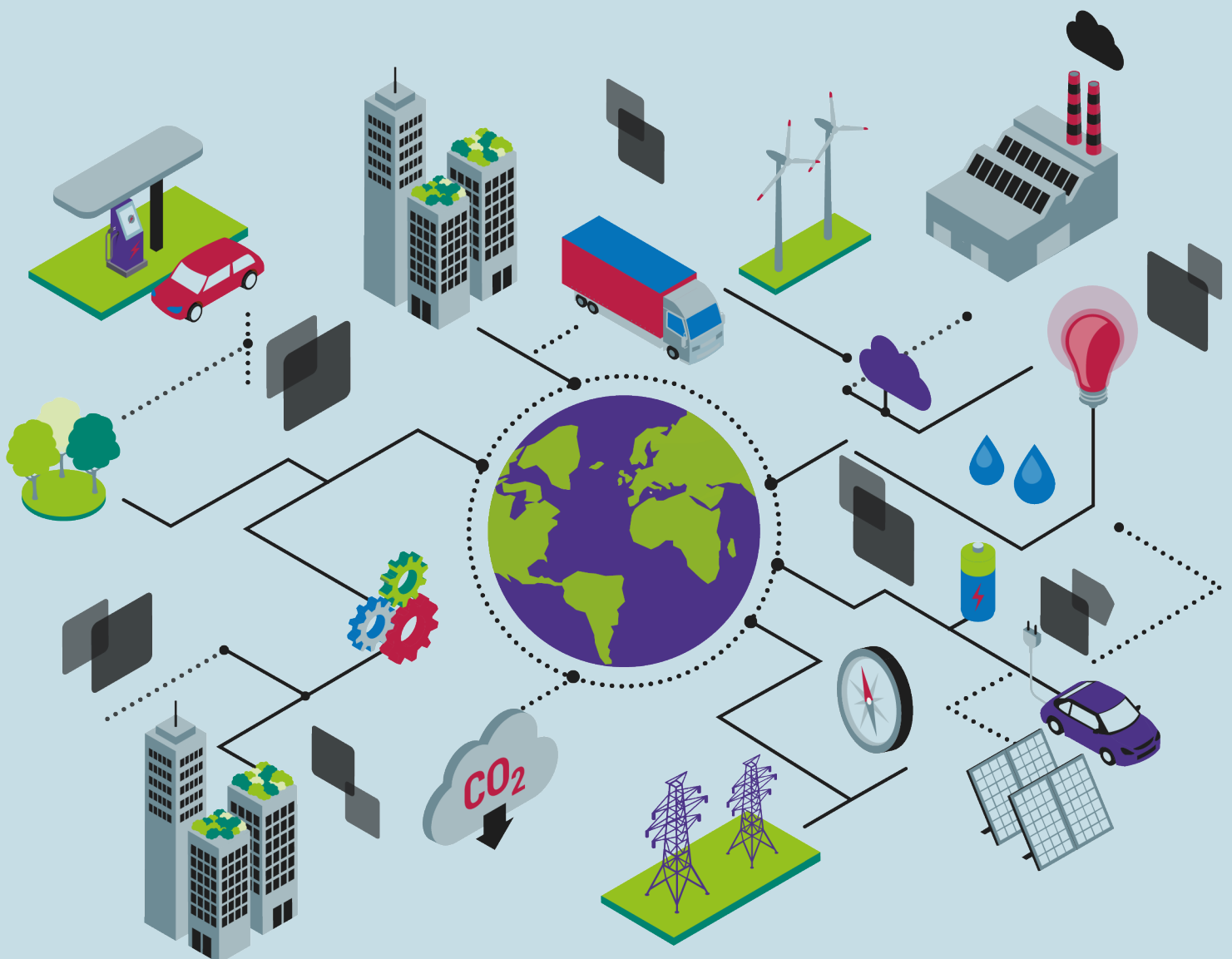


GLOBAL CLIMATE ACTION 2022

Progress and Ambition of Cities, Regions,
and Companies



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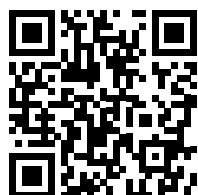
Data-Driven EnviroLab, Utrecht University, and CDP. (2022). Global Climate Action 2022: Progress and Ambition of Cities, Regions and Companies. Research report prepared by the team of: Zhi Yi Yeo, Katherine Burley, Ian French, and Angel Hsu (Data-Driven EnviroLab), Mark Roelfsema, Chelsea Jones (Utrecht University) and Andrew Clapper and Lucy Du (CDP).

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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.

We thank Lili Li, Kelvin Xu, and Sam Anthony for their help in the collection of data in the development of the database of non-state actors. We thank Kaihui Song for their contributions to our discussions in the formulation of the progress and ambition analysis.

Our thanks to Takeshi Kuramochi and Frederic Hans (NewClimate Institute) for the critical feedback provided on this report. Special thanks go to Polina Korneeva for report design, Amandeep Gill-Lang, Natalie Short, Ella Feathers, and Charlotte Ballard for the support on communications and outreach.



ES

EXECUTIVE SUMMARY



Non-state actors, including cities, regions, and companies, are integral to limiting global warming to well below 2°C or even 1.5°C - the global goal codified in the 2015 Paris Agreement - and avoiding the worst effects of climate change. In this fourth edition of Global Climate Action 2022: Progress and Ambition of Cities, Regions, and Companies, we find that non-state actors continue to establish new climate efforts, with many setting new targets despite setbacks from global events, including the COVID-19 pandemic and Russian invasion of Ukraine.

Cities and Regions - Landscape

Nearly 12 percent of the global population is covered by subnational climate action in 13 major economies accounting for 71 percent of global emissions.

This report focuses on 13 economies: Argentina, Australia, Brazil, Canada, China, the European Union, the United Kingdom, India, Indonesia, Japan, Mexico, South Africa, and the United States, including 2,406 cities and 122 regions that have made quantifiable emissions targets. Together these individual non-state actors have set 3,020 quantifiable emissions targets, with 448 actors setting more than one target. These targets cover over 894 million people, which represents approximately 11.5 percent of the global population, after accounting for geographic overlaps between actors (World Bank, 2021b). Regional targets cover around 610 million people, with city targets accounting for an additional 284 million people who are not covered by any regional targets.

In our sample, Europe leads the way in the number of targets, with 2,480 coming from cities and regions in the European Union and the UK, followed by North America with 314 targets. European Union and UK cities account for over 80 percent of total targets. Within the EU, Italy has the greatest number of targets with 900 individual targets, followed by Spain with 706. East Asian nations lead in population coverage with 326 million people living in cities and regions with targets, followed by North America and Europe. These three regions account for over 86 percent of the total population coverage in our data. Within these three regions, population coverage is primarily driven by the United States (228 million), China (160 million), the EU (160 million), and Japan (124 million).

The most recent data indicates a decline in the number of city and regional governments pledging climate action. While 2020 was previously a key target year that benchmarked subnational climate action, since the COVID-19 pandemic, many cities and regions have yet to make post-2020 pledges, although recent years have seen some growth in target-setting.

Our data points to the fact that momentum around quantifiable emissions target setting for 2020 has not yet translated into post-2020 targets. Prior to 2020, we saw around 6,000 actors pledge emissions reduction targets, with more than 5,600 actors aiming to reduce emissions by 2020. After accounting for the expiration of the 2020 targets, data this year indicates that the total number of subnational actors committing to quantifiable emission reduction targets has dropped by half, with only around 3,000 actors having set quantifiable emission reduction targets. While this drop in the total number of subnational actors committing to quantifiable emission reduction targets is sobering, underscoring the urgent need to rebuild momentum, one point of optimism is the growth in the number of subnational entities pledging post-2020 targets. In 2018 and 2019, only 264 of the approximately 6,000 subnational actors had quantifiable targets aiming for post-2020 emissions reductions. Since the 2020 COVID-19 pandemic, there has been significant growth in post-2020 targets, with an absolute increase of 1,672 subnational actors with quantifiable post-2020 targets. Of the post-2020 targets, most city and region targets are focused on the medium (2026 to 2035) and long-term (2036 or later), indicating a lag in nearer-term, immediate action (2021 to 2025). In 2021, just 665 out of the 1,642 subnational actors with targets before 2030 had set additional longer-term targets. At the same time, subnational entities setting targets for the first time demonstrate higher overall ambition. Between 2018 and 2020, as actors have started to look beyond 2020 targets, the median greenhouse gas reduction percentage has increased from 20 percent to 40 percent.

Cities and regions are improving in reported emissions inventories, providing more detail regarding emissions scopes.

Subnational governments' reported inventories have seen notable improvements since we began tracking them. Over

70 percent of all actors with quantitative targets in our database reported disaggregated emissions for at least one emissions scope, indicating that these actors are identifying the sources of their emissions (WBCSD & WRI, 2004). We found that the number of actors who report their emissions by scope has increased across all data sources since 2018. While Scope 3 emissions reporting has increased slightly (no actors reported Scope 3 emissions in 2018 or 2019), it is far less common than Scope 1 and 2 tracking, with less than 5 percent of actors reporting Scope 3 emissions in 2022.

Companies - Landscape

Companies totaling at least 16.4 trillion USD in revenue have made quantifiable absolute emission reduction targets, focused primarily between 2025 and 2035.

Over 1,000 companies, operating within the 13 focus economies in this report have reported quantifiable absolute emissions reduction targets through CDP's 2021 Climate Change questionnaire. These companies represent revenue of at least USD 16.4 trillion, which is higher than every country's GDP except for the United States and China (World Bank, 2021a). Over 40 percent of these companies (385) appear on either the Fortune Global 500 and Global Forbes 2000 lists.

Mid-term targets (between 2025 and 2035) continue to be the most common across all focus countries, followed by short-term targets. Overall, 58 percent of targets are mid-term, 27 percent are short-term (2022-2025), and 14 percent are long-term (2025-2035). For companies that include Scope 1 or 2 emissions, the average percentage reduction pledged is 36 percent for short-term targets, 48 percent for mid-term targets, and 86 percent for long-term targets, although there is wide variability across countries. Short-term targets and mid-term targets showed more variation than long-term targets, with average percentage reductions pledged for short-term targets ranging from 29 percent (China) to 38 percent (Argentina), average percentage reduction pledged for mid-term targets ranging from 42 percent (Indonesia) to 51 percent (South Africa), and average percentage reduction pledged for long-term targets ranging from 85 percent (India and EU27) to 91 percent (Canada).

Net-zero ambition of cities, regions and companies

Non-state actors are increasingly setting targets aligned with global decarbonization pathways for mid-century.

We identified 3,224 targets where subnational governments have mentioned net-zero related terms, such as “net-zero target” or “zero emissions” in their commitments or target statements. The majority of subnational governments setting net-zero targets are concentrated in North America (59 percent) and Europe (29 percent). In all other regions, less than 10 percent of actors have quantifiable net-zero targets. Nearly all of Australia's population is covered by net-zero targets, since all eight states and territories have made net-zero targets, although only four have quantifiable targets of at least 80 percent reduction. Japan follows close behind, with over 96 percent of its population covered by net-zero targets. Where subnational governments have pledged a quantitative net-zero target, most commit to at least either 80 or 100 percent emissions reduction, although it remains to be seen whether these cities and regions plan to use offsetting or carbon dioxide removal technologies to achieve these targets.

We also found 296 companies that have committed to reduce their emissions by at least 80 percent by 2050. Based on self-reported data to CDP's 2021 Climate Change questionnaire, we identified 592 companies that publicly report a company-wide net zero target. It is important to note that corporate net-zero target commitments have increased rapidly over the last years and the updated landscape of net-zero targets might not be fully reflected in the 2021 CDP data, which primarily reflects accounting periods in 2020, due to a time lag between the reporting of the data and the publication of the data. As a result, we believe that the current count of net-zero targets from companies is likely higher than the numbers reported here.

Ambition of cities, regions and companies

Focusing on Global North cities and regions, and on global ambition for companies, we use three IPCC reference scenarios to evaluate the ambition of targets in line with or more ambitious than the 2°C, 1.5°C Paris Agreement goals.

For cities and regions, based on the three scenarios, we find that less than 10 percent of Global North cities and regions' targets are considered ambitious (126 out of 1,317 targets), with 35 targets aligning with the IPCC scenario that keeps warming to 1.5°C with limited or no overshoot, 81 targets aligning with keeping warming to 2°C, and 10 targets with emissions reductions in line with the currently available cost-effective mitigation options. Many of these ambitious targets (58 percent) are also net-zero targets.

For companies, we find a more promising picture. The assessment of companies was done on a global level for absolute Scope 1 and 2 emission reduction targets. The global ambition of targets from companies that reported both in 2018 and 2021 has increased from 2.0 to 2.9 percent annual reductions for the period 2020-2030. For all companies that reported in 2021, the median ambition on a global level between base year and target year is 3 percent per year, and 70 percent of the targets are in line with 2°C emission pathways, and 42.5 percent with 1.5°C pathways. In terms of progress, companies have reduced more than expected from their original targets (assuming linear reductions between base year and target year), and still need to reduce emissions after 2021 by 2.5 percent per year (median) to achieve their emissions reduction targets. These remaining reductions vary significantly, especially for targets with less than ten years of remaining time to maturity. Note, however, that the possible use of offsets and impact of Scope 3 emissions were not included in this assessment due to data limitations, but these are important to consider in future assessments.

Progress of cities, regions and companies

Many subnational governments' targets are not on track to being met. In total, only 46 percent of cities and regions are on track (622) to meet their targets, with the remaining 53 percent (711) falling short. Median annual progress for subnational actors is 1.6 percent per year. For companies, the picture of progress is more optimistic. Based on the CDP dataset of 1,500 companies and 2,000 Scope 1+2 targets with sufficient information to quantify emissions reductions, 75 percent of companies are on track to meet their self-reported targets, and global median annual progress is 5.8 percent per year. For a full picture of progress, it is

necessary to consider whether a non-state actor uses offsets to achieve their emission reduction goals, and whether Scope 3 emissions are included.

Progress versus ambition: looking ahead to remaining emissions reductions

Evaluating both non-state actors' progress and ambition together, the global picture is mixed. Companies appear to be more ambitious and on-track compared to cities and regions. Many subnational governments are not on track to achieve their self-stated emission reduction targets, and the majority of targets fail to be ambitious enough to align with the Paris Agreement goals. Since Global North cities and regions comprise the majority of subnational actors, the reality is that they, along with companies, would likely be held to more stringent benchmarks than those presented in our analysis (IPCC, 2022). The picture of ambition provided in this report is therefore conservative, with even greater ambition and emissions reductions required for us to meet the goals of the Paris Agreement.

While we acknowledge that subnational actors face constraints on emissions both within and outside of their control, our findings show that much more effort is required. Cities and regions should coordinate with stakeholders within their jurisdictions to meet emission reduction goals. With countries submitting new NDCs to the Paris Agreement, cities, regions and several businesses should also consider increasing the ambition of their targets and report these updated targets. This process could go hand in hand with adoption and implementation of regulatory policies such as emission trading systems and corporate climate-disclosure reporting requirements such as those proposed in the EU (European Commission, 2022a).

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01

INTRODUCTION



1.1 Background and objectives

The 2021 UN Climate Change Conference (COP 26) in Glasgow presented a stark reminder that national efforts to reduce greenhouse gas emissions are insufficient to limit global warming to well below 2°C or 1.5°C. Non-state actors, such as cities, regions, and companies, are integral to achieving the 1.5°C goal and avoiding the most detrimental effects of climate change, so it is crucial to understand the extent and impact of climate action from these entities (Hsu, Höhne, et al., 2020; Kuramochi et al., 2020; Lui et al., 2021).

In this fourth edition of Global Climate Action 2022, we find that non-state actors have established new efforts, with many setting new targets despite setbacks from global events, such as the COVID-19 pandemic and the Russian invasion of Ukraine. This year's report features several additions, including two new focus economies (Australia and Argentina) and the addition of a new approach to assess target ambition. We also narrow our focus on individual non-state actors, i.e. individual targets made by cities, regions, and companies, while analysis of international cooperative initiatives is published in a separate report (NewClimate Institute et al., 2022).

In the first part of the report, we describe the landscape of non-state climate action across 13 major economies, including new analyses on net-zero targets and the evolution of individual subnational action over time. In the second part of the report, we assess how non-state entities are progressing towards their targets, identifying which actors are on track and which are falling behind. We also consider target ambition using new methods of defining and evaluating ambition for both subnational governments and companies. For cities and regions, the data for this report primarily comes from nine major reporting platforms for non-state actors (such as CDP, the Under2 Coalition, and the Global Covenant of Mayors), supplemented with data from individual country reports and peer-reviewed studies (See Appendix 1 for a list of data sources). For companies, the data comes from the CDP Climate Change Questionnaire 2021 and includes data on companies that

have reported absolute emissions targets targeting either Scope 1 or Scope 2 emissions, or both, and which have agreed to publicly share this data. An overview of the key findings are presented here:

Landscape of non-state climate action

- Over 11.5 percent of the global population is covered by emissions reduction targets from individual cities and regions.
- While we see the number of cities, regions, and companies setting targets increase, this growth might not necessarily be enough to rebuild momentum lost after many subnational governments' 2020 targets have expired.

