One Earth

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Commentary

From drumbeating to marching: Assessing non-state and subnational climate action using data

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The 2015 Paris Agreement emphasized non-state actors (NSAs) in climate action, but "greenwashing" concerns persist. The UN introduced a framework for NSA accountability through improved reporting. Yet, data remain inconsistent, especially in the Global South. We propose refining reporting, broadening data collection, and using innovative tech like AI for better tracking and accountability.

Building momentum for Paris

With a record-setting year in 2023 for global temperatures, it is abundantly clear that current efforts to curb climate change are falling painfully short, even in the wake of the landmark 2015 Paris Agreement. This groundbreaking climate treaty ushered in a new "all hands on deck" paradigm shift to tackling climate change, exemplified by the surge in voluntary commitments from a diverse array of entities. The number of businesses, financial institutions, and subnational governments, collectively known as non-state actors (NSAs), pledging climate mitigation, financing, and adaptation efforts has expanded from approximately 300 in 2014 to over 32,500 (Figure 1). These NSAs are addressing critical voids left by national government efforts, frequently pledging emission reductions surpassing the ambitions of national mandates and[1] contributing funding, capacity building, and on-the-ground implementation of specific climate actions. California is frequently regarded as the prime example of subnational climate leadership—establishing vehicle emission standards that catalyzed more stringent national regulations, alongside being a pioneer in setting a carbon-neutral goal. Companies, too, have set internal carbon prices and adopted renewable electricity consumption targets, even in the absence of regulation requiring them to do so. Collectively, NSAs have been an essential driving force, lending crucial impetus to the drumbeating for securing global climate coordination while setting the tempo and cadence for advancing the pace required to keep goals within reach.

Yet, as the first Global Stocktake concludes, has this drumbeating translated into a marching of real action, effectively addressing gaps in action and implementation? To answer this question, it is critical to evaluate evidence of NSA actions' contributions and progress, and over the past 7 years since the Paris Agreement came into force, we've seen a mixed picture of both. Processes and platforms, exemplified by the UN's Global Climate Action Portal, have evolved to improve the recording of NSA actions, capturing crucial details such as their location, stakeholders, and nature. But these data show the inclusiveness of NSA efforts has not expanded as initially intended, revealing a shortfall in climate actions that encompass adaptation, resilience building, and nature-based solutions.[2] NSA engagement is further still skewed toward developed countries, particularly in Europe,[3] while there is an underrepresentation of Global South actors, particularly in reported self-disclosures of emission inventory and progress data to major reporting platforms like CDP (formerly the Carbon Disclosure Project). Even where data are available, they are often incompatible and incomplete, rendering aggregate analyses challenging and sometimes impossible. Amidst this variegated and diverse reporting and data terrain, there has been a notable push for increased standardization (such as the UN's High Level Expert Group on NSAs' net zero emission commitments, among others) in the methods by which NSAs disclose data as well as the need for interoperability—a buzzword exemplifying the need for seamless data exchange between platforms.

These gaps will require urgent attention if NSAs are to be held accountable for their commitments, given the absence of substantial data regarding their accomplishments. Despite the growing orchestration of subnational and non-state climate action, for instance through summits and mobilization campaigns, there is little evidence that NSAs' potential impacts are achieved. Studies have shown that only a fraction of European cities pledging emission reductions beyond the EU target were actually on track,[4] and a greater number have failed to pledge efforts beyond 2020 after the COVID-19 pandemic.[3] In fact, many non-state efforts often, and increasingly, fail to produce tangible and attributable outputs and positive impacts,[5] and more ambitious goals are often not achieved.[4] The absence of concrete results has prompted discussions at multiple policy levels. Together with emerging evidence of unsubstantiated and misleading climate claims by major corporations,[6] these findings triggered national governments and the UN to intervene to address NSA greenwashing and the lack of

