technical assistance support. A simple example is the city space, where C40 engages around 100 of the largest cities around the world, and ICLEI engages with around 2,500 smaller local and regional entities.

On the industry side, a recent initiative is the **Small and Medium Enterprises (SME) Climate Hub**, an initiative of the We Mean Business Coalition, the Exponential Roadmap Initiative and the United Nations Race to Zero campaign. The Hub partners with multinational companies, financial institutions and governments to create clear incentives and opportunities for small and medium enterprises that commit to halving their emissions before 2030 and achieving net zero before 2050. The vision of the founding partners is for the Hub to be a place where these businesses come to get tools to analyse emissions and pledge to be net zero by 2050. The Hub provides tools to support the analysis, pledge and reporting but has no formal requirements or reviews.

Trends and Political Incentives

A challenge in writing this report has been the rapidly developing landscape of climate pledges and reporting. As an example, CDP's 2021 annual disclosure report had submissions from 13,120 entities, but by the 2022 report (released in February 2023) this had increased to 18,600 entities. However, the number of entities that meet the CDP alignment criteria declined during this period, reflecting in part the use of strengthened criteria, but also indicating that the credibility and implementation of the pledges remain way too low.

Two areas that reflect more dedicated efforts towards harmonization, common reporting and protocols are:

- Cities, where the movement is towards a common Global Protocol for Community-Scale Greenhouse Gas Inventories and common reporting platforms (such as the Global Covenant of Mayors and CDP/ICLEI).

- The finance sector, with efforts to have common methodologies and protocols for assessing and reporting on net zero targets and progress. These include the efforts by the Partnership for Carbon Accounting Financials to develop a Global GHG Accounting and Reporting Standard for the Financial Industry, and the efforts by the Task Force on Climate-related Financial Disclosures to improve and increase reporting of climate-related financial information.

The drivers for these developments are likely different. It seems that city governments are pushed in part by their constituencies and in part by central governments, whereas the finance industry is reacting more to upcoming legislation in, for example, the United States, the European Union and the United Kingdom.

- In the United States, the Securities and Exchange Com mission has proposed new climate disclosure regulation, building on the existing GHG Protocol and on the Task Force on Climate-Related Financial Disclosures. The new regulation rules are still in the political process but are seen as likely, giving a strong push to both finance institutions and the industry sectors to step up on climate reporting.

- The European Union is similarly preparing the European Union Sustainability Reporting Standards, designed to make corporate sustainability and environmental, social and governance (ESG) reporting within the region more accurate, common, consistent, comparable, and standardized, just like financial accounting and reporting.

- The UK government has similar efforts and has introduced mandatory climate-related financial disclosures by publicly quoted companies and large private companies.

If these new regulations are fully implemented, they will provide a strong push for the corporate sector to accelerate efforts on climate accounting and reporting, with an associated requirement for partners in other countries to enhance their efforts to allow for scope 3 reporting by companies in the regulated countries. For many companies in developing countries, this will require significant improvement in climate data collection and reporting, with a very strong need for local regulation and significant capacity development efforts.

3.4 Monitoring, Reporting and Verification Systems and Protocols Used in Relation to Non-State Actor Pledges

Returning to one of the framing questions for this report, this section discusses how the pledges made by non-state actors and the associated accounting systems can be further strengthened and harmonized to provide more transparency. Before getting into the more technical details, some reflections are provided on how actors make pledges and what monitoring, reporting and verification really means in this context. They are illustrated in Figure 3.5, which serves as a simple version of the described city engagement process.

Figure 3.5 Schematic overview of a credible pledge and monitoring, reporting and verification system

In the presentation of the various partnerships and initiatives in section 3.3, it is evident that some initiatives focus on the pure mobilization function and do not follow through to do real monitoring, reporting and verification, while other initiatives have established formal structures supported by guidance and technical expertise that ensures both tracking, reporting and validation. The information provided on the various websites does not, however, provide enough details to make a systematic overview.

There is no doubt that the mobilization function has had a very strong effect on the engagement of non-state actors that were not necessarily aware of or planning to engage in pledge and target-setting. It will be important to ensure that this momentum is maintained, even if there is a collective move towards more structured and comparable approaches to monitoring, reporting and verification.

It is also clear that the role and credibility of non-state actor engagement will be much larger if there are more uniform and more transparent monitoring, reporting and verification systems that document the targets, actions and results – and ideally that ensure interoperable systems and stronger integration with countries' Nationally Determined Contributions.

In an event organized by the One Planet Summit at COP 26 in 2021, the needs for credibility and comparability were very well articulated:

"For several years now, private actors have been organising themselves into coalitions, for example within the One Planet Summit or the Race to Zero initiatives. The resulting commitments are essential to ensure that the individual actions of actors will ultimately have a systemic effect.

However, these bundled actions are hampered by methodological differences or lack of transparency on environmental data throughout the value chain. This calls for more coordination of coalitions as a whole and the development of tools to facilitate data flow and accountability for the commitments made. Such tools would de facto improve the relevance of actions and the measurement of their impacts."

(One Planet Network 2021)

There is clearly a very long journey before these results become a reality. However, as illustrated in chapter 2, the process towards creating transparency on government action has taken more than a couple of decades. Increased clarity and transparency on the actions of non-state actors will evidently need to happen much faster. Yet, the understanding of the various climate issues has evolved significantly, and the methodological guidance from the national process provides a solid foundation that can be adapted and used.

The work to create more common approaches for non-state actor reporting has also been happening at a smaller scale for nearly two decades. For example, the GHG Protocol, developed by the World Resources Institute and the World Business Council for Sustainable Development initially as a pilot effort, has evolved from a rather simple Corporate Standard to an elaborate Protocol with associated guidance that continues to be strengthened. The GHG Protocol is used by many of the initiatives listed in section 3.3, and it is considered to be one of the three "primary protocols" in a study by the UNEP Copenhagen Climate Centre (formerly the UNEP DTU Partnership) (UNEP Copenhagen Climate Centre 2020).

The study provides an overview of no less than 68 protocols that have been identified via CDP's annual overview of reporting protocols, including both public and private protocols. With CDP reporting covering some 8,400 companies in 2020 and now more than 18,000, it is the main registry for non-state actors and plays a key role in promoting and organizing global disclosures. In general, the large number of protocols in use is a challenge for transparency and comparability. However, the study showed that the majority of protocols rely on the approaches proposed by three long-established protocols: the Global Reporting Initiative's "reporting requirements of emissions," the GHG Protocol's "corporate accounting and reporting standard" and the International Organization for Standardization's (ISO) 14064 standard on "quantification and reporting of greenhouse gas emission removals" (see Table 3.1).

Table 3.1 The three primary protocols for reporting greenhouse gas emissions

The Global Reporting Initiative (GRI) is a voluntary corporate sustainability reporting initiative launched in 2001 and updated in 2016. It offers guidelines to companies, which can be adapted to the sector, geographic location and size of the company. The guidelines targeting greenhouse-gas emissions (hereinafter, the GRI protocol) are applicable to direct, indirect and supply-chain emissions. These guidelines are available in English, Spanish and a number of other languages.

The ISO 14064 standard, developed by the International Standards Organization (ISO) is part of the ISO 14000 standard series, published in 2006 and updated in 2018, which provides international standards for environmental management. The ISO 14064 standard offers tools to quantify, monitor, report and verify greenhouse gas emissions. This standard can be used by businesses, but caters to governmental organisations too. The main protocol (ISO 14064-1:2018, hereinafter the ISO protocol) has been complemented by a second protocol focused on reporting project-level greenhouse gas emissions (ISO 14064-2:2019) and a third protocol focused on reporting verification (ISO 14064-3:2019). All protocols are available in English, Spanish and a number of other languages.

The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard is a protocol that can be used for reporting on corporate greenhouse-gas emissions. The protocol was developed by the World Resources Institute (WRI), a not-for profit environmental advocacy group, and the World Business Council for Sustainable Development (WBCSD), a not-for-profit coalition of multinational companies. It was first launched in 2001 and last updated in 2018. In addition to the multi-sector protocol for reporting direct emissions (hereinafter, the WRI/WBCSD protocol), WRI and WBCSD have developed protocols to account for indirect and supply-side emissions. The protocols is available in English, Spanish and a number of other languages.

Source: UNEP DTU 2020

Many of the other "secondary" protocols adapt certain parts of these three primary ones for national or sectoral use. This means that in spite of the large diversity of initiatives, protocols, and structures for monitoring, reporting and verification, etc., there is an element of common background structures to build on. The purpose of this report is not to assess any of the protocols specifically, but to document the current diversity and to discuss ways of moving towards more uniform, transparent and comparable approaches.

In September 2021, the members of the ISO agreed on the London Declaration committing its members to contribute International Standards and Publications to help accelerate the successful achievement of the Paris Agreement and the wider Sustainable Development Goals.

There is no single agreed definition of net zero targets, measurement and reporting requirements for non-state actors that would build trust with governments, investors and consumers. Multiple definitions, with key differences including the scope of emissions and the role of offsetting, creates ambiguity, delay and inaction. Moreover, the proliferation and growing complexity of climate change standards, regulations and policy commitments pose a significant challenge.

Source : https://our2050.world/

Following the approval of the declaration, ISO, in collaboration with the British Standards Institution and the Race to Zero campaign, established the Our2050World initiative to mobilize the global standards community to help non-state actors achieve their climate action goals faster and more effectively. The rationale statement by the initiative very much echoes the points made in this chapter.

Whether this new initiative will be successful in bringing together the many non-state alliances and actors remains to be seen. However, it reflects the emerging convergence on city reporting with the Global Protocol for Community-Scale Greenhouse Gas Inventories, and in the finance sector with the International Sustainability Standards Board and the Task Force on Climate-related Financial Disclosures.

As part of the Our2050World initiative, the British Standards Institution commissioned a study by NatCen (Steen, Craig and Chowdhury 2022) to examine how net zero is understood as applied to non-state actors, to understand the main barriers to achieving net zero emissions for non-state actors, and to explore the role that standards can play in achievement of net zero. The study presents a combined assessment of available studies as well as interviews with stakeholders from non-state actors and governments. The report presents some interesting findings and recommendations that are very aligned with the views expressed in this report:

"Potential customers for standards face a confusing set of choices: a huge number of standards are available from a range of organizations, with limited centralized guidance about what is available and what would be most beneficial. There is a clear need to make standards easier to understand and easier to use. For some actors, especially smaller organizations and those in low- and middle-income countries, there is an argument for reducing the cost of standards.

Despite consensus that standards have a critical role to play, there were opposing views about whether new standards are needed: one view was that standards bodies should develop new standards for Net Zero, whereas another view was that existing standards are sufficient. Existing standards included the Science Based Targets initiative (which recently released a dedicated Net Zero standard), and standards for measuring and reporting including ISO standards and the Greenhouse Gas Protocols. A prominent view was that one way for standards bodies to make a valuable contribution to the landscape would be to co-ordinate, synthesize and refine existing standards in order to help non-state actors make sense of the complex and inter-connected system."

(Steen, Craig and Chowdhury 2022)

When comparing the developments around non-state actor pledges and reporting with the described historical process under the UNFCCC process for country parties, it is evident that the negotiations have gradually led to a harmonized approach to reporting: the Biennial Transparency Report process. It is also evident that the same does not yet apply to the guidance on Nationally Determined Contributions, which is still quite flexible, resulting in diverse forms of targets and approaches. This makes it difficult to make direct comparisons across the Nationally Determined Contributions of countries, but the expectation is that, in line with provisions from the Paris Agreement, guidance for future Nationally Determined Contributions will gradually move towards economy-wide reduction targets and become increasingly comparable.

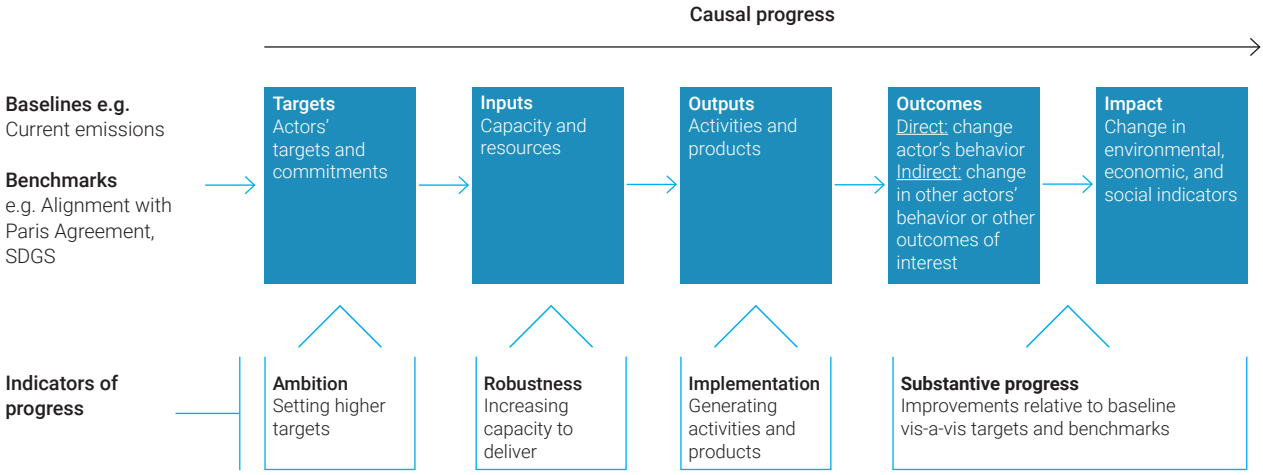
From the review of non-state actor initiatives and of monitoring, reporting and verification structures, it seems that pledge formats may in a similar way need to initially be flexible and tailored to the specific sector, while inventories and the reporting and review structures may be easier to harmonize. This will definitely require further consideration and elaboration possibly by the UNFCCC Secretariat in collaboration with select representatives of the non-state actor community and is discussed further in the concluding chapter.