Progress

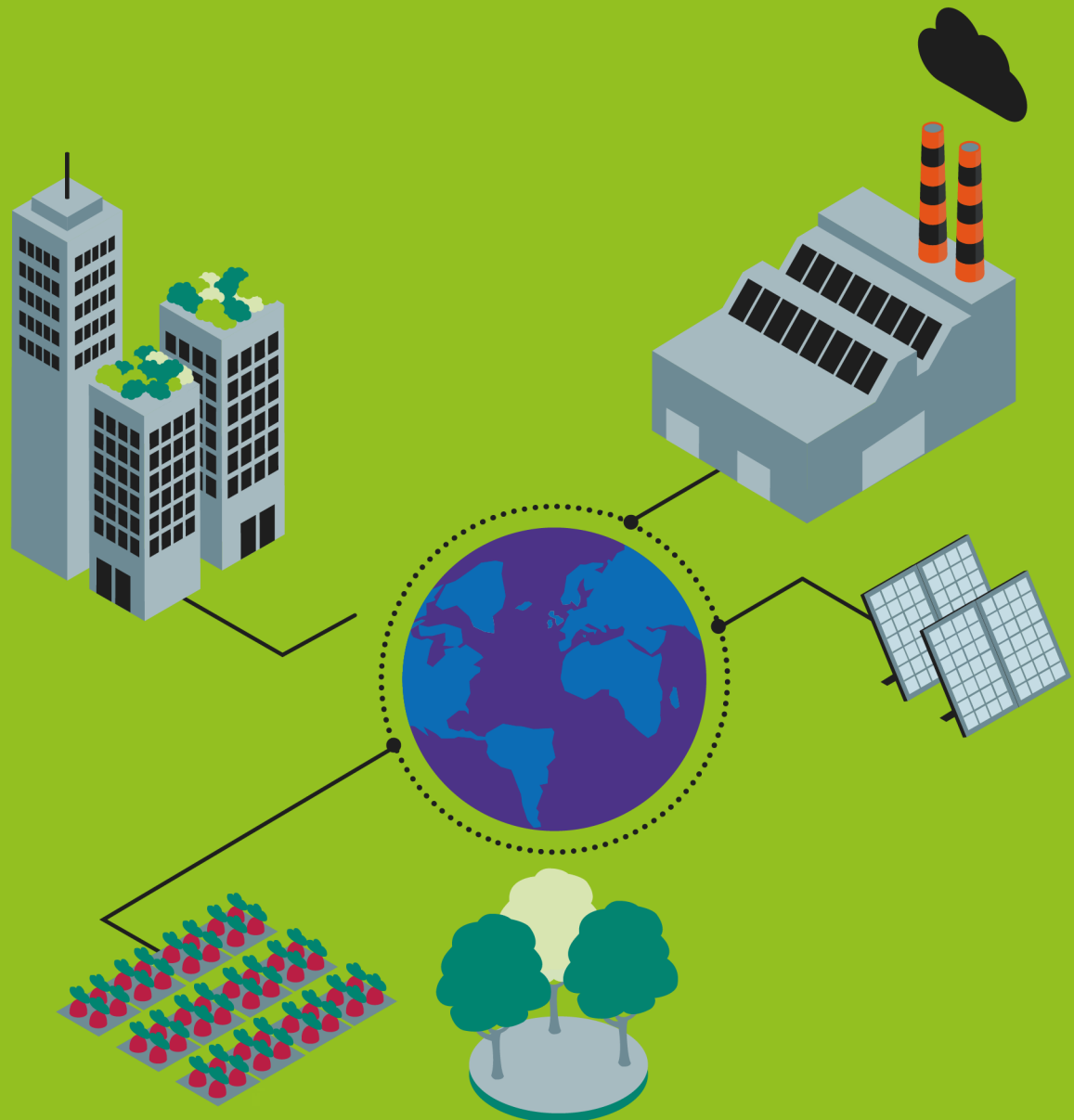
- In general, we find that more companies are on track to achieving their targets, with around 75 percent on track as compared to only around 46 percent of subnational actors on track to achieving their target.
- We are only able to assess progress for a fraction of cities, regions, and companies, since many fail to report a baseline and additional monitoring inventory required for this analysis. Of the 2,406 cities and 122 regions that have made quantifiable targets, 961 cities (40 percent) and 99 regions (81 percent) have reported inventory emissions.

Ambition

- More companies have also set ambitious targets, with over 70 percent of targets meeting emission reduction levels required to at minimum keep warming to less than 2°C. For subnational actors, only 9 percent of targets meet the same threshold. More analysis, however, is required to understand how companies use carbon offsets and whether changes in company structure affect target achievement.
- For subnational governments, more than half of ambitious targets (58 percent) are also net-zero targets.

02

GLOBAL LANDSCAPE ANALYSIS



The global landscape of non-state climate action has rapidly evolved since cities, regions, and companies were officially recognized as critical contributors to the Paris Agreement. More actors, representing an increasingly broad range of geographies and sectors, are pledging their own climate actions or participating in cooperative initiatives. While individual non-state actors – cities, regions, and companies – can declare efforts to address climate change in a variety of ways, including adaptation and financing, we focus here on those who have made quantifiable pledges to reduce their emissions. We specifically focus on 13 major emitting economies: Argentina, Australia, Brazil, Canada, China, the European Union, India, Indonesia, Japan, Mexico, South Africa, the United Kingdom, and the United States. Both Argentina and Australia see subnational actors' quantifiable climate targets cover a significant proportion of the country's population (9 percent for Argentina, 67 percent for Australia) and are included for the first time in this year's report. Since the United Kingdom separated from

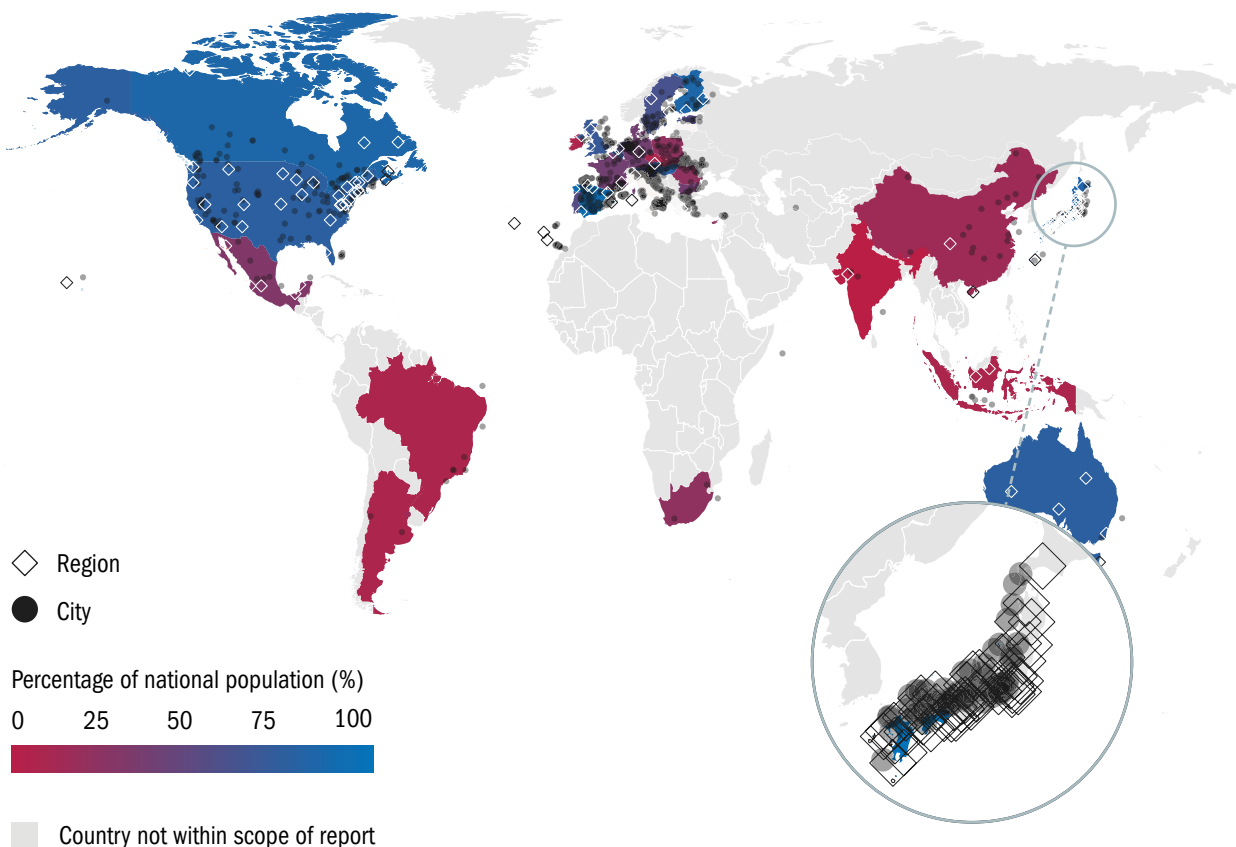
the European Union, we have also included this distinction in our analysis. Quantifiable targets are defined as absolute emissions targets where the actor has specified and provided information on a base emissions/year, a reduction target, and a target year. In the following sections, we explore the trends in cities, regions, and companies that have made quantifiable targets to reduce their greenhouse gas emissions in 2022 and beyond.

2.1 Cities and regions

Overview

Among the 13 focus economies, 2,406 cities and 122 regions have made quantifiable emissions targets. Together these individual non-state actors have set 3,020 quantifiable emissions targets, with 448 actors who have set more than one target. After accounting for geographic overlaps between actors, these targets cover over 894 million people, which represents approximately 11.5 percent of the global

Figure 1. Map of quantifiable emissions reduction targets from cities and regions. Data only shown for 13 major emitting economies.

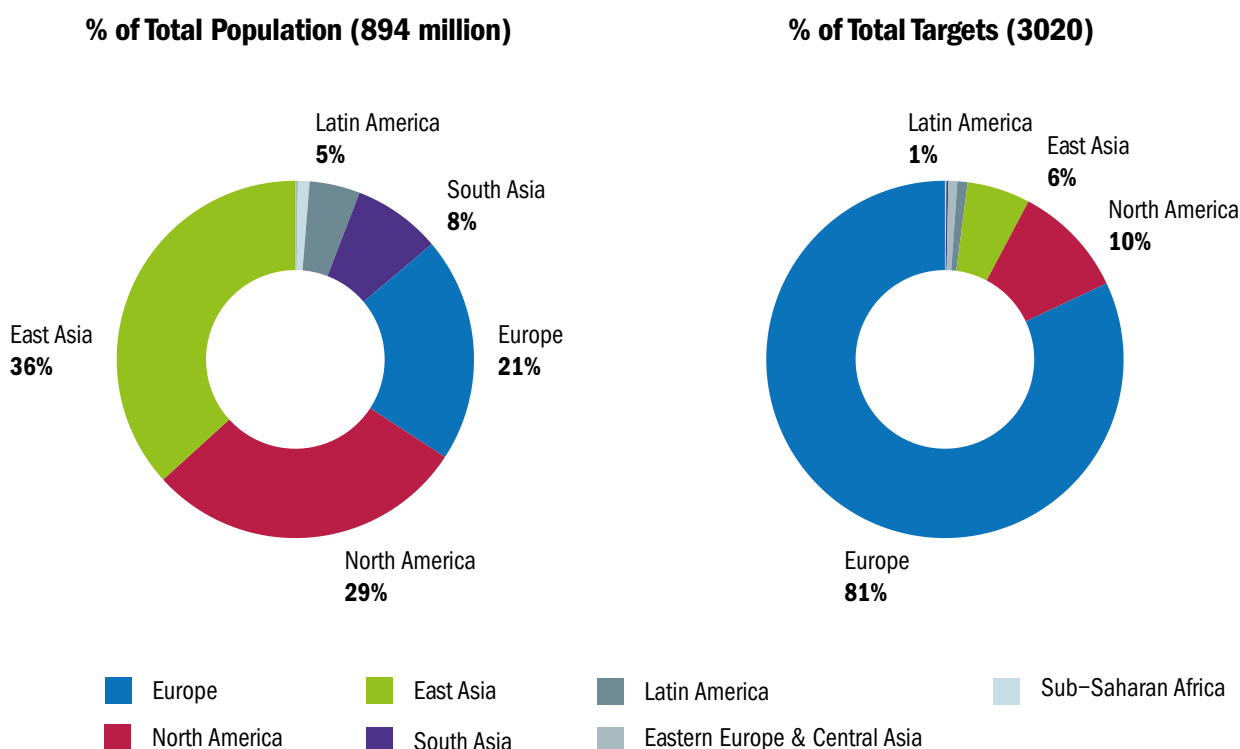


population (World Bank, 2021b). Regional targets cover around 610 million people, with city targets accounting for an additional 284 million people who are not covered by any regional targets.

Europe leads the way in the number of targets, with 2,480 of these targets coming from cities and regions in the European Union and the UK, followed by North America with 314 targets. The European Union and UK cities account for over 80 percent of total targets. Within the EU, Italy has the greatest number of targets with 900, followed by Spain

with 706. While Europe dominates the number of targets, the population covered by subnational governments pledging quantifiable targets is somewhat more evenly spread across the focus regions. East Asia leads with 326 million people living in cities and regions with targets, followed by North America and Europe. Together, these three regions account for over 86 percent of the total population in our data. Within these three regions, the United States (228 million), China (160 million), the EU (160 million), and Japan (124 million) rank highest.

Figure 2. Percentage of total population coverage and total targets by geographic region.



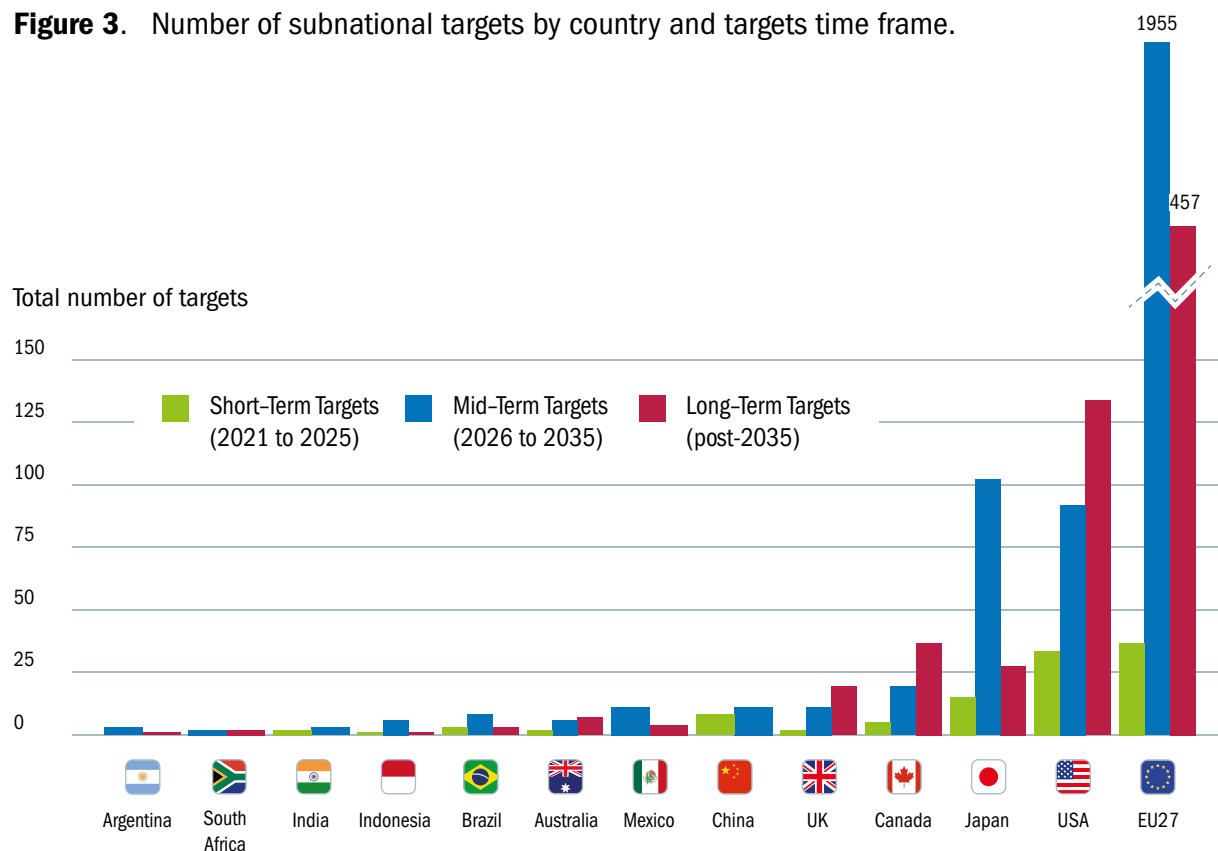
Target time frames

We consider “short-term” targets to be those set from 2021 until 2025, “medium-term” targets as years from 2026 to 2035 and “long-term” targets as years 2036 or later. The vast majority of targets (2,163) are set for 2030 (72 percent), followed by 595 targets set for 2050 (20 percent). The medium-term time frame is most common for targets in eight of 13 countries, while long-term targets are the most common in Australia, Canada, the UK, and the US. We do not observe any subnational actors in Argentina,

Mexico, or South Africa who have set short-term targets, while subnational actors in India and China have not set any long-term targets. Of the 666 subnational actors who have set long term targets, 417 of these have also set at least one short or medium term targets.

Trends in target-setting

Initial momentum for subnational target setting may have stalled due to the COVID-19 pandemic, which hit a global pause on climate change efforts. This year’s analysis shows

Figure 3. Number of subnational targets by country and targets time frame.

a reduction in the number of quantifiable pledges from subnational actors. The first and second iterations of the Global Climate Action from Cities, Regions and Companies report (Data Driven Yale et al., 2018; NewClimate Institute et al., 2019) recorded more than 6,000 quantifiable emission reduction pledges from city and regional governments, yet there has been a notable decrease in subnational pledges overall, although the number of post-2020 targets has increased (Figure 4).

Many non-state global climate policy efforts focused on the year 2020 as a critical deadline for peak emissions, which may explain the abundance and proliferation of subnational targets aimed for this year (Ge et al., 2019). The focus on subnational target setting for the 2020 target year provides some explanation for the drop in the total number of subnational actors committing to quantifiable emission reduction targets as highlighted above. However, one point of optimism is the growth in the number of subnational entities pledging post-2020 targets. In 2018, out of the 5,985 subnational actors with climate targets, just 264, or less than 5 percent, had set a target for the

post-2020 period. In our 2019 report, just one hundred additional subnational actors, or 6 percent, out of 6,123 had set targets for the post-2020 period. Since the 2020 COVID-19 pandemic, there has been significant growth in targets, with an absolute increase of 2,199 subnational actors with quantifiable post-2020 targets. This growth, however, is dominated by several major economies, namely the United States, Japan, the EU27, and the UK (Figure 5). In 2018, the EU27 accounted for 45 percent of all subnational post-2020 greenhouse gas reduction targets. As of 2022, this proportion has increased to a striking 82 percent. This growth of cities and regions with quantifiable post-2020 targets within the EU27 is largely attributed to the large number of signatories within the EU Covenant of Mayors initiative (European Commission Joint Research Centre et al., 2022). The next largest contributors - the United States and Japan - respectively account for just 7 percent and 5 percent.

Given the urgent need for rapid decarbonization, the growth in subnational target setting for the post-2020 period is encouraging, demonstrating that more cities and regions

are looking to align mitigation efforts for 2030 and beyond. The dramatic decrease in the overall number of subnational actors with climate targets since 2019, however, underscores an urgent need to rebuild momentum ahead of 2030. In 2021, just 665 out of the 1,642 cities and regions with targets before 2030 had set additional longer-term targets beyond this year. At the same time, cities and regions setting targets for the first time demonstrate higher overall ambition. Between 2018 and 2020, as cities and regions have started to look beyond 2020 targets, the median greenhouse gas reduction percentage has increased from 20 percent to 40 percent. This shift may similarly be attributed to the fact that the EU Covenant of Mayors for Cli-

Figure 5. Number of post-2020 subnational targets by report year and focus economy.

