GLOBAL CLIMATE ACTION 2022

How have international climate initiatives delivered, and what more is possible?

NEW CLIMATE INSTITUTE
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NewClimate Institute, German Institute of Development and Sustainability (IDOS), Radboud University. Global Climate Action 2022: How have international initiatives delivered, and what more is possible? Research report prepared by the team of: Takeshi Kuramochi, Sander Chan, Sybrig Smit, Andrew Deneault, Natalie Pelekh.

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ACKNOWLEDGEMENTS

This work was generously funded by the IKEA Foundation (grant no. G-2010-01689). We especially thank Edgar van de Brug for his support throughout the project duration.

Climate Cooperative Initiatives Database (C-CID) was developed with generous support from Volkswagen Stiftung and the Klimalog research and dialogue project at the German Institute of Development and Sustainability (IDOS), supported by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the IKEA Foundation (grant no. G-2010-01689). The 2022 version of C-CID is developed by Sander Chan (Radboud University/IDOS) and Andrew Deneault (IDOS). This version includes contributions by: Mishel Mohan and Sharan Gulati (Global Center on Adaptation); Evy Bosch, Gianmarco Diprima, Afifa Afrin, Kyle Wada, and Amahnui Amenchwi (IDOS).

Many reviewers also provided critical feedback on this report. Our thanks to: Idil Boran (York University), Thomas Hale (University of Oxford), Angel Hsu (Data-Driven EnviroLab, University of North Carolina), Niklas Höhne (NewClimate Institute), and Mark Roelfsema (Utrecht University). Special thanks go to Amandeep Gill-Lang for proofreading and copyediting, Polina Korneeva for report design, Nicolas Fux and Victoria Fischdick for the support on communications and outreach.

IKEA Foundation

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EXECUTIVE SUMMARY

This report is the latest stocktake of international cooperative climate action. International cooperative initiatives (ICIs) have been a major feature of international climate governance ever since the UNFCCC started recording them in 2013. These partnerships engage a wide range of non-state and subnational actors, including businesses, investors, civil society, national governments, and international organizations.

We identified 601 ICIs launched since 2013 with more than 70,000 instances[1] of participation by cities and regions, businesses, and by domestic and international NGOs. The total number of ICIs covered in this study has more than doubled compared to previous analyses as a result of examining outcomes from all major climate summits and campaigns since 2014. The growth of active initiatives (85% of all ICIs launched since 2013) has flattened since 2019. This is partly explained by the expiration of many initiatives that were launched prior or around the UN Climate Conference in Paris in 2015. The outbreak of the COVID 19 pandemic may also explain lower growth of new initiatives, especially in 2020.

The global status of mitigation-related initiatives is bleaker than in the past assessments. In sum, performance trends in recent years give some reasons for concern.

Overall productivity of initiatives is trending downwards. Through assessing the extent whether initiatives' outputs (e.g., infrastructure, research, new installations) are consistent with their functions (e.g., training, norm-/standard setting, technical on-the-ground implementation), we observed a higher share of low or non-performing initiatives in both mitigation and adaptation since 2019. Overall productivity of initiatives is also trending downwards. ICIs have been launched without further implementation and operationalization of commitments. This gap between commitments and implementation risks to undermine the credibility of ICIs and the campaigns and summits that convene them.

The downwards trend in productivity may be explained by ICIs initially picking 'low-hanging fruit' and subsequently having to take more difficult measures. Moreover, the COVID-19 pandemic has likely affected the performance of ICIs. During the pandemic, ICIs' production of outputs that are location-specific (such as in-person trainings, and new infrastructure or installations) decreased at a faster rate than those that are not location specific (such as websites, online platforms, and research publications). Conversely, we observe a rapid growth of webcasted events, which may reflect a replacement of physical activities by virtual ones.

Our analysis suggests a strong and growing underrepresentation of the Global South. Although ICIs have great potential to contribute to sustainable development in developing countries, studies have consistently shown a strong underrepresentation of the Global South. Implementation disproportionately takes place in the Global North. In line with previous assessments our analysis shows the underrepresentation of funders, leaders, and participants of ICIs based in non-OECD countries. Moreover, since 2015 the share of outputs produced in the Global North has steadily grown. Some imbalances are to be expected as they appropriately and reflect differentiated responsibilities and the need for a strong focus on climate mitigation. Nonetheless, the benefits of ICIs, particularly adaptation and resilience building, should also accrue to developing countries.

Summit and campaign organizers should steer towards higher performance by setting requirements for ICIs, particularly among initiatives that are launched at climate conferences, summits and by COP presidencies. For instance, before featuring ICIs at climate conferences, organizers should require ICIs to provide evidence that they are making progress against targets and/or have capacities and resources to deliver on pledges. Possible measures identified in the literature include the appointment of dedicated staff and/or a secretariat, regular reporting, credible budgets, and openness for new partners to join an initiative, while facilitating interfaces between non-state, subnational actors, policymakers and funders.

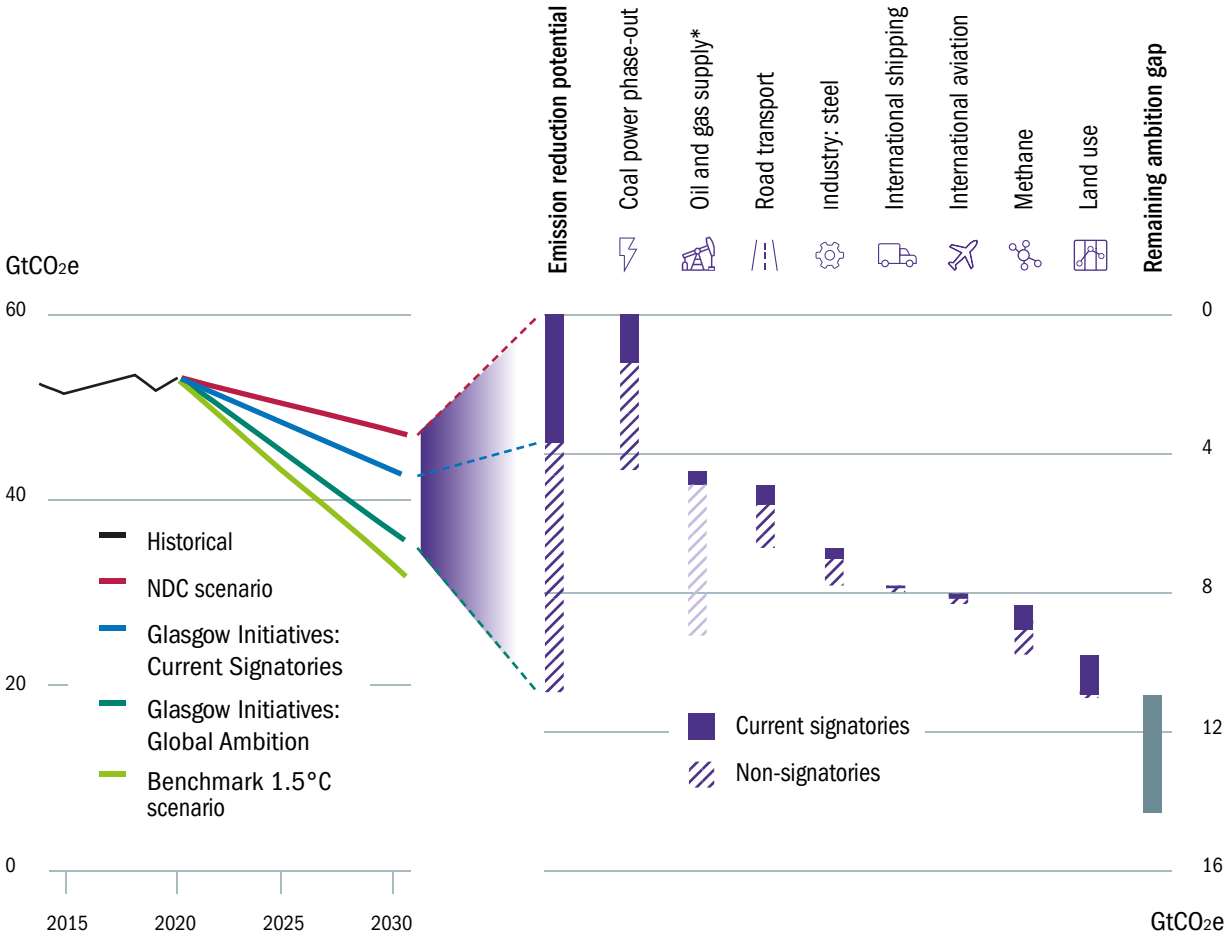
The initiatives launched at COP26 ("Glasgow Initiatives") have the potential to fill a considerable part of the ambition gap in 2030 between current NDCs and 1.5°C-consistent

1 A single actor may participate in multiple initiatives. These counts of participation – instances -- are aggregated to obtain the total count in the 70,000 figure.

emission pathways, but this potential will only materialise if more countries, especially large emitting countries, join them and fully deliver.