3.5 Do the Non-State Actors Deliver on Pledged Action?

In section 3.1, the issue of the credibility of non-state actor initiatives was briefly touched on, and the rather bleak picture presented there seems unfortunately to be the dominant one. To better assess the impacts of the various initiatives, however, it would be useful to have a better common framework for assessing progress and impacts. Elements of a possible framework were presented by Hale et al. (2020) in a review of more than 40 studies that have examined progress and implementation of non-state and subnational actor initiatives.

The framework is presented in Figure 3.6 and is basically a "theory of change" approach adapted to the non-state actor pledging process. It provides a more granular presentation of the stepwise process illustrated in Figure 3.5.

Figure 3.6 Model for measuring progress, implementation and impact of climate action



Source: Hale et al. (2020)

Hale *et al.* (2020) also provide an assessment of 42 major studies published between 2014 and mid-2019 by scholars, non-governmental organizations and cooperative initiatives that in various ways have mapped and measured progress and impacts of non-state and subnational climate action. The results of the assessment are that almost all studies focus on the potential impacts of pledges if fully implemented, and much less on assessing the progress and the actual results achieved.

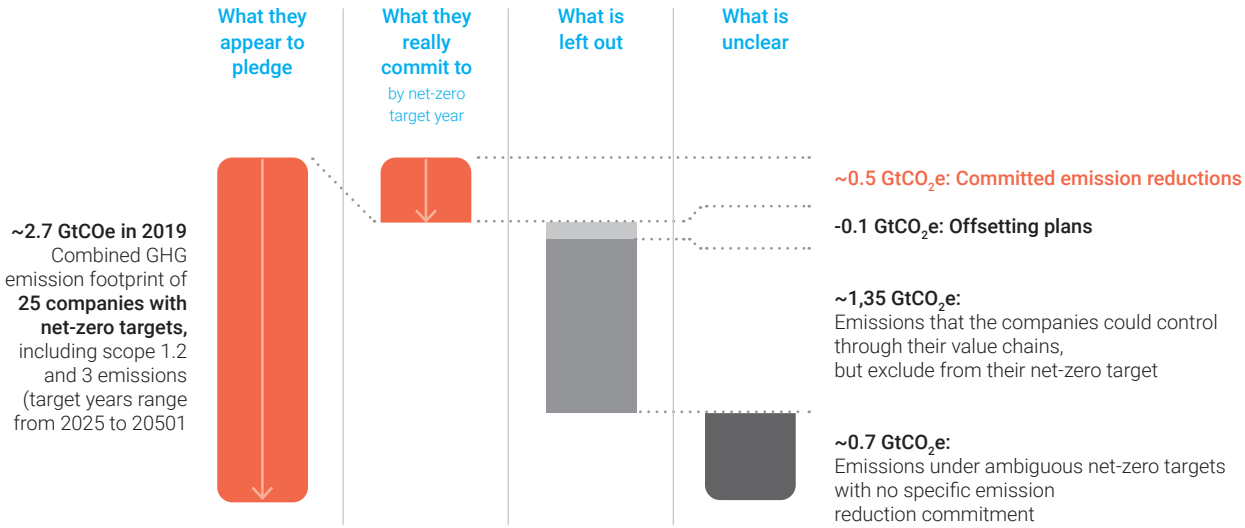
These findings are largely confirmed in recent studies such as the report on Global Climate Action from Cities, Regions, and Companies (NewClimate Institute et al. 2021), where a number of leading institutions have jointly analysed both pledges and the progress towards achieving the pledges. The report confirms the general trend that the number of pledges is increasing. Similarly, the recent Yearbook of Climate Action by the UNFCCC Secretariat (2022c) confirms that the interest in joining the various initiatives has continued to grow; in 2022, the Global Climate Action Portal registered a 38 per cent increase in the number of participants.

The Global Climate Action report does, however, confirm the earlier assessment by Hale et al. (2020) that analysis of impacts is difficult, and indicates that while some positive progress is seen for the achievement of 2020 targets, only half of the cities analysed had achieved their target, while companies were generally doing better. But all actors will need to accelerate action rapidly to stay aligned with their targets for 2030, not to mention for net zero emissions by 2050. The report concludes: *"While the momentum of non-state and subnational climate actions continues to build, this report finds that there is limited evidence of this ambition translating into realized impacts"* (NewClimate Institute et al. 2021).

Looking in more detail at the industry sector, the Corporate Climate Responsibility Monitor 2022 assesses the climate strategies of 25 major global companies (NewClimate Institute and Carbon Market Watch 2022). It explores "insights on transparency and integrity" in four main areas of corporate climate action: 1) tracking and disclosure of emissions, 2) setting emission reduction targets, 3) reducing own emissions and 4) climate contributions and offsetting claims.

The key findings are aligned with the conclusions from the other quoted papers and reports, suggesting that targets for 2030 are inadequate and that only 3 out of 25 major companies have in place commitments to aim for net zero emissions in 2050, even if all companies have announced targets for net zero. Considering that these 25 companies have a combined carbon footprint equivalent to 5 per cent of global emissions, this is clearly a major concern. The differences between pledges and the different elements of achievement and gaps are illustrated in Figure 3.7, adapted from the Corporate Climate Responsibility Monitor Report.

Figure 3.7 Integrity of corporate net zero pledges



Source: NewClimate Institute and Carbon Market Watch 2022.

Notably, the "value chain" varies significantly depending on the type of industry. For some industries, it is possible to influence and potentially change the value chain, whereas for others this would be virtually impossible.

The aim of this chapter was not to assess in detail the many non-state actor pledges and what they achieve, but to illustrate why better and more comparable data are urgently required in the non-state actor space. A review of the emerging landscape of reporting and verification entities would be useful to better understand current approaches and procedures and potential gaps that need to be filled going forward, but this goes beyond the scope of the current report.

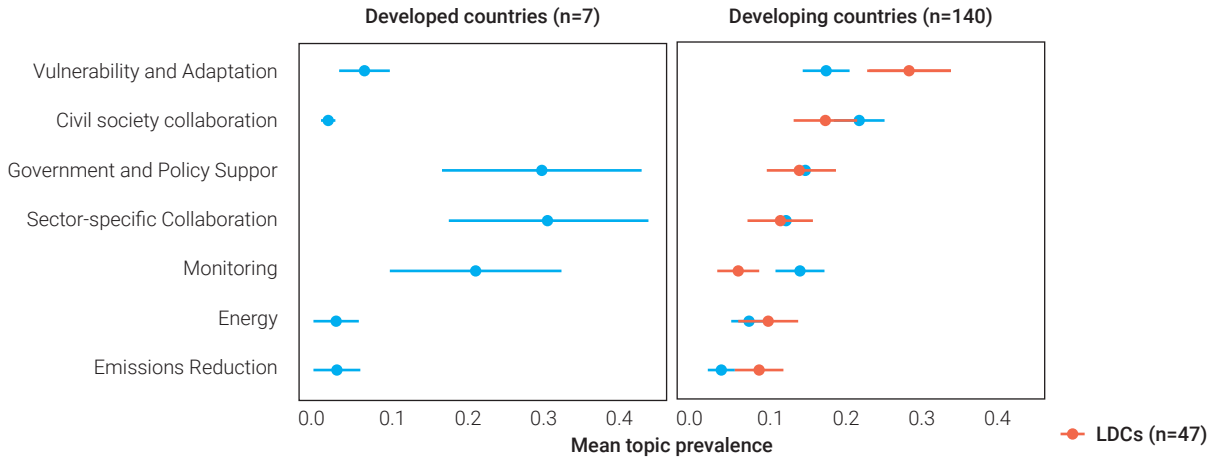
4 Analysis of Existing Non-State Actor Integration in the Updated Nationally Determined Contributions

Following the two previous chapters describing transparency efforts at the national and non-state actor levels, this chapter presents an analysis of the current level of engagement or integration of non-state actor actions in countries' Nationally Determined Contributions. However, a major challenge when looking at linking non-state actor action and national efforts described in the Nationally Determined Contributions is that very limited analysis is available on how the efforts of non-state actors are considered or integrated with the Nationally Determined Contributions.

A 2019 study by Hsu et al. (2019) examined 166 Nationally Determined Contributions and intended Nationally Determined Contributions submitted to the UNFCCC and evaluated specific mentions of non-state actors. At that time, 147 Nationally Determined Contributions mentioned non-state actors, and only 7 were written by developed countries (Australia, Belarus, Canada, Japan, Monaco, the Republic of Korea and Turkey). Most mentions of non-state actors were found in developing country Nationally Determined Contributions, where these actors were primarily referenced in the context of vulnerability and adaptation efforts. These countries describe non-state actors as useful vehicles for services and information to climate-vulnerable communities and active contributors to climate adaptation and resilience planning.

Eighty per cent of countries that did not mention non-state actors in their Nationally Determined Contributions were developed countries – including the 28 Member States of the European Union. Where non-state actors were mentioned in developed country Nationally Determined Contributions, they were referenced more commonly in terms of specific sector collaborations (for example, renewable energy implementation) or to support existing national government policies.

Figure 4.1 Average frequency (mean topic prevalence) with which national governments reference non-state actors in their Nationally Determined Contribution submissions



Source: Hsu et al. (2019)

Note: The most common function national governments (n=147) reference non-state actors is in terms of vulnerability and adaptation, while emission reductions or mitigation functions are the least common.

There are several potential explanations for why non-state actors are not referenced in detail or at all in the Nationally Determined Contributions. Mbeva and Pauw (2016) note that the formal guidance for Nationally Determined Contributions provided to national governments does not mention non-state actors. Generally, the preparation of Nationally Determined Contributions reflects the design of the Paris Agreement, and the politics of the negotiation and guidance was therefore quite flexible, and no requirement was made for explicit references to non-state actors, leading to the diverse nature of these submissions (Pauw, Mbeva and Dzebo 2017).

Another reason for the lack of non-state actor linkages in developed country Nationally Determined Contributions, particularly in terms of mitigation and financing efforts, is due to developing country concerns regarding the potential for non-state actions to distract or detract from national-level commitments. China, Brazil, India and South Africa warned that action by non-state actors "can't substitute for the core actions" at the national level, particularly in developed countries (Statement on Behalf of BASIC 2014, pp. 2-3). An additional explanation for the lack of non-state actor linkages and references in the Nationally Determined Contributions found by Hsu et al. (2019) may be that countries do not view their Nationally Determined Contributions as the most appropriate channel for incorporating non-state actions. It is important that enhanced integration does not lead to very complex and unmanageable structures and avoids issues of double counting in the aggregation process.

The next section provides an overview of UNFCCC reporting mechanisms, which may provide national governments a greater opportunity to link to non-state actor actions explicitly.

4.1 Updated Nationally Determined Contributions and Long-Term Strategies: Greater Linkages to Non-State Actors or Deeper Gaps?

The first set of Nationally Determined Contributions was submitted in the lead-up to the 2015 Paris climate negotiations (intended Nationally Determined Contributions), after which countries have been required to submit new or updated Nationally Determined Contributions that exceed the original ambition to reflect "the highest possible ambition" (Röser et al. 2020). As of February 2022, 124 countries had submitted new or updated Nationally Determined Contributions that the World Resources Institute's ClimateWatch platform had translated and converted to a machine-readable format suitable for analysis. The Paris Agreement in Article 4 paragraph 19 also indicates that all Parties, taking into account respective capacities and differentiated responsibilities, should aim to develop long-term low greenhouse gas emission development strategies (Long-Term Strategies) that communicate steps towards mid-century decarbonization (UNFCCC 2022d). As of February 2023, 58 Long-Term Strategies were available from the UNFCCC website.

Applying and building on methods utilized in Hsu et al. (2019) and in Hsu and Rauber (2021), the analysis for this report compiled and converted all available updated Nationally Determined Contributions and Long-Term Strategies documents into a single corpus, or collection of documents, to answer several questions:

- First, are more national governments referencing, therefore linking to, non-state actors in their new or updated Nationally Determined Contributions or Long-Term Strategies?
- Second, if Parties are referencing non-state actors, are these mentions in the context of transparency and reporting?

Specifically, the analysis replicated Hsu et al.'s (2019) unstructured topic modelling approach (Roberts et al. 2014), which identifies the main themes present in the corpus of texts, to detect passages in countries' new and updated Nationally Determined Contributions and Long-Term Strategies documents that include keywords related to non-state actors[27] (see Table 4.1).

Table 4.1 Terms used to detect non-state actor categories in the Nationally Determined Contributions and Long-Term Strategies document corpus

Actor category	Terms
General non-state actors	Companies, non-governmental, non-governmental, subnational, NGO, non-government, investor, organization, investor, city, university, corporation, NGOs, institution, town, municipality, metropolis, metropolitan, district, province, territory, county, college, private sector, local government, civil society, non-profit, business, and businesses
Civil society organizations	NGO, civil society, non-profit, and non-profit
Local government	City, cities, local government, town, municipality, county, and province
Business actors	Company, private sector corporation, and business

Note: Pluralized versions of the above keywords were also included in the sub-setting process.