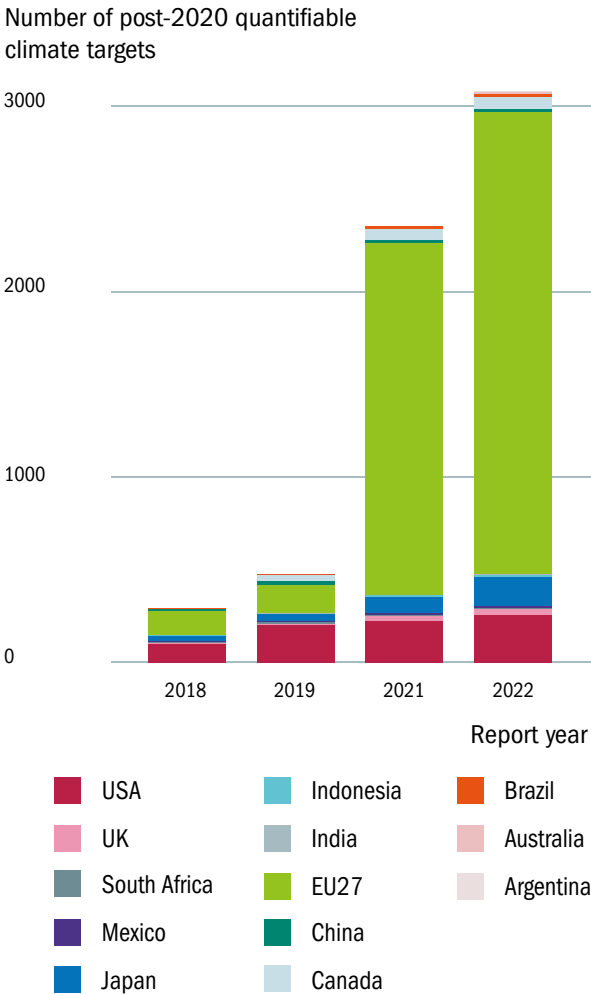
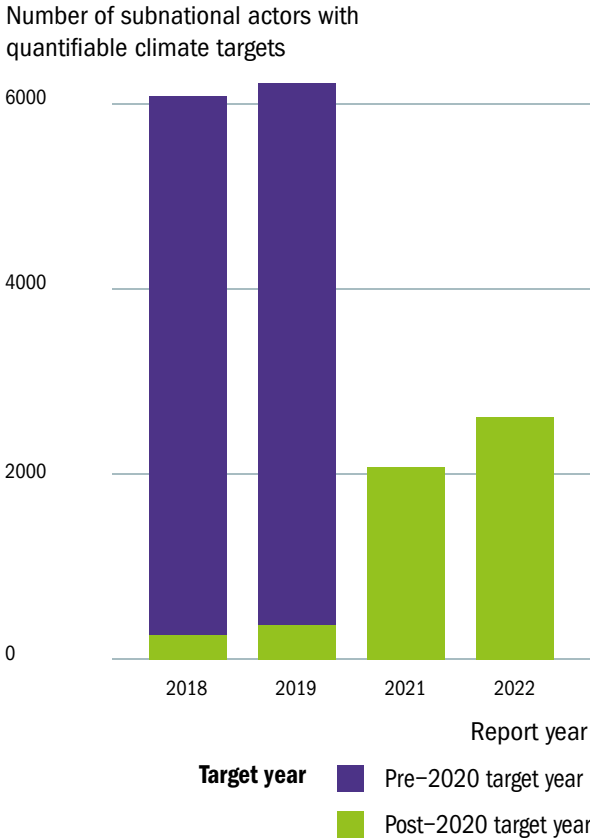


Figure 4. Comparison of number of subnational actors included in previous reports with the present.



mate and Energy (EUCoM), which boasts thousands of signatories, updated its requirements, mandating that all participating actors must pledge reductions of at least 40 percent by 2030. While this collective increase in ambition should be applauded, it is critical that more cities and regions begin to set targets beyond this initial reduction.

The next three years are an especially important window of opportunity to increase target-setting ahead of the Paris Agreement's 2025 deadline for countries to increase ambition. As of now, updated national policies and pledges since COP26 will still result in a temperature rise of 2.4-2.6°C by the end of the century, failing to achieve the 1.5°C and well below 2°C goals established in the Paris Agreement (UNEP, 2022). More worryingly, this indicated temperature rise assumes that countries are able to meet these updated pledges. The United States, for example, was on track, as of

December 2020, to only achieve a 16-18 percent reduction in emissions below 2025, compared with its promises of 26-28 percent (Stilson et al., 2021). Increased participation of subnational actors during the next several years will be critical for countries to avoid falling further beyond their nationally determined contributions, meet their updated pledges, and further ramp up climate ambition.

Trends in emissions reporting

Subnational governments' reported inventories have seen notable improvements since we began tracking them. Since a city or region's greenhouse gas emissions come from a variety of sources and can result directly or indirectly from a range of activities, emission inventories should be disaggregated by emissions scope. Scope 1 emissions result directly from fossil-fuel combustion activities within an entity's boundary, whereas Scope 2 emissions arise from purchased electricity, heat or steam, and Scope 3 emissions are indirect emissions including out-of-boundary or supply chain emissions that result from an actor's activities (WBCSD & WRI, 2004).

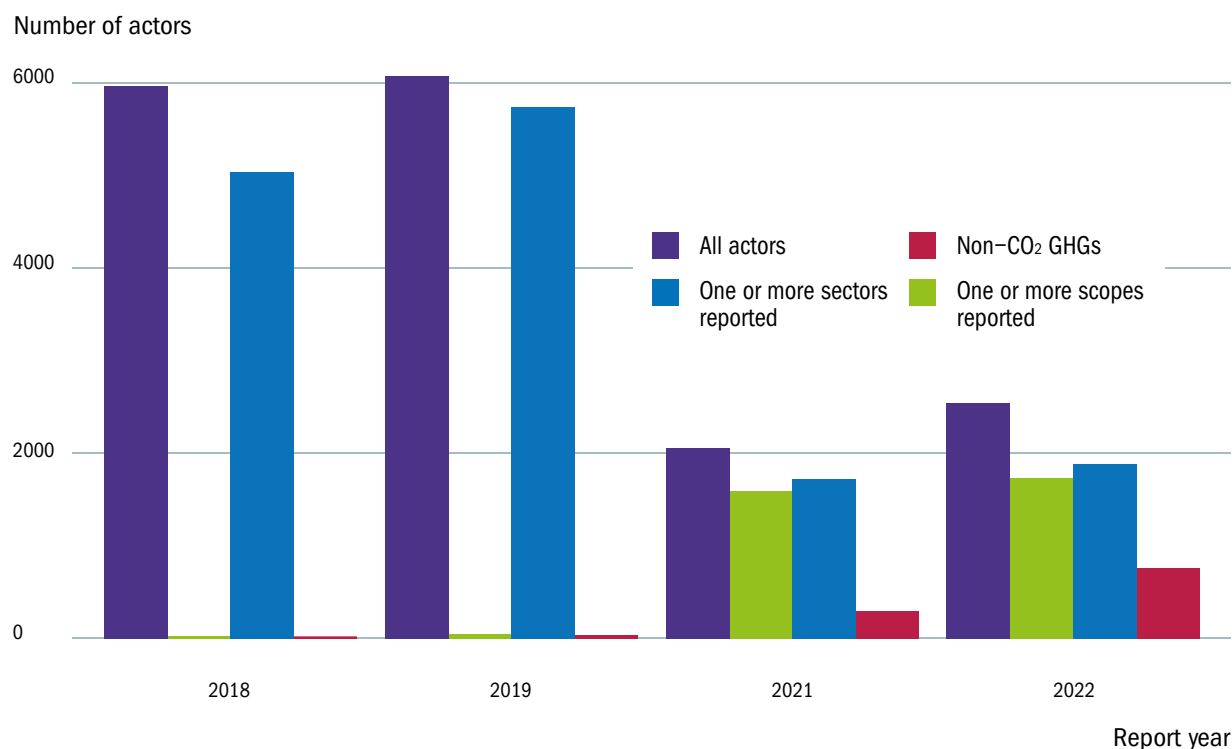
Over 70 percent of all subnational actors with quantitative targets in our database reported disaggregated emissions for at least one emissions scope, which is important to prevent double counting both direct and indirect emissions arising from purchased electricity, heat and steam (i.e., Scope 2 emissions) (WBCSD & WRI, 2004). We found that the number of subnational actors who report their emissions by scope has increased across all data sources since 2018. Despite the increase in Scope 3 emissions reporting in subnational actors, there were relatively few actors (less than 5 percent) reporting Scope 3 emissions in 2022 as no subnational actors reported Scope 3 emissions in 2018 or 2019.

The Glasgow Climate Pact (UNFCCC, 2022) called for further actions to reduce non-CO₂ greenhouse gas emissions. We found that the number of subnational actors reporting non-CO₂ greenhouse gases in their emissions inventories has also increased since 2018, a promising sign that subnational actors are paying closer attention to their non-CO₂ greenhouse gas emissions. Non-CO₂ greenhouse gases, such as methane (CH₄) and nitrous oxide (N₂O), are important contributors to climate change (Hopkins et al., 2016), however most subnational actors focus solely on CO₂ emissions, possibly because CO₂ is the most dom-

inant greenhouse gas for cities or because CO₂ emissions are relatively easier to measure due to more reliable data on fuel consumption. This increase in the number of subnational actors that also report non-CO₂ greenhouse gas emissions may indicate that more subnational actors are considering the effects of these other gases when they set their climate goals and targets. Despite the increase, it is still uncommon for subnational actors to report non-CO₂ gases in their emissions inventories, with just under 30 percent of subnational actors reporting in 2022. Some data sources allow actors to report their emissions by the sector-specific activities where emissions are generated (e.g. transportation, electricity, etc.). This analysis reveals that most subnational actors have been tracking how different sectors and activities contribute to their overall emissions. For this report, we identify actors reporting sectoral emissions as those who have provided sector- or activity-specific emissions inventory data for at least one sector, where the sectors and activities are defined by the actor or data source. The number of subnational actors tracking sectoral emissions closely follows the overall pattern of non-state actors with quantitative targets, with a sharp drop off in the 2021 report due to the expiration of 2020 targets. In each report year, over 75 percent of actors have reported their emissions by sector (Figure 6).

These reporting trends are encouraging, and it is important to isolate likely explanations for what we observe. The increase in reporting could be partially due to changes to the actor's emissions accounting methodology or changes to coordinating networks' reporting requirements. For example, the European Covenant of Mayors aligned their reporting and monitoring framework with the Global Covenant of Mayors' Common Reporting Framework in 2019 (EU Covenant of Mayors for Climate & Energy, n.d.). The total number of subnational actors with quantitative targets in each year is also an important factor. Figure 6 shows how the landscape of subnational actors and emissions inventories has changed before and after 2020. While sectoral reporting has been consistent across all report years, this analysis suggests that subnational actors who have set post-2020 targets are reporting their emissions with much higher granularity by collecting information on non-CO₂ greenhouse gases and scopes in their inventories. This information can help subnational actors better understand where their emissions are coming from and

Figure 6. Number of subnational actors reporting scopes, sectors, or non-CO₂ GHGs by report year.



how to tailor their action plans to address the different types and sources of emissions. It can also help improve aggregate estimates since scope-disaggregated data can ensure emissions between sources are not double counted.

2.2 Companies

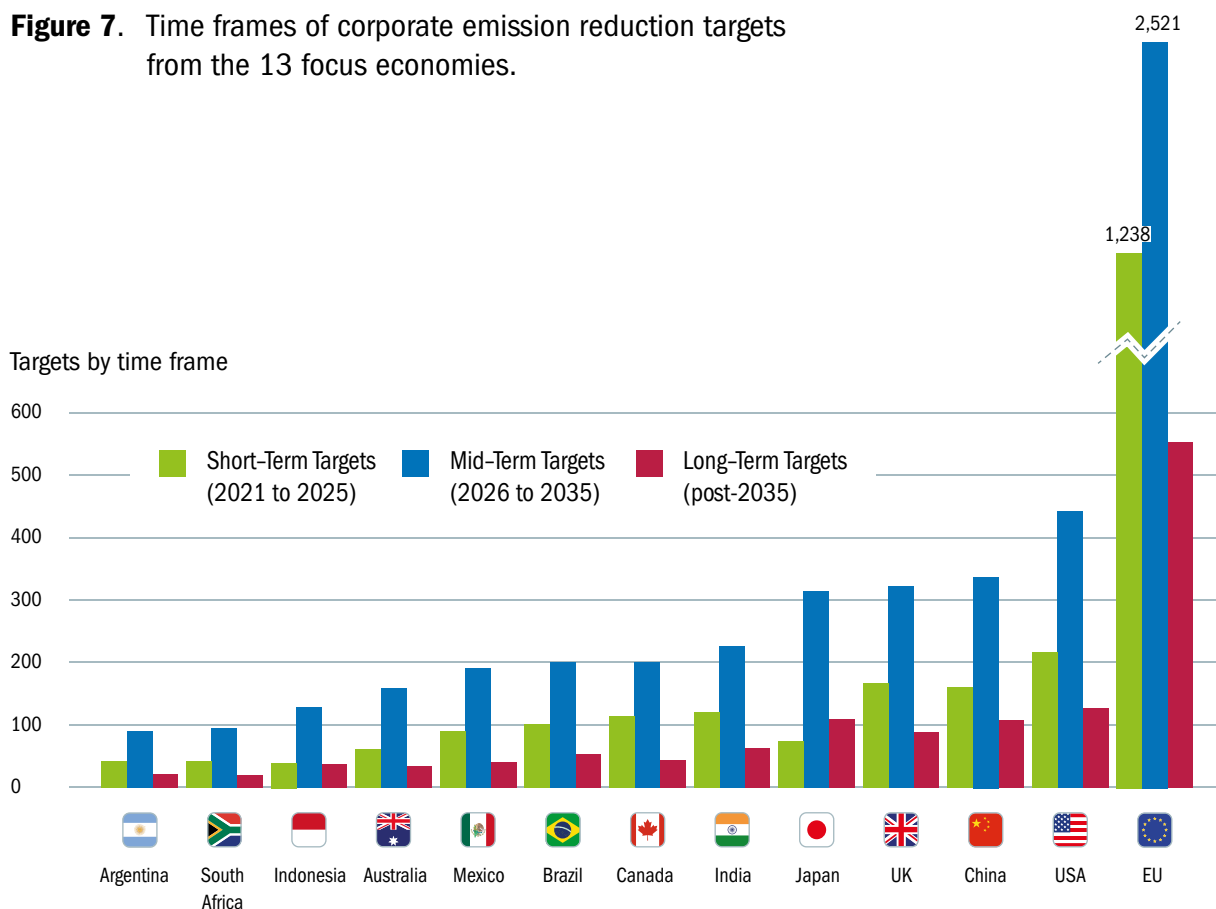
Corporate emissions reduction targets typically extend beyond the borders of the country in which the company is headquartered, as targets may be company-wide or specifically set for a company's facilities and locations in different countries. [Figure 7](#) aggregates corporate emissions reduction targets by target country, defined as the country where a company has reported emissions covered by a specific target, rather than the country where their headquarters are located¹. This definition is used to assess coverage of location-based emissions reduction targets.

Over 1,000 companies, operating within 13 of the world's major emitting economies, have made quantifiable absolute emissions reduction targets through CDP's 2021 Climate Change questionnaire. These 13 economies accounted for nearly 81 percent of global GDP in 2021 (World Bank, 2021a). These companies represent revenue of at least USD 16.4 trillion, which is higher than every country's GDP except for the United States and China (World Bank, 2021a). Over 40 percent of these companies (385) appear on either the Fortune Global 500 and Global Forbes 2000 lists.

Mid-term targets (between 2026 and 2035) continue to be the most common across all focus countries, followed by short-term targets. Overall, 58 percent of targets are mid-term, 27 percent are short-term (2022-2025), and 14 percent are long-term (2025-2035).

1. Targets for companies with locations in the EU27 are counted at the country level. For example, if a company has reported emissions in both France and Germany, the company's target would be counted twice in the EU27.

Figure 7. Time frames of corporate emission reduction targets from the 13 focus economies.

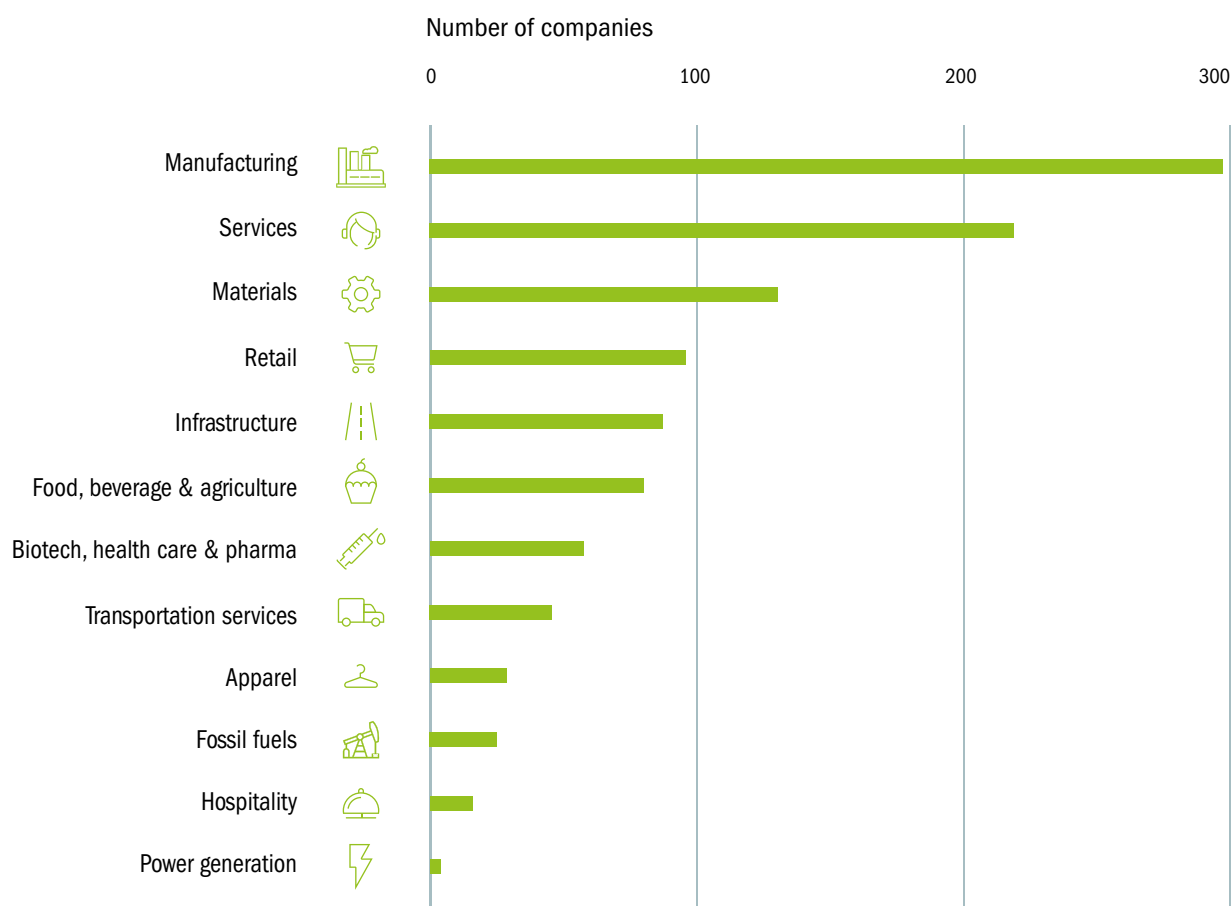


For companies that include Scope 1 or 2 emissions, the average reduction pledged is 36 percent for short-term targets, 48 percent for mid-term targets, and 86 percent for long-term targets, although there is wide variability across countries. Short-term targets and mid-term targets showed more variation than long-term targets, with average percentage reductions pledged for short-term targets ranging from 29 percent (China) to 38 percent (Argentina), average percentage reduction pledged for mid-term targets ranging from 42 percent (Indonesia) to 51 percent (South Africa), and average percentage reduction pledged for long-term targets ranging from 85 percent (India and EU27) to 91 percent (Canada). Note that these average percentage reductions pledged by companies operating within these focus economies do not necessarily indicate ambition of

the target, as they do not yet factor in considerations of the target year and base year/emissions of the target. The following section on ambition delves into further details regarding companies' emission reduction ambition.