The report assessed the potential contributions of 12 international sector initiatives launched around and during COP26 (hereinafter, 'Glasgow initiatives') on future greenhouse gas (GHG) emission reductions. We found that the theoretical coverage of these Glasgow initiatives is large: they cover sectors that could potentially lead to 11 $GtCO_2e$ lower emissions in 2030 compared to the aggregate of NDCs, addressing a considerable part of the 'ambition gap' between the NDC scenario and the benchmark 1.5°C scenario (Figure ES-1). However, not all governments have signed up and impact of signatories is quite small because many already have the action included in their NDC: Therefore, a full implementation of the initiatives' 1.5°C-aligned

Figure ES-1. (Left) Potential GHG emissions reductions resulting from full implementation of selected Glasgow initiatives. The emission projections for the reference NDC scenario and the benchmark 1.5°C scenario are also presented. (Right) Coverage of the 'ambition gap' between the reference NDC scenario and the benchmark 1.5°C scenario by the Glasgow initiatives.



*Due to overlaps with other sectors and very broad sector coverage, we only use the current membership of initiatives in this sector as additional impact. The impact shown here illustrates the sector's significance.

goals by the current signatories would only lead to about 5 $GtCO_2e$ of emission reductions additional to the NDC scenario (Figure ES- 1).

Ambition can be raised in two ways based on these results: First, the biggest potential lies in additional governments signing up to initiatives that have not yet done so (6 $GtCO_2e$). The theory of change of the initiatives is to put non-signatories on the spot, but membership since the Glasgow COP has changed only marginally. Second, governments that have signed up have not yet fully taken these actions into account in their NDCs and therefore could increase the ambition in their NDCs (5 $GtCO_2e$).

Future COPs could generate momentum in sectors not covered by the Glasgow initiatives. Although the Glasgow initiatives' emission reduction potential is substantial, there are still sectors in which momentum for rapid transition toward decarbonisation is needed, including the buildings sector and heavy industry sectors other than steel, such as chemicals and cement. These sectors have not been well covered by ICIs, especially by those that involve large emitting countries and established international institutions. The presidencies of the next few COPs as well as the UN Climate Change High-Level Champions may take the leadership to generate momentum to accelerate decarbonisation in these sectors.

The Glasgow initiatives may have similar shortcomings as observed in previous international initiatives, but there are also improvements that have been made, noticeably on including finance commitments, which could lead to more effective implementation.

We also compared these Glasgow initiatives to those previously launched at major international conferences, which have shown mixed performance results , in terms of, for example, financing and reporting requirements. The limited literature indicates that there continues to be a lack of enforcement mechanisms in some Glasgow initiatives. However, there are also noticeable improvements in other Glasgow initiatives , such as annual progress assessment mandated to international organisations and, more importantly, securing finance for implementation.

Continued political drive from national governments can help realize the Glasgow initiatives' potential.

The political drive as shown by the UK Presidency has been crucial for establishing the Glasgow initiatives with their launch. Continued political drive is required for the potential impact of the initiatives to materialise and expand. Upcoming COP Presidencies and UN Climate Change High-Level Champions may represent this political drive and generate more leadership, particularly among large emitting countries, in order to maintain momentum and credibility after COP27 and to drive towards more signatories and implementation of global climate action.

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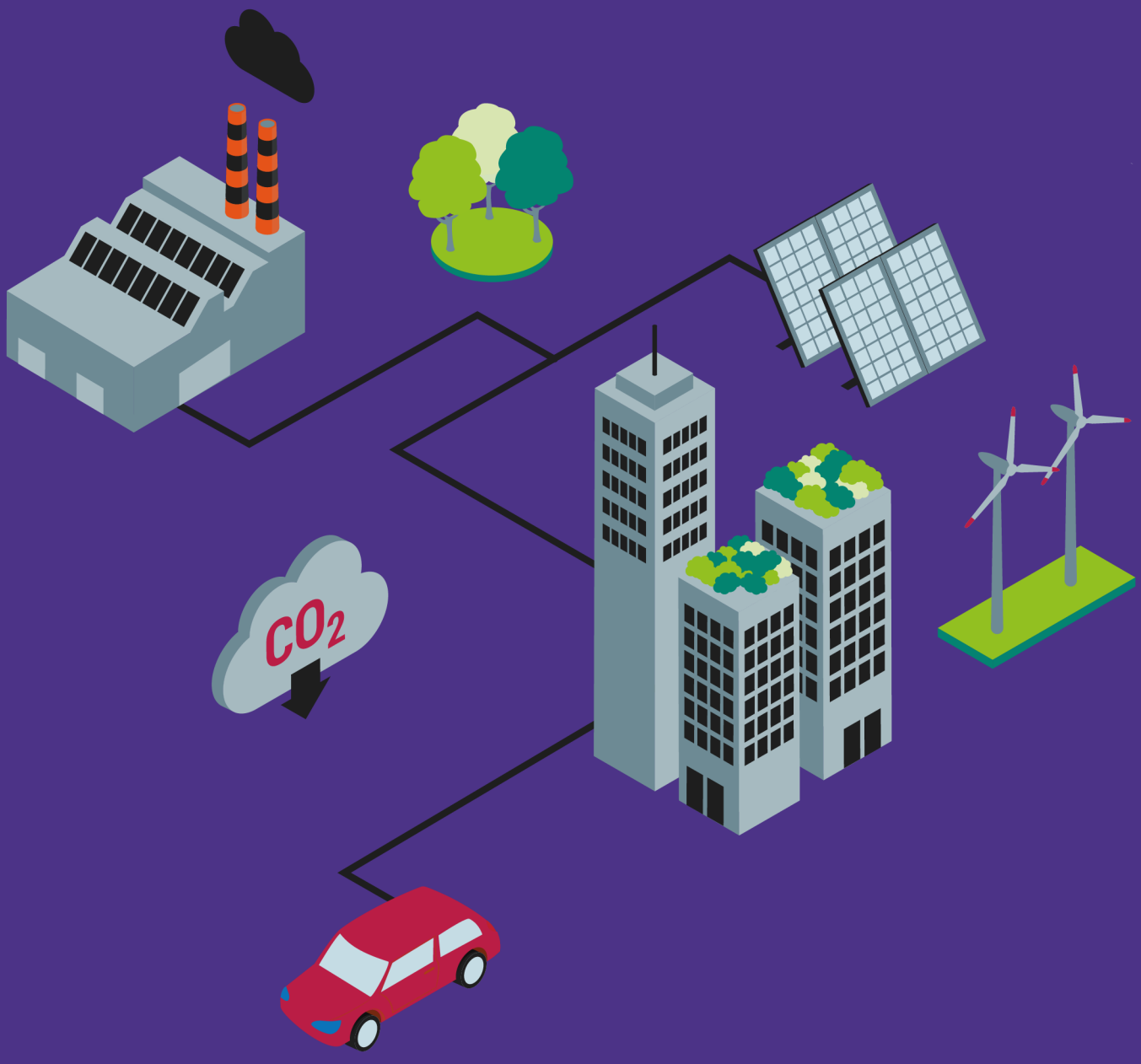
INTRODUCTION



International cooperative initiatives (ICIs) have been a major feature of international climate governance ever since the UNFCCC started recording them in 2013. These partnerships engage a wide range of non-state and subnational actors, including businesses, investors, civil society, national governments and international organizations; they collaborate and implement across national borders pursuing common climate goals – including the mitigation of greenhouse gases (GHGs) and building adaptive capacity and resilience against current and future climate impacts (Chan et al., 2018; Hsu et al., 2018; Hsu, Höhne, et al., 2020). Previous research has shown that the potential impact of non-state and subnational actors could be significant (Kuramochi et al., 2020; Lui et al., 2021); in particular, these cooperative initiatives could bring down the 2030 emission levels to those in line with a 2°C-consistent pathway if fully implemented (Lui et al., 2021).

Following the Paris Agreement's goal to achieve net zero greenhouse gas emissions in the second half of the 21st century, the term 'net zero emissions' became a main organising principle also for subnational and non-state actors to address climate change (Hale et al., 2022). The Glasgow Climate Pact adopted at the COP26 has cemented 1.5°C as the principal ceiling for warming with an explicit reference to global net zero CO_2 emissions by 2050 (UNFCCC, 2021a; Depledge et al., 2022). In the lead-up to and during COP26, driven by the COP26 presidency, many sector-level and non-state actor initiatives that aim to accelerate transition to achieve 2050 global net zero CO_2 emissions were announced (Depledge et al., 2022).

