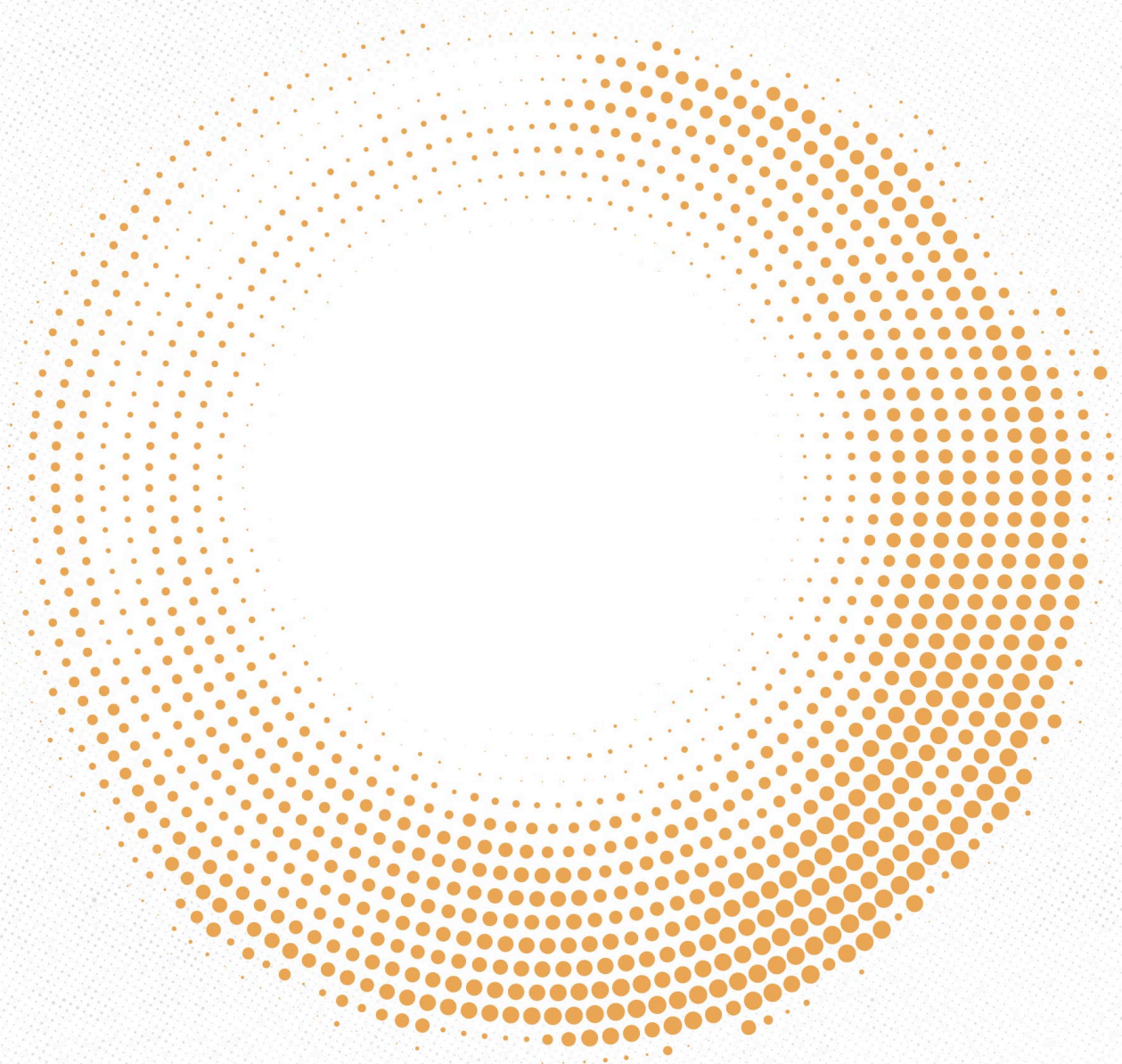


NET ZERO STOCKTAKE 2024

Assessing the status and trends of net zero target setting across countries, subnational governments, and companies.

September 2024



A report by:

NewClimate Institute, Oxford Net Zero, Energy & Climate Intelligence Unit and Data-Driven EnviroLab.

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Executive summary

The Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report (2021-23) reminded the world what is necessary to stop human-caused climate change this century. To have a realistic chance of limiting global average temperature increase to 1.5°C with no or limited overshoot, the world must reach **net zero carbon dioxide (CO₂) emissions in the early 2050s**, alongside rapid, deep, and sustained reductions in other greenhouse gas (GHG) emissions. All GHG emissions should reach net zero approximately two decades later.

This report offers critical insights into the progress of whole-economy net zero target-setting and the overall performance of more than 4,000 entities on key procedural and substantive elements of net zero integrity — essentially, whether mitigation targets and their associated strategies contain the core components necessary to drive deep decarbonisation over the next 30 years.