Companies from a wide range of industries have made quantifiable climate targets. The Manufacturing and Service sectors continue to dominate, with just these sectors accounting for over half of all pledging companies (Figure 8). The top four industries - Manufacturing, Services, Materials, and Infrastructure - remain the same as the previous two reports, however, this year Retail surpassed Food, beverage & agriculture to claim the fifth spot.

Figure 8. Number of companies making quantifiable GHG emissions reduction targets by CDP-ACS Industry Classification.



2.3 Net-zero targets of subnational actors

The science is clear: global net-zero emissions by 2050 are needed to limit temperature rise to 1.5°C and avoid the worst impacts of climate change (IPCC, 2018). Since the IPCC Special Report on 1.5°C was released, a number of subnational governments and companies have set their own net-zero targets to align decarbonization efforts. In our dataset, we identified 3,224 targets where subnational governments have mentioned net-zero related terms, such as “net-zero target” or “zero emissions” (Data-Driven EnviroLab & NewClimate Institute, 2020), in their commitments or

target statements. Of these, 10 percent (324) are quantifiable targets (meaning they report base emissions and year, target year, and target percent reduction) and include a percent reduction target of at least 80 percent by 2050 (Data-Driven EnviroLab & NewClimate Institute, 2020).

Figure 9 shows the global distribution of subnational net-zero targets. The points indicate net-zero targets and the shading represents the percentage of population covered by net-zero targets within each country. The majority of subnational governments setting net-zero targets are concentrated in North America and Europe. Furthermore, North America and Europe have a higher proportion of actors whose pledges qualify as quantitative net-zero tar-

gets, meaning they commit to reduce emissions by 80 percent or more by 2050; in North America, 59 percent of actors have quantifiable net-zero targets, followed by 29 percent in Europe. In all other regions, less than 10 percent of actors have quantifiable net-zero targets. Notably, nearly 100 percent of Australia's population is covered by net-zero targets, since all eight states and territories have made net-zero targets although only four have quantitative targets of at least 80 percent reduction. Japan follows close behind, with over 96 percent of its population covered by net-zero targets.

Although we classify a subnational government with a net-zero target as one that has either pledged a net-zero target or committed to reduce emissions by at least 80 percent, some cities and regions are more ambitious, even striving for 100 percent emissions reductions. We have identified

324 quantitative net-zero targets in our dataset with a goal of at least 80 percent reduction by 2050 across 306 unique subnational actors. 100 percent reduction targets are more prevalent in Europe, while 80 percent reduction targets are slightly more common in North America. Across quantitative net-zero targets, 2050 is by far the most common target year, with over 70 percent of these entities aiming to achieve their reduction target by 2050. We identified 11 subnational actors who aim to achieve an interim target of more than 80 percent but less than 100 percent, or a net-zero goal for a more limited emissions scope on their way to 100 percent emissions reductions. For example, Fort Collins, Colorado has pledged to reduce their city-wide emissions by 80 percent by 2030 and 100 percent by 2050, compared to a 2005 baseline. Others have set interim targets for a more limited emissions scope, such

Figure 9. Map of net-zero targets from cities and regions

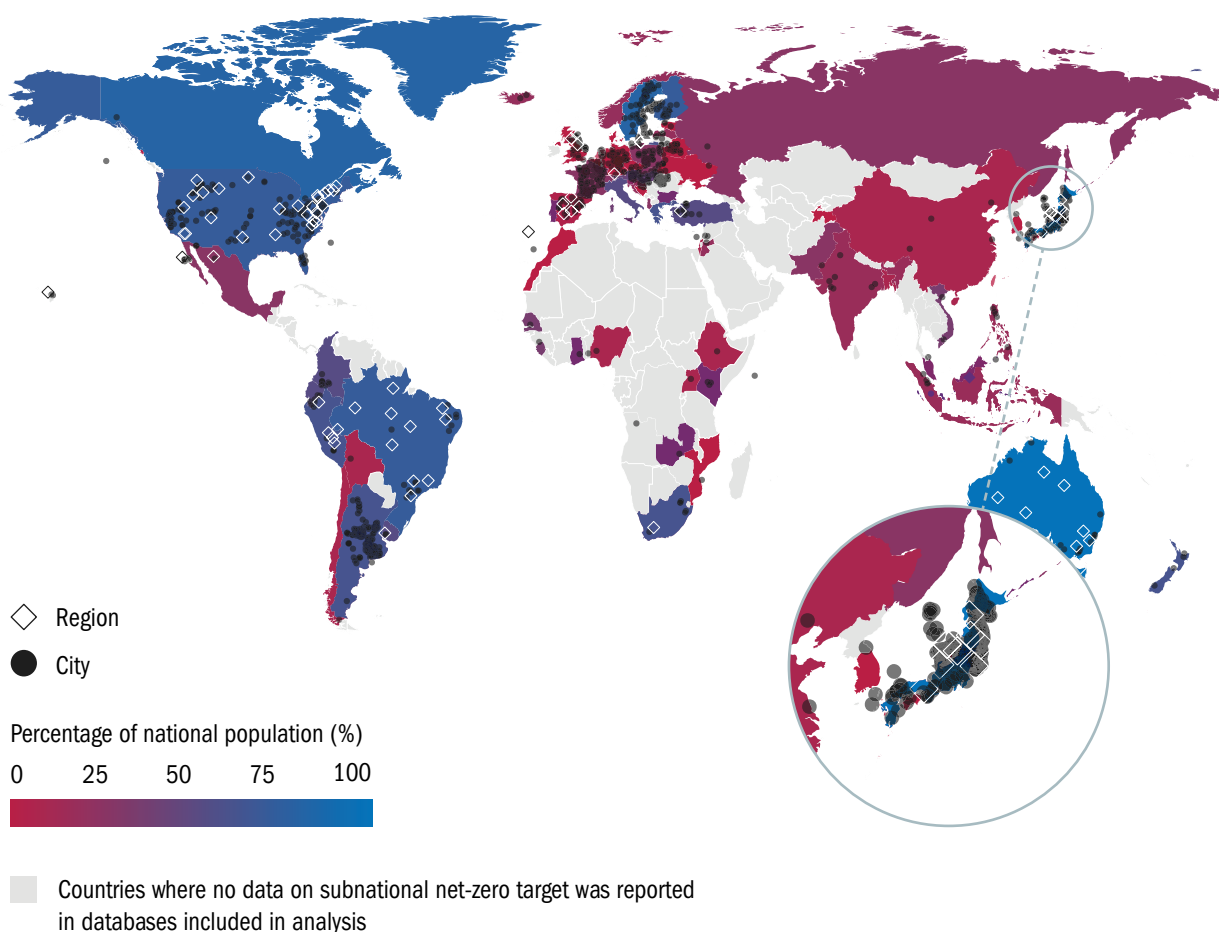
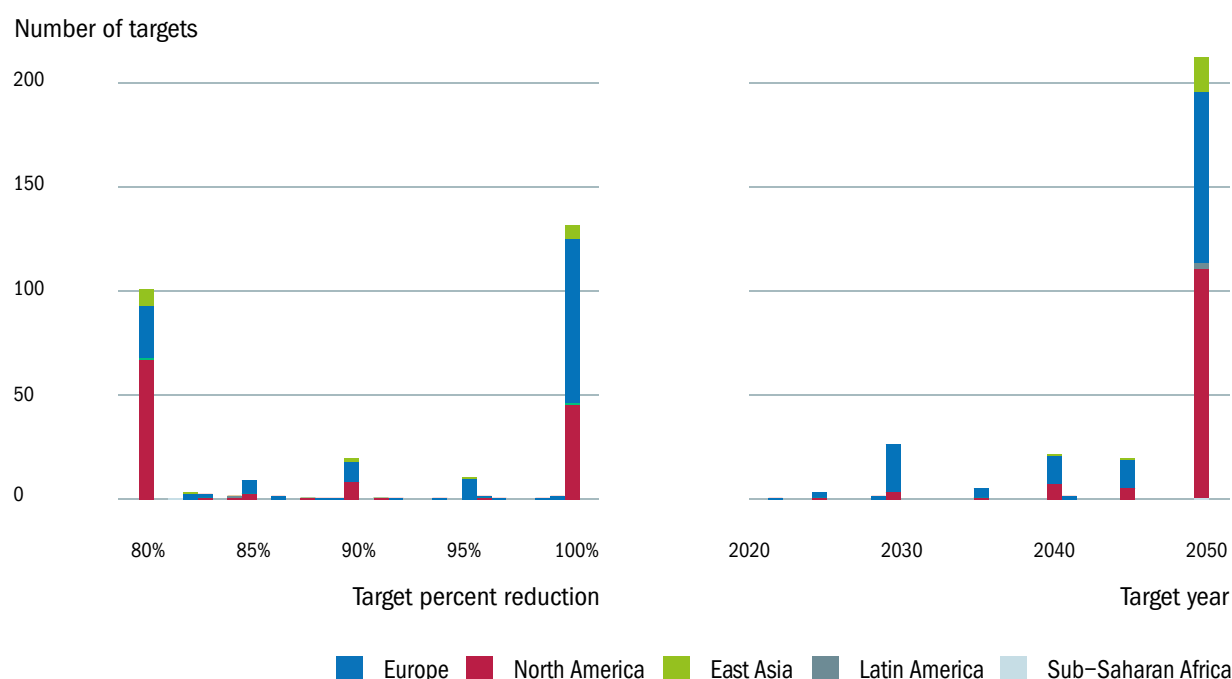


Figure 10. Number of subnationals net-zero* targets based on (left): percentage reduction of the target, (right): target year.



*A quantifiable net-zero target is defined as a target which has an emissions reductions target of 80 percent or more by the year 2050.

as Helsingborg, Sweden, which has set a target to reduce 80 percent of their emissions from road transportation by 2030 and 100 percent of city-wide emissions by 2035.

We also found 296 companies that have committed to reduce their emissions by at least 80 percent by 2050, aligning with our definition of net-zero targets for subnational actors. Of 344 total targets that meet this criteria, the most common target year is 2050 (127 targets), followed by 2030 (100 targets). From this selection, 41 companies (14 percent) have set multiple targets with a goal of at least 80 percent reduction by 2050. Similar to subnational governments, multiple corporate targets of at least 80 percent reduction can vary in scope (i.e. Scope 1 and Scope 2), target coverage (i.e. Company-wide and Business division), or target year (i.e. 2030 and 2050). Starting with the 2021 CDP Climate Change questionnaire, companies can report net-zero targets they have set in question C4.2c. Net-zero targets reported to this question are here understood to be comprised of two main elements: the reduction of value chain emissions by an amount consistent with net-zero

in global scenarios that limit warming to 1.5°C with no or limited overshoot, and the neutralisation of impact of residual emissions, with a preference for alignment with the SBTi's Net-Zero Standard (Science Based Targets, 2021), though this is not required. Based on this alternative definition, we identified 592 companies that publicly report a company-wide net-zero target. It is important to note that net-zero targets by companies have increased rapidly over the last years and the updated landscape of net-zero targets might not be fully reflected in the 2021 CDP data due to a time lag between the reporting of the data and the publication of the data. As a result, we believe that the current count of net-zero targets from companies is likely higher than the numbers which are reported here, as evidenced by the growth in companies signing on net-zero initiatives such as the Race to Zero campaign, which saw membership by companies rise from just over 1,100 companies in October 2020 to more than 8,300 companies in September 2022 (Data-Driven EnviroLab & NewClimate Institute, 2020; UNFCCC, n.d.).

03

TRACKING PROGRESS AND AMBITION OF INDIVIDUAL NON-STATE AND SUBNATIONAL ACTORS



3.1 Methodology for assessing progress and ambition

As the number of individual actor climate targets grows, it has become more critical to understand which actors are making progress towards their goals. We compare actual emissions reductions achieved in the most recent inventory year for each actor with “pro-rated” emissions reduction targets assuming a linear emissions reduction between the base and target year adapted from Hsu, Tan, et al. (2020) and NewClimate Institute et al. (2021). We acknowledge that assuming a linear emissions reduction between the base and target year does not take into account that individual actors may reduce emissions non-linearly over time, yet an assessment of these shortcomings and sensitivities remain outside the scope of this analysis (NewClimate Institute et al., 2021).

Apart from the progress of the targets, our analysis also aims to assess the annual original ambition of actors’ targets and elucidate how they contribute to the Paris Agreement’s goals. We analysed how targets align with required reductions for 2°C and 1.5°C pathways (See Box 1).

Cities, regions, and companies, initially define ambition

relative to a base year, which we refer to as the original required ambition as this often coincides with the year the target was set. We gauge a target’s original ambition by considering annualised reductions required for an entity to meet its emissions reduction target. Assuming a linear reduction trend, we divide the pledged emissions reduction by the number of years between the base and target years. Annualised reductions are used instead of the absolute percentage reductions to account for varying base years among different actors. The required annualised reductions are then compared against the three IPCC scenarios (See Box 1) to determine whether a target is ambitious.

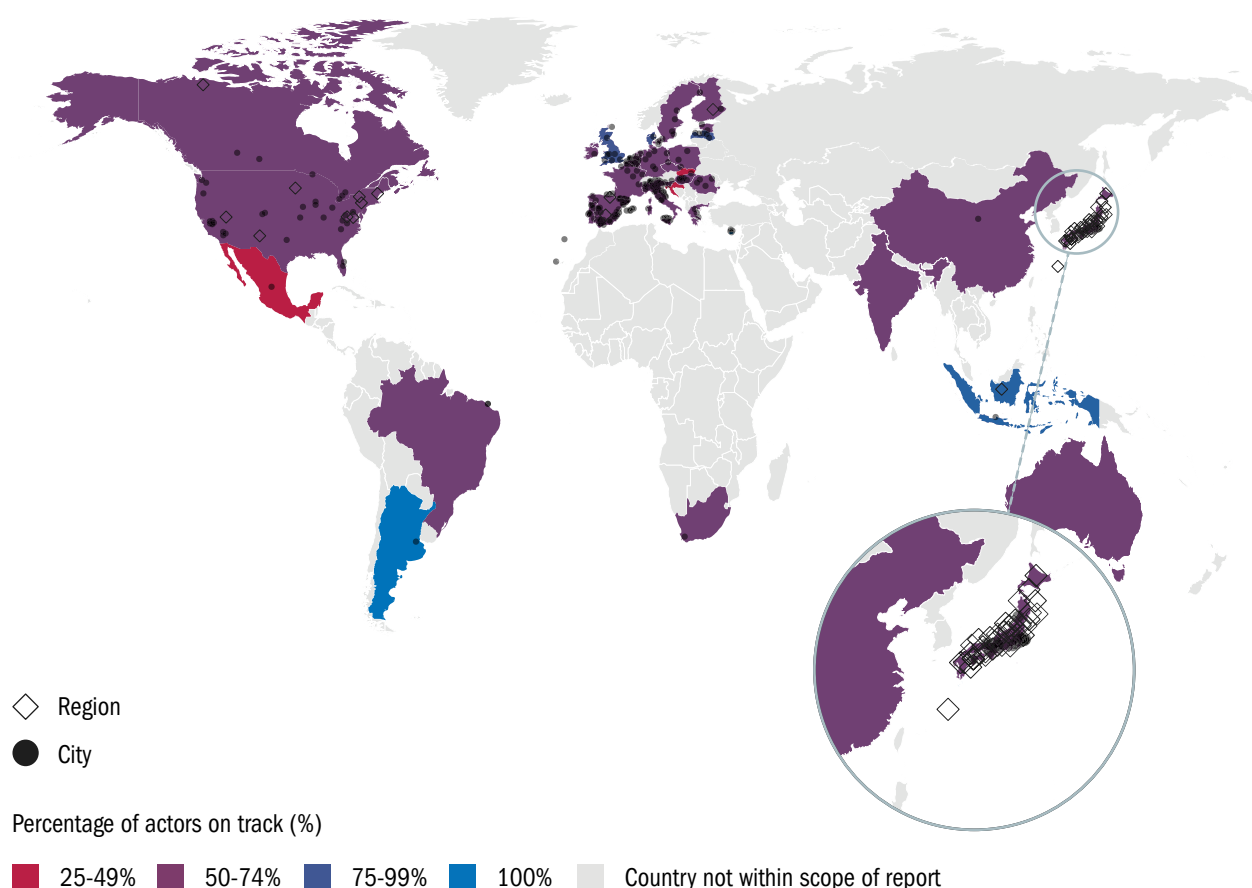
Over time, an entity’s greenhouse gas emissions also change. Compared to the original ambition in terms of required annual reductions, some entities need to increase their remaining effort due to slower progress, while others do not. To better understand where an entity stands in terms of meeting their targets, we also assess the remaining effort, defined as the committed remaining annual reductions between the most recent inventory year and target year. For example, if an entity has made significant progress towards their target, the remaining effort to achieve its target will be much lower than compared to its base year. We first used an entity’s base emissions together with the pledged emissions reduction to calculate the target year emissions (i.e., the emissions level in the target year). We then used

Box 1. IPCC Reference Scenarios for ambition

The latest IPCC Sixth Assessment Report (Working Group III) reports that to limit warming to 1.5°C with limited or no overshoot, global greenhouse gas emissions will need to decrease by 43 percent by 2030, 69 percent by 2050, and 84 percent by 2050, while pathways that limit warming to 2°C requires emissions reductions of 27 percent by 2030, 47 percent by 2040, and 63 percent by 2050 compared to 2019 levels (IPCC, 2022). The report highlights, however, that current mitigation options costing less than USD100 tCO₂eq could reduce global emissions by at least half 2019 levels by 2030 (See Appendix 2 for details on the specific reference percentages). We use these indicators as a benchmark to assess actors’ ambition within the report.

It is important to note, however, that regional contributions to global greenhouse gas emissions still vary widely, and an entity’s emissions largely stem from its geography and stage of economic development. Keeping in mind equity considerations, we focus our analysis of subnational ambition on Global North cities and regions, defined in this report as entities in Australia, Canada, EU27, UK, Japan, and the US, while highlighting particular subnational actors in the Global South that have made ambitious targets. As many companies operate across borders, we assess progress and ambition for companies on a global level. With a greater global focus on net-zero targets, we also included long-term, post-2035 targets in our assessment.