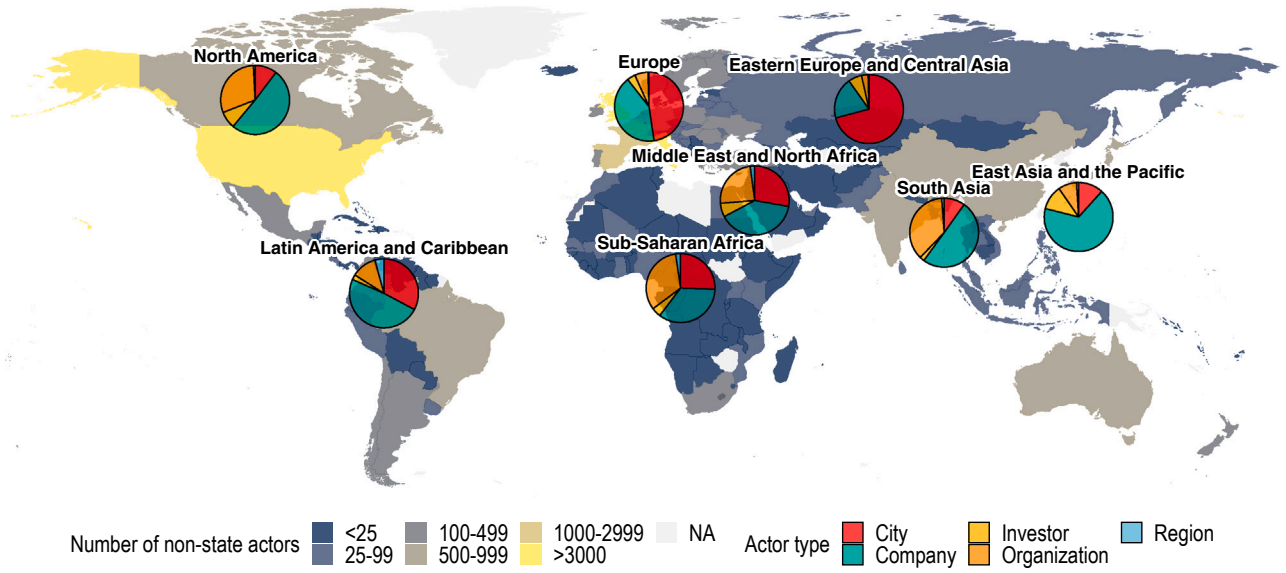

Figure 1. Global distribution of NSAs
Pie charts show fractions of NSAs for each geographic region. Data are from the UN's Global Climate Action Portal as of August 2023.[18]

accountability, particularly in the realm of net-zero target setting.

In response to this heightened focus on NSA accountability, the UN Climate Secretariat introduced a "Non-Party Recognition and Accountability Framework"[7] in June 2023. This framework would provide more stringent scrutiny, requiring businesses and subnational governments not only to regularly report on progress, as national governments are required, but also to have their targets, plans, and progress "independently verified." While at the time of writing the UN Climate Secretariat had just launched a consultation period for this proposed framework, the timing alongside the Global Stocktake's (GST) first conclusion is noteworthy since it suggests a new era of accountability that places significant emphasis on data to deliver on climate commitments effectively. For this upcoming phase of NSA accountability to succeed, it is critical to identify key requirements for success by extracting lessons learned from the initial implementation period of the Paris Agreement.

Three steps to improve NSA accountability

The conclusion of the first GST offers a critical opportunity to design and standardize the next phase of NSA accounting and accountability. We offer three recommendations aimed at guiding the UN and other stakeholders' necessary investments to enhance NSA action tracking.

First, streamlining reporting processes is needed to integrate NSAs' data and efforts with national governments. The UN's proposed Non-Party Accountability and Recognition Framework introduces a parallel accounting approach to national governments' own reporting requirements under the Paris Agreement, necessarily introducing a two-track approach. It remains unclear how countries will integrate these two tracks since NSA action, in theory, is meant to help countries ratchet up the ambition of their nationally determined contributions (NDCs) over time through the GST's "facilitative, catalytic cycles."[8]

One way to achieve a better interconnection between various stakeholders is by adopting an ecosystem-based approach to aligning data and reporting standards, governance, and evaluation processes. The concept of a "net zero conveyer belt"[8] envisions a linkage between voluntary NSA initiatives, the UN's orchestration endeavors, and the multitude of standard-setting and regulatory bodies that must align if we are to deliver on societal decarbonization collectively. To kickstart the conveyor belt, however, the data shared between various elements of the belt must be coordinated: initiatives' goals should not conflict with regulatory standards, and efforts should be made to ensure data reported to an initiative align with regulatory requirements. Simplified data collection and reporting processes are essential to lower the reporting burden for individual NSAs and make overall aggregation and synthesis easier for data analysts and orchestrators like the UN Climate Secretariat. A recent example is the EU's proposed law to make green claims by companies reliable, comparable, and verifiable.[9] If the law passes, companies would need to provide evidence that assertions of carbon neutrality are backed by data that are accurate, complete, and up to date (i.e., reliable); able to be presented and compared to other data (i.e., comparable); and can be checked and validated by independent experts (i.e., verified).