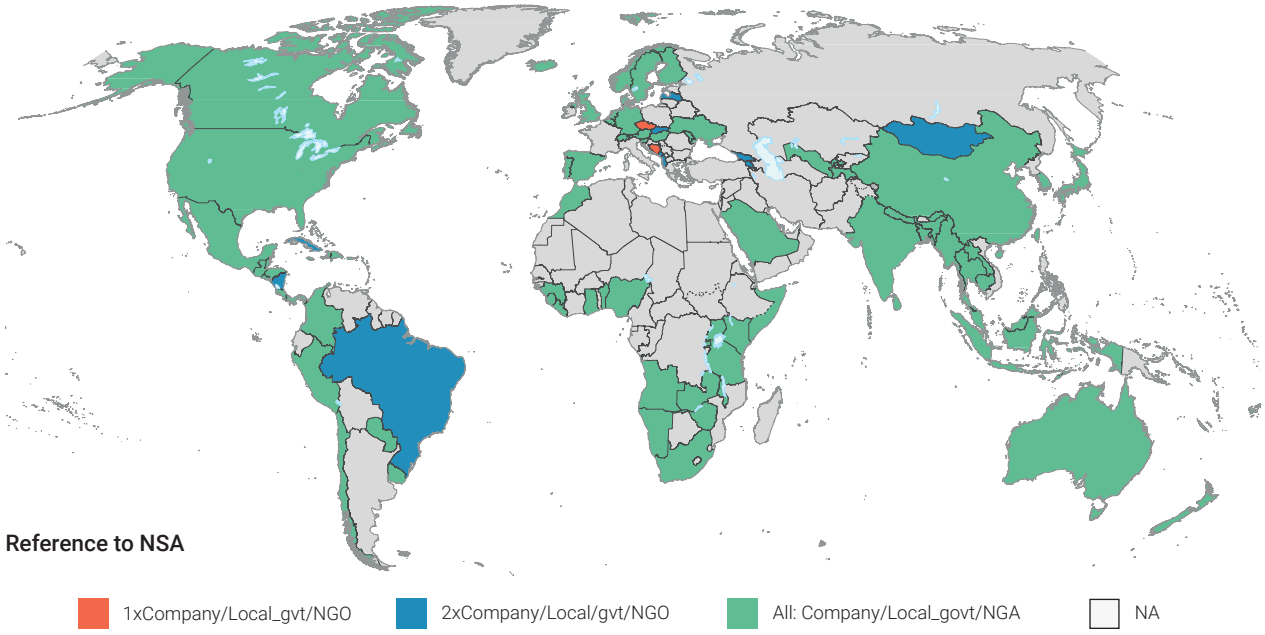
[27] Under the assumptions of the model, each document in the corpus is viewed as a distribution over the topics and represented as a mean probability of a text belonging to a specific topic (e.g., topic 1 - 30%, topic 2 - 20%, etc.) and each topic is viewed as a distribution over the words in the vocabulary (e.g., for a topic related to energy, we might have a word distribution that looks like: "energy" - 6%, "coal" - 1%, "industry" - 1%). The topics were labelled by examining the most prevalent words associated with each topic and representative text passages from the Nationally Determined Contributions and Long-Term Strategies to facilitate the analysis (Table 2). Next were extracted the term probabilities (e.g., the word clouds and bar charts in Table 4.2) associated with each topic and mean probabilities (e.g., column 1 in Table 2) for each topic by text and actor to analyse how national governments reference non-state actors in high-level climate policy documents. See Hsu et al. (2019) for more on the methodology.

4.2 General Non-State Actor References in NDCs

Compared to the first round of Nationally Determined Contributions and intended Nationally Determined Contributions, the analysis found that nearly all the updated Nationally Determined Contributions and Long-Term Strategies documents referred to non-state actors (see Figure 4.2). When a country did make mention of non-state actors in either of these documents, it tended to mention all three major non-state actor groups: companies, local governments and non-governmental organizations (85 per cent). Generally, the analysis found a growing consideration of the importance of non-state actors, as seen in statements such as the United States' Long-Term Strategies: "Already, many non-governmental organizations are acting ambitiously to address climate change within their operations or support the overall transition of the U.S. economy. Even more, broad-based engagement on research, education, and implementation through our universities, cultural institutions, investors, businesses, and other non-governmental organizations will be required to reach our 2050 goal."

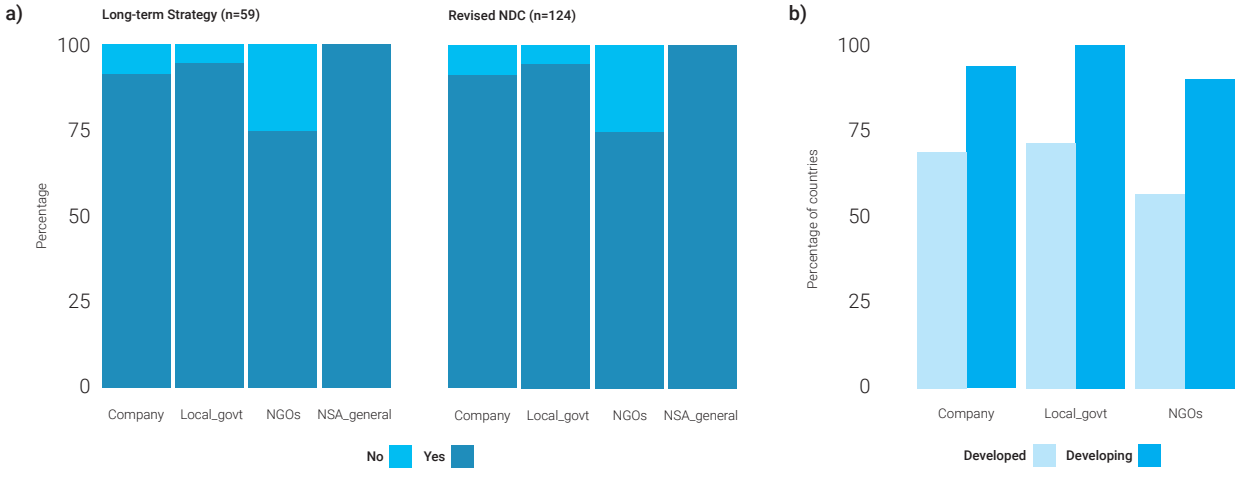
Twelve per cent of the Nationally Determined Contributions mentioned at least two non-state actor types, while 3 per cent made mention of only one group. Comparing non-state actor references in Nationally Determined Contributions versus Long-Term Strategies, the latter documents, while fewer in number, had a higher percentage of texts mentioning non-state actors for all three actor categories (see Figure 4.3a). Developing country (n=84) texts also tended to make more references to all three non-state actor categories compared to developed countries (n=41) (see Figure 4.3b).

Figure 4.2 Countries with reference to non-state actors



Note: The map is shaded according to whether countries mention 1) either companies, local government, or non-governmental actors (in pink); 2) mentions of either companies, local government or non-governmental actors (in blue); 3) mentioning all types of non-state actors of interest (in green). Non-state actor terms are defined in Table 4.1.

Figure 4.3 Percentages of national climate policy texts mentioning non-state actors by a) document type and b) development status



Major Themes Related to Non-State Actors in National Climate Policy Strategies

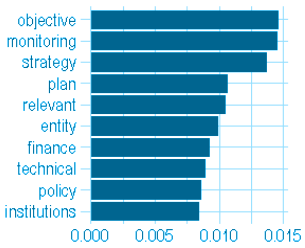
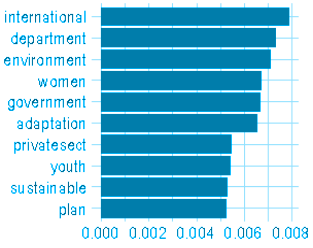
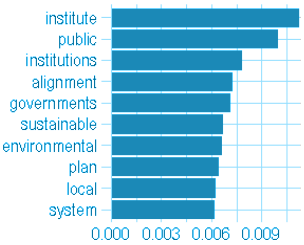
The analysis identified nine common themes related to non-state actors in countries' Nationally Determined Contributions and Long-Term Strategies, which were then supplemented and contextualized with text examples (see Table 4.2 for all text references). Based on the examination of word probabilities associated with the topic, the most prevalent theme identified was topic 5 related to non-state actor institutions (expected topic proportion = 0.3). The second most common topic was topic 4 related to adaptation, with the word "adaptation" being the most highly associated, followed by "gender" and "women."

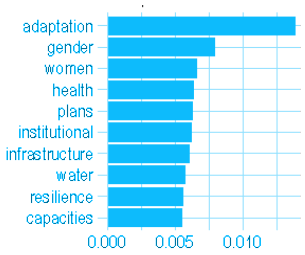
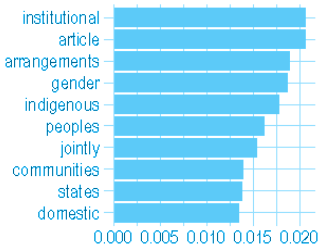
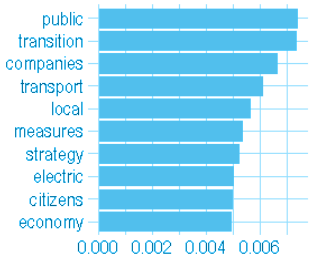
Topics 6 (low-carbon transition) and 8 (business and government) had equal expected prevalence across the documents. While topic 6 was labelled as "low-carbon transition," these public-facing approaches related to non-state actors are referenced in the context of energy and low-carbon transitions, with a specific focus on companies. For example, Panama, in its Nationally Determined Contribution, makes mention of a "transition to a circular economy" at "all levels and sectors of the national economy" and references local municipalities and local development.

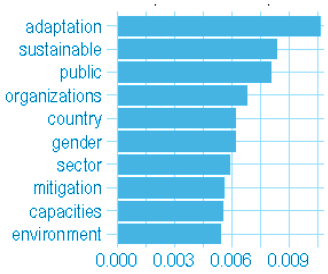
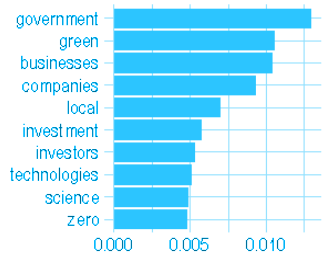
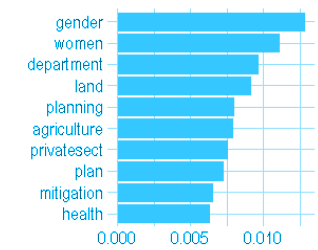
Topic 8, labelled as "government and business," comprises words that suggest private sector collaboration with the government for investment in "green technologies" and science-based approaches to tackling climate change. Here, the "development activities of research organizations and industrial companies" are complex but crucial endeavours that the government can support and incentivize, as stated in Slovenia's Long-Term Strategies. Topic 2, identified as pertaining to a theme of international organizations due to the frequency of "international" and "organizations" appearing commonly with "local," "government" and "institutions," was a less common topic reflected in the texts of the Nationally Determined Contributions and Long-Term Strategies (mean probability = 0.10).

Topic 1, interpreted as monitoring and planning, and topic 9 (gender and women), were the least prevalent (mean probabilities of 0.02 and 0.05, respectively). In the topic 1 context, Vanuatu's Nationally Determined Contribution was one of the few to specifically mention non-state actors in the context of an "integrated MRV Tool" that is "a first of its kind initiative to integrate most of the domestic and international climate action monitoring, tracking and reporting requirements." This monitoring system will support "government agencies, development partners, and NGOs towards evidence-based decisions and data insights reporting." Cambodia also used an integrated monitoring tool to track "cross-cutting issues," particularly for non-state actor groups such as "youth, gender, and private sector engagement."