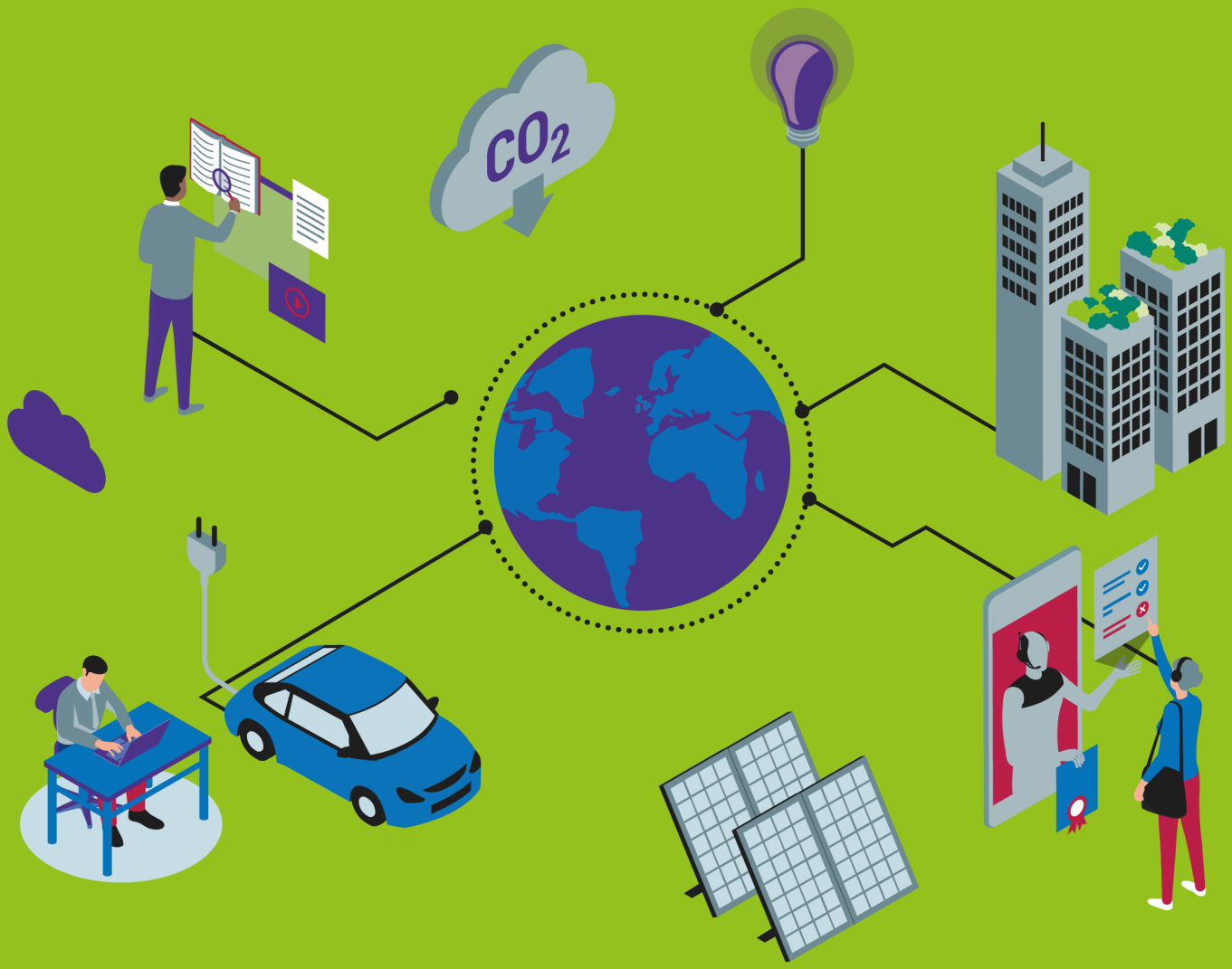
Against this backdrop, this report presents an up-to-date global assessment of ICIs' impact on climate change mitigation.[2] First, we present the latest global landscape of the climate-related initiatives, updating our 2021 analysis (NewClimate Institute et al., 2021). This analysis leverages findings from the Climate Cooperative Initiatives Database (C-CID), which samples 601 ICIs and gathers data, among other things, on participants, targets, functions, organizational features, outputs, and geographic implementation patterns (Chan, Deneault, et al., 2022). Second, we assess the potential contributions of several major initiatives launched around COP26 to the achievement of the Paris Agreement's long-term 1.5°C temperature goal. Covering 12 initiatives in total, we present our preliminary findings on the potential impact of the initiatives on global GHG emissions up to 2030 additional to the aggregate impact of nationally determined contributions (NDCs). We also discuss how different Glasgow initiatives are compared to sector-level initiatives launched in the past to obtain insights into the potential effectiveness of these new initiatives.

This report focuses on the international initiatives that engage a wide range of national, non-state and subnational actors. An up-to-date analysis individual non-state and subnational actors' climate action is published in a separate report (Data-Driven EnviroLab et al., 2022).

2 In addition to international cooperative initiatives, we also see cooperative initiatives and partnerships emerging within countries. This report, however, focuses on international initiatives.

02

GLOBAL LANDSCAPE OF INTERNATIONAL COOPERATIVE INITIATIVES

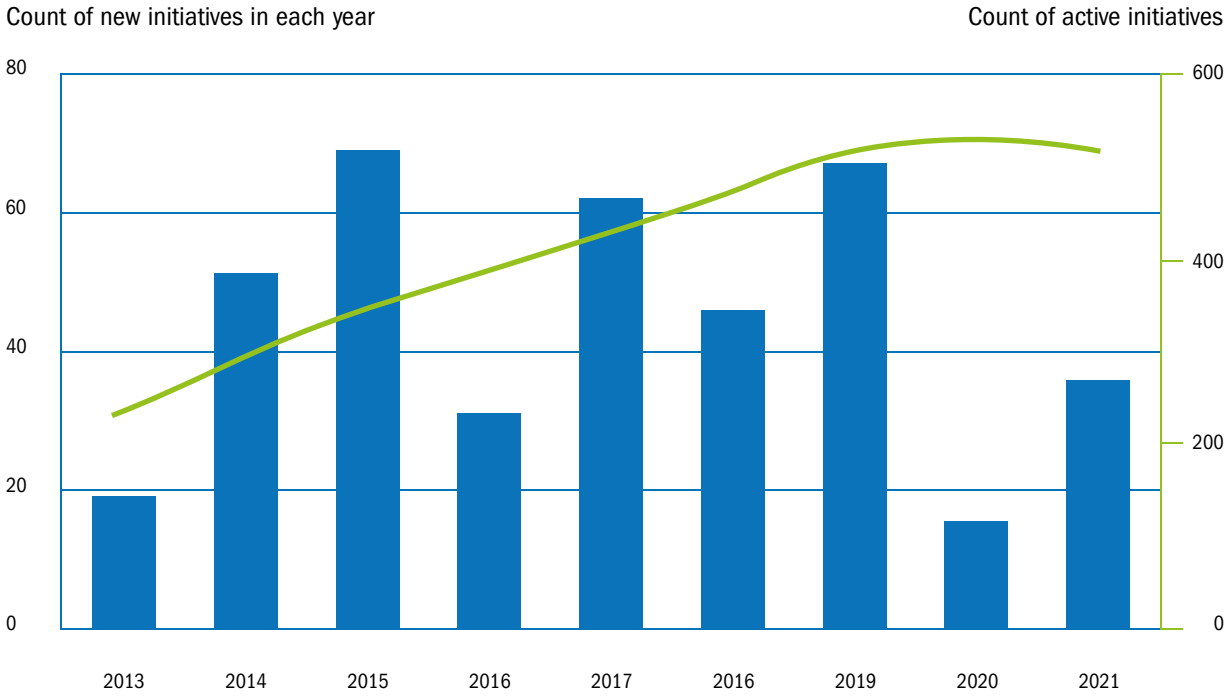


2.1 Number of new and active ICIs

Since the first UN Climate Summit in New York in 2014, the number of ICIs has steadily grown. We have identified more than 600 initiatives that implement across multiple countries and engage over 70,000 state, non-state and subnational actors. Whereas previously we identified initiatives from UN records, particularly UNFCCC's Global Climate Action Platform (GCAP) and UNEP Copenhagen Climate Centre (UNEP-CCC)'s Climate Initiatives Platform we now include outcomes from all major climate summits and campaigns since 2014. Many major initiatives have been launched at COPs, however, climate conferences that launch ICIs are not confined to the context of the UNFCCC. For instance, our sample not only includes initiatives launched at COPs, but also UN Climate Summits in 2014 and 2019 convened by the Executive Office of the Secretary General; the Climate Action Pacific Partnership (2017); successive One Planet Summits (since 2017); the 2018 Global Climate Action Summit convened by the Governor of California (Chan, Hale, et al., 2022), as well as initiatives mobilized through dedicated campaigns, including the Lima-Paris Action Agenda (2013-16), the Marrakech Partnership for Global Climate Action (since 2016), and more recently the 'Race to Zero' and 'Race to Resilience' campaigns led by the UN Climate Change High-Level Champions. Moreover, we include recent initiatives launched atCOP26, particularly 'Glasgow Breakthroughs' for the power, road transport, steel, hydrogen, and agriculture sectors to 'accelerate collaboration between governments, businesses and civil society to deliver on climate goals faster' (Glasgow Climate Pact, 2021). These Breakthroughs were part of the broader Glasgow Breakthrough Agenda that includes both government- and business-led initiatives, often in cooperation with initiatives launched before or during COP26.

Although our current analysis of C-CID data (Chan, Deneault et al., 2022) samples more ICIs than previous ones (Chan et al., 2022, previously the largest study, sampled 297 ICIs), the broader scope and scale of the study, should not be confused with growth. An analysis of the number of active ICIs only partly confirms previously observed year-on-year growth trends (Figure 1). While initiatives have

Figure 1. Count of new and total cooperative initiatives from 2013-2021



Source: Chan et al. (2022)

been launched in great numbers, some have completed their objectives, and others expired or became inactive. Therefore, we cannot assume cumulative growth and should expect fluctuations in net growth rates. Currently, 85% of initiatives launched since 2013 are (still) active; we find that they have set targets for 2022 or beyond, and/or we have found evidence that they are still in operation (e.g., through the production of annual reports, social media communications, policies, infrastructure, etc.). However, the growth of active initiatives has flattened since 2019. This change is partly explained by the expiration of many initiatives that were launched prior to, or during, the 2015 UN Climate Conference in Paris. The outbreak of the COVID-19 pandemic may also explain lower growth of new initiatives, especially in 2020.