Second, future iterations of the GST must expand the scope of NSA climate action tracking by including parameters that contextualize progress and ambition, necessitating a fundamental shift in measurement approaches. For more reliable evidence of ambition and progress, NSA reporting needs to extend beyond the sole numbers of emissions and the scope of action to include the representation of types of actions, actors, and geographies. Assessing representation can encompass inputs such as targets and financing, outputs such as policies and investment, outcomes like behavioral change, which can also help to ratchet overall ambition and impacts like improved social and

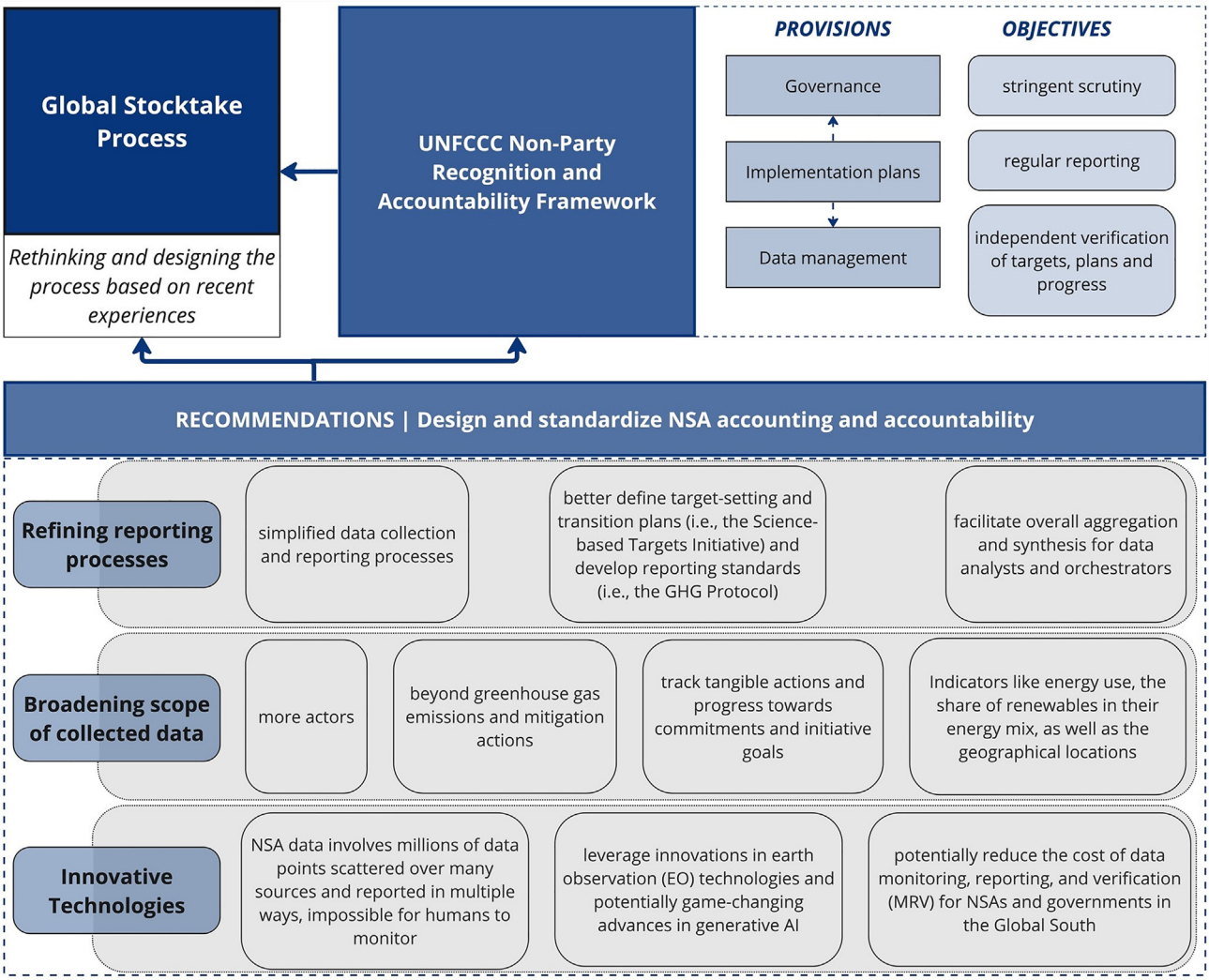

Figure 2. Commentary recommendations for improving NSA data

Overview of provisions and objectives outlined in the UNFCCC Accountability Framework and three types of recommendations provided to enhance the design and standardization of NSA accounting and accountability through the GST.

environmental indicators and reduced emissions—all of which are geographically and contextually determined. To assess such progress and ambition of long-term emissions reduction targets, insights are also needed into cities, regions, and companies' net-zero and decarbonization plans. It is therefore crucial to evaluate emission numbers with their impact on economic sectors, energy, and land use within their relevant developmental and geographical contexts. To achieve this aim, indicators such as energy use, the share of renewables in their energy mix, interim goals, and the geographical locations of their climate actions are needed. In this way, interaction with national policies and alignment with the national or regional economies and infrastructure can be verified.