Table 4.2 Topical themes identified across national climate policy documents, top predictive terms associated with each theme, and sample text from the Nationally Determined Contribution and Long-Term Strategies document corpus

Topic / Expected topic proportion	Representative word cloud	Top term probabilities	Representative sentences
1. Monitoring and planning / 0.02			"Vanuatu's integrated MRV Tool is a first of Its kind initiative to integrate most of the domestic and international climate action monitoring, tracking and reporting requirements. Further, it supports government agencies, development partners, and NGOs towards evidence-based decisions and data insights reporting." **– Vanuatu (NDC)** "Cambodia has developed an integrated and detailed MRV system for her updated NDC that comprises tracking and reporting on progress towards adaptation and mitigation, finance received, and required capacity support. […] In developing the system, particular attention was paid to integrating cross-cutting issues in the tracking, such as those related to youth, gender, and private sector engagement." **– Cambodia (LTS)**
2. International organization / 0.10			"The review and update process has received active participation by scientists, ministries, agencies, non-governmental organisations, research institutes, enterprises, international organisations, and development partners." **– Viet Nam (NDC)** "It highlights that an approach at the level of the whole of society (international, national, regional and local levels, public and private sectors and civil society) is needed to efficiently deal with the consequences of climate change and a just and inclusive transition to a climate-neutral society." **– Slovenia (LTS)**
3. Public institutions / 0.05			"Through the participatory process, the Republic of Paraguay has managed to identify the necessary institutional arrangements, having to consolidate them a posteriori for the fulfilment of the climatic commitments assumed, with a view to the sustainable development of the country." **– Paraguay (NDC)** "Policy and programme alignment among line ministries, among regions, and between ministries and local governments (vertical and horizontal alignment) and coherent institutional arrangements." **– Cambodia (LTS)**

Topic / Expected topic proportion	Representative word cloud	Top term probabilities	Representative sentences
4. Adaptation / 0.15			"All measures related to promoting gender equality in relation to adaptation should also be considered as having very high priority. Gender-related measures are meant to be structuring in the sense that they are meant to ensure gender is mainstreamed across all the other measures, including for example sectoral adaptation plans." **– Albania (NDC)** "Actions in this pathway have a strong focus on enhancing resilience, particularly to climate-induced impacts, gender, youth, disability, poverty, and remote locations are some of the factors that will require particular attention in the allocation of resources and planning for the actions listed in this pathway." **– Tonga (LTS)**
5. Non-state actor institutions / 0.3			"Domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner." **– Vanuatu/USA/EU/Eswatini/Seychelles/ Tajikistan… (NDC)** "We continue to support amongst other things, increasing the proportion of women and girls in decision making and leadership positions, supporting their access to finance, education, building their resilience to climate change, and improving data on gender and inclusion." **– United Kingdom (LTS)**
6. Low-carbon transition / 0.13			"The transition to a circular economy implies acting transversally at all levels and sectors of the national economy, influencing lifestyles and individual consumption patterns, up to the transformation of industrial processes and the incorporation of sustainability into development agendas. local, at the level of municipalities and other instances of local development." **– Panama (NDC)** "The energy offices initiate and participate in several projects on energy efficiency and renewable energy sources, funded by the EU, county administrative boards, regional associations and other organisations. The offices work regionally in partnership with companies, county administrative boards, municipalities and others, e.g. on plans and strategies." **– Sweden (LTS)**

Topic / Expected topic proportion	Representative word cloud	Top term probabilities	Representative sentences
7. Adaptation and development / 0.07			"The main principles taken into account in formulating Thailand's NAP [National Adaptation Plan] include Sufficient Economy Philosophy, local wisdom, sustainable development, Ecosystem-based Adaptation (EbA), Community-based adaptation (CbA), proactive principle, resource efficiency, good governance, public participation, human rights and gender responsiveness." **– Thailand (NDC)** "Closely monitoring and regularly evaluating the efficiency of adaptation actions. Developing mechanisms for business sector investment in climate change adaptation; taking climate change-related opportunities for socio-economic development. Developing human resources and strengthening international cooperation and conducting scientific research and technological development on climate change adaptation." **– Viet Nam (NDC)**
8. Government and business / 0.13			"At its core, the work on just transition is underpinned by a firm belief that Canada cannot reach net zero without the participation, know-how and innovative ideas of all Canadians. People and communities must be at the heart of climate action to ensure that all Canadians are empowered to benefit from the green transformation and that no one is left behind." **– Canada (NDC)** "Due to the complexity of the transition to climate neutrality, the management of development activities of research organisations and industrial companies will present a great challenge, so Slovenia will provide appropriate guidance for development incentives with the objective of ensuring research and infrastructural support for the transition." **– Slovenia (LTS)**
9. Women and gender / 0.05			"Gender will be mainstreamed throughout the implementation of all adaptation measures. This will ensure that gender-biases are prevented when planning for their implementation, and that the measures can also directly target gender inequality as an important factor of vulnerability to climate change." **– Zimbabwe (NDC)** "Enabling environment for mainstreaming gender across government policies, programmes, services, corporate budgeting and monitoring and evaluation" **– Tonga (LTS)**

Developed versus Developing Country Topic Focus

The analysis shows clear differences in thematic topics between developing and developed country national policies (Figure 4.4a). Developing country policies focus on adaptation (topic 4) and adaptation and development (topic 7). Viet Nam's Nationally Determined Contribution, for instance, refers to "developing mechanisms for business sector investment in climate change adaptation." Developing countries' climate documents also have a stronger focus on monitoring and planning (topic 1), although this topic has the lowest probability compared to all of the topics. Fiji's Long-Term Strategies mentions the "design and implementation of a robust and transparent bottom-up MRV system," which includes "capacity building across all sectors to strengthen bottom-up data gathering."

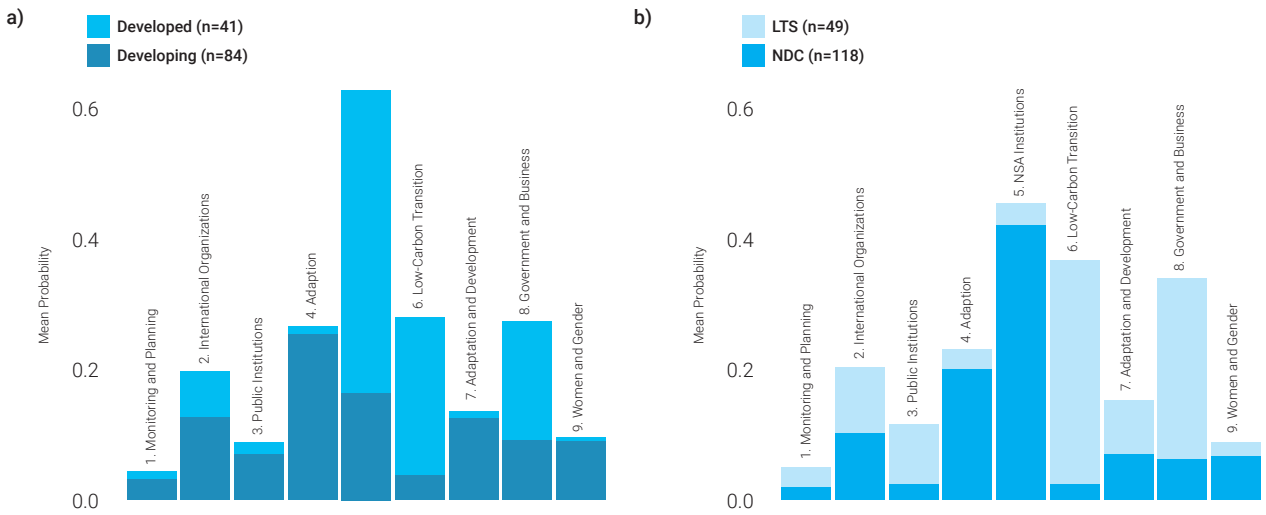
Developing country climate texts were also more likely to reflect an emphasis on international organizations (topic 2). Specifically, this topic has a financial focus, with Colombia stating the essential importance "international support from cooperating countries," the Dominican Republic, Honduras, and Thailand emphasizing the role of international cooperation (partners), and Morocco stressing the role of "international financial institutions including new financial mechanisms. climate, including the Green Climate Fund (GCF) and the financial instruments of multilateral development banks." Developing countries tend to focus more on public institutions (topic 3) and women and gender (topic 9). Tonga, for example, in its Long-Term Strategies describes an "enabling environment for mainstreaming gender across government policies, programmes, services, corporate budgeting and monitoring and evaluation."

In contrast, developed country policies were more likely to focus on non-state actor institutions (topic 5) as well as themes related to business actors such as low-carbon transition (topic 6) and government and business (topic 8) (Figure 4.4a). For topic 6, low-carbon transition, developed countries such as Sweden point to "energy offices" that "initiate and participate in several projects on energy efficiency and renewable energy sources" and that "work regionally in partnership with companies, county administrative boards, municipalities and others" in their implementation. Also, Canada's Nationally Determined Contribution emphasizes a "just transition" where the "participation, know-how and innovative ideas of all Canadians" "must be at the heart of climate action to ensure that all Canadians are empowered to benefit from the green transformation."

In topic 8, broadly centred on government and business, there is a focus on the transition of the private sector, industry and companies in the waste and electricity sectors towards a "zero" emission future enabled by "research" and "strategy" as well as technological investment. The United Kingdom's Long-Term Strategies states "achieving net zero and our finance goals requires changes from the whole economy – we need every company, bank, insurer, and investor to adjust their business models, develop credit plans for the transition and implement them." The Republic of Korea's Long-Term Strategies discusses partnerships between the government and industry sector to "scale up investment in applying new future technologies and developing technological innovations for the low-carbon transition of existing industrial processes".

Comparing document types, it is evident that the topic probabilities are not equal, with some topics more likely to appear in Nationally Determined Contributions versus Long-Term Strategies, and vice versa (Figure 4.4b). Nationally Determined Contributions had a greater likelihood of reflecting topics 4 (adaptation) and 5 (non-state actor institutions). A close inspection of how the texts of Nationally Determined Contributions specifically referenced non-state actor institutions and in which context revealed surface-level "disclaimer statements" that primarily contain general references to non-state actors. Long-Term Strategies placed a much higher emphasis on low-carbon transition (topic 6), and government and business (topic 8). In particular, the Long-Term Strategies more strongly focused on government and business partnerships and alignment. The texts have a nearly equal probability for topic 2 (international organizations) and adaptation and development (topic 7).

Figure 4.4 Probability of topics appearing in national climate policy texts, shaded by a) development status and b) document type



Implications for Alignment and Capacity Gaps

Within the national climate policy documents examined – the new and updated Nationally Determined Contributions and Long-Term Strategies – the total number of non-state actor references in national policy documents increases compared to the initial Nationally Determined Contributions (Hsu et al. 2019), with all Nationally Determined Contributions mentioning non-state actors in general (see Figure 4.3). The increased number of non-state actor references in the texts of the new and updated Nationally Determined Contributions and Long-Term Strategies demonstrate national governments' growing recognition of the role and contribution of non-state actors to climate action.

In terms of thematic areas, there are nine common themes, which primarily had general mention of non-state actor institutions, specifically in inter-sectionalities with under-represented groups through frequent mentions of gender, youth and indigenous peoples. Developed countries and primarily in Nationally Determined Contribution texts tended to reflect this topic. Similar to Hsu et al. (2019), adaptation was found to be a common topic, mentioned primarily by developing countries and through Nationally Determined Contributions. Adaptation, as opposed to mitigation, is a higher concern for these countries, particularly least developed states and countries most vulnerable to the impacts of climate change (Conway and Mustelin 2014; Bueno Rubial and Siegele 2020).

Comparing Nationally Determined Contributions and Long-Term Strategies texts, a greater emphasis was observed on low-carbon transition and government and business partnerships in the Long-Term Strategies than Nationally Determined Contributions, with developed countries exhibiting a higher likelihood of reflecting these topics overall. This finding is in line with the fact that 86 per cent of developed countries have committed to some form of long-term net zero or carbon neutrality target. In contrast, only 45 per cent of developing countries have made such a commitment, and 63 per cent of Long-Term Strategies texts are from developed countries (Net-Zero Tracker).

However, growing recognition of non-state actors in national climate policy texts does not necessarily translate into a more vigorous integration and alignment between the national state and non-state actors. Based on the analysis of updated Nationally Determined Contributions and Long-Term Strategies documents, two primary conclusions stand out: 1) a general lack of alignment between non-state actors and the UNFCCC national policy processes, and 2) the need for enhanced capacity on monitoring and reporting to support non-state actor integration. These conclusions are further elaborated in the following sections.

Missing Non-State Actor and National Coordination

The results show that despite developing and developed countries' growing recognition of non-state actors, only vague references to how non-state action will be aligned with national objectives and implementation are made in national climate policy texts. It was found that Nationally Determined Contributions and Long-Term Strategies texts were broad and cursory concerning non-state actors, making only passing reference in statements that referred to all relevant stakeholder groups involved in updating the Nationally Determined Contributions but failing to clarify how to achieve joint coordination.

For example, the United States' Long-Term Strategies states: "Already, many non-governmental organizations are acting ambitiously to address climate change within their operations or support the overall transition of the U.S. economy. Even more broad-based engagement on research, education, and implementation through our universities, cultural institutions, investors, businesses and other non-governmental organizations will be required to reach our 2050 goal." More detailed statements regarding exactly how the engagement of non-state actors will help the United States achieve its 2050 net zero emissions goal are not specified in the 65 pages of the U.S. Long-Term Strategies.

Similarly, China references in its Nationally Determined Contribution that "Support is being given to peaking pioneers from localities, sectors and companies," but does not specify how or what support. Costa Rica's Nationally Determined Contribution reflects a more distant approach, stating its commitment "to promoting the empowerment of civil society, the public and private sectors, and academia in matters of climate change so that they take ownership of climate action and can lead from their spaces of action." The United Kingdom's Long-Term Strategies similarly takes this approach, with a passage referencing the need for "every company, bank, insurer and investor to adjust their business models, develop credible plans for the transition and implement them" in the context of topics 6 (low-carbon transition) and 8 (government and business). While Long-Term Strategies documents show a more substantial prevalence of business transition topics 6 and 8 (see Figure 4.4b), the examples above clearly show that they fail to provide more detailed information, similar to the texts of Nationally Determined Contributions.

Based on the topic analysis results and the context from the Nationally Determined Contributions and Long-Term Strategies documents, there is clearly a lack of integration and alignment of climate objectives and actions by non-state actors with those by the national governments. These results confirm the observations of Elsässer et al. (2022), which also found increasing fragmentation and complexities in global environmental governance despite growing interactions among transnationally operating institutions. The repeatedly stated need for identifying, consolidating, and aligning institutional arrangements and ministries suggests a persisting lack of national and international guidance, coordination and governance.

Need for Enhanced Capacity on Monitoring to Support National and Non-State Actor Coordination.