Key findings this year:

- **Net zero target-setting has consolidated across states and regions, cities, and companies, with increases of 28%, 8%, and 23%, respectively, since the Net Zero Stocktake 2023.**
- **More than 40% of non-state entities still lack emission reduction or net zero equivalent targets.**
- **Although the number of credible net zero targets is growing, 5% or less of entities across companies, states and regions, and cities meet all our minimum procedural and substantive integrity criteria.**
- **The 655 Race to Zero members in the Net Zero Tracker database perform significantly better on minimum integrity criteria compared with non-members. But both groups need to improve.**
- **National-level net zero (or other mitigation) targets serve as a 'ceiling' of ambition for subnational governments, but some subnational regions go above and beyond.**
- **Improving vertical alignment between national and subnational governments is critical, especially in areas such as target-setting, coordination, and policy implementation.**

At its core, the Net Zero Tracker evaluates the global scale of net zero target-setting, focusing on large emitters to assess the credibility of their commitments. This is our fourth comprehensive annual analysis, following *Taking Stock 2021*, *Net Zero Stocktake 2022*, and *Net Zero Stocktake 2023*. These earlier reports provide valuable benchmarks to gauge progress over time, both in terms of setting net zero targets (intent) and implementing credible measures to help achieve them (integrity). Key procedural and substantive integrity measures include the establishment of near-term interim targets to spur immediate emissions cuts, transparency regarding the use of carbon credits, coverage of all emissions, and regular progress reporting.

Of the 198 countries, 708 states and regions, 1,186 cities, and 1,977 publicly listed companies we track, **at least 1,750 now have net zero targets**, up from 769 in December 2020:

- **148 countries** including the EU and Taiwan, up from 124 in December 2020
- **186 states and regions**, up from 73
- **271 cities**, up from 115
- **1,145 publicly listed companies** from the Forbes Global 2000, up from 417.

Most large, high-emitting countries have already set net zero (or similar) targets, including 19 G20 members. A notable exception is Azerbaijan, this year's host of the UN climate summit (COP29). We may

see new and improved national targets in the next 12 months, as the third 'ratchet' of the Paris Agreement encourages countries to submit updated emissions-cutting Nationally Determined Contributions (NDCs).

National-level targets (including the EU and Taiwan) now account for:

- **93% of global GDP (PPP)**, up from 68% in December 2020
- **87% of global GHG emissions**, up from 61%
- **88% of the global population**, up from 52%.

While the number of countries setting net zero targets has levelled off, the proportion of these targets formalised into law or official policy has steadily risen, now covering 73% of global GHG emissions. Meanwhile, over the past 18 months, net zero target-setting has increased among states and regions, cities, and companies, growing by 28%, 8%, and 23%, respectively. However, alarmingly, more than 40% of non-state entities still lack any form of mitigation target, including major companies such as Tesla, Nintendo, and Berkshire Hathaway.

Since our last Stocktake report 18 months ago, we have observed a significant rise in net zero target-setting among companies based in Asia, likely a result of both regional decarbonisation efforts and improved internal data collection. The number of companies with net zero targets has grown in China from 27 to 48, in India from 20 to 29, in Japan from 118 to 184, and in South Korea from 22 to 41.

The world requires more short- and long-term targets to be set, but it is equally important that existing targets are strengthened. Nearly two years after the UN Secretary General's *Integrity Matters* report clarified what 'good net zero' looks like, non-state entities have made limited progress in enhancing the credibility of their targets. Although the number of credible net zero pledges has grown, only 5% or fewer of non-state entities meet all the basic procedural and substantive integrity criteria we evaluate.

Subnational governments and publicly listed companies tend to perform well on procedural criteria, including: (i) formalising net zero targets; (ii) setting interim goals; (iii) publishing annual progress reports; and (iv) developing implementation plans. But they often fall short on more substantive criteria. For example, many companies' net zero targets focus only on CO₂ emissions, neglecting other greenhouse gases, or cover only parts of their value chain (e.g. addressing Scopes 1 and 2, but not Scope 3 emissions).

This year, we examine how members of the UN Climate Change High-Level Champions' Race to Zero campaign compare with non-members on integrity criteria. Overall, we find that the hundreds of Race to Zero members in the Net Zero Tracker database outperform non-members on both procedural and substantive measures, though both groups still have significant room for improvement.

Alongside our usual overview of annual net zero progress, this report investigates how state and regional entities in 14 major-emitting countries are progressing on net zero. Subnational governments in these countries play a critical role in mitigation efforts, though they vary significantly in the powers they possess and the level of climate ambition they set. We find that, while national net zero targets often serve as a 'ceiling' for subnational ambition, some regions surpass these goals. In some cases, such as in Australia and Japan, subnational regions may have influenced national net zero target-setting.

National governments could unlock more subnational progress by, for example, supporting regions through policy guidance on implementation and enhanced coordination between subnational governments. Further support would not only help achieve current targets but also foster the conditions and consensus needed for goals and policies that align with national objectives.

Overall, this report presents a world on the path to net zero but in dire need of swift, sustained action to turn targets into concrete, credible implementation plans. The third ratchet of the Paris Agreement, culminating at COP30 in Brazil in 2025, offers a crucial opportunity to achieve this necessary shift.