Tracking progress must also be nuanced and adapted to account for local complexities, allowing for a more comprehensive and equitable climate action evaluation. For far too long, the global community has focused on monitoring momentum, participation, and ambition, neglecting to track tangible actions and progress toward commitments and initiative goals. To assess progress meaningfully, we must contextualize high-level metrics tracking tons reduced, populations included, etc., in a way that extends beyond the surface. For instance, singularly encouraging all businesses and subnational governments to set net-zero goals may be unproductive or undesirable if these targets cannot be met credibly, given the diverse emission sources, energy mixes, infrastructure profiles, and capital available to different NSAs.

Although our first two recommendations—to simplify and better align data collection and reporting while simultaneously expanding the diversity of data collected—may appear contradictory, we believe both can be achieved through innovations in earth observation (EO) technologies and potentially game-changing advances in generative AI. Digital technologies are promising ways of seamlessly enhancing data interoperability and filling data gaps.[10–12] Tracking and processing NSAs' and subnational actors' data

involves millions of data points scattered over many sources and reported in multiple ways, which would be impossible for humans to monitor. Generative AI, in the form of large-language models (LLMs) powering population chatbots like ChatGPT and Bard, has the potential to broaden not only information accessibility but also the types of information the GST could track. For example, an LLM trained on climate-specific documents could help better define nebulous terms like "resilience," "climate vulnerability," and "adaptation,"[13] allowing for comparisons between one country or company's strategy and another's. This approach would help if we are to assess progress toward the UN's Race to Resilience campaign, which has set a target to increase the resilience of 4 billion people by 2030 but has been difficult to define and says little about the quality of implementation and planning efforts.[14]

More diverse data and information sources mined from emerging digital tools could broaden our ability to better define and understand climate action where self-reporting lags. Since tracking approaches in the climate governance domain predominantly reflect the preferences of their creators, they are inherently biased and limited in scope.[15] Consequently, particular actions are frequently afforded precedence and acknowledgment, traditionally emphasizing large-scale and mitigation-focused activities and reporting entities like Global North-based, large corporations and cities. Advances in ML and AI are expanding our ability to analyze massive amounts of new information—such as annual corporate responsibility reports or government policy documents, which are largely unstructured—in previously impossible ways. Incorporating data and insights from these new data streams could potentially reduce the cost of data monitoring, reporting, and verification for NSAs and governments in the Global South and give access to a more reliable information base for improved data-driven policy solutions, documenting progress toward national targets, participating in climate markets, and accessing climate finance.[16]

Marching ahead: The future path of NSA accountability

The conclusion of the GST presents an important opportunity to rethink and design the tracking of NSA efforts to expand the scope to more actors, drive effective climate action, and spur the necessary ambition to achieve the Paris goals among governments and NSAs. The growing emphasis on NSA accountability demonstrates both the recognition of their potential contributions as well as concerns that NSA promises are not all what they seem. Our proposed solutions can contribute to a more accountable governance environment, where the merits of NSA efforts are evaluated not merely based on increasing participation, potential aggregate impact, or prospective innovations but on their quantifiable and attributable effects. Tracking for accountability, however, must incorporate a deeper understanding of the ex-post effects that materialize after actions have been implemented.

Moving forward, there are two primary paths within and outside of the UN Framework Convention on Climate Change (UNFCCC), and NSAs can play a vital role in both. In the best case, the UNFCCC's NSA recognition and accountability framework will offer a clear and coherent structure that will encourage data harmonization and consistency for global tracking efforts. Toward this goal, experts should collaborate within and outside the UNFCCC to engage innovations in AI, satellite technology, and global governance. Priority focus should be placed on developing methods that connect NSA action with the UNFCCC and national government goals.[17] This requires drawing upon the multiple parallel efforts many NSA organizations are undertaking to better define target-setting and transition plans and develop reporting standards, as well as the growing number of regulatory efforts national governments are putting in place to require mandatory corporate emissions disclosure. An enhanced integration of multiple NSA data reporting standards and UN efforts is needed since they are largely disconnected at the moment (Figure 2).

It's time to move from drumbeating to marching.

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DECLARATION OF INTERESTS

The authors declare no competing interests.

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