The cursory consideration and lack of non-state actor integration in national policy documents could be attributed at least partly to the limited capacities to monitor and coordinate action between national institutions and non-state actors. Effective monitoring arrangements underpin successful solutions and are relevant to both local and international cooperation (Haas, Keohane and Levy 1993; King 1997). Widerberg and Stripple (2016) found that monitoring and reporting have been crucial to creating successful transnational multi-stakeholder partnerships. Atkinson et al. (2017) state that the "vast majority of locally based self-organized climate change groups" are "fragmented and embryonic" and even "lack the capacities/ resources to engage" with broader non-state actor networks, which prevents "mutual learning" and "concerted action."

Despite the acknowledged importance of monitoring and evaluation, many developing countries still lack institutional capacity (Aldy 2018). Such capacity limitations are even greater for many non-state actors (Hsu et al. 2019; Hale 2020; Hsu, Tan et al. 2020). In the Hsu et al. (2019) analysis of the initial Nationally Determined Contributions, the "monitoring and information sharing" topic had a stronger focus on "defining methodological approaches," "research" and "implementation." Further, Chan, Ellinger and Widerberg (2018, p. 28) found that "only 44 per cent of actions launched at the 2014 UN Climate Summit have monitoring arrangements in place." The findings, particularly regarding the monitoring and evaluation topic 1), confirm these previous results – general terms, such as "capacity support," "finance," and "budget" in the monitoring and planning topic, and 2) suggest that there may be financial constraints or capacity limitations that might stymy monitoring.

In conclusion, the analysis here shows that the current level of integration of non-state actor action in the Nationally Determined Contributions is very limited, and even the new and updated Nationally Determined Contributions submitted over the last couple of years only present some sporadic improvements, but with limited systematic integration. Strengthening the integration is beyond pure harmonization going to face issues of data availability, capacity constraints, confidentiality concerns, etc.

5 Examples of Linking Non-State Actor and National Reporting Efforts

At the international level, a limited number of initiatives aim to improve the links between national and non-state actor action and reporting. The main international (and a few national) initiatives are presented here along with a discussion of related experiences.

5.1 UNFCCC's Global Climate Action Portal

The Global Climate Action Portal and some of the overview figures were presented in chapter 3. While the portal is certainly the most complete showcasing of non-state actor climate actions to date, it does not directly accept submissions from non-state actors themselves. Out of necessity, since the UNFCCC has not been given the mandate or resources to directly collect and process data, the Portal is using a network of a dozen or so data providers, including CDP and the Global Covenant of Mayors, among others, to provide data. The process to transfer data from these providers to the Global Climate Action Portal is manual and time intensive, which means that the portal is currently only updated on an annual basis and does not include all non-state actor actions, although it strives to be as complete as possible.

The Global Climate Action Portal's reliance on other data providers puts some restrictions on the data reported – the progress indicators page, for example, was designed in collaboration with CDP, who regularly surveys cities, states and regions, companies and investors to reflect the data available through the CDP questionnaire rather than building a comprehensive framework of progress monitoring (Hale 2020), which would be much more demanding but more compatible with national reporting formats. For most actors, progress data are unavailable on the Global Climate Action Portal, limiting its functionality to a "declaration platform" rather than a non-state actor tracking tool, which is much needed in the context of the Global Stocktake. Since most non-state climate action occurs from entities in the Global North (Hsu et al. 2016; NewClimate Institute et al. 2021), the Global Climate Action Portal is inherently predisposed towards these countries.

This is not meant as a critique of the current efforts but more an expression of what would be desirable, if the resources were made available. While the UNFCCC has made a concerted effort to showcase non-state actor and cooperative initiatives from the Global South, the Global Climate Action Portal still reflects and showcases the clear dominance of actors from developed countries. This Global North focus is specifically problematic where it fails to capture the pledges from developing country non-state actors, including China and countries in Africa and Southeast Asia (Hsu et al. 2016).

5.2 Methodologies for Integrating Non-State Actors' Climate Actions in National Climate Policy Evaluation: The Initiative for Climate Action Transparency

ICAT[28], funded by a broad group of countries and philanthropies, is a multi-stakeholder partnership among several governments, non-profit and inter-governmental organizations, including the United Nations Environment Programme, the World Resources Institute, and the GHG Management Institute, among others. Its mission is to provide countries with support, tools and methods to build robust transparency frameworks to align effective climate action with national development goals. ICAT has prepared an assessment guide called the ICAT Non-State and Subnational Action (NSA) Guide to assist policy-makers and analysts in determining the impact of non-state actions (Lütkehermöller, Elliott and Singh 2020). Although tracking progress of non-state actors is not mandatory under the Enhanced Transparency Framework, data on non-state actors are vital for a better understanding of the full scope and scale of domestic mitigation efforts and complement national monitoring, reporting and verification systems (Lütkehermöller, Elliott and Singh 2020).

ICAT's goal is to improve awareness about non-state and subnational actions and to facilitate coordination and communication between national entities and non-state actors for efficient implementation and aligned decision-making. Improving the "understanding of climate actions at different scales and by different actors in a country can support the development of realistic and comprehensive targets, support effective policy planning to achieve the temperature goal of the Paris Agreement, and help countries identify promising subnational and non-state approaches that can be scaled up or supported by the national government or other partners" (Elliott et al. 2022).

Variations in emissions inventory assumptions and methodology complicate individual assessments and the comparability of results (Lütkehermöller, Elliott and Singh 2020). These variations result from climate policies and commitments not being expressed uniformly. Accordingly, the estimated impacts of non-state actor actions often need to be converted or harmonized into common metrics. Additionally, methodologies are evolving freely and may require numerous assumptions and considerations that might differ across actor groups. Lastly, data limitations, such as access and availability, may pose a significant challenge for users and influence whether specific actions can be included in the national impact assessment (Elliott et al. 2022).

[28] See: https://climateactiontransparency.org.

To assist with these methodological challenges, ICAT has developed guidance documents and tools such as the ICAT Climate Action Aggregation Tool (CAAT), which provides a way for policymakers to evaluate the mitigation potential of non-state actor actions to increase national ambition beyond existing targets. They have also worked with selected countries, including Colombia, India, and Mexico, to provide in-depth case studies for how national governments can account for non-state actor climate actions within the context of Nationally Determined Contribution planning and updates. In Colombia, for example, the ICAT Non-state and Subnational Action Assessment Guide was implemented to help inform the country's updated Nationally Determined Contribution and refine accounting protocols for measurement, reporting and verification of private sector and city-level actions (ICAT).

A recent paper by ICAT and the World Resources Institute (Elliot et al. 2022) analyses the experience with the use of the guide in a few selected countries and concludes that there are a number of challenges getting many actors to apply similar methodologies in a transparent and comparable way, and some actors are lagging on the action with no clear incentive to do so. The study does, however, also conclude that assessment of non-state actor actions is critical to understanding who is or should be taking action and how this can support governments in meeting the pledges in their Nationally Determined Contributions.

5.3 Country Examples

Fossilfritt Sverige or Fossil Free Sweden is an initiative launched by the Swedish government that aims to foster dialogue and cooperation between the national government and non-state actors (Chan, Ellinger and Widerberg 2018). The initiative began in 2015 in direct response to the Lima-Paris Action Agenda. Galvanized by this Agenda, the Swedish government initiated Fossilfritt out of a recognition that its climate policy efforts need support from non-state actors, particularly large companies and cities, to implement national targets but "also to influence national policy processes and negotiation positions" (Chan, Ellinger and Widerberg 2018).

Through Fossilfritt Sverige, organizations are asked to report their efforts to reduce emissions to NAZCA rather than having entities report separately through their platform, lending international transparency to these non-state actor efforts. The initiative includes 450 private actors, such as businesses and trade associations, and subnational governments and entities, such as municipalities, county councils, regions, county boards, and civil society, including educational and research organizations (Nasiritousi and Grimm 2022; Fossilfritt Sverige n.d.).

Denmark provides another example where 95 out of 98 municipalities have engaged in the DK2020 initiative, which aims to advance the goals of the Paris Agreement at the city level (Realdania 2020). In the programme all municipalities prepare a comprehensive climate plan including both emission reduction actions and relevant adaptation needs. DK2020 is modelled after the C40 Climate Action Planning Framework, an ambitious standard for climate action accounting that requires members to report all scopes of emissions – 1, 2 and 3 – in accordance with the Paris Agreement, which Danish municipalities had not been reporting in full prior to the initiation of DK2020 (Coulombe, Maya-Drysdale and McCormick 2022).

CONCITO, Denmark's green think tank, works with KL – the association of all municipal authorities – and Realdania, a non-profit, to advise municipalities as they develop their own climate action plans. The fact that almost all municipalities take part provides a unique opportunity to analyse how the aggregate municipal plans compare to the national climate plan and if there is scope for improved national ambition.

Chile has also made efforts to improve accounting systems, tools and the capacity of subnational actors, working with the ICAT initiative (ICAT). The national government has established a carbon neutrality goal by 2050 and requires the development of subnational climate action plans. Recognizing the need for subnational entities to create climate action plans grounded in science, Chile's national government has been working together with subnational stakeholders to evaluate existing climate action systems and tools to design locally appropriate mitigation actions that are aligned with the national target. This effort is an example of how a national government is coordinating with subnational actors at the outset of establishing country-level goals and building capacity from the bottom up to create a comprehensive monitoring, reporting, and verification system that will include non-state actors.

6 Digital Technology Opportunities for Improving Climate Data Quality, Transparency and Harmonization Across National and Non-State Actors

In parallel with the evolving transparency efforts on both the national and the non-state actor side, digital technologies offer an increasing number of new opportunities for data collection, analysis and sharing. This chapter presents some of these new developments and discusses several recent initiatives that have emerged with the aim to improve especially climate data management and use.

A number of data-related issues exist in the current transparency efforts by states and non-state actors that, if addressed, could enhance the possibilities for delivering more comprehensively on the ambitions of the Paris Agreement:

- Enhancing data scalability to better enable the capture of data from all actors at various scales across sectors, requiring a different magnitude of actors and related datasets than currently possible;
- Improving data granularity for better tracking of mitigation progress, and enhancing the data quality to better and more credibly utilize the opportunities of carbon markets and climate finance while addressing the risks of double counting and greenwashing;
- Enhancing granularity in spatial, temporal, and sectoral coverage, as well as the timeliness of access to data to reduce information asymmetries, enabling data-driven decisions for policymakers and decision-makers;
- Offering possibility to lower the costs of monitoring and reporting significantly, and as these costs currently are mostly covered directly by non-state actors and countries themselves, it is often limiting data availability where most needed;
- Nesting climate action data to allow for the attribution and support of local and regional action at the national and international levels to enable aggregation and comparability of data across actors.

Given the magnitude of actors and datasets required, a decentralized approach is one possible way to address some of the challenges associated with existing climate accounting. Digital technologies, such as Internet of Things sensors, machine learning and distributed ledger technology (DLT, commonly known as blockchain) could enable new ways of data collection, processing, and ownership, leading to more efficient data flows across all actors (Hsu, Khoo et al. 2020; Kloppenburg et al. 2022; Schletz, Hsu, Mapes et al. 2022). In the subsequent sections, more detail is presented on where and how such digital approaches and related technologies can offer innovative solutions to the current issues and limitations.

6.1 What Are Relevant Digital Technologies to Address Current Climate Data Limitations?

There are multiple areas in which digital technologies can address current climate data limitations. Here they are divided into digital MRV to scale up data collection, coverage and granularity, as well as data governance for supporting interoperability and decentralized ownership of climate data.

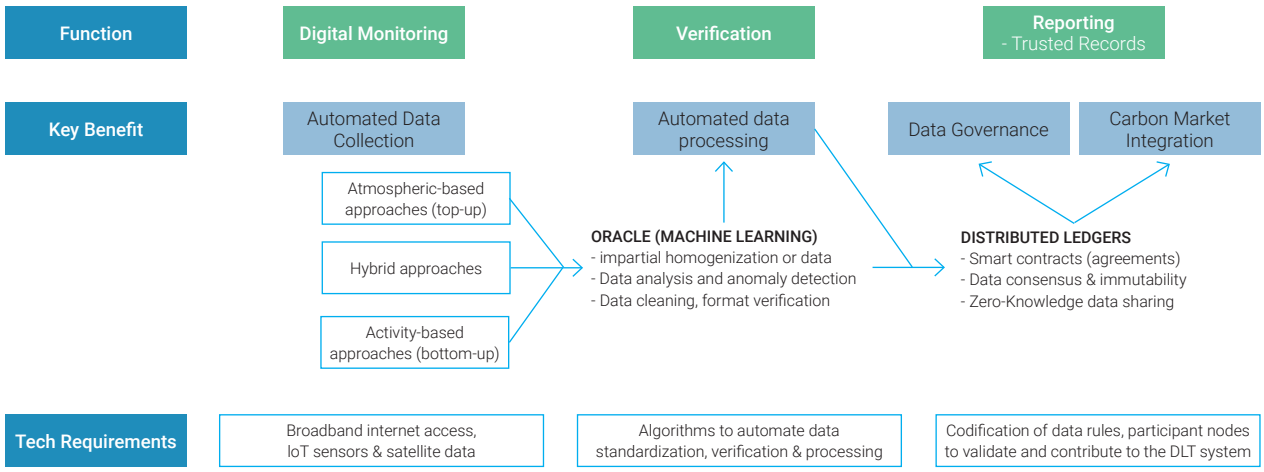
Digital MRV

Current data availability is insufficient to hold actors accountable and to provide sufficient incentive to create the ambition needed for the Paris Agreement goals, both in terms of coverage and in terms of granularity. An alternative system would therefore require increasing data availability and quality while not making reporting prohibitively expensive. The costs associated with monitoring and reporting are already a key obstacle, particularly for developing countries and non-state actors.