We now count more than 70,000 instances of participation in cooperative initiatives: including businesses (33,842; up from 13,583, in a sample of 297 initiatives in 2020); cities and regions (14,525; up from 13,012); and domestic and international NGOs (5,980; up from 2,424). Only among investors we record fewer instances of participation in ICIs (3,290; down from 4,510) - which is likely due to the expiration of initiatives that engage many investors. When disaggregated by climate policy focus (mitigation versus adaptation), we find higher rates of participation in mitigation initiatives (29,789; up from 18,510) and initiatives that address both adaptation and mitigation (36,564; up from 17,607) than in initiatives that mainly focus on adaptation (4,802; up from 1,665) (Chan, Deneault, et al., 2022).

2.2 Performance on outputs relevant to key functions

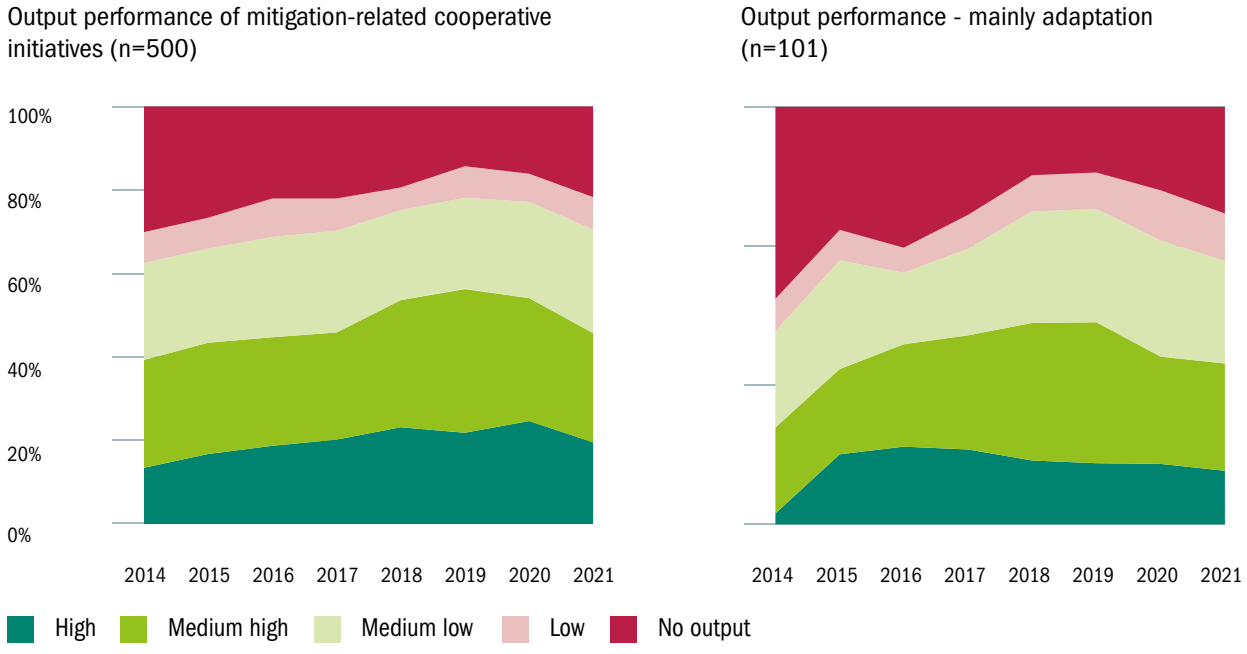
The larger number of ICIs engaged in mitigation that we now track is particularly interesting, more ICIs in mitigation could translate to a greater mitigation potential. Current studies already point towards the enormous potential of ICIs to reduce emissions, possibly even allowing a development pathway by 2030 consistent with limiting global warming to 2°C (Lui et al. 2020; also see Section 3 in this report). However, a mere focus on mitigation potential, especially over a larger set of ICIs, may lead to undue optimism. For instance, non-state and subnational actors may be more likely to achieve their potential when they set less ambitious targets (Hsu, Tan, et al., 2020). Moreover, in many cases commitments may not be implemented or ICIs may become less effective over time, as 'low-hanging fruit' in climate action have been picked. A recent study, for instance, observed a lower average performance among initiatives launched at more recent climate summits when compared to earlier summits (Chan, Hale, et al., 2022). Therefore, the counts of ICIs, their multitudes of participants, and the many climate commitments they make, should not be confused with high impact.

The expanding landscape of ICIs has not been matched by improved performance or greater likelihood that their commitments are kept, or desired impacts and outcomes are achieved (Figure 2). In contrast to previous reports that demonstrated higher year-on-year improvements in ICIs' performance, trends since 2019 seem more concerning. Particularly, newer initiatives may risk future underperformance. For instance, 36 new mitigation initiatives launched in 2021, including 24 at COP26, are less likely to have monitoring arrangements in place (25% vs. 51%) compared to older initiatives; or, dedicated staff or a secretariat (44% vs. 48%). This may indicate a lack of institutional robustness, although monitoring arrangements and organizational capacities may still be in the process of being built up. Nonetheless, the share of high performing (FOF score between 0.75-1.0; dark-green area) and medium-high performing (0.5-0. 75; light-green area) initiatives has decreased in recent years, both among mitigation-related and mainly-adaptation initiatives (Figure 2). An explanation of the FOF methodology is given in Box 1. We also find that more initiatives have failed to produce any outputs for two or more consecutive years, which we subsequently consider as inactive. Better performing initiatives are still found among those that mainly address mitigation, and in areas typically associated with mitigation action, for instance in energy, industry and transport (Chan et al., 2018; Chan, Hale, et al., 2022). However, with approximately 60% of all initiatives not generating any relevant output, we should also assume that these initiatives will not contribute to emissions reductions and adaptive capacities.

Box 1. Count of new and total cooperative initiatives from 2013-2021

To gauge whether ICIs are likely to deliver on their promises, we present an assessment of output performance measured by 'Function-Output-Fit' (FOF), the degree to which ICIs produce attributable and tangible outputs and activities that are consistent with their functions (Chan et al., 2018; Chan and Amling, 2019; Chan, Hale, et al., 2022). An example would be an ICI that seeks to reduce emissions among a target population through training (function 1) and campaigning (function 2). For this ICI to perform well, it should reasonably be expected to produce relevant outputs such as education and training events (fitting outputs to function 1), and social media campaigns, and campaigning material (fitting with function 2). Hence, a Function-Output-Fit is the degree to which an initiative produces outputs that are in line with its functions. It is important to note that output performance is a minimal performance indicator and does not guarantee desired behaviours ('outcomes') or favourable changes in environmental or social indicators ('impacts'). Rather, relevant outputs are a necessary part of a causal chains from targets and resources ('inputs') to outcomes and impacts (Hale et al., 2021).

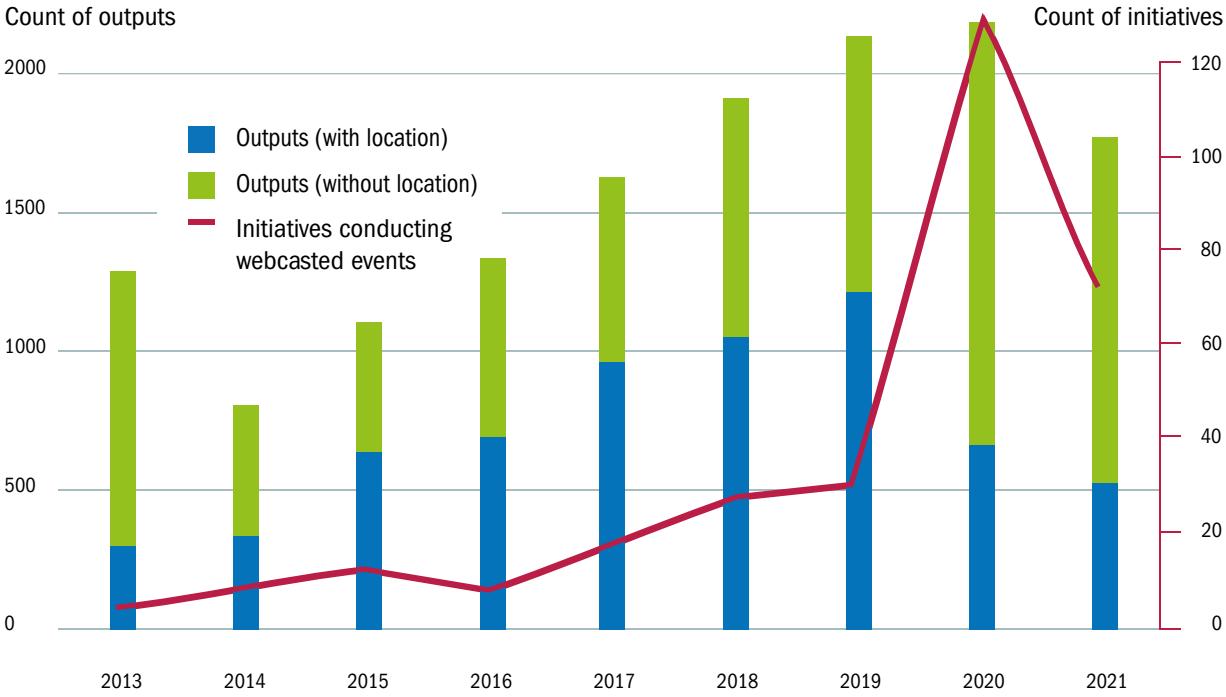
Figure 2. The share of mitigation-related (mainly mitigation or mixed mitigation-adaptation) and mainly adaptation initiatives at different levels of performance



Source: Chan et al. (2022)

Explaining negative performance trends in recent years requires more in-depth research. The ongoing COVID-19 pandemic and subsequent political and economic turbulence have likely affected the output performance of ICIs. Overall, we find decreasing productivity among ICIs since 2020 (fewer outputs generated). This trend already started in 2019 among outputs that relate to specific locations ('location-based outputs'), such as in-person trainings and physical infrastructure (Figure 3). Outputs that are not (or less) location-specific, such as websites, online platforms, and research publications decreased only in 2020 and at a slower rate. Simultaneously, we observed a rapid growth of webcasted events, which may reflect a replacement of physical activities by virtual ones. Arguably, such substitution may carry significant benefits, for instance in reaching broader audiences.