Figure 11. Map of all actors' progress towards climate targets. Companies' progress is included in the percentages but their locations are not designated since coordinates of company locations are not available.



the target year emissions to re-calculate remaining effort based on the actor's latest reported inventory emissions (see Appendix 3). The remaining effort between the inventory year and the target year is calculated by taking the new overall percentage reduction divided by the difference between the target year and the latest inventory data year.

Overview

Only a fraction of cities, regions, and companies are included in our assessment since many fail to report a baseline and additional monitoring inventory that would allow for progress assessment. Our analysis indicates a mixed picture of progress across actor types, with more

companies on track to meeting their targets as compared to cities or regions (details in respective sections). [Figure 11](#) provides a summary of global subnational and non-state climate action progress, aggregated to the country level. Most of the countries presented in [Figure 11](#) have more than 50 percent of cities, regions, and companies with quantifiable targets on track to meet their emissions reduction pledges. Only four countries (Belgium, Croatia, Mexico, and Slovakia) have less than 50 percent of cities, regions, and companies on track to meeting their targets. However, it is important to note that there are varying numbers of actors with sufficient available data for measuring progress within countries, ranging from countries with just

a few actors (e.g., Argentina, Slovenia, Cyprus) to countries with several hundred actors (e.g., Japan, United States of America).

From our progress and ambition analysis, we see that more than half of subnational actors are not on track to meeting their current climate targets, compared to only 25 percent of companies not on track. Furthermore, less than 10 percent of cities and regions' targets meet the IPCC scenarios used to benchmark ambitious targets. This figure differs significantly for company targets, with 70 percent of company targets meeting the 2-degree IPCC scenarios. While most subnational actors are not far from meeting their pledged targets, we identified a group of subnational actors currently on track to over-achieving their original target that should consider re-evaluating their current targets and setting more ambitious goals. For companies, a comparison

between those that reported emissions and targets in both 2018 and 2021 showed that overall annualised target ambition for the 2020-2030 period has increased from 2.0 percent to 2.9 percent. These findings are discussed in greater detail below.

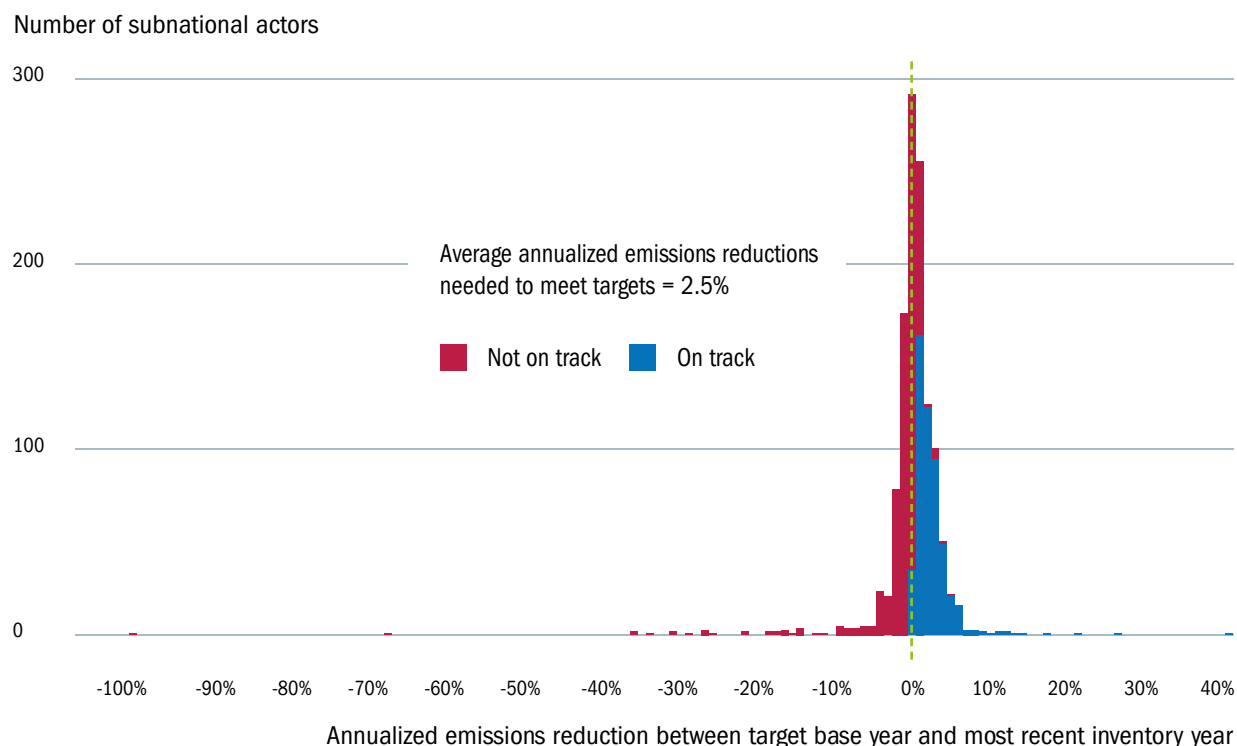
3.2 Cities and regions

Progress towards GHG emissions targets

Of the 2,406 cities and 122 regions that have made quantifiable targets, 961 cities (40 percent) and 99 regions (81 percent) have reported inventory emissions. Within this group of subnational actors that have reported emissions inventories, there were a total of 1,203 emissions reductions targets from cities and 131 emissions reductions

Figure 12. Distribution of annualised emissions reductions between a subnational actor's base year and their most recent inventory year.

Note: The line in green indicates the annualised emissions reductions required by actors to meet their target, averaged across all actors.



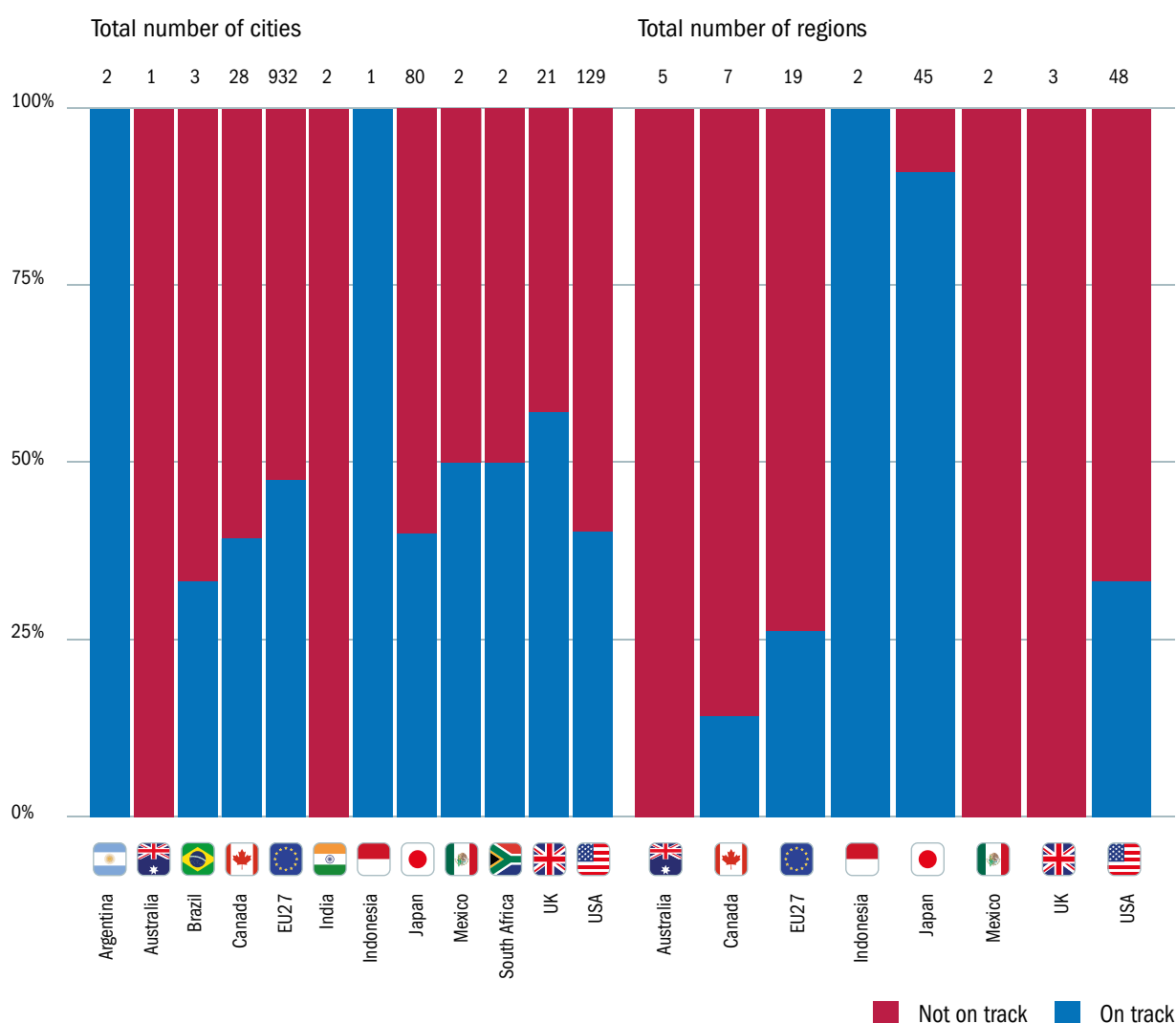
targets from regions. For the purposes of this analysis, we used subnational governments' total Scope 1 and Scope 2 emissions, which consist of direct emissions coming from within the city boundary, including emissions from direct combustion (Scope 1), as well as the consumption of grid-supplied electricity (Scope 2).

We find that, on average², cities and regions need to reduce emissions 2.5 percent per year to achieve their emissions reduction targets (Figure 12). In total, more than 46 percent of cities and regions are on track (622) to meet their

targets, with the remaining 53 percent (711) falling short. Median progress for subnational actors is 1.6 percent per year. Both cities and regions see a similar proportion of actors that are on track to meet their targets (46 percent of cities are on track vs 50 percent of regions).

Many cities and regions that are not on track to meeting their targets have seen increased emissions between their base emissions and most recent inventory emissions (mean per annum change = -0.7 percent; denoted by a negative annualised emissions reductions in Figure 12). Over 19

Figure 13. Number of targets set by subnational actors based on progress status of the target, categorized by focus economy.



2. All mean and average calculations in the report refer to the the arithmetic mean.

percent of city actors and 13 percent of regional actors have seen their emissions increase between their base year and most recent inventory year. On the other hand, most cities and regions who are on track to meeting their targets have annualised emissions reductions greater than the average required reductions of 2.5 percent (mean = 4.4 percent reductions in emissions on an annual basis).

Some countries, such as Indonesia, Argentina, and Japan, see a greater number of their cities and regions on track to meeting their climate targets, while others see roughly equal numbers of cities and regions that are on track as those that are not on track (e.g., South Africa, United Kingdom, EU27). There are several countries, however, where most, if not all, of the subnational actors within the country are not on track to meeting their targets, signalling the need for jump-starting and accelerating climate action.

Our analysis shows the need for many cities and regions to ramp up their efforts to achieve climate targets that have been set, given that less than half of the targets assessed are currently on track to being met. As more cities and regions pledge emissions reductions targets, it is imperative to institute measures to ensure these targets translate to actual emissions reductions.

Target ambition

Beyond understanding whether targets are on track to being achieved, we also examine targets' ambition. As highlighted above, we use three IPCC reference scenarios to evaluate a target's ambition, while keeping the analysis focused on Global North cities and regions. Based on the three scenarios, we found that less than 10 percent of Global North cities and regions' targets would be considered ambitious (126 out of 1,317 targets), with 35 targets aligning with the IPCC scenario that keeps warming to 1.5°C with limited or no overshoot, 81 targets aligning with keeping warming to 2°C, and 10 targets with emissions reductions in line with the currently available cost-effective mitigation options (Figure 14). Many of these ambitious targets (close to 58

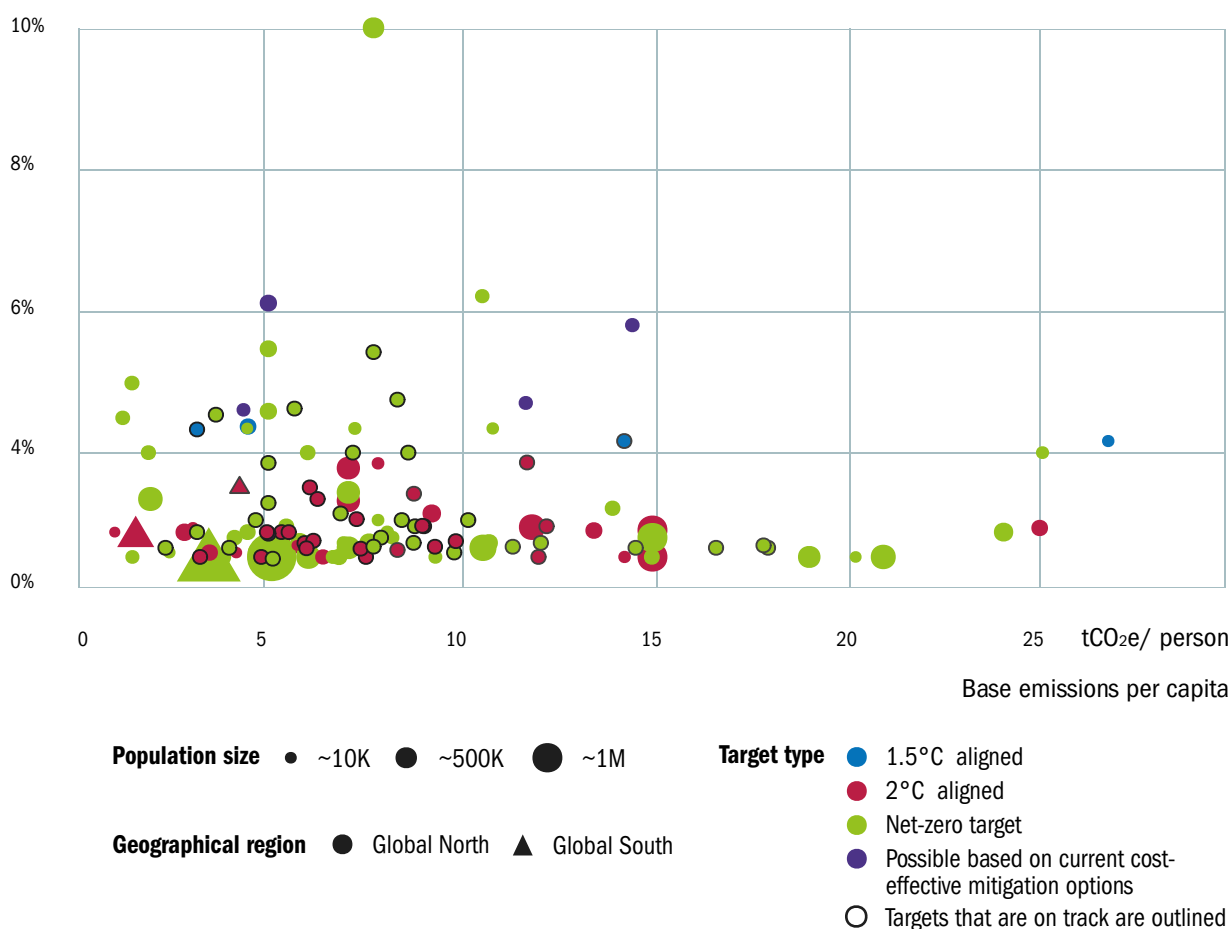
percent) are also net-zero targets (following the definition of a net-zero target as being one that has a quantified percentage reduction of more than 80 percent and a target year at or before 2050 as in Chapter 2.3). Additionally, we also found 3 targets from Global South cities and regions that have made targets aligned with one of the three scenarios highlighted above (details in Box 2). We also found, however, that many of these targets that are evaluated as ambitious tend to not be on track to being achieved - there is insufficient progress for 57 percent of targets considered ambitious (n = 72), with 61 percent of these targets (n = 44) also being net-zero targets. We also see that the cities and regions with ambitious targets that are currently on track are actors with slightly smaller populations (average population of ~440,000 for ambitious cities and regions with targets that are on track, against average population of ~506,000 for ambitious cities and regions with targets that are not on track).

Comparing the original required ambition between a target and base year, we found that near to mid-term targets have slightly higher annualised ambition as compared to longer term targets. The average original required ambition for targets with target years between 2022-2025 is 2 percent, as compared to 1.9 percent for targets with target years between 2026-2035 and 1.6 percent for targets with a post-2035 target year (Figure 15A). Unfortunately, we found that the cities and regions with the most ambitious near to mid-term targets were largely not on track to achieving their targets (only 30 out of 75 ambitious targets with a target year of or before 2035 were on track to achieving their targets). While higher original ambition rates for near and mid-term targets are encouraging and echo the need for immediate action in rapidly reducing emissions to keep warming well below 2°C or 1.5°C (IPCC, 2022), the lack of progress for more ambitious targets indicates that more action beyond target-setting is required to keep warming in line with the Paris Agreement goals.

Figure 14. Plot of subnational actors' annualised emissions reductions between base year and most recent inventory year against the base emissions per capita for the actor.

Note: Colour of the points indicate the IPCC reference scenario that corresponds with the target's ambition level or if a target is a net-zero target and shape of the point indicate the geographical region which the actor is in (Global North vs. Global South).

Annualised targeted emissions trend between baseline year and target year



Box 2. Leading Global South targets

Three subnational actors in the Global South have climate change mitigation targets that meet the criteria for at least one of our three reference scenarios for ambition: the city of Leon and the state Jalisco in Mexico and Buenos Aires, Argentina. Each actor has taken a unique path to climate action. Buenos Aires has committed to reduce their city-wide emissions by 53 percent by 2030 and 84 percent by 2050, compared to a 2015 base year. Buenos Aires has demonstrated their commitment to climate action for nearly two decades. Buenos Aires started preparing their first greenhouse gas emissions inventories as early as 2003 (Buenos Aires Ciudad, 2020). The city released its first Climate Change Action Plan in 2009 and enacted a Climate Change Law in 2011, which requires climate action plans to be updated every five years (Buenos Aires Environmental Protection Agency, 2009; C40 Cities, 2016). The state of Jalisco in Mexico has committed to reducing 100 percent of their city-wide emissions by 2050, compared to a 2010 base year. Jalisco was one of the twelve founding signatories of the Under2Coalition, which is the largest global network of regional subnational actors committed to net zero targets (The Climate Group, 2022). The city of Leon, Mexico has ramped up their climate action in recent years. In 2020, the city established a Municipal Climate Change Program (PMCC) in 2020 with goals for mitigation, adaptation, and education and started reporting to CDP in 2021 (CDP, 2021c). As part of this program, Leon has set a target to reduce their emissions by 37 percent by 2030, compared to a 2017 base year.