Many countries are in the process of developing national data web platforms and are moving gradually towards more automatic and systematic data collection and reporting processes, and this is clearly a direction many countries want to go.

Digital MRV can in this way gradually automate monitoring, reporting and verification procedures to reduce the complexity involved in the conventional highly manual data processes (Climate Ledger Initiative [CLI] 2019; Belenky et al. 2022; Social Alpha Foundation [SAF] and UNEP 2022). Digital MRV "will reduce the cost of generating carbon assets, increase the transparency and security of carbon market transactions, and even make it possible to tokenize carbon assets; conduct intermittent, system-wide verification of monitoring systems; and move towards real-time generation of carbon credits" (Belenky et al. 2022). The combination of data sensors, machine learning and blockchain enables the automation of data collection, processing and quality control, and dissemination (Schletz, Hsu, Mapes et al. 2022) (see Figure 6.1).

Figure 6.1 Digital MRV functionalities, components and requirements



Source: Authors

Data collection or monitoring can follow three general approaches: activity-based, atmospheric-based and hybrid (National Academies of Sciences, Engineering, and Medicine [NASEM] 2022):

- Activity-based approaches (often referred to as "bottom-up" approaches) generally utilize activity data – a term referring to representative indicators or drivers of greenhouse gas emissions such as fuel consumption statistics, traffic counts, population or land area. To achieve an estimate of greenhouse gas emissions, these activity measures are transformed using a conversion factor such as an emission factor– the emission or removal of a greenhouse gas per unit of activity as provided by the Intergovernmental Panel on Climate Change in its Guidelines for National GHG Inventories (IPCC 2019). In addition, Internet of Things sensors can be used to automate the collection of source-specific data, using for example smart meters, sensors and actuators (Hsu, Khoo et al. 2020).

- Atmospheric-based approaches (often referred to as "top-down" or "Earth observation (EO)" approaches) use atmospheric measurements of greenhouse gases and an understanding of atmospheric transport and chemical processes to infer information on greenhouse gas fluxes (emissions and sinks). Surface, aircraft and space-based observations are combined with analytical approaches and models to transform measurements of atmospheric concentrations into estimates of emissions.

- Hybrid approaches generate greenhouse gas emissions information through the combination and more complete integration of activity- and atmospheric-based approaches, and/or other data sources, data assimilation or emerging digital technologies. For example, an activity-based approach using multiple overlapping core datasets could be further constrained by atmospheric-based estimates. Hybrid approaches are nascent and hold the possibility of combining multiple measurement streams, atmospheric-, and activity-based approaches to produce more complete and accurate estimates of greenhouse gas emissions and sinks.

To date, machine learning approaches have been applied in four broad categories related to Earth observation (EO): feature classification (e.g., land use or land cover and land cover change), anomaly, target, and change detection, and regression-based methods (e.g., estimating a variable of interest such as greenhouse gas emissions from a set of underlying predictor variables) (Salcedo-Sanz et al. 2020; NASEM 2022). Here, machine learning trains a computer to "learn" and identify relationships with data inputs to improve the performance of traditional data fusion algorithms and approaches (Meng et al. 2020).

In hybrid approaches, machine learning provides automated data processing and potential verification of the collected data (Rolnick et al. 2022). The sensor-enabled availability of large datasets of close to real-time data allows for the triangulation between data sets as a reference for consistency checks (Marjani et al. 2017; Howson 2019). Machine learning can model complex, non-linear and non-parametric relationships between data to achieve potentially more complete and newer greenhouse gas emissions information (NASEM 2022). These machine learning algorithms and machine learning-powered models can take a series of data inputs to train a model to uncover statistical patterns, making predictions on new, "unseen" data (Huntingford et al. 2019; Milojevic-Dupont and Creutzig 2021). However, these machine learning algorithms are also criticized as a "black box" due to their complexity and often difficulty in interpretation, potentially undermining the transparency needed for credible greenhouse gas accounting (Castelvecchi 2016).

These machine learning approaches are now being applied to massive datasets, incorporating multiple data types, and often integrated within emerging digital infrastructures (e.g., blockchains, distributed ledgers) (NASEM 2022). Blockchain is a novel way that allows for distributed data ownership and management, thereby providing new answers to data governance questions, such as who shares what data with whom and who has access to what data. Blockchain decentralizes data ownership and governance by distributing data ownership across a network of "nodes" that each hold a copy of the

entire information ledger, allowing individual actors or agents to contribute information and create consensus on which information should be added. For greenhouse gas data, each actor could integrate their accounting system as a node to contribute their data (NASEM 2022; Schletz, Hsu, Mapes et al. 2022).

Blockchain enables approaches that offer a balance between privacy-preserving and trusted, verified data to maintain transparency (Schletz, Hsu, Mapes et al. 2022). Such approaches are called verifiable credentials, decentralized identifiers, and Zero-Knowledge proofs (ZKPs) and help to manage anonymity, auditability, revocability and traceability (Ben-Sasson et al. 2015; Sporny, Longley and Chadwick 2019; Hyperledger 2021). Blockchain stores the data using cryptography and timestamping to make the history immutable and data within the system tamper-resilient and very difficult to defraud (Kewell, Adams and Parry 2017; Franke, Schletz and Salomo 2020). In addition to data management and governance functionalities, blockchain can also improve carbon market integration through facilitating the creation and traceability of assets, such as tokenization and the creation of non-fungible tokens (NFTs) to better link climate data to the specific asset as metadata (Dong et al. 2018; Franke, Schletz and Salomo 2020).

Data Governance and Interoperability

At the same time, the emergence of these digital MRV approaches also raises questions regarding the reconciliation of diverse data accounting systems, needing to combine new and traditional climate data approaches. Hybrid approaches need to create interoperability across Earth observation data, non-traditional data (e.g., open social activity data) and digitally enabled collection of other relevant data. Here the open exchange of data between different data systems, types and standards is a key consideration with respect to integrating the influx of new datasets and sources while maintaining traceability and trackability (Sudmanns et al. 2020; NASEM 2022). Creating such interoperability requires two basic components: a data harmonization approach and a digital infrastructure (see Figure 6.2).

Data harmonization deals with the comparability of data across a wide range of formats and approaches. Data taxonomies, or schemas, are critical for finding parsimony between distinct datasets and utilizing machine learning-based approaches for deriving data-driven insights. Such taxonomies allow for entity matching or unit conversions across different data accounting systems or the comparison between different data collection approaches, such as remote sensing technologies, digital MRV approaches and the methodologies of the Intergovernmental Panel on Climate Change that are currently the most common.

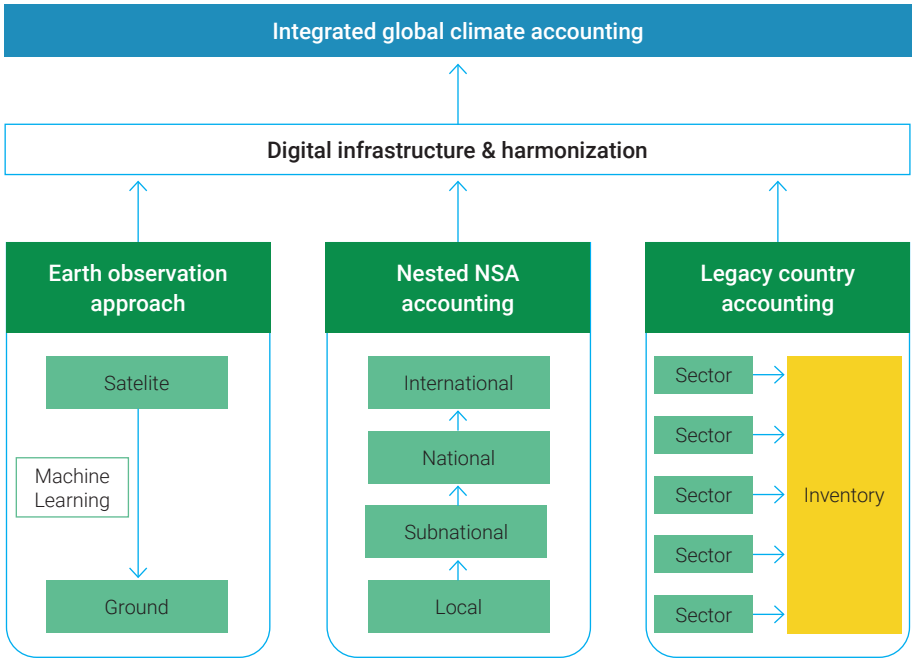
Comparing data from different, independent systems and approaches helps to validate data, and also helps to identify non-coherent sources so that the data collection can be improved. In the context of data harmonization, developing machine learning approaches that can support the matching of data sets is an important area to increase the scalability, as manual data matching will no longer be possible for the data volumes that we will see in the future. An example of such a machine learning approach for data harmonization is the ClimActor package that harmonized more than 10,000 city and regional data into a global dataset (Hsu, Yeo et al. 2020).

Digital infrastructure is needed to create interoperability and automate data flows among the various data systems and approaches. Automating the information flow makes data available in closer to real-time to support policymakers and other decision-makers to create relevant incentives and appropriate governance design. Here, blockchain provides promising possibilities to create a platform of platforms that aggregates and shares data in a decentralized way (Notheisen, Cholewa and Shanmugam 2017; Seidel 2018; Cong and He 2019; Franke, Schletz and Salomo 2020). In contrast to other centralized data management systems, blockchain distributes all data across a network of "nodes" that can all hold a complete account of all data (Kewell, Adams and Parry 2017). These nodes can be allocated to the relevant entities that can then use these nodes to contribute data and decide on data governance decisions, such as for example enforcing the rules of the network (Bano et al. 2017).

As an example, the OpenClimate project (www.collabathon.openclimate.earth) aims to be an integrated accounting platform with a particular focus on subnational and non-state actor climate data to improve nested non-state actor accounting. OpenClimate seeks to combine climate data across governance levels – from local to international – to address present reporting delays and information asymmetries (Wainstein 2019). Given these layered governance levels of climate actors, it is important that the data are "nested" into an integrated system. In nested accounting, emissions are accounted for at one level of analysis (e.g., the local level for a specific project or facility) and then factored into higher levels, such as the municipality, region and country (Wainstein 2019; Schletz, Hsu, Mapes et al. 2022).

Nesting climate data becomes particularly important in the context of carbon markets when the ownership of an emission reduction unit is transferred from one jurisdiction to another, to prevent that this unit is used by multiple actors at the same time (double-spending). The importance of nested accounting was recently recognized in guidance for the Article 6.4 market mechanism, stating that "to avoid double-counting the concept of "nested accounting" – where emissions are accounted for at one level of analysis (e.g., a specific improved forest management (IFM) project) and are factored into emissions at a higher level of analysis (e.g., a Party or group of Parties)" (UNFCCC 2022e, p. 16).

Figure 6.2 Digital integration of different data collection approaches



Source: OpenClimate

In this way, blockchain serves as an aggregation platform, a "clearinghouse" or meta-registry, linking all heterogeneous emission systems in one decentralized and shared platform. Such a decentralized platform is particularly relevant in the context of carbon markets, to enable the creation and settlement of carbon market transactions as envisioned by Article 6 of the Paris Agreement (Dong et al. 2018; Jackson et al. 2018; Schletz, Franke and Salomo 2020; NASEM 2022). Similarly, with the growing focus on holding non-state actors accountable, there is an increased need for mechanisms to assess actor progress without significant delays.

Currently, most climate data are transferred and submitted manually, particularly at the national and international scale, leading to significant delays and information asymmetries. For example, the new Biennial Transparency Reports from all national Parties are collected on a bi-annual basis with an expected one year for the review period, and the Global Stocktake will only be convened on a five-year basis. This scheduling means that parts of the data that feed the national and international decision-making will be at least two and up to five years old and likely already dated when they are fully available.

In view of this situation, there a growing interest in both the scientific and policy communities in developing such a digital infrastructure for a potentially global climate data platform, and some of the larger initiatives are described in next section.

6.2 Which Initiatives Are Currently Developing Digital Climate Data Solutions?

A rapidly growing number of institutions are joining the climate data space, with the aim of leveraging digital technologies to improve climate data accounting. All these institutions typically come together in various consortia or communities of actors to generate and integrate climate data (see Table 6.1). While these initiatives strive to improve climate data quality and increase interoperability, they have different (governance) approaches. Also, the primary scope varies among the projects – from enhancing corporate accounting practices (One Planet and Carbon Call); to making regional, national, sectoral and installations data generally available (Climate TRACE); to supporting national registry and inventory reporting around climate markets (Warehouse); to integrating non-state and subnational data through "nested accounting" into national and international processes such as the Global Stocktake.

When examining the initiatives, it seems obvious that there are strong synergies and complementarity between them. If the aim ultimately is to create a new and better global climate data accounting system, then there will be a need to bring together as many as possible around a joint approach to avoid competing platforms, as is described earlier for the accounting systems.