Figure 3. Counts of outputs with and without location, compared to count of initiatives that have conducted virtual events.



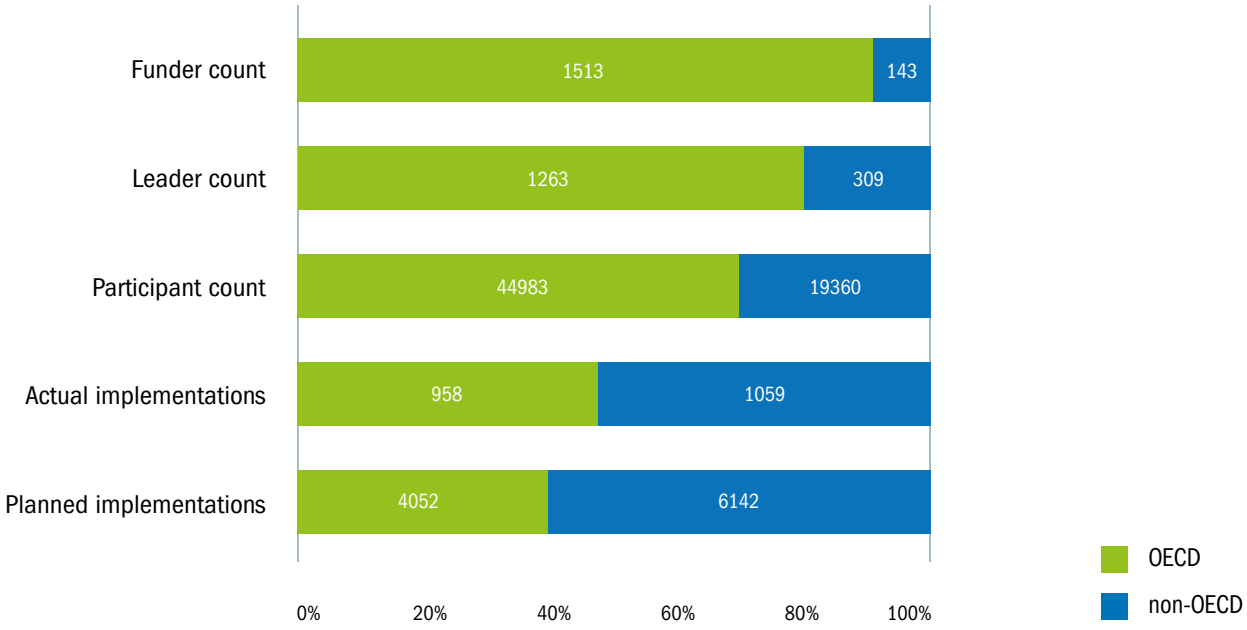
Source: Chan et al. (2022)

2.3 ICIs and implementation in the Global South

Climate action can contribute more broadly to sustainable development and has great potential to benefit developing countries. For many of these potential sustainable development benefits to materialize, ICIs should demonstrably target and implement activities in developing countries. However, studies have consistently shown a strong underrepresentation of participation by non-state and subnational actors based in the global south (Pattberg et al., 2012; Bulkeley et al., 2014; UNFCCC, 2017, 2018, 2019). These imbalances also feature large among ICIs. Most funders, lead partners and participants in initiatives are

based in high-income industrialized countries (members of Organization for Economic Cooperation and Development [OECD]) (Figure 5). Although more implementation is planned in developing (non-OECD) countries, arguably, the share of planned implementation for mitigation-related (mainly mitigation and mixed mitigation-adaptation) action in high-income countries is very high. Despite accounting for just 18% of the global population, almost 40% of implementation is planned in OECD countries. We observe an even greater imbalance when looking at actual implementation, almost 50% of demonstrated implementation activities take place in OECD countries. Although we find

Figure 5. OECD and non-OECD country data on mitigation-related (mainly mitigation and mixed mitigation-adaptation ICIs). Actor counts by type and planned/actual implementation counts, disaggregated by OECD membership of the countries where actors are based in



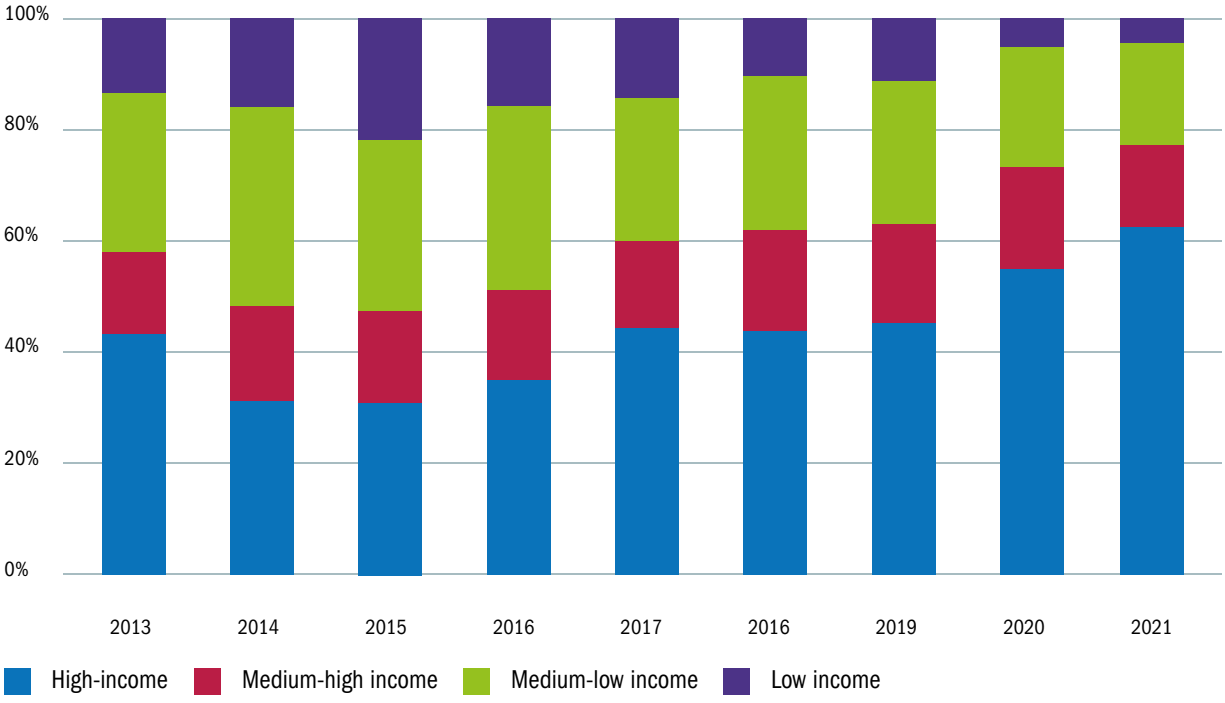
Source: Chan et al. (2022)

generally disproportional underrepresentation of actors and implementation in developing countries, significant differences are found across regions and actor types. For example, 17% of business participants in ICIs are based in Asia and only 4% are based in Africa. Moreover, among local and domestic NGOs participating in ICIs, almost half are from Asia, Africa and Latin-America and the Caribbean. Global South based actors are also relatively well represented among participating national governments (67%), but low among cities, regions, and investors.

We also note that biases in data collection may partly explain geographic imbalances. For instance, when the UNFCCC initially recorded ICIs, the focus was strictly on their potential mitigation contributions (Chan et al., 2016). Moreover, some imbalances are to be expected and reflect differentiated responsibilities; given historical emissions, actors based in industrialized countries should engage more in mitigation efforts and in funding climate action. In a forthcoming paper, case studies of India and Kenya illuminate ICI's and participation in the global South that remain under the radar of international inventories (Shrivastava et al., forthcoming).