Despite these goals and rigorous reporting, we found mixed results on these governments' progress towards their targets. Jalisco is not on track towards their target, with emissions increasing relative to their base year. For actors such as Jalisco who are striving to achieve their climate goals but face increasing emissions, consistent emissions tracking and reporting can provide valuable information that can help them get back on track. Buenos Aires and Leon are on track towards their targets, however, their targets apply to a smaller subset of city-wide emissions. Leon's target applies to direct emissions only, while Buenos Aires' target applies to BASIC emissions under the GPC framework, which does not include emissions from power generation delivered to the grid. In this report, actors' most recent inventory emissions are typically defined as total Scope 1 and Scope 2 emissions, unless an actor's target specifically indicates that it applies to a more narrow Scope of city-wide emissions. While Buenos Aires is on track for reducing emissions in the scopes included in the target, their total Scope 1 and Scope 2 emissions have increased. Cities and regions can increase the scope of their targets by engaging with stakeholders to encourage emissions reductions in areas that are outside of their direct control.

Cities face a number of constraints on their ability to reduce emissions, both in resources available to them and the emissions that are under their direct control. Resource constraints may be especially pressing for subnational actors in the Global South. It is important to recognize that setting climate targets and achieving them are not the same – achieving progress towards climate goals is an incredibly difficult task that often does not follow a straightforward trajectory, even for subnational actors that want to take ambitious action. As the number of subnational actors committing to reduce their emissions continues to grow exponentially, the potential to contribute to global greenhouse gas reductions is clear. Global stocktaking efforts will need to shift focus from potential to achievement – evaluating the actual progress of actors towards their targets and what actors are doing to achieve their goals. The key to tracking progress is accurate and consistent emissions reporting. If actors are limited in their authority to address certain types of emissions in their city, actors can engage with stakeholders to increase their influence over emissions and the scope of their targets. These three actors have already taken important steps in climate action by setting ambitious targets, reporting emissions inventories, and working with different stakeholders within the city to reduce their emissions.

Accounting for the most recent emissions inventory

To provide a view into the ambition that cities and regions have to achieve to keep to their targets, our analysis includes the remaining effort that is required to still meet subnational entities' original ambition updated based on their most recent inventory year. The greater variability in remaining effort required after accounting for an actor's most recent inventory year (Figure 15B) reflects the variability of emissions changes between a subnational actor's base emissions and most recent emissions inventory. An increase in the required remaining effort for a target indicates that the subnational actor emissions have either decreased at a rate that is insufficient to meet their targets, or that the subnational actor's emissions have increased. A decrease in the remaining effort for a target signals that the actor's emissions have decreased at a rate that is greater than necessary to meet their target. It is important to note an increase in the remaining effort is not necessarily an indication of increased ambition (Figure 15B). The remaining effort indicates that, while there are several cities and regions that are outperforming their initial target and should consider increasing the ambition of their climate targets, especially for nearer term targets, cities and regions in general will need to ramp up climate action to meet their initial targets. The average remaining effort³ increased from 1.8 percent calculated between base and target year, to 2.0 percent calculated between the most recent inventory year and target year. The acceleration of climate action is especially needed for mid-term targets, as the increase in average remaining effort was the greatest going from 1.9 to 2.1 percent.

Ambition and net-zero targets

Based on the definition of a quantifiable net-zero target in Box 1, we also identified 247 quantifiable net-zero targets that were included in our progress analysis. Of these 247 targets, only 84 targets are on track, with a majority targeting 100 percent emission reduction. As noted in Figure 15A, while some targets have been classified as net-zero targets, they might not necessarily have annualised ambition rates that would place them in an ambitious reference scenario.

These targets typically have an older base year, which results in relatively low annualised ambition rates as compared to other targets or the reference scenarios used that use a more recent base year. While we acknowledge this limitation in using annualised percentages, annualised percentages can also serve as a guide for subnational actors to benchmark required emission reductions, ultimately increasing the ambition of their targets and reducing the time taken to achieve net zero.

The Ambition Gap

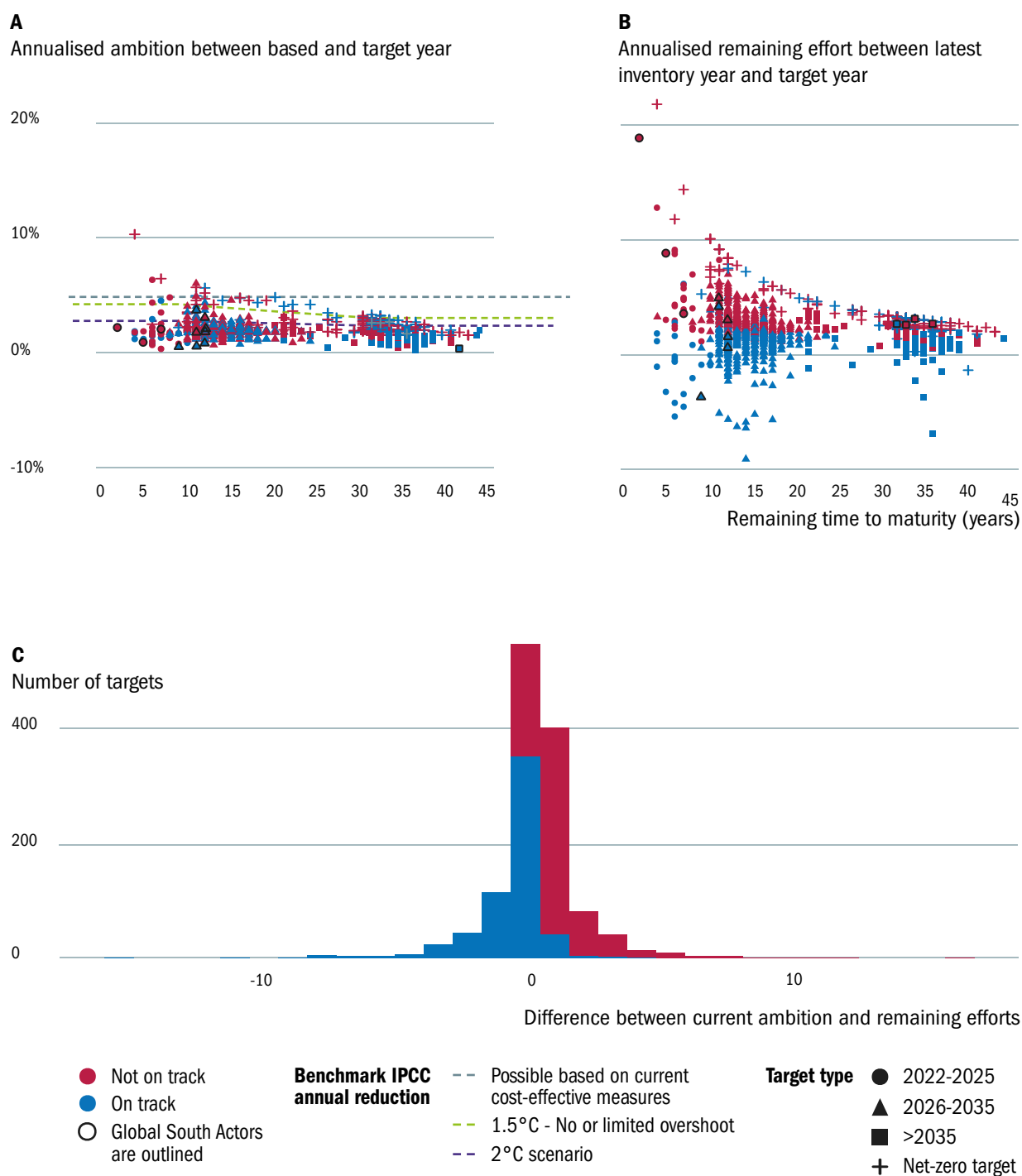
To provide a more nuanced understanding of the progress (or lack thereof) of cities and regions towards achieving their target, we calculated the difference between the annualised original ambition based on base year and target year, and the updated annualised remaining effort based on the most recent inventory year and target year. This "ambition difference" represents the gap between the original ambition of the target set and the current remaining effort by the subnational actor in order to keep that ambition. An increase in this ambition difference signifies that the subnational actor needs to ramp up climate action and their emissions reductions in order to meet their original target, while a decrease in ambition difference shows that the actor is outperforming their original target.

Most of this ambition difference is small (Figure 15C; mean = 0.19 percent), signalling that many cities and regions' progress is close to what they had originally pledged. Cities and regions not on track towards their targets had slightly greater ambition differences (mean = 1.30 percent) as compared to cities and regions on track to meeting their targets (mean = -1.09 percent). Of the cities and regions on track, 142 had an ambition difference that was lower than the mean of the group (mean = -1.09 percent). This difference indicates that this group of cities and regions are in general, more on track to achieving their targets than their peers and should consider increasing the ambition of their targets. This group of cities and regions that were more on track to achieving their targets had an average annualised ambition of 1.65 percent (absolute percentage reduction of 36.6 percent) with an average target year of 2032.

3. Outlier targets with less than -100 annualised remaining effort between the most recent inventory year and target year were removed for calculations of arithmetic means (n = 5).

Figure 15. Overview of cities and regions' annualised ambition and remaining effort.

Note: A) Annualised original ambition is measured between base year and target year per remaining time to maturity. B) Annualised remaining effort is measured between most recent inventory data year and target year per remaining time to maturity. C) Distribution of the “ambition difference”, as calculated by taking the difference between annualised original ambition and annualised remaining effort.



Our analysis indicates that across all the targets included in our analysis, many subnational governments are not on track to meet their goals and a majority of the targets do not meet ambition levels that align with the Paris Agreement goals. This finding points to the fact that not only is additional effort required for subnational actors to meet their current targets set, many of these cities and regions will also need to drastically increase the ambition of their targets to keep climate action on track to achieving the Paris Agreement Goals of keeping warming to well below 1.5°C. Furthermore, the analysis adopts global benchmarks from the IPCC Sixth Assessment Report (Working Group III) - the reality is that there would be more stringent requirements for Global North countries and actors (IPCC, 2022). Thus, the picture of ambition provided in this report is meant to be a conservative one, with even greater ambition and emissions reductions required for us to meet the goals of the Paris Agreement.

While we acknowledge that subnational actors face constraints on the emissions within their control, our findings point to the fact that much more needs to be done and that subnational actors should strive to further work together with the multitude of stakeholders within their jurisdiction and incorporate these emissions sources as part of their climate target setting and planning. With countries submitting new NDCs (Climate Analytics & NewClimate Institute, n.d.), including some which fall within the focus economies of our analysis, cities and regions should also consider increasing the ambition of their targets and report these updated targets.

3.3 Companies

Introduction

Companies have an important role to play in on-the-ground implementation of the Paris Agreement goals. As many companies operate across borders, we assess progress and ambition on a global level. This work builds on the analysis from NewClimate Institute et al. (2021), which concluded that companies reporting to CDP were generally on track to meet post-2020 company-wide absolute emissions reduction targets through 2035, although this result varies

considerably. The assessment in this report goes one step further to compare and disentangle progress and ambition in different ways, and we also analyse progress in setting ambitious targets between reporting years 2018 and 2021.

The progress and ambition analysis for companies is based on the same dataset used in the landscape analysis, but on a global level and therefore beyond the 13 focus economies. As a result, we include more companies (1,480) and targets (2,096). Similar to the cities and regions' analysis, we apply similar methods to assess ambition and progress, however, we also include a time series analysis by comparing companies' ambition from 2018 to 2021.

Companies' absolute GHG emission reduction targets were collected from the 2021 CDP Climate Change Questionnaire (CDP, 2021c), which contains the latest inventory and absolute reduction targets for the year 2020. Therefore, the most recent inventory year in most cases is 2020 and in some cases the first quarter of 2021. Note that the dataset consists of self-reported data and only public responses to CDP; despite CDP's quality control and data cleaning efforts, delayed data updates or reporting errors could occur. In addition, although Scope 3 (supply chain) targets and use of offsets is crucial for giving a full picture of progress and ambition, information and transparency of these is mostly lacking for large multinational companies (NewClimate Institute & Carbon Market Watch, 2022). Therefore, although we do not discuss Scope 3 emissions here, it remains a topic high on our research agenda.

The dataset includes almost 1,500 companies that have set more than 2,000 quantifiable absolute Scope 1 or Scope 2 company-wide targets. Quantifiable indicates that only current targets are taken into account, set for target years in 2021 or later, and include sufficient information to assess their progress and ambition. In addition, we removed outliers (see [Appendix 4](#)). Total global GHG emissions for the companies and targets evaluated in 2020 are 5.3 GtCO₂eq and the three largest emitting industries are power generation, manufacturing and fossil fuels. The dataset is divided into three target groups: 1) short-term (2021-2025) including 30 percent of total targets, 2) mid-term (2026-2035) including 55 percent of total targets and long-term (>2035) including 15 percent of total targets.

As companies can have multiple targets, they can be categorised into different groups. Furthermore, 20 percent are net-zero targets, which we have defined as targeting 80 percent or more reductions, which makes 26 percent of the companies putting forward one or more net-zero targets.

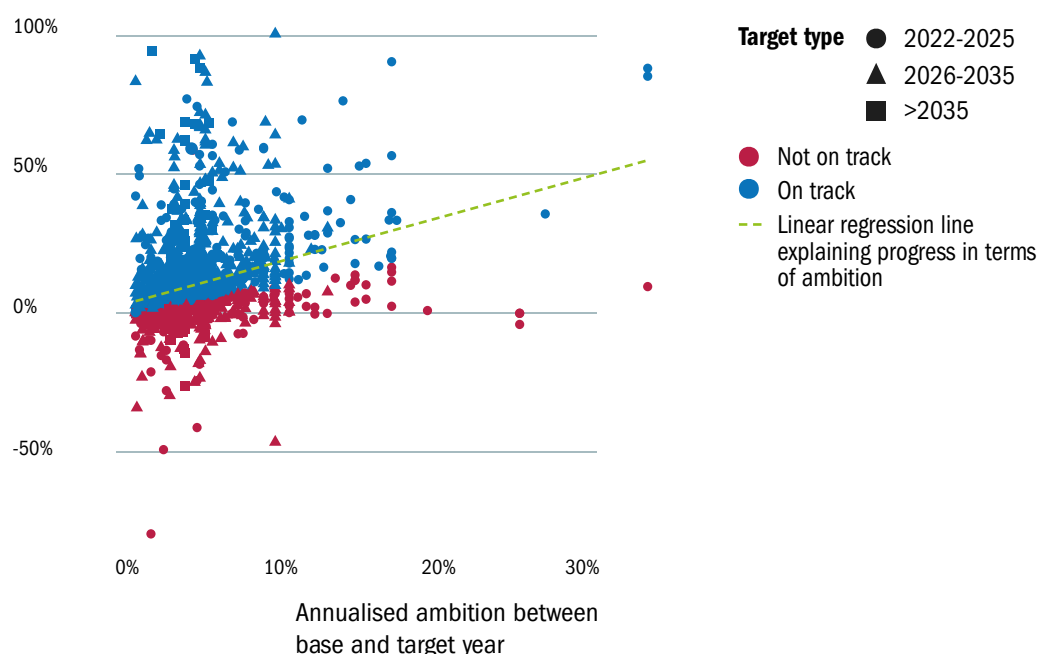
Comparing companies' annual progress and ambition

We compare annual progress and ambition⁴ for the different (Scope 1+2) target groups. This distinction clearly shows that companies with higher annual ambition also show higher annual progress (see Figure 16). Variation is large, however, especially for annual progress, so we discuss progress and ambition separately in more detail.

Figure 16. Comparison of companies' annualised progress and ambition for each Scope 1+2 target per target year group (short-term, mid-term, and long-term).

Note: Annualised progress is the yearly reduction between base year and inventory year, while annualised ambition is the yearly change between base year and target year.

Annualised progress from base year



Progress of companies towards meeting their targets

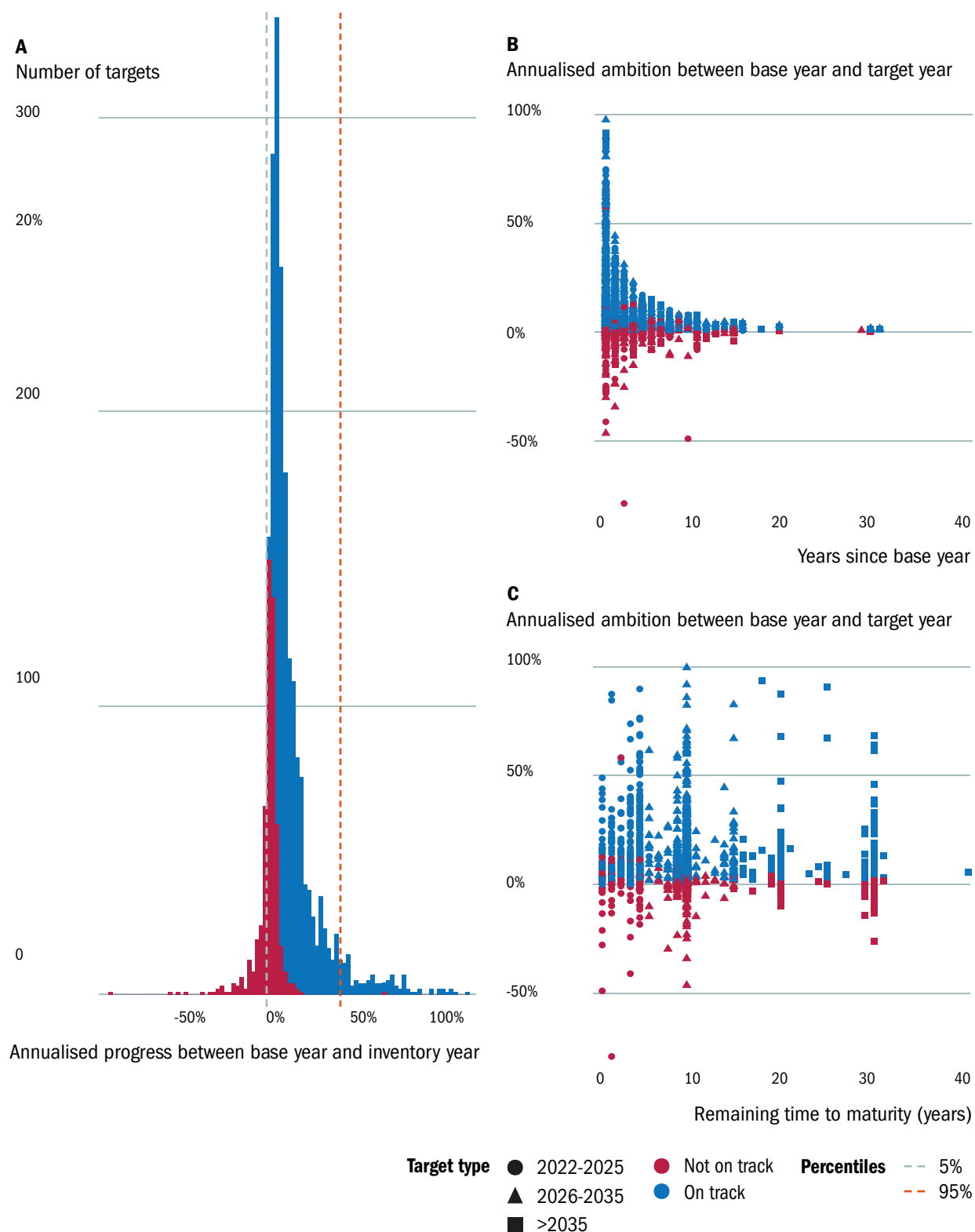
Annual progress gives an indication of companies' credibility towards meeting their self-declared emission reduction targets. In total, 75 percent (around 1,550) of the targets are on track, meaning that current GHG emissions are on

or below a linear emissions pathway between base year and target year to meet their target. The best performing industries in this respect are Hospitality and Apparel with respectively 90 percent (25 targets) and 82.5 percent (37 targets) of the targets on track, while the worst performing industry is Food and Beverages with 58.5 percent (69 targets) percent on track (see Figure 17).