Table 6.1 Overview of existing climate data initiatives that are using emerging technologies

Initiative	Primary Scope	Description
One Planet Data Hub	**Financial institutions**	The effort seeks to enhance transparency to monitor financial institutions. The initiative "will bring together international organizations, regulators, policy makers and data service providers to advise on the creation and design of an open-data public platform that will collect, aggregate, and standardize net zero climate transition data based on private sector climate commitments" (Bloomberg).
Carbon Call	**Corporate climate accounting**	"The Carbon Call mobilizes companies to report their emissions regularly, transparently, and comprehensively. Participating organizations representing the science, data, philanthropic communities, and intergovernmental organizations, will cooperate to improve access to underlying data and science that is reliable, up to date and can be easily exchanged among carbon accounting records (or what we refer to here as "carbon accounting ledgers") and the data ecosystems that support them." (Carbon Call 2023).
Climate Chain Coalition	**Climate finance and digital MRV**	An open global initiative of over 300 diverse stakeholders that uses blockchain and other emerging technologies (e.g., Internet of Things, big data) to mobilize climate finance and improve measuring, reporting and verification of climate actions for mitigation and adaptation (Climate Chain Coalition 2023).
Climate Ledger Initiative	**Digital MRV**	A platform that brings together representatives of developing and developed countries, international institutions, climate change practitioners and blockchain experts and entrepreneurs. The initiative seeks to leverage digital technologies such as the Internet of Things, artificial intelligence, sensors, remote sensing and blockchain to accelerate climate action in line with the Paris Agreement and the Sustainable Development Goals (Climate Ledger Initiative 2023)
Carbon Markets Initiative	**Voluntary carbon market, MRV**	The initiative aims to develop the transparency platform needed to scale a trusted voluntary carbon market. For this, it seeks to restore trust in voluntary carbon markets using emerging technologies to reduce the time and cost required for verification by researching cutting-edge technologies (e.g., blockchain, remote sensing, machine learning) (Song, Li and Ott 2022).
Climate TRACE	**Sectoral data, country, and global**	Climate TRACE ("Tracking Real-time Atmospheric Carbon Emissions") is a collaborative initiative with more than 66 contributors, including non-profits, tech companies, and climate leaders that uses satellite data, remote sensing, artificial intelligence and other data science to measure and track greenhouse gas emitting activities. (Climate TRACE n.d.)
Climate ARC	**Financial institutions**	Identifying and developing the frameworks, methodologies and standards needed to guide the direction and pace of net zero financing decisions. ARC curates data and information in a way that leads financial decision-making, works with partners to make data more accessible and develops new data solutions where there are gaps. It seeks to build the skills and assembling networks of people worldwide to integrate climate science into financial decisions (Climate ARC 2023).
Climate Action Data 2.0 & the Digitally enabled Integrated	**Non-state and subnational actor data**	The CAD2.0 community consists of more than 60 organizations and individuals working in existing data disclosure platforms to provide credible climate action information from regions, cities, businesses, investors and civil society (Climate Action Data 2.0 Network). The community leverages next-generation digital technologies to independently evaluate non-state actor contributions to global climate mitigation to enable a "digitally-enabled global stocktake."
World Bank Warehouse	**National inventories and independent standards**	A "meta-registry" that integrates data from various national governments and independent standards to create information linkages and enables the tracking of emission reduction units. It uses blockchain technology to create interoperability between various data and reporting systems.

At the same time, the different governance approaches of these initiatives make alignment and collaboration challenging. Especially in the corporate space, there are often restrictions around sensitive or proprietary data. This leads to inherent tensions and potential conflicts between enforcing "radical transparency" and the need to safeguard data (Hsu and Schletz n.d.). Accordingly, data governance is a critical issue for the international climate (data) community – for example, who shares what data with whom and who has access to what data. These questions need to be answered by the broader climate community, using an open and inclusive development approach to co-create the resulting "digital data commons" infrastructure. Many of the largest global data platforms and companies are engaging in this work, which may help accelerate the process but also risks making climate data a commercial commodity.

Infrastructure developed and maintained by a consortium of corporations poses the continued risks of monopolization of the digital data commons and is not aligned with the decentralized ethos of the Paris Agreement (Schletz, Hsu, Robiou du Pont et al. 2022). Kloppenburg et al. (2022) raise the risk of digital technologies to create ethical issues around privacy, surveillance, autonomy, fairness, transparency and accountability (Floridi et al. 2018). Accordingly, "attention needs to be paid to the wider political and normative context in which digital technologies are proposed, designed, and used as environmental governance tools" (Kloppenburg et al. 2022).

Such governance tools are implicated in an environmental governance that is diverse, heterogeneous, and fragmented in nature, causing existing power imbalances across scales of state and non-state actors (Gupta and Mason 2016; Hull, Gupta and Kloppenburg 2021). More specifically, they warn that "digitalized environmental governance tends to favour multi-stakeholder collaboration whereby private actors play an ever more central role in providing technology and data" (Kloppenburg et al. 2022). This leads to an increasing narrative and assumption that private companies with their data and technological solutions are needed to address these environmental challenges more effectively. However, the risks associated with surrendering environmental governance to private companies need to be considered (Schletz, Hsu, Robiou du Pont et al. 2022). In addition, there is a growing body of work that questions the rationales of "governing through transparency" (see, for example, Gupta and Mason 2016; Ciplet et al. 2018; Weikmans, van Asselt and Roberts 2020).

6.3 How to Move Forward on the Development and Implementation of Digital Climate Data Technologies?

The discussions in the previous section point at four key challenges for the adoption and implementation of digital technologies, which are aligned with the findings of Belenky et al. (2022) and the concerns raised by Kloppenburg *et al.* (2022):

- Lack of digital literacy to use emerging technologies;
- High upfront cost of digital technologies, which can be prohibitive;
- Data ownership and governance of potentially sensitive data and the digital commons;
- Need for harmonized methodologies for attribution/accounting.

The use of digital technologies presents new opportunities, and as always, such innovation is associated with high uncertainty regarding how the technology should be developed and used. Specifically in the Global South, the capacities for the development and testing of relevant technologies remain limited in many countries. A study by the Social Alpha Foundation and UNEP (2022) found that "there is a lack of digital literacy and capacity among enterprises and the public sector to leverage blockchain for energy, climate and sustainable development." Particularly in the local context, there is a lack of awareness of the potential of blockchain and insufficient digital skills (United Nations Department of Economic and Social Affairs 2017).

At the same time, countries in the Global South have to be key players in the adoption of these new technologies and could potentially benefit the most from the creation of an integrated global climate data accounting architecture. This would greatly improve accounting capacities and thus make it more suitable for participation in global climate markets and for receiving climate finance (SAF and UNEP 2022). Mittal (2019) states that "the importance of digital infrastructure to emerging economies cannot be overemphasized" and that "public policy additionally needs to encourage stakeholders to pursue collaborative business models to encourage greater use of the infrastructure and to help expand the demand for digital services across different sectors of the economy. Given the broadening scope of digital services, it's also imperative to modernize policies and regulations to encourage investment and innovation throughout the digital environment." Also, many countries in the Global South have a history of leapfrogging new technologies (for example, mobile phones).

Accordingly, there is a strong need to find ways of supporting digital literacy and to build capacity to better understand and utilize the digital technologies presented here. At the local scale, technology-oriented innovation hubs can support the formulation of digital technology solutions. These innovation hubs can steer social learning and nurture the local capacity to identify local sustainability challenges where blockchain digital technologies can be translated into solutions (Mittal 2019). For the scaling up of local solutions, Peng, Wei and Bai (2019) found that establishing horizontal linkages, for example within city networks or academia, can improve the transfer of knowledge and learning across groups. In addition, such capacity-learning requires the integration of local, regional and national actors to bridge social-ecological, temporal and jurisdictional scales of multi-level governance (Bulkeley 2013). There is likely also a generational information technology literacy divide, where the younger generations are much more exposed to new technological solutions and platforms, so finding a way of engaging youth in this process could be instrumental.

The initiatives presented in the previous section demonstrate the interest and capacity of primarily non-state actors to participate in and even push for the development of digital technologies. Such initiatives also show an ability to develop digital literacy and the capacities needed. For example, the World Bank Warehouse[29] conducted three simulation rounds with national governments. The Climate Ledger Initiative[30] "brings together representatives of developing and developed countries, international institutions, climate change practitioners and blockchain experts and entrepreneurs." In addition, the CAD2.0 community hosted a Datathon[31] that "is expected to facilitate the understanding of data related to the technical dialogue of GST1 and could contribute to the assessment of collective progress."

6.4 How to Co-Create Innovative Solutions and Make Them Accessible?

For the development of solutions to such a major technological challenge, the innovation literature recommends so-called dynamic prototyping approaches (Schloesser, Riesener and Schuh 2017). These approaches are characterized by the iterative development of prototypes as functional system increments (Riesener et al. 2019; Peña Häufler et al. 2020). Rather than developing the entire prototype or here a data system in one phase, the technology architecture needs to be created dynamically, following a bottom-up and co-creative approach with all relevant participants included to reflect the climate data ecosystem needs. Experience from other fields shows that complex technological solutions cannot be built out in a single instance but usually require a number of iterations along the development path (O'Connor and Rice 2001; O'Connor and McDermott 2004). Developing pilots in a number of coordinated local settings is one way to offer such dynamic and iterative testing to continuously improve digital technologies and grow the knowledge base (Belenky et al. 2022).

Many developing countries currently lack the necessary technologies, starting with basic necessities such as broadband internet access, to more advanced technologies such as smart meters, sensors and all corresponding standardization, preventing the generation of quality data (GEF 2019). Here, governing bodies in the countries will ultimately be responsible for establishing the required digital infrastructure, but many countries will require financial, organizational and technological support (OECD 2019).

So while digital MRV has the potential to make climate data accounting more streamlined and cost-effective over time, it also introduces increased complexity and requires significant upfront investment in equipment, capacity-building and development of the underlying digital infrastructure (Belenky et al. 2022). Once in place, the cost of scaling or replicating a digital MRV system will be less than for a conventional MRV system, and scaling becomes easier due to the modular structure of digital MRV systems. Developing financial mechanisms to cover the upfront costs for developing countries and scaling digital MRV systems will be important to make the technologies available (Mittal 2019).

One possible financial mechanism could be to link the development to the creation of carbon assets in carbon markets, as assets generated with digital MRV could provide significantly higher data quality and should thus also yield a greater economic return per unit, as risks and uncertainties related to greenwashing and double counting are reduced. Also, initiatives mentioned earlier that are providing funding and resources for capacity building on transparency, such as the Capacity-building Initiative for Transparency (CBIT) and the ICAT, could potentially also support efforts in this area.

[29] See https://www.theclimatewarehouse.org.
[30] See https://www.climateledger.org.
[31] See https://www.openearth.org/cop27-datathon and https://unfccc.int/topics/global-stocktake/global-stocktake-governance-and-facilitation/the-global-stocktake-climate-datathon.

7 Conclusions and Recommendations

Coming back to the framing questions for this report presented in chapter 1, the results of the analysis are presented in the form of several conclusions followed by a number of recommendations for possible action.

How have national-level reporting and transparency efforts evolved over the last decades, and what learning does that provide for the non-state actor communities?

As described in chapter 2, the development of the transparency efforts for parties under the UNFCCC has evolved in a very gradual manner. This reflects the parallel improvement in scientific and political understanding of the complexity of the climate change problem and the incremental enhancement of institutional capacity and skills, especially in weak institutional settings in many developing countries.

With the Enhanced Transparency Framework, the transparency efforts have now reached a level where almost all countries will take part and provide the first compressive BiennialTransparency Reports next year. This is a major achievement backed by consistent and long-term negotiations and capacity-building support, and it will be very interesting to observe the quality of the Biennial Transparency Reports, when they are submitted.

Still, there are some outstanding issues that require political attention:

- The guidance for preparation of Nationally Determined Contributions will need to be strengthened and aim to harmonize target-setting, baselines and analytical approaches while maintaining full flexibility for integration in national planning. This is necessary to be able to better compare ambitions and achievements over time. The enhanced reporting requirements can provide a push for more details and clarity in the next round of Nationally Determined Contributions, but with the tight timing of Biennial Transparency Report submissions in 2024 and new Nationally Determined Contributions in 2025 this may be difficult.

- The in-depth review of Biennial Transparency Reports will be essential to distil the key findings and for gradual improvement of the reports over time, as was the case earlier with National Communications. The task of conducting so many reviews within the allocated one year will present a major challenge that does not seem to have been addressed yet in terms of allocating the necessary funds and linked to that build the team of qualified reviewers.

- The links between Nationally Determined Contributions and Long-Term Strategies also will need to be strengthened quickly to establish higher credibility of the many Long-Term Strategies and net zero pledges by governments. With the next Nationally Determined Contributions likely aiming for 2035, the development path in these new submissions really needs to be aligned with 2050 (or later) plans to remain credible.

As described in chapter 2, there have been significant learnings and experiences from the evolving transparency process. These experiences have been used throughout this report to assess the situation on transparency for non-state actors. The sheer size and heterogeneity of non-state actor engagement is an added complicating factor, but to quote the United Nations Secretary-General's Expert Group, the pledges and net zero emission commitments of non-state actors going forward must move forward as follows:

- *"Non state actors must annually disclose their greenhouse gas data, net zero targets and the plans for, and progress towards, meeting those targets, and other relevant information against their baseline along with comparable data to enable effective tracking of progress toward their net zero targets.*

- *Non state actors must report in a standardised, open format and via public platforms that feed into the UNFCCC Global Climate Action Portal to address data gaps, inconsistencies and inaccessibility that slow climate action.*

- *Non-state actors must have their reported emissions reductions verified by independent third parties. Special attention will be needed to build sufficient capacity in developing countries to verify emission reductions.*

- *Disclosures ought to be accurate and reliable. Large financial and non-financial businesses should seek independent evaluation of their annual progress reporting and disclosures, including opinion on climate governance, as well as independent evaluation of metrics and targets, internal controls evaluation and verification on their greenhouse gas emissions reporting and reductions."* (HLEG 2022)

The country transparency process has shown how the large and more developed actors move first, and how with financial and technical support the smaller and less resourceful actors can gradually participate more fully. The main difference is that implementation will need to be much faster given the increased urgency of the climate challenge. But since plenty of experience is available on

harmonizing transparency efforts, and non-state actor engagement in some areas has already started to move towards more comparable and harmonized approaches, there is reason to believe that it will be possible to move quickly.