Although concerning, geographic imbalances in participatory, leadership and implementation patterns are not unexpected. Our findings are in line with previous analyses (Chan et al., 2015, 2018; UNFCCC, 2017, 2018, 2019). The hope, however, was that disparities between developing and developed countries would gradually reduce over time as climate action increasingly also address questions of adaptation and resilience building, and as conference and campaign organizers have frequently emphasized and targeted climate action in developing countries. Our analysis of location-based outputs demonstrates the opposite; the share of outputs and activities by ICIs in developing countries has steadily been decreasing since 2014 (Figure 6). This trend may indicate that the benefits of ICIs are largely accruing to developed countries and may further widen discrepancies between developing and developed countries.

Figure 6. Proportion of location-based outputs by countries' income group (World Bank categories).



Source: Chan et al. (2022)

03

GLASGOW INITIATIVES: AN ASSESSMENT OF GLOBAL POTENTIAL IMPACT

3.1 Initiatives considered in the analysis

Ahead of COP26 then-UK Prime Minister Boris Johnson called on leaders around the world to come up with ambitious commitments on "coal, cars, cash and trees" (Carbon Brief, 2021). The COP26 presidency was successful in mobilising a wide range of actors, both national governments and non-Party stakeholders to commit to ambitious emission reduction goals, in line with the 1.5°C goal and net zero CO_2 emissions by 2050 as explained in the introduction, through international initiatives and partnerships. The number, scope and ambition of these initiatives and partnerships outside the formal agenda at COP26 were unprecedented (Depledge et al., 2022).

In our analysis, we considered the initiatives that were highlighted in the COP26 presidency's outcomes document (COP26 Presidency, 2021a) (Table 1). These selected initiatives (hereinafter 'Glasgow initiatives') are those that focuses on GHG emissions from own operations by state- and non-state actors. Besides those presented in Table 1, a few financial sector initiatives were announced, such as the Glasgow Financial Alliance on Net Zero (GFANZ); financial institutions have no significant GHG emissions from own operations but could potentially contribute to vast GHG emission reductions through aligning global financial flows with net-zero emissions pathways.

3.2 Summary of the methods

Our reference for the quantification of impact on greenhouse gas emissions is the NDC scenario, which assumes that Nationally Determined Contributions (NDCs) submitted as of mid-2021 as well as other announced ambitions will be fully implemented. The NDC scenario considers the impact of the COVID-19 pandemic on 2020 emissions and, to a limited extent, on future emissions, while the impact of the Russian invasion on Ukraine is not yet considered. The time horizon of our analysis is 2030. Detailed description of the methods and assumptions are presented in an Appendix.

We constructed two scenarios for the quantification of the potential impact on future GHG emissions of selected Glasgow initiatives. The first is the 'Global Ambition' scenario. For the energy- and industry-related initiatives, the Global Ambition scenario assumes all countries in the world to sign up to these initiatives and fully implement 1.5°C-aligned global emission reduction ambition in the initiatives' focus sectors. For methane and land use initiatives, the Global Ambition scenario assumes full implementation of the initiatives' targets. The second is the 'Current Signatories' scenario, which assumes national government signatories as of October 2022 fully implement the 1.5°C-aligned sector transition for energy and industry, by which Glasgow initiatives are informed and guided, or the targets for methane and land use emissions. For the Glasgow Breakthroughs, we considered the signatories of sector Breakthrough goals rather than the signatories of the umbrella Glasgow Breakthrough Agenda. For example, China has endorsed the Glasgow Breakthrough Agenda as a whole but it has not endorsed any of the sector-specific Breakthrough goals, except for hydrogen. We quantified most of the initiatives presented in Table 1, but excluded Glasgow Breakthroughs on Hydrogen and Agriculture, as their goals do not allow for quantification.

The two Glasgow initiatives scenarios provide knowledge to policymakers in a number of ways. First, the Global Ambition Scenario informs policymakers about how much of the global ambition gap between the NDC scenario and 1.5°C-consistent scenarios could potentially be bridged by the Glasgow initiatives. Second, the Current Signatories shows how much the NDCs can be strengthened globally if the national government signatories to these Glasgow initiatives would reflect the initiatives' ambition. Third, the comparison of Global Ambition and Current Signatories scenarios provides an indication about which countries would need to come on board as signatories to maximise the initiatives' potential impact.

All of the Glasgow initiatives have been announced with the intention to accelerate transition toward global sector decarbonisation consistent with the Paris Agreement's long-term 1.5°C goal. Therefore, the potential impact of the two Glasgow initiatives scenarios were assessed by quantifying how much of the 'ambition gap' between the reference NDC scenario and the benchmark 1.5°C scenario is covered by the initiatives' global ambition or by the initiatives' sig-

Table 1. Key announcements in the lead-up to and during COP26 that focus on sector-specific emission reductions. Source: COP26 Presidency (2021a), Carbon Brief (Evans et al., 2021).

Sectors & areas	Initiative	Main goals
Energy supply	Glasgow Breakthroughs: Hydrogen*	The Breakthrough aims to make affordable renewable and low carbon hydrogen globally available by 2030.
	Beyond Oil and Gas Alliance (BOGA)	BOGA's core members are committing to end new concessions, licensing or leasing rounds and to set a Paris-aligned date for ending oil and gas production.
Power	Global Coal to Clean Power Transition (GCCPT)	GCCPT signatories pledge to rapidly scale up their deployment of clean power generation and energy efficiency measures in their economies. GCCPT aims to: · To rapidly scale up technologies and policies in this decade to achieve a transition away from unabated coal power generation in the 2030s (or as soon as possible thereafter) for major economies and in the 2040s (or as soon as possible thereafter) globally. · To cease issuance of new permits for new unabated coal-fired power generation projects (New' coal-fired power generation projects are defined as coal-fired power generation projects that have not yet reached financial close), cease new construction of unabated coal-fired power generation projects and to end new direct government support for unabated international coal-fired power generation.
	Powering Past Coal Alliance (PPCA)	PPCA members commit to accelerating the transition from coal to clean energy, grounded in the objectives of the PPCA Declaration. PPCA cooperates closely with the GCCPT.
	No New Coal Compact (NNCC)	NNCC signatories pledged to no longer build coal power plants.
	Glasgow Breakthroughs: Power	The Breakthrough aims to make clean power the most affordable and reliable option for all countries to meet their power needs efficiently by 2030.
Industry	Glasgow Breakthroughs: Steel	The Breakthrough aims to make near-zero emission steel the preferred choice in global markets, with efficient use and near-zero emission steel production established and growing in every region by 2030.
Transport	Glasgow Breakthroughs: Road transport	The Breakthrough aims to make zero-emission vehicles the new normal by making them accessible, affordable, and sustainable in all regions [by 2030].
	COP26 declaration on accelerating the transition to 100% zero emission cars and vans	Initiatives' signatories commit to rapidly accelerate the transition to zero emission vehicles. Signatories will work towards all sales of new cars and vans being zero emission globally by 2040, and by no later than 2035 in leading markets.
International bunkers	Clydebank Declaration	The signatories of the Declaration are to support the establishment of green shipping corridors – zero-emission maritime routes between 2 (or more) ports.
	International Aviation Climate Ambition Coalition	Coalition members are to advance ambitious actions to reduce aviation CO2 emissions at a rate consistent with efforts to limit the global average temperature increase to 1.5°C.
Land use	Glasgow Leader's Declaration on Forests and Land Use ('Glasgow Forest Declaration')	The Glasgow Forest Declaration's signatories are to conserve forests and other terrestrial ecosystems and accelerate their restoration.
	Glasgow Breakthroughs: Agriculture*	The Breakthrough aims to make climate resilient, sustainable agriculture the most attractive and widely adopted option for farmers everywhere by 2030.
Non-CO2 GHGs	Global Methane Pledge	Participants joining the Pledge agree to take voluntary actions to contribute to a collective effort to reduce global methane emissions at least 30% from 2020 levels by 2030.

* We did not quantify the impact of the Glasgow Breakthroughs Hydrogen and Agriculture, because their 2030 goals are not quantifiable in terms of GHG emission reductions.

natories. The benchmark 1.5°C scenario is comparable to the scenarios in the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR6) that have a 50% or higher chance of keeping warming below 1.5°C in 2100 with no or limited overshoot (Riahi et al., 2022); 2030 emissions under the benchmark 1.5°C scenario are projected to reduce from 53 $GtCO_2e$ in 2019 to 33 $GtCO_2e$ in 2030.

The NDC scenario and the 1.5°C scenario projections are based on the Announced Policies Scenario (APS) and the Net Zero Emissions by 2050 (NZE) scenario of the International Energy Agency's World Energy Outlook 2021 (WEO2021) for energy and industry CO_2 emissions (IEA, 2021b). Emission projections for non-energy CO_2, non-CO2 GHGs and land use-related GHGs were based on a variety of sources for both scenarios (see Appendix for details). To estimate the potential emission reductions in the Current Signatories scenario, country-level emission projections were developed for eight major emitters: Brazil, China, EU27, India, Indonesia, Japan, Mexico, USA, as well as the world. These included emission projections for energy, industry and non-CO_2 GHGs. LULUCF emission projections were developed for 98 countries. Potential emission reductions for all remaining signatory countries were proxied using their 2019 share of global emissions in the targeted sector. These shares are based on a combination of IEA's sector emissions data (IEA, 2021a), PRIMAP-hist (Gütschow and Pflüger, 2022) and Grassi et al. (2022). All GHG emissions figures presented in this report were aggregated with 100-year global warming potential (GWP) values of the IPCC Fourth Assessment Report. Global and national GHG emissions totals include emissions from LULUCF, unless stated otherwise. Further details on the methods and data are presented in the Appendix.