4. We have used arithmetic average.

Figure 17. Overview of annualised companies' progress between base year and most recent inventory year.

Note: A) in terms of number of targets. B) Across number of years since base year. C) Across remaining time to maturity (=period between most recent inventory year and target year).



Annual progress varies significantly for targets with base years close to the inventory year, and across remaining maturities (see Figure 17A,B). The remaining time to maturity is the period between the inventory year and the target year. However, progress is measured over the period between base year and inventory year. The median annual progress between base year and most recent inventory year is 5.8 percent annually over the (median) period of two years since base year, although variation is large, which is illustrated by the 5-95th percentile range between -2.5 percent and 37.0 percent (see Figure 17A). Average annual progress is highest for short-term targets until 2025 (7.2 percent), and lowest for long-term targets after 2035 (4.4 percent). In addition, the highest annual progress is found in the Hospitality and the Services industry and is lowest in Fossil Fuels industry. Many targets have a base year close to the inventory year and these show a large variation in progress (see Figure 17B). Some of the large changes in GHG emissions between recent base year and inventory year might be caused by changes in company structure or target coverage of company business units that have not been updated in the database yet. The variation of progress across remaining time to maturity varies significantly, especially for the targets that expire between now and ten years (see Figure 17C).

Assessment of the ambition from companies' mitigation targets

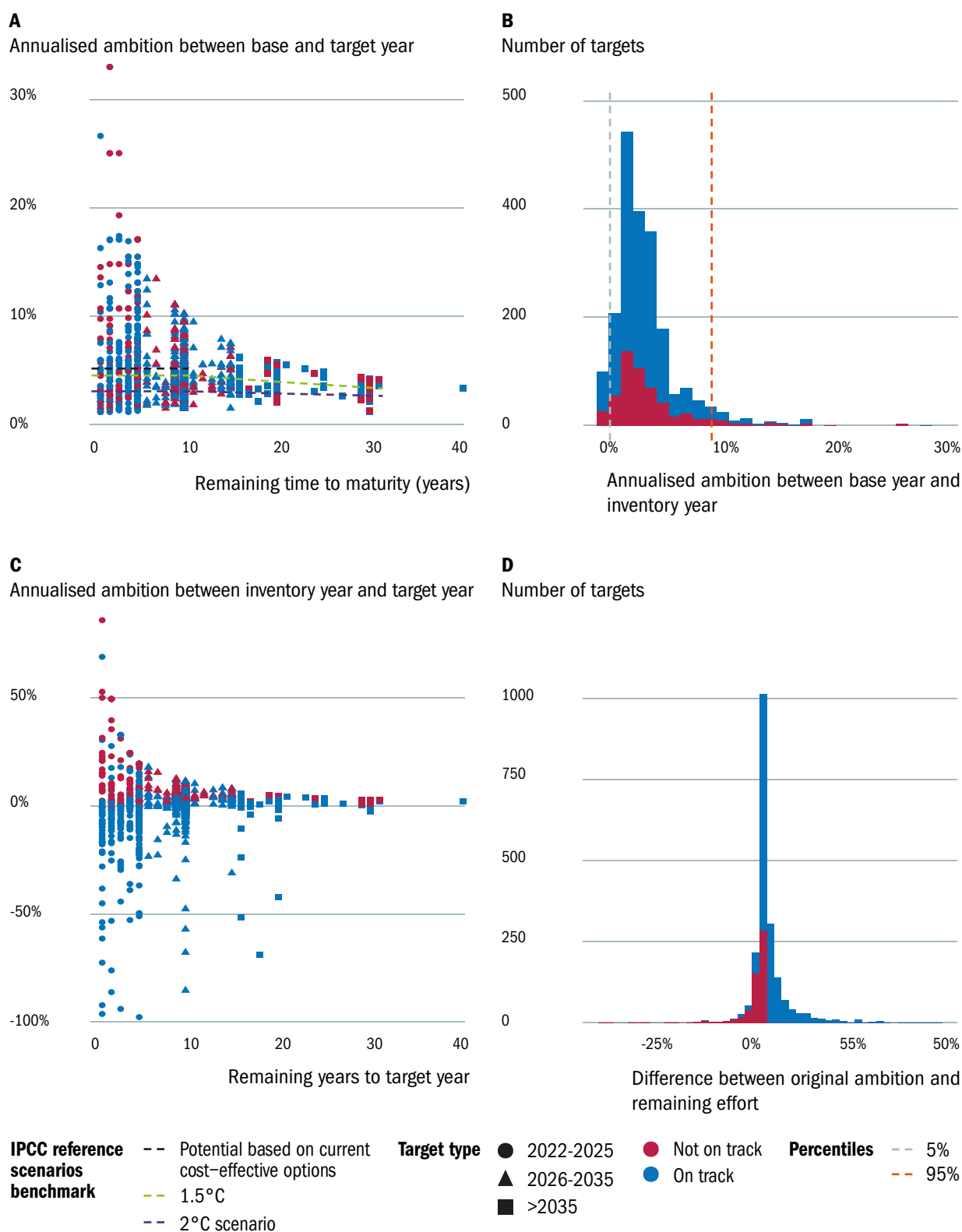
The median original required ambition of targets is around 3 percent, and large variation is illustrated by the wide 5-95th percentile range between 0.5 percent and 9.0 percent (see Figure 18A,B).

A caveat in using the reference scenarios by IPCC (see Box 1) to benchmark the ambition of companies' targets is that such an approach does not differentiate 2°C or 1.5°C emissions reductions between sectors. For example, hard-to-abate sectors such as cement and steel-making might require lower emissions reductions in the short-term, while emissions reductions for the energy supply sector which is expected to achieve net-zero emissions earlier, might be higher. Original ambition is defined between base year and target year, and 70 percent of the targets are in line with a 2°C pathway, and 42.5 percent are in line with a 1.5°C pathway. The highest ambition is found in the Services and Biotech, Healthcare and Pharma industries. In this assessment we do not take into account Scope 3 emissions that cover GHG emissions in the supply chain outside operational emissions, which can be much higher. In addition, it is often unclear to what extent these companies use offsets for achieving emissions reductions.

The variation of companies' remaining effort is much larger than the original ambition, especially for targets that are close to maturity (see Figure 18C). Nonetheless, the remaining (annual) effort is somewhat lower than the original ambition and the median is around 2.5 percent annually. This shows that generally companies have made more progress than promised when they initially set their target. The median gap between original ambition and remaining effort is 0.15 percentage points annually (see Figure 18D). One caveat in these results is that our sample could be skewed by a greater prevalence of companies on track reporting progress, since companies making insufficient progress may choose to stop reporting.

Figure 18. Overview of annualised companies' ambition and remaining effort for Scope 1+2 targets.

Note: Annualised ambition is measured between base year and target year: A) per remaining time to maturity. B) In terms of number of targets. Remaining effort is measured between most recent inventory year and target year. C) Per remaining time to maturity. D) In terms of number of targets.

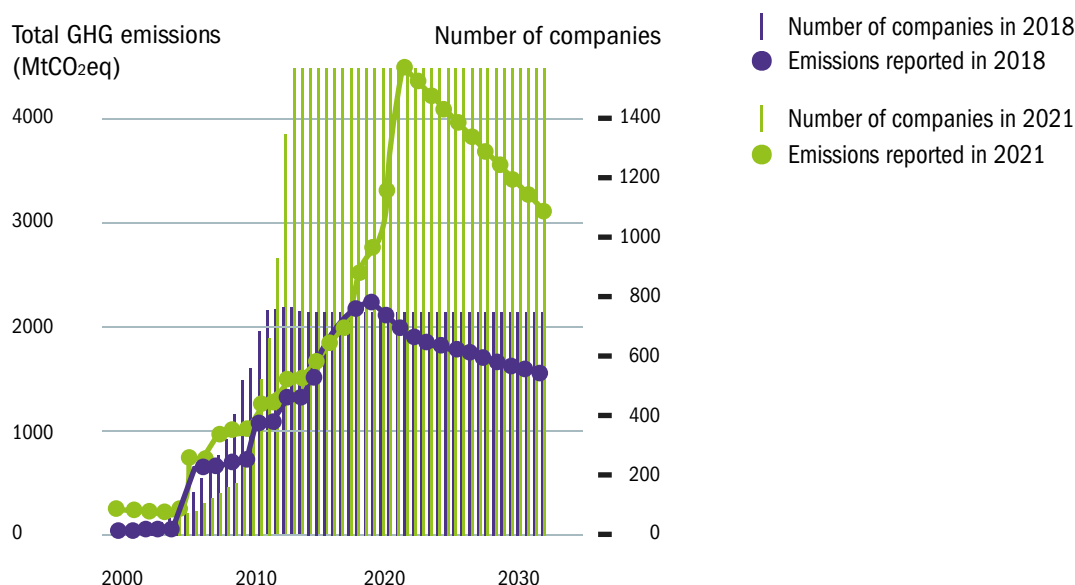


Comparing companies' ambition pathways between now and three years prior

We saw that companies' remaining efforts change over time due to progress companies make towards achieving their targets, but they could also make target updates or put forward new targets. Therefore, instead of looking at the prevalence of company ambition based on the most recent dataset from 2021 only, comparison of ambition from the reported 2018 targets three years ago and the current 2021 dataset gives insights into how this picture has changed over time. From both datasets, we constructed emission ambition pathways for each company between the

inventory year (2018 or 2021) and the target year. We then aggregated each company-specific pathway into a single pathway for all companies for each inventory year. The construction of ambition pathways between 2000 and 2030 for both the 2018 and the 2021 CDP survey data shows an overall trend of both an increasing number of companies reporting to the CDP survey through 2021 and greater total reported emissions (see Figure 19). By assuming targets are achieved, and extrapolating targets with target years before 2030 with current policies' reductions between 2020 and 2030, the projected ambition pathways show that ambition has increased for the companies in the 2021 dataset relative to those in the 2018 dataset.

Figure 19. Aggregated company Scope 1+2 ambition pathways based on targeted emission levels for the 2018 and 2021 dataset between 2000 and 2030 and number of companies with quantifiable reduction targets for a subset of companies covering around 85% of the GHG emissions for all quantifiable targets.



Ambition pathways were constructed from all company responses to the CDP surveys from both 2018 and 2021 that included quantifiable targets, consistent with the progress and ambition analysis. In these surveys, companies were asked to report their emissions reduction targets, including the year and percentage reduction in emissions to be achieved. The number of targets reported and the

emissions scope that targets covered vary widely among companies. For this reason, we divided the companies reporting into different profiles that represented the differing conditions for the types, number and scope of targets set so they could be more accurately compared to one another.

Three different profiles were created into which companies were classified for further analysis:

Profile 1: companies reporting only one target in a single year.

Profile 2: companies with multiple sequential targets, but which refer to the same defined scope of emissions.

Profile 3: companies that do not fit in any of the previously defined profiles and for which one target was selected, prioritising greater coverage, ambition, and duration.

Since not all companies and targets could be categorised into these three profiles, these categories only cover 85 percent of total GHG emissions reflected in the progress and ambition analysis. Based on these profiles, we extrapolated ambition pathways for both the 2018 and 2021 datasets for years from 2000 through 2030 based on companies' emissions targets set and linearly interpolating between them. We then aggregated the ambition pathways of all companies together for each survey, resulting in an overall ambition pathway for all 2018 reporting companies and one for all 2021 reporting companies. One caveat is that we did not correct for overlap between companies, as Scope 2 emissions of energy use companies might be Scope 1 emissions of electricity and utility companies.

Additionally, we identified a subset of overlapping companies who reported in both the 2018 and 2021 CDP surveys and compared the aggregated ambition pathways for these companies based on 2018 and 2021 data. Finally, we also categorised companies by their corresponding economic sector, such as Power generation, Manufacturing and Infrastructure, showing differences in reported emissions and the pace of targeted emissions reductions within these sectors. Using this analysis, we evaluated companies reporting to the CDP survey up to 2030 and how their ambition changed between the 2018 and 2021 CDP surveys.

Participation from companies that fit into the aforementioned profiles in the CDP survey increased by over two-fold compared to 2018, with 1,632 companies participating in 2021 compared to just 782 in 2018. As a result of more companies participating, the total estimated emissions by 2030, based on reported emissions targets and interpolation of pathways, also increased from 2018 to 2021.

The construction of the emissions pathway based on the aggregated 2021 CDP survey data showed that, should companies' targets be met, this achievement would result in 3.1 GtCO₂eq by 2030. This emissions level is almost double the aggregated emissions from targets based on the 2018 CDP survey data, which resulted in 1.6 GtCO₂eq by 2030. Although the projected emissions for 2030 on the pathways increased drastically in 2021 due to a greater number of companies reporting, companies reporting in 2021 did show overall increased ambition in terms of their targeted emissions reductions.

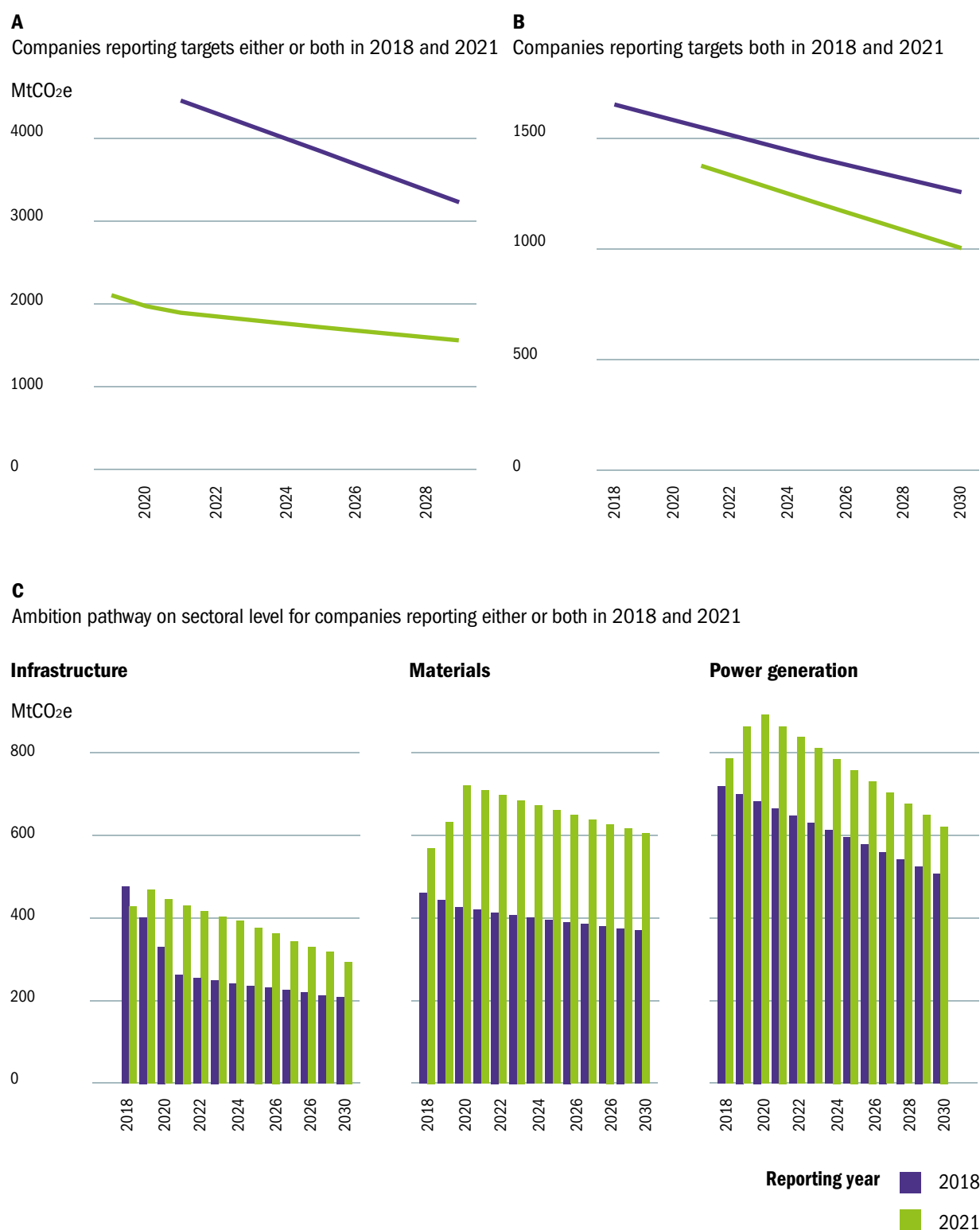
The aggregated ambition from 2018 reporting companies resulted in emissions reductions of roughly -22 percent by 2030 compared to 2020 emissions, while the aggregated ambition reported in 2021 led to emissions reductions of 30 percent by 2030 compared to 2020 (see Figure 20A). The annual change in emissions of aggregated emissions between 2020-2030 was -3.0 percent based on 2021 reported ambition, a significant increase compared to an average annual change in emissions of -2.2 percent in the same period from 2018 reported ambition. Despite the higher aggregated emissions reported in 2021 compared to 2018 due to a greater number of companies included in the 2021 dataset, 2021 reporting showed both greater proportional emissions reductions and a faster rate of average annual change in emissions reductions up to 2030 than in the 2018 reporting, indicating that companies did in fact increase ambition between the two inventory years.

While the overall trend of participating companies between the two survey years shows an increase in both estimated emissions by 2030 and in the ambition of emissions reductions, a slightly different trend emerges when only those companies who reported in both 2018 and 2021 surveys, or the overlapping companies, are compared.

There are 529 companies who reported in both the 2018 and 2021 CDP survey. For these companies, the total estimated emissions by 2030, based on reported emissions targets and interpolation of pathways, is higher in the 2018 responses than in those from 2021 indicating that GHG emissions have decreased faster than pledged (see Figure 20B). The total estimated emissions in 2030 from these companies based on the 2018 survey is 1.3 GtCO₂eq, while the estimated emissions for overlapping companies report-

Figure 20. Comparison of companies' ambition pathways between 2020 and 2030 for companies reporting in 2018 and 2021.