To what extent are pledges and actions of non-state actors included in the current national plans (Nationally Determined Contributions), and how can non-state and national-level climate action and reporting become more integrated?

The analysis in chapter 4 clearly shows an increased number of references to non-state actors in the texts of the new and updated Nationally Determined Contributions and Long-Term Strategies, which to some extent demonstrate growing recognition among national governments of the roles and contributions of non-state actors to climate action. However, growing recognition of non-state actors in national climate policy texts does not necessarily translate into a more vigorous integration and alignment between a country's state and non-state actors. Based on the analysis of updated Nationally Determined Contributions and Long-Term Strategies documents, two primary conclusions stand out:

- General lack of alignment and more formalized links between non-state actors and the UNFCCC national policy processes.
- Need for enhanced capacity for monitoring and reporting both in non-state actors and in government institutions to support integration of non-state actors.

These conclusions link with and support the recommendations by the United Nations Secretary-General's Expert Group presented in the previous section. Alignment and integration with countries' Nationally Determined Contributions will require a move towards a much higher degree of clarity and transparency of the pledges, plans and results of non-state actor initiatives. Many initiatives are supporting such a move, but with the latest CDP report documenting submissions from 18,600 companies – of which 4,100 disclosed that they had already developed a 1.5 degree Celsius-aligned climate transition plan – showed that less than half a per cent of the companies met the grade of disclosing information for 24 key indicators that CDP has judged as vital for a credible climate plan (CDP 2023).

A specific and significant challenge is how to deal with the emissions from multinational corporations given that they operate in many different countries and at the same time represent a large part of corporate emissions, especially if including the fossil fuel industry.

How credible are non-state actor pledges and how can current accounting systems be further strengthened and harmonized to provide improved transparency as a tool for enhanced mitigation ambitions?

- The first part of the question was addressed earlier in the report and is repeated in the paragraph above, clearly documenting that the answer is no – at least in general terms with some exemptions where companies and cities actually have delivered on promises. The number of pledges keeps increasing rapidly, and many actors are now dedicated to serious climate action, but for most of the actors there is a significant gap between stated ambitions and actual plans and actions.

The final part of this report focuses on how the situation can be improved. Here, some of the more detailed recommendations from the Secretary-General's Expert Group can set the scene:

- *"Working with policymakers and standard setters to align and implement schemes for standardised reporting to ensure comparability of disaggregated greenhouse gas emissions data from the pledges they cover, and to enable public access to disclosure of target delivery."* (HLEG 2022)
- A global central digital repository of climate disclosures that encompasses all reporting data points is needed (such as efforts to create the net zero Data Public Utility (NZDPU)). It is important that the open-source repository is:

✓ able to accommodate varied levels of reporting capacity;

✓ accessible to all users while enabling non-state actors across the world to upload information at no extra cost (e.g., an agreed electronic format that allows easy bulk extraction);

✓ able to include data quality information and data validation checks to ensure that it contains high-quality reliable and usable information;

✓ consistent with the recommendations of this expert group to the template and record level;

✓ overseen by the UNFCCC and feeds into its Global Climate Action Portal.

This is clearly not an easy task, as described earlier, but looking at historical examples of comparable efforts, the United Nations, in collaboration with other multilateral organizations (such as the World Bank and the Organisation for Economic Co-operation and Development (OECD)) seem well placed to play an essential role in supporting and coordinating the various initiatives towards greater alignment.

There are multiple historic precedents for the United Nations taking on such a role. In promoting financial accounting standards in 1982, the United Nations Economic and Social Council created the Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR) (Tschopp and Huefner 2015). The ISAR subsequently promoted internationally recognized accounting and auditing standards through research, technical cooperation and communication with member countries. Developing countries in particular benefited from ISAR, as it provided lessons learned that served as a guide for those countries that have implemented or were considering implementing these international financial reporting standards. Until comparable and consistent standards were developed, the quality of financial reporting was low,

investors found little value in financial disclosures, and companies were reluctant to report negative information. With a growing number of stakeholders, ownership increased, and useful and timely information and financial reporting became more valuable (Tschopp and Huefner 2015).

More recently, United Nations institutions supported the diffusion of corporate social responsibility (CSR) reporting standards through the Global Reporting Initiative and the Global Compact (United Nations Sustainable Stock Exchanges [SSE] initiative, 2015). ISAR has promoted CSR reporting standards since 2001 by publishing research papers and promoting the harmonization of these standards. Already in 2008, ISAR and the Global Reporting Initiative signed a memorandum of understanding aimed at promoting CSR reporting in developing countries (Tschopp and Huefner 2015). For CSR reporting, including the wide array of stakeholders involved, each with their own agenda, required an inclusive organizational structure and decision-making process to ensure that all stakeholder needs were addressed (Tschopp and Huefner 2015). Similarly, the United Nations Sustainable Stock Exchanges initiative, with support of, among others, the UN Global Compact, developed the Model Guidance on environmental, social and governance (ESG) reporting (UN SSEI, 2015), serving as a voluntary technical tool for stock exchanges.

These examples show the leading role that the United Nations has played in the development and harmonization of accounting standards. Taking on a similar role in the development of new climate data accounting approaches could be instrumental to harmonize existing data standards and create the capacities in developing countries to access and benefit from emerging digital technologies.

There is a clear and urgent need to incorporate and strengthen reporting of non-state actor climate efforts in national and international reporting processes for the UNFCCC and the Paris Agreement. As this report illustrates, national governments need to link their Nationally Determined Contributions and Long-Term Strategies with subnational government and private actors within their jurisdictions. Non-state actors working independently or collaboratively have substantial potential to contribute to national climate efforts in a variety of ways, including additional mitigation (Kuramochi et al. 2020), capacity-building or catalysing additional ambition from other non-state actors or national governments (Chan, Ellinger and Widerberg 2018). Closer linkages could further incentivize additional non-state actor action, generating a snowball effect since visibility and recognition at the national levels and within the UNFCCC could motivate additional non-state actors to participate and follow through on their actions (Wei 2016).

These conclusions and the underlying analysis lead to the following recommendations:

Recommendation 1: Ensure good understanding among the states and non-state actors of the benefits from more harmonised and integrated approaches for monitoring, reporting and verification (MRV) and climate data management.

Dedicated efforts are needed to ensure good understanding, engagement and support for such uniform approaches across all actors, and the benefits of engaging and complying will need to be communicated at all relevant levels.

Recommendation 2: Provide specific guidance for national governments to include and reference non-state actor actions in official communications and reports.

As previously described, the official UNFCCC reporting channels, the Enhanced Transparency Framework in particular, through the Nationally Determined Contributions / Long-Term Strategies and the Global Stocktake, does not have specific mandates or guidance for Parties to report non-state actor actions. This could include advice and guidance on how non-state actors can contribute to overall Nationally Determined Contribution formulation, ambition, capacity-building and implementation support measures. One way to improve non-state actor monitoring and coordination with national governments would be for the UNFCCC to provide a template or guidance to include specific details related to non-state actor actions.

A guidance document that could be used as an example, or an entry point for developing such a template of guidance, could be the ICAT guidance documents that provide options and considerations for countries to measure and account for the impact of non-state actor actions in a "forward-looking" manner to inform future climate action and Nationally Determined Contribution planning (Lütkehermöller, Elliott and Singh 2020; Elliott et al. 2022). At a minimum, the ICAT Non-state and Subnational Action Guide suggests identifying relevant city, region, and corporate actors and actions, determining their overlap with national policies, as a starting point to assess non-state actor contributions to and beyond country-level efforts. The ICAT Climate Action Aggregation Tool (CAAT) tool can then be one possible way to support national governments striving to quantify the potential contributions and impact of non-state actor mitigation actions.

Recommendation 3: Establish a central clearinghouse for country-level and non-state actor actions, utilizing digital tools to facilitate interoperability between existing and future datasets.

While the Global Climate Action Portal is currently a crucial component of the climate data ecosystem, it does not provide the necessary one single centralized platform capable of coordinating all these actors and systems. Such a platform would require financial and human resources and considerations about how it can build on and utilize the already existing independent platforms.

Since non-state actor data on emission inventories and climate actions are heterogeneous and dispersed across multiple platforms and domains, interoperability, defined as the open exchange of data between different data systems, types, and standards, is required to integrate the influx of new datasets and sources while maintaining traceability and trackability (NASEM 2022). In this case, a repository portal could establish standards and practices to help decision-makers and other data users understand the unique characteristics and quality of a diverse set of greenhouse gas emissions data and develop

a timely and comprehensive accounting of non-state actor climate pledges and progress.

Within this system, the idea of a federated data commons can play an important role. Federated data commons, in the form of a coordinated repository or federation of repositories, would enable non-state actors to contribute to national reporting voluntarily and, eventually, the Global Stocktake, without necessarily having to submit data directly to a centralized portal like the Global Climate Action Portal. Using digital infrastructure tools, individual datasets could be made interoperable through artificial intelligence / machine learning tools and then connected through a federated repository or data clearinghouse.

Emissions or other relevant climate action data from non-state actors at multiple jurisdictions and scales could then be aggregated at various levels to inform national and international accounting processes such as the Global Stocktake (Schletz et al. 2022). Such a coordinated repository could bring different types of information together and facilitate the integration of multiple types of data at various spatial scales. It could also bring together different types of information, facilitate the integration of multiple types of data at various spatial scales, and make the information available to decision-makers on time and in ways that meet their needs (NASEM 2022).

While creating a federated repository is a longer-term project for the global community, there are immediate steps that can be taken. Focused resource allocation or government purchases could bring data and methods into the public domain in accordance with transparency and open principles (for example, FAIR data principles, which stand for findable, accessible, interoperable and reusable) and have a significant short-term impact on greenhouse gas emissions data utility (NASEM 2022). Furthermore, data providers can facilitate data comparability and verification, as well as methods for fostering trust between data providers and users.

Recommendation 4: International institutions such as the UNFCCC Secretariat or UNEP could play a more active facilitation role in creating dialogues between non-state actors and Parties to enhance mutual understanding of actual and planned efforts.

The role of international environment and climate governance institutions has evolved, since many were initially conceptualized and designed in the early 1990s, including the UNFCCC. Since the Paris Agreement broadened participation beyond primarily nation-states to include city, region and private actors as well as international cooperative initiatives, scholars have argued that the role of the UNFCCC could expand from being a compliance or treaty mechanism to becoming more of an orchestrator (Abbott et al. 2016) of climate action, where a public actor can enlist intermediaries such as non-state actors in pursuit of common policy goals (Nasiritousi and Grimm 2022). According to Abbott et al. (2016), orchestrators could draw upon intermediaries, including partnerships and networks, to provide external monitoring of progress and compliance. In this way, monitoring responsibilities and accountability would be dispersed among multiple actors, increasing overall capacity within a global governance system.

UNEP, in particular, could serve a critical function in facilitating dialogue and knowledge-sharing between non-state actors, international cooperative initiatives and networks, and Parties to improve coordination and to better integrate accounting of climate efforts. This is already the case for the finance and insurance industries through the UNEP Finance Initiative. As evidenced by the need for guidance documents and tools such as ICAT and the ICAT Climate Action Aggregation Tool (CAAT), many national governments fail to account for climate actions and policies by non-state actors.

Recommendation 5: Support non-state actors in improving data collection and reporting through the use of digital technologies.

The United Nations Secretary-General Antonio Guterres has on several occasions called for greater scrutiny of pledges by non-state actors, particularly those that aim for decarbonization (UN News 2021), and at COP27 he specifically called for UNFCCC to play a decisive role in standardizing and verification of reporting by non-Party stakeholders.

A plethora of independent initiatives have been launched to improve the state of data on non-state actors, primarily corporate actors and financial institutions. The Secretary-General's Expert Group recommendations have already been presented, and, for example, Microsoft has partnered with UNEP, Climateworks Foundation, major accounting firms and other organizations to launch the Carbon Call to address corporate climate data interoperability and standardization. The Climate TRACE initiative, comprising more than a dozen start-ups, aims to use artificial intelligence and machine learning, combined with satellite remote sensing, to develop more detailed and timely bottom-up greenhouse gas emission inventories (Climate TRACE). Former New York City mayor Michael Bloomberg and French President Emmanuel Macron have teamed up to develop recommendations for improving data transparency and accounting for financial institutions (Bloomberg n.d.).

All of these efforts demonstrate growing global recognition that available, timely data documenting non-state actor climate actions, their impact and progress are critical to ensuring the credibility of non-state actors in the Paris climate governance system. While the establishment of so many initiatives is encouraging, there are also valid concerns about duplicative efforts, which could result in divergent accounting and reporting standards that threaten to make the existing fragmented, heterogeneous data accounting landscape on non-state actors even more incoherent. To the extent possible, leaders and proponents of these initiatives should ensure that whatever standards, templates and reporting practices are developed are transparent and can be made interoperable.

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