3.3 Results

Under the NDC scenario, global GHG emissions are projected at 48 $GtCO_2e$ in 2030 (Figure 3). This means that there is a 15 $GtCO_2e$ ambition gap in 2030 between the aggregate NDC emission levels and those under the benchmark 1.5°C scenario.

Our preliminary results show that the Glasgow initiatives cover sectors that fill nearly 11 $GtCO_2e$ out of the 15 $GtCO_2e$ ambition gap in 2030 ('Global Ambition scenario; Figure 3). The largest potential emission reductions relative to NDCs are visible in the power sector (more than 4 $GtCO_2e$), which is mutually covered by four initiatives. Other sectors with a large ambition gap covered by the Glasgow initiatives include road transport (direct emissions), land use, and cross-sectoral emissions of methane. For the power and road transport sectors, the emission reduction potential figures are somewhat smaller than those indicated in the Glasgow Breakthrough Agenda document (COP26 Presidency, 2021a), likely due to different reference scenarios. If all major emitting countries would become signatories to the Glasgow initiatives assessed and they fully deliver, the Global Ambition scenario projections show that global GHG emissions could be reduced to 37 $GtCO_2e$ in 2030 from 48 $GtCO_2e$ under the NDC scenario. The estimated Global Ambition scenario emission levels are consistent with a 1.8°C warming in 2100 (66% probability) (UNEP, 2022).

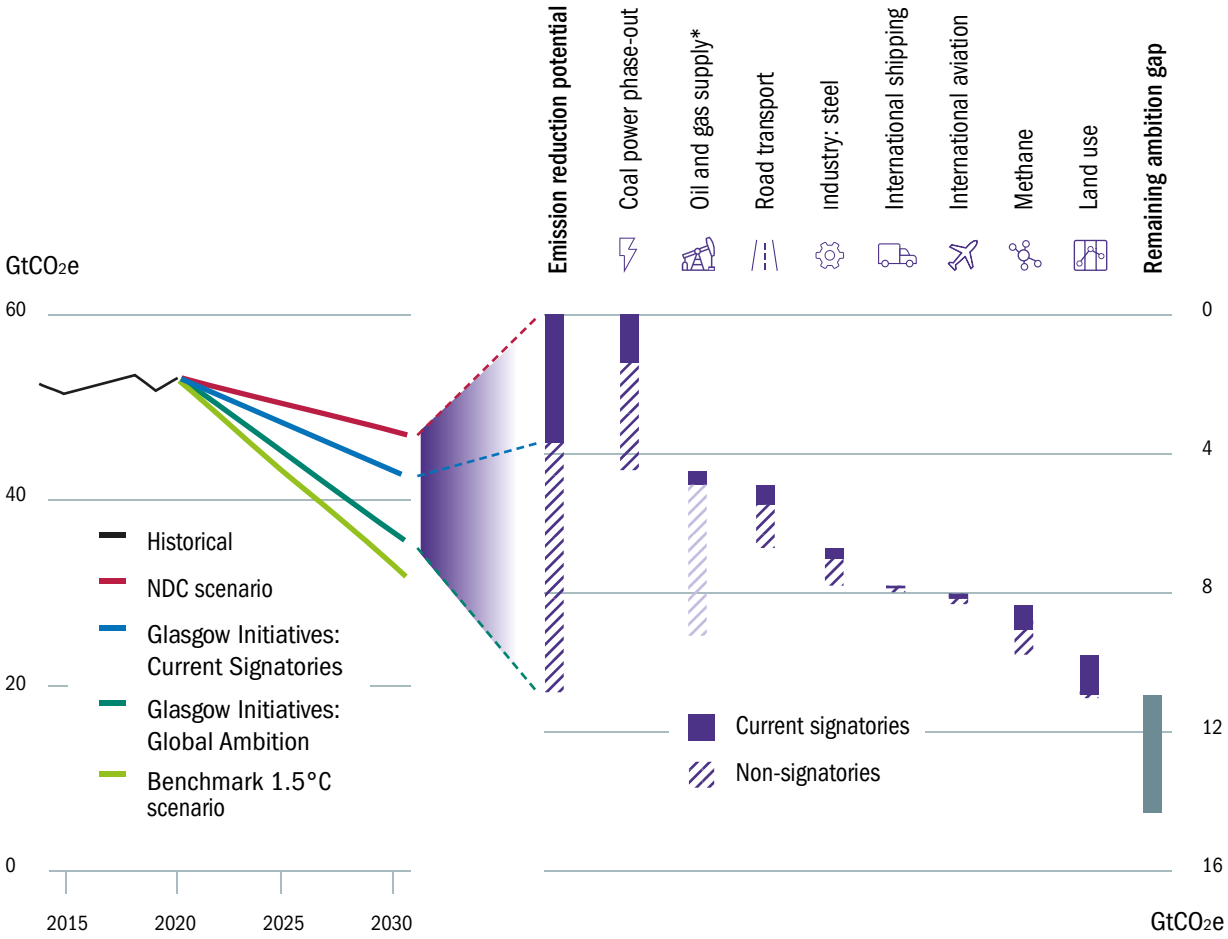
The emission reductions are estimated to be a lot smaller when only the current signatories are considered. We estimate that about 5 $GtCO_2e$ of the 15 $GtCO_2e$ ambition gap in 2030 would be filled by the Glasgow initiatives' national government signatories, assuming full implementation (Figure 3). Nevertheless, the results imply that the 2030 emissions under NDCs could be decreased by 5 $GtCO_2e$ if the national government signatories of the Glasgow initiatives would reflect initiatives' ambition in their updated NDCs. The emission reduction potential would likely be higher if the potential impact of non-state actor signatories are fully taken into account, as indicated by earlier studies (Kuramochi et al., 2020; NewClimate Institute et al., 2021). If the current national government signatories would fully live up to the global ambition of the Glasgow initiatives, global total GHG emissions under the Current Signatories scenario could be reduced to 43 $GtCO_2e$ in 2030, which is in line with a warming of 2°C in 2100 (66% probability) (UNEP, 2022).

For most initiatives that were assessed, current national government signatories account for less than half of the global sector total GHG emissions covered by the initiatives (Figure 9); the exceptions are the Glasgow Forests Declaration and the Glasgow Breakthrough Hydrogen initiative which aim for technology development instead of direct emission reductions. Most notably, China is a signatory to only one

Glasgow initiative that was included, the Glasgow Leaders' Declaration on Forests and Land Use; it has endorsed the Glasgow Breakthrough Agenda but only the sector goal on hydrogen, which was not quantified in our analysis.

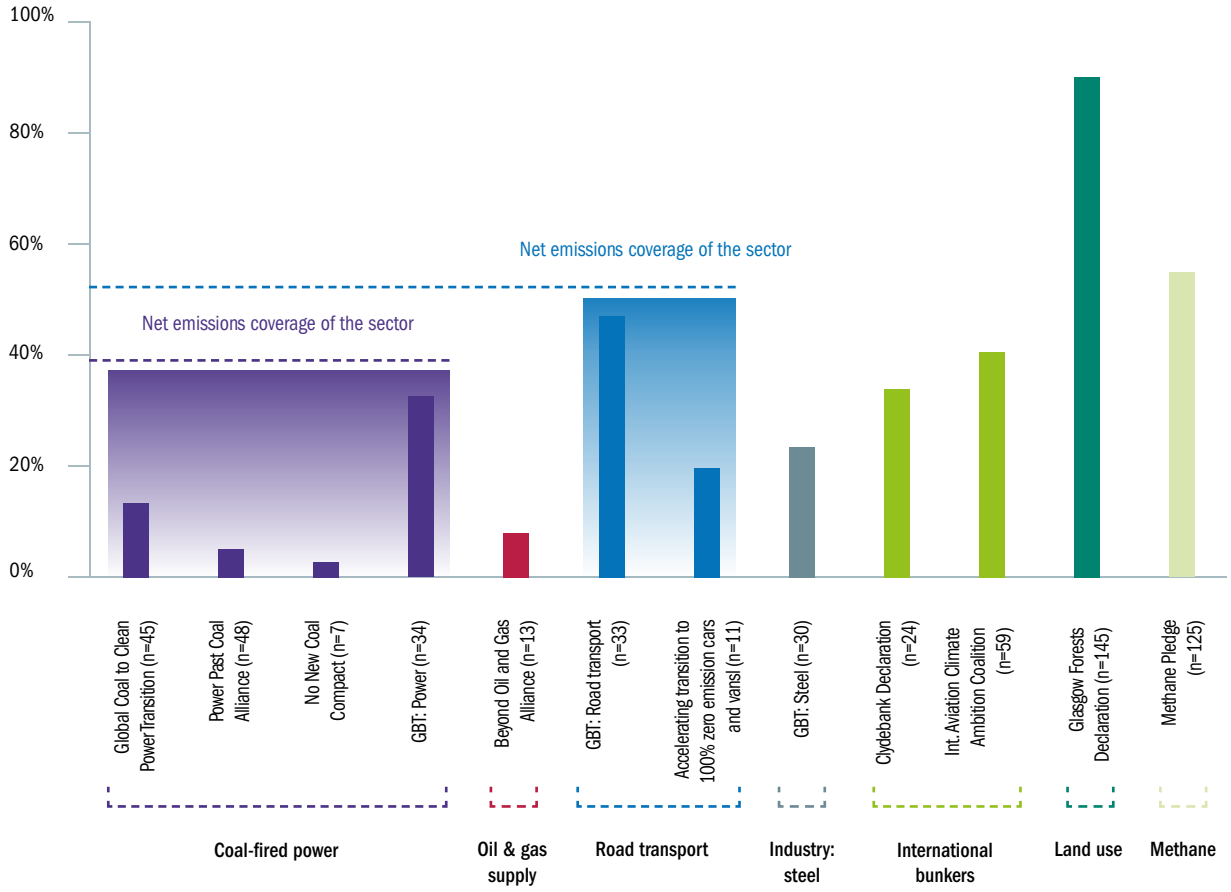
Some initiatives target emission reduction actions that are already part of NDCs and would not lead to additional emission reductions compared to NDCs. This mainly applies to the Global North countries. Most notably, the initiatives aiming for early phase-out of unabated coal-fired power have limited potential impact in these countries compared to the NDC scenario as most participants already have extensive coal phase-out policies. This finding is consistent with that of Jewell et al. that the countries that signed up to the Powering Past Coal Alliance are those that rely less on coal-fired power and have the capacity to bear the costs of coal phase-out (Jewell et al., 2019).