Note: For A) All companies in selection. B) Companies that reported in both years. C) All companies in infrastructure, materials and power generation sectors.



ing in the 2021 survey were 1.0 Gt CO₂e by 2030. In the period between 2020-2030, the ambition of overlapping companies in the 2018 survey resulted in a percentage decrease in emissions of 20 percent, while their ambition in 2021 resulted in roughly a 29 percent decrease in emissions over the same period, which is respectively 2.0% and 2.9% annually. This comparative decrease in estimated 2030 emissions for overlapping companies between the two inventory years points to a clear effort by these companies to improve upon their targets and increase their ambition. This conclusion is made clearer when considering the percentage reduction in estimated emissions based on ambition. This subset of overlapping companies reporting in both years shows an effort to increase ambition by improving upon targets of the previous inventory year.

When analysing companies in the three large sectors, Infrastructure, Material and Power generation, similar trends were found in terms of the difference in emissions reported from year to year as well as the ambition of emissions reductions (see Figure 20C). Total emissions reported for all three sectors were greater in 2021 than in 2018, as a result of more companies participating in 2021 than in

2018. The pace of ambition also increased in each sector between the two survey years, as shown by the difference in the slope of the emissions ambition curve in 2021 vs. in 2018 for all three sectors.

Companies in the infrastructure sector saw estimated emissions fall by 24 percent in the period 2020-2030 according to 2018 reported ambition and by roughly 37 percent in the same period according to 2021 reported ambition. Meanwhile, power generation companies' 2018 ambition resulted in emissions reductions of 24 percent by 2030 compared to 2020 and their 2021 ambition resulted in emissions reduction of 34 percent by 2030 compared to 2020. Companies in the Materials sector showed the largest increase in ambition between 2018 and 2021; their 2018 ambition showed emissions reductions of 24 percent by 2030 compared to 2020 and their 2021 ambition showed emissions reductions of 40 percent by the same year.

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4.1 Summary of the key findings

Cities and regions

- The overall number of cities and regions pledging emission reduction targets has fallen compared to 2020, which saw a large number commit to reduce their emissions. Although the number of cities and regions pledging mid-term and post-2030 targets, including net-zero goals, has increased since 2020, post-pandemic recovery has stalled the growth of subnational climate targets.
- Cities and regions are improving in the diversity of greenhouse gas information reported, from scope-disaggregated information and non-CO₂ greenhouse gases and Scope 3 emissions. The overall number of subnational governments reporting more than one emissions inventory to gauge progress has not substantially increased and available data remains skewed towards entities in the Global North.
- Progress towards city and region emission reduction targets remains challenging, with less than half (46 percent) of subnational governments making sufficient progress to meet their self-declared targets. Over 90 percent of cities and regions' targets do not meet the ambition level necessary to meet the minimum of the Paris Agreement goals (keeping warming well below 2°C).

Companies

- Target ambition has increased. The ambition of companies that have reported to CDP since 2018 has increased from 2.0 to 2.9 percent annually for the period 2020-2030.
- Based on the CDP dataset of 1,500 companies and 2,000 targets that have sufficient information to quantify emissions reductions, annual progress between base year and current inventory year is positively correlated with annual ambition between base year and target year. Although variation is large, median progress is 5.8 percent per year.
- Around 75 percent of the companies are on track to meet their self-reported targets, meaning that they

are on or below the linear pathway between base year and target year.

- Median ambition between base year and target year is 3 percent, and 70 percent of the targets are in line with 2°C emission pathways, and 42.5 percent with 1.5°C pathways.
- For a full picture of progress and ambition, insights are necessary into use of offsets and Scope 3 emissions for which not enough information was included but is high on the agenda for future assessments.

4.2 Recommendations

Cities, regions, and companies need to step-up efforts to realize the Paris Agreement's 'all hands on deck' approach to bridge the emissions, implementation, and ambition gaps. The 2022 UNEP Emissions Gap Report identifies a 20 to 23 GtCO₂e/year emissions gap between countries' nationally-determined contributions (NDCs) and a 1.5°C pathway (UNEP, 2022). The IPCC Sixth Assessment Report further identified a 4 to 7 GtCO₂e estimated implementation gap between countries' mitigation pledges and actual impact (IPCC AR6 WGIII, Chapter 4). The Climate Action Tracker has further identified a 19-23 GtCO₂e ambition gap in 2030 between countries' net-zero pledges and a 1.5°C pathway (Climate Action Tracker et al., 2021). These three gaps in emissions, implementation, and ambition, are the primary reasons why cities, regions, and companies must increase climate action to fill these gaps. With the Paris Agreement's "all hands on deck approach" (Hale, 2016), non-state actors are critical contributors to global mitigation, adaptation, and financing efforts (UNFCCC, 2015). As national governments evaluate ways they can increase the ambition of their NDCs, so should cities, regions, and companies.

While many non-state actors are focused on the mid-term (2026-2035), nearer-term immediate action is needed to accelerate necessary transitions.

Our analysis in this report shows most targets from high-emitting countries and regions are targeted towards the mid-term, leaving a lapse in short-term, nearer-term actions. Cities, regions and companies should evaluate what actions, including relatively easier to implement efforts in energy efficiency, fuel switching, behavioural shifts, etc.,

might be possible in the next three years. Further delaying action makes deeper emissions cuts more challenging, and if global pandemic and geopolitical events of the last two years have shown, the world cannot delay climate action further.

Although cities, regions and companies are slowly improving emissions monitoring, the overall number of non-state actors self-reporting progress data remains stagnant.

Our evaluation of progress in this report is limited to available, self-reported data. While we have seen some improvement in the detail with which cities, regions and companies report emission inventories, including disaggregation by scope, sector, and gas, a more comprehensive and broader analysis of progress is stymied by the relatively low numbers of progress reports and inventories available as only 42 percent of subnational actors that have quantifiable targets provide adequate emissions data for our progress analysis. Greater capacity building and knowledge sharing, through international cooperative initiatives and climate action networks, to develop regular emissions inventories could help improve the global non-state actor reporting landscape. Additionally, consideration of alternative datasets, derived using “hybrid” greenhouse gas emissions accounting approaches that combine aspects of atmospheric measurement and activity-based estimation methods (National Academies of Sciences, 2022) may help future analyses obtain a more comprehensive view of non-state actors’ progress.

Aligning targets with needed ambition is critical to ensuring city, region, and corporate climate actions can actually narrow the emissions gap.

For the first time, this report contextualises city, region and corporate climate targets within IPCC scenarios that provide benchmarks for required reductions. As our results show, while companies’ targets for the most part are aligned with global 1.5°C pathways, only 10 percent of cities and regions’ targets are sufficiently ambitious enough. Since cities and regions located in the Global North comprise the majority of subnational actors in our dataset, the reality is that they would likely be held to more stringent benchmarks than those presented in our analysis (IPCC, 2022). The picture of ambition provided in this report is therefore conservative, with even greater ambition and emissions

reductions required for us to meet the goals of the Paris Agreement. With countries submitting new NDCs, cities, regions, and companies should also consider increasing the ambition of their targets accordingly.

Increased interaction between national governments and non-state and subnational actors on policy implementation could increase the speed and likelihood of target achievement.

A good balance and clear division of responsibilities between state and non-state actors is essential. Countries should facilitate action by adopting clear and strong climate policies, but also provide for capacity and finance where needed. These policies and actions could set the ambition loop in motion - as evidenced by the electric vehicle market (Roelfsema, et al., 2021), which was initiated by national governments and a few leading manufacturers, with growth of electric vehicle sales continuing to this day. For example, the EU has agreed on a ban of fossil-fueled cars by 2035 (European Commission, 2022b), and the US aims to implement a 50 percent share of zero-emission vehicles by 2030 (US Government, 2022). In response, Mercedes-Benz has set a 2035 target for 100 percent emission-free cars (Mercedes-Benz, 2022), and Renault goes one step further in Europe, where it has committed to increase the sale of electric vehicles to 100 percent of passenger cars by 2030 (Renault Group, 2022).

More insights are needed to assess the role of offsets and impact of supply chain emissions.

From the Corporate Climate Responsibility Monitor (NewClimate Institute & Carbon Market Watch, 2022) we know that information on the use of offsets is often lacking. In addition, the largest impact of companies on GHG emissions is often through their supply chain (Scope 3 emissions). Reporting of both offsets and supply chain emissions is currently low. Therefore, it is crucial to account for this in voluntary reporting databases. However, to make these targets more transparent and improve reporting standards, national governments’ guidance and policy could enhance and accelerate this process. In order to assess these factors, new research methodologies are needed to address the potential of offsets and disentangle overlap and additionality of supply chain emission targets, which is not straightforward.

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Glossary

Cities	Local governments that are administrative units of a specific geographical territory. For the purposes of this report, the term “cities” includes towns, urban communities, districts, and counties, as defined by the actors themselves and often also defined in the country’s legal system.
Climate action	by subnational and non-state actors: Any kind of activity that is directly or indirectly aimed at reducing GHG emissions or driving climate change adaptation and resilience that is led by these actors. Actions can be pursued individually (by one sub-national or non-state actor) or cooperatively in the form of initiatives (by a group of actors, including non-state and/or sub-national sub-national states, provinces and regions).
Targets	by subnational and non-state actors: Planned climate action as well as action currently under implementation, which has been publicly announced. Targets can be put forward and pursued individually (by one sub-national or non-state actor) or cooperatively in the form of initiatives (by a group of actors, including non-state and/or sub-national actors).
International Cooperative Initiative (ICI)	Multi-stakeholder arrangement through which subnational and non-state actors (e.g., cities, regions, businesses, NGOs, etc.) cooperate across border to mitigate or adapt to climate change, often in partnership with national governments or international organizations.
Non-state actor	Any actor other than a national government. This includes local and other sub-national governments, private actors, such as companies and investors, civil society and international organizations, among others.
Quantifiable targets	to reduce greenhouse gas emissions: For the purposes of this report, quantifiable targets typically include a specific emissions reduction goal, target year, and baseline year (e.g., a goal to reduce emissions by 20% compared to 2000 levels by 2020). In addition, calculating these targets’ mitigation impact requires baseline year emissions. (See Technical Annexes I and II for more details on how emissions reductions targets are selected and quantified).
Scope 1 emissions	Direct emissions resulting from owned or controlled sources. See www.ghgprotocol.org for further details.
Scope 2 emissions	Indirect emissions resulting from purchased electricity, heat or steam. See www.ghgprotocol.org for further details.
Scope 3 emissions	Other indirect emissions not included in Scope 2 that are in the value chain of a reporting actor, including both upstream and downstream sources. See www.ghgprotocol.org for further details.
Regions	Subnational administrative units that are generally broader in population and in scope than cities. They usually have separate governing bodies from national and city governments but encompass lower administrative levels of government; often, they are the first administrative level below the national government. “Regions” in this report includes US and Indian states, German Länder, and Chinese provinces. Regions can also include councils of sub-national governments acting together.
Subnational actor	Any form of government that is not a national government, such as cities, sub-national states, provinces and regions.

Appendix

1. Data sources for subnational and company climate action

Additional data sources referenced where no quantifiable targets were used in our analysis: C40 Cities, Global Climate Action Portal, ICLEI

Name of data source	Reporting Platform	Number of actors from database included	Number of targets from database included	Regions covered
CDP Cities 2021	CDP	279	373	All focus economies
CDP European Commission Joint Research Centre Cities	CDP	31	43	EU27, UK
CDP States and Regions 2021	CDP	31	46	Australia, Canada, EU27, Mexico, UK, USA
National Development and Reform Commission	N/A		10	China
US Climate Alliance	Climate Alliance	21	32	USA
US Climate Mayors	Climate Mayors	2	3	USA
Chinese Cities Five Year Plans	N/A	2	2	China
EU Covenant of Mayors for Climate & Energy (EUCoM)	EUCoM	1093	1,189	EU27
Global Climate Action Report Data 2021	N/A	92	106	Canada, China, EU27, Indonesia, India, Japan, Mexico, UK, USA
Kona et al., 2021	GCoM	10	10	EU27
European Commission, Joint Research Centre	GCoM	995	1,124	EU27, Mexico, UK
WWF Japan	N/A	44	44	Japan
Accelerating Net Zero Report Data 2020	N/A	20	30	Australia, Canada, EU27, Indonesia, USA
Under2Coalition 2022	Under2Coalition	8	8	Canada, EU27, Indonesia, Mexico, UK, USA

The company assessment was based on the latest available CDP questionnaire (2021c). This was disaggregated to the 13 focus economies for the landscape analysis, but fully used for the progress and ambition analysis.

2. Reference scenarios for ambition

Scenario name	Total emissions reductions % (2030)	Annualised emissions reductions % (2030)	Total emissions reductions % (2040)	Annualised emissions reductions % (2040)	Total emissions reductions % (2050)	Annualised emissions reductions % (2050)
1.5 degrees with limited or no overshoot (IPCC AR6 C1)	43%	3.91%	69%	3.28%	84%	2.71%
Below 2 degrees with immediate action (IPCC AR6 C3a)	27%	2.45%	47%	2.24%	63%	2.03%
Possible based on current cost-effective measures	50%	4.55%	N/A	N/A	N/A	N/A

3. Formula for calculating a target's updated ambition

To calculate the ambition accounted for an actor's latest reported emissions inventory, we first calculate the expected target year emissions for the target.

$$\text{Emissions}_{\text{Target Year}} = \text{Emissions}_{\text{Baseline}} - (\text{Emissions}_{\text{Baseline}} * \% \text{Reduction}_{\text{Pledged}})$$

Using the expected target year emissions, we then calculate the percentage reduction required for the actor to achieve the target, based on their latest reported emissions inventory.

$$\% \text{Reduction}_{\text{Updated}} = ((\text{Emissions}_{\text{Latest Inventory}} - \text{Emissions}_{\text{Target Year}}) / \text{Emissions}_{\text{Latest Inventory}}) * 100$$

Using the updated percentage reduction required, we then calculate the updated annualised reductions required as an indication of the actor's updated ambition.

$$\text{Annualised reductions required}_{\text{Updated}} = \% \text{Reduction}_{\text{Updated}} * (\text{Year}_{\text{Target}} - \text{Year}_{\text{Latest Inventory}})$$

4. Data collection and progressing for progress and ambition analysis

Cities and regions

The landscape of quantifiable targets for cities and regions within the 13 focus economies were collected from the datasets listed in Appendix 1. Only targets with information regarding the targeted percentage reduction, target year, baseline year, and baseline emissions were included as quantifiable targets. The database was also filtered to only include emissions reductions targets which covered community-wide emissions and excluded targets from the waste, transport, land use, buildings, and agricultural sectors and targets that applied to subnational government operations or consumption-based emissions. For subnational actors with multiple targets with the same target year and same target scope, we selected the target which included the broader scope of emissions.

The cities progress and ambition analysis was conducted on cities and regions in Global North countries: Australia, Canada, EU27, UK, Japan, and the US. We only included targets where the subnational actor had reported at least 1 emissions inventory from a year later than the baseline year of the target.

Companies

The companies' progress and ambition analysis has been done on the global level and used the dataset based on the 2021 questionnaire (CDP, 2021a). This dataset included the following variables that were used for this analysis:

- Company information
- Name
- Primary industry
- Inventory scope 1 and scope 2 emissions
- Target year, emission reduction targets and base year, adjusted to only include scope 1 and 2 emissions
- Target coverage (%)
- Latest inventory year

The data was filtered to only include active, quantifiable, scope 1+2 and full coverage targets. This was defined as:

- Active
- Target status is 'underway', 'achieved', 'new' or 'revised'

- Target year is 2021 or later
- Scope 1+2
- Target scope includes either scope 1 or 2, or both. All 'scope 3' only targets were removed
- Full coverage
- All targets that cover 90% or more of the total company emissions
- In addition, we removed outliers which were defined as
- The annualised ambition (relative to base year and/or reporting year) is higher than 100% or lower than -100%.
- The annualised progress (between base year and reporting year) is higher than 100% or lower than -100%
- Note that if annualised progress or ambition is positive, this means that the company has achieved or aims for emission reductions.

5. Constructing company ambition pathways for emissions

CDP data

CDP provided data for the 2018 and 2021 versions of the CDP Climate Change Questionnaire. The data from each survey was provided in three different formats (raw inventory data, cleaned target data and progress data) and for Scope 1, 2 and 3 emissions according to the definitions of the Greenhouse Gas Protocol.

Raw inventory data includes the full emission profile of companies and was gathered directly from the answers given by companies in the 2018 and 2021 CDP surveys concerning their base year (BY) emissions and most recent year (MRY) emissions, broken down by Scope 1, Scope 2 and Scope 3. This data was used in the data processing in case BY and MRV emissions from the target dataset were missing or seemed unreliable, and to calculate the proportion of emissions from different scopes, so that these same proportions could be applied later when calculating target year (TY) emissions by scope.

Cleaned target data includes emissions data covered by company targets and is provided by CDP. CDP organized all information provided in the 2018 and 2021 surveys into coherent data sets, including BY, MRV and TY emissions.

The **cleaned target data** was converted by CDP into **progress data** following 4 different company profiles.

- Profile 1 companies reported only 1 target in a single year.
- Profile 2 companies are companies with multiple sequential targets, but which refer to the same defined scope of emissions.
- Profile 3 companies are those companies which do not fit in any of the previously defined profiles and for which one scope and target year combination is prioritized.

For the 2021 progress data, explicit data was available for BY, MRV and TY emissions. However, for the 2018 progress data, the MRV and TY emissions had to be calculated by UU manually using the percent targeted reduction and the percent of target achieved reported by the company.

Both the **raw inventory data** and **progress data** were used when constructing the emissions pathways.

Utrecht University processing

The CDP data was used to construct ambition pathways for company emissions between 1990 and 2030. We calculated the Scope 1 and 2 BY, MRV and TY emissions for each company using the proportion of Scope 1 and 2 emissions in each

company's MRY emissions. Either market-based or location-based Scope 2 emissions were used in these calculations depending on the type of Scope 2 emissions indicated by the company.

As emissions data is self-reported, we assessed the consistency of the BY, MRY and TY trends. This was done using the solely Scope 1 & 2 emissions for BY, MRY and TY emissions that have been calculated. First we applied two filters:

1. If base year emissions for target and inventory are almost (<10% difference) the same inventory data was used;
2. If the base years between scope 1 and scope 2 are unequal target data was used.

Second, for the remaining data the differences between the raw inventory data emissions and the progress data emissions were compared in Excel using a regression equation. The choice regarding which data source to use for each company's emissions was based on quadratic distance of the total emissions calculated from the data source from the regression line of fit. For each company, the data source that had the lowest quadratic distance was chosen for use in constructing the emissions pathway.

After selecting the appropriate data per company and profile, additional data cleaning was done in Python for each profile group to select companies meeting only the following conditions:

- The scope defined for the target included Scope 1 or Scope 2 emissions. Targets that covered only Scope 3 emissions were not considered when constructing the emissions pathways.
- Companies who did not report any information for base year, target year, scope, targeted reduction, base year emissions or a percent of target achieved were removed from the analysis, since this information is integral to constructing the emissions pathways.

After this additional data cleaning, emissions pathways were then constructed in Python for each profile group by interpolation using the BY, MRY and TY emissions (calculated and selected for each company using the regression method) as midpoints. Emissions pathways were constructed including years from 1990 to 2050, beginning with each company's base year.

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