Figure 8. (Left) Potential GHG emissions reductions resulting from full implementation of selected Glasgow initiatives. The emission projections for the reference NDC scenario and the benchmark 1.5°C scenario are also presented. (Right) Coverage of the 'ambition gap' between the reference NDC scenario and the benchmark 1.5°C scenario by the Glasgow initiatives.



*Due to overlaps with other sectors and very broad sector coverage, we only use the current membership of initiatives in this sector as additional impact. The impact shown here illustrates the sector's significance.

Figure 9. The sectoral greenhouse gas emissions coverage by the national government signatories of the Glasgow initiatives.



Emission estimates are based on 2019 sector emissions for coal-based power, oil and gas supply, road transport and steel (IEA, 2021a), 2019 economy-wide emissions for international bunkers and 2019 methane emissions from PRIMAP-hist ver. 2.3.1 (Gütschow and Pflüger, 2022), and 2016–2020 average deforestation-related emissions from Grassi et al. (2022). The number of national government signatories as of October 2022 are provided in parentheses.

04

DISCUSSION AND LOOKING FORWARD

4.1 Initiatives' overall performance

The findings from Section 2 on the global status of mitigation-related ICIs are bleaker than in the past assessments (e.g. Chan et al., 2018; NewClimate Institute et al., 2021). In sum, performance trends in recent years give some reasons for concern. Since 2019 we observe higher shares of low or non-performing initiatives, both in mitigation and adaptation. Overall productivity of initiatives is also trending downwards. Given the large scale of climate action through ICIs and the growing number of mobilization processes through campaigns and climate summits, their organizers have an important role to ensure credibility. ICI announcements are too often not followed up by implementation and operationalization of commitments. This risks to undermine the credibility of ICIs, but also the campaigns and summits that convene them.

Discrepancies in participatory and implementation patterns across developed and developing countries are widening. Actors from the Global North make up the majority among funders, participants, leaders in ICIs. Moreover, almost half of implementation by ICIs take place in the Global North. By contrast, the share of outputs produced in low- and medium-low-income countries has been declining since 2015. Some imbalances are to be expected as they appropriately reflect differentiated responsibilities and the need for a strong focus on climate mitigation. Nonetheless, benefits of ICIs, particularly adaptation and resilience building, should also accrue to developing countries.

The literature suggests that summit and campaign organizers, such as the UN Climate Change High-Level Champions could steer towards higher performance by setting requirements for ICIs, especially those that are featured at summits and recognized by the UNFCCC in the Global Climate Action Platform (GCAP), such as the appointment of dedicated staff and/or a secretariat, regular reporting, credible budgets, and openness for new partners to join an initiative, while facilitating interfaces between non-state, subnational actors, policy-makers and funders (Chan et al., 2018; Chan, Hale, et al., 2022). Summit and campaign organizers can also target adaptation and resilience building, particularly in developing countries, for brokering new initiatives and convening South-based actors, for instance through regional climate events, to help reduce disparities between developing and developed countries.

4.2 Glasgow initiatives: Reasons for cautious optimism

Some Glasgow initiatives have not fully reflected the lessons from the past initiatives that did not deliver the targeted impact. For example, the Glasgow Forests Declaration is seen as 'the culmination of decades of' limited progress in combatting rainforest deforestation after the launch of the New York Declaration on Forests (NYDF) in 2014 (Abdenur, 2022; Nasi, 2022). The Glasgow Forests Declaration, a voluntary and legally non-binding agreement much like the NYDF, is unclear whether it aims for gross or net zero deforestation, which caused confusion and controversy (Jung, 2021; Nasi, 2022); it has also been assessed to still lack specific benchmarks, indicators and processes that would allow for appropriate tracking of progress towards the stated goal (Abdenur, 2022).

Recent literature (Climate Action Tracker, 2022; Cogan et al., 2022; IEA et al., 2022) as well as our own analysis using an internet archive (Internet Archive, 2022) also indicate that the number of national government signatories has not increased significantly for many Glasgow initiatives, with many major emitting countries still not signed up to date (Beyond Oil and Gas Alliance, 2022; COP26 Presidency, 2022; Global Methane Pledge, 2022). While this observation in the past year is partly due to the global energy security crisis following the war in Ukraine, it is worrying that the momentum generated at the COP26 might already be waning.

At the same time, we also see potential improvements for certain Glasgow initiatives that incorporate some of the above-mentioned recommendations. On regular assessment and reporting of progress, the Glasgow Breakthrough Agenda is promising that it explicitly asked two established institutions, IEA and IRENA, to assess annual progress toward the five sector goals (COP26 Presidency, 2021b). In addition, the Global Methane Pledge is also promising

as it will involve IEA in the progress assessment but other initiatives less so (Depledge et al., 2022); the first report was published in September 2022 (IEA et al., 2022). Another important feature of the Glasgow initiatives is that the inclusion of initiatives with commitments to finance, which is essential for implementation. Some experts take a view that the finance commitments of USD 19bn could make the Glasgow Forests Declaration substantially more effective than the NYDF (Jackson, 2021; UK Government, 2021; Santiago, 2022).

For national government signatories of mitigation-related ICIs such as the Glasgow initiatives, it is also crucial that they reflect the initiatives' goals into their enhanced NDCs to realise the country's full emissions-reduction potential (Obergassel et al., 2021). In this regard, the signatories of the Global Methane Pledge, under the U.S. leadership, are taking concrete steps to implement domestic methane reduction policies in line with the Pledge's goal (U.S. Department of State, 2022). We expect these follow-up actions to take place also in other initiatives.

The UK Presidency showed strong political drive for the Glasgow initiatives in close cooperation with the UN Climate Change High-Level Champions, who will continue playing an important role of mobilising climate action by non-Party stakeholders under the updated Marrakech Partnership work plan up to 2025 (UNFCCC, 2021b). This political drive allows for hope that the Glasgow initiatives will be taken forward and implemented; it is crucial that leadership and ownership of these initiatives is continued for this to materialise.

4.3 Looking forward

Summit and campaign organizers have an important role to play to ensure that the ICIs they give recognition to meet minimum requirements. For instance, when ICIs are featured at climate conferences, they should provide evidence that they are making progress against targets and have capacities and resources to deliver on pledges. Institutional robustness, including the appointment of dedicated staff or the presence of a secretariat, or, regular reporting, should be considered as requirements, as they increase the likelihood of pledges being kept.

National governments can strengthen consistency between NDCs and their pledges under international initiatives. National governments could swiftly reflect their pledges under international initiatives in their updated NDCs as soon as the domestic policy process allows. The secretariat and the leadership of the initiatives can also ensure that the national government signatories do so by regularly reporting the status of their action.

There is a potential to generate momentum in sectors currently not covered by the Glasgow initiatives. The Glasgow initiatives covered several important sectors that account for about 75% of the additional emission reductions that need to happen to bring the 2030 emissions down to 1.5°C-consistent levels from the NDC scenario levels. However, there are still sectors in which momentum for rapid transition toward decarbonisation is needed, including the buildings sector and heavy industry sectors other than steel such as chemicals and cement. These sectors have not been well covered by ICIs, especially by those that involve large emitting countries and established international institutions, launched in the previous years either (Roelfsema et al., 2018; Lui et al., 2021). The presidencies of the next few COPs as well as the UN Climate Change High-Level Champions, (UNFCCC, 2021b) may leverage their position to generate momentum to accelerate decarbonisation in these sectors.

Some initiatives target emission reduction actions that are already part of NDCs and would not lead to additional emission reductions compared to NDCs. This mainly applies to the Global North countries. Most notably, the initiatives aiming for early phase-out of unabated coal-fired power have limited potential impact in these countries compared to the NDC scenario as most participants already have extensive coal phase-out policies. This finding is consistent with that of Jewell et al. that the countries that signed up to the Powering Past Coal Alliance are those that rely less on coal-fired power and have the capacity to bear the costs of coal phase-out (Jewell et al., 2019).

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