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Abbreviations and acronyms

CCRM	Climate Corporate Responsibility Monitor
CDR	Carbon dioxide removal(s)
CO₂	Carbon dioxide
ECIU	Energy & Climate Intelligence Unit
EU27	27 member states of the European Union
FLAG	Forest, land and agriculture sector
GDP PPP	Gross Domestic Product based on Purchasing Power Parity
GGPC	Greenhouse Gas Protocol (Corporate) standard
GHGs	Greenhouse gases
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
LUCF	Land-use change and forestry
OECD	Organisation for Economic Co-operation and Development
RtZ	Race to Zero led by the UN Climate Change High-Level Champions
SBTi	Science Based Targets initiative
UN	United Nations
UN Expert Group (HLEG)	United Nations' High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities
UNFCCC	United Nations Framework Convention on Climate Change

1. Setting the scene and scientific underpinning

Net zero's history can be divided into three phases. Phase One from 2008 to 2018 saw the scientific concept of net zero – a balance between human-caused GHG emissions and human-enhanced removals – transform into an international climate policy objective.

Phase Two between 2018 and 2022 began after the release of the Intergovernmental Panel on Climate Change's (IPCC) landmark *Special Report on Global Warming of 1.5°C* (IPCC, 2018). The aftermath of that report, the rise of Greta Thunberg-inspired climate consciousness and the dedicated net zero push towards COP26 in Glasgow saw a trickle of national net zero pledges develop into a flood across nations, regions, cities, companies, and financial institutions. In 2018, less than two-tenths of global GDP was covered by net zero targets; by 2021, that proportion had grown to more than nine-tenths (Net Zero Tracker, 2022).

If Phase One and Two were about principles and pledges, Phase Three, which started around 2022, is about plans and delivery. Yet, only a few years into the most consequential phase of the net zero journey, most plans still lack minimum levels of integrity. Simply put, pledges are not plans, and incomplete plans are not the detailed plans that are required to deliver net zero targets.

Reasons, not excuses

Since our last Net Zero Stocktake report 18 months ago, wars, economic challenges, and other headwinds have further diverted the attention of policymakers, boards, and citizens. Russia's invasion of Ukraine has heightened national and short-term energy security concerns at the expense of decarbonisation in some countries;¹ more protectionism and more industrial policy are manifestations of intensifying superpower rivalries; and the world's most severe bout of inflation in 40 years has squeezed the fiscal balance sheets of most nations. At the same time, energy-intensive technologies like artificial intelligence and cryptocurrencies are further driving up global electricity demand, causing some technology companies to recalibrate near-term emission targets.² The International Energy Agency (IEA) says that electricity consumption from data centres and the above technologies could double by 2026, compared with 2022 levels (IEA, 2024a).

On top of these developments, 2024 has seen a wave of elections across most of the major economies. Where the future direction and speed of decarbonisation hangs in the political balance – most notably in the United States (US) – companies and investors have delayed or hedged their commitments to decarbonisation.

Until recently, slow progress on net zero was more understandable due to ambiguity around what constituted a 'good net zero' plan for a government or company. This uncertainty allowed them and other entities to claim robust net zero plans, even if key elements were absent. From 2020, best practice on net zero began to be consolidated by the Race to Zero. Then, in November 2022, a UN Secretary-General commissioned report, *Integrity Matters: Net Zero commitments by Businesses, Financial Institutions, Cities and Regions*, launched at the 2022 UN climate summit (UN HLEG, 2022). Compiled by an expert-laden new UN High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities (UN Expert Group), the report clarified the essential details for net zero targets set by companies, financial institutions, states and regions, and cities.

The UN Expert Group recommendations sit atop a crowded landscape of voluntary net zero guidelines, primarily aimed at the private sector. In the past 18 months, the International Sustainability Standards

¹See 'Countdown to COP28: Time for world to focus on oil and gas phase-out, renewables target – not distractions like CCS' for more (CAT, 2023a)

²See, for example, 'Sustainability: big tech's AI push putting climate targets at risk' (Green, 2024)

THE UN HIGH-LEVEL EXPERT GROUP'S RECOMMENDATIONS

- 
-  **1. Announce a net zero pledge**
 -  **2. Set targets quickly and fully**
 -  **3. Use voluntary credits responsibly**
 -  **4. Create and publish a transition plan**
 -  **5. Phase out the use of fossil fuels**
 -  **6. Align on lobbying and advocacy**
 -  **7. Prioritise people and nature in the just transition**
 -  **8. Increase transparency and accountability**
 -  **9. Invest in just transitions**

The Net Zero Tracker collects data on more UN Expert Group recommendations than any other initiative in the world and is aligning further still in the lead up to the UN climate summit in Brazil in 2025 (COP30).

Board (ISSB) issued new disclosure standards,³ the Transition Plan Taskforce released its sector-specific guidance, and the International Organization for Standardization (ISO) announced the development of a comprehensive 'Net Zero Standard' to further crystallise and scale net zero best practice.⁴ Additionally, the influential Science-Based Targets initiative announced that an updated version of its Corporate Net-Zero Standard would be released in 2025.⁵ Fortunately, these standards align on key aspects of best practice and often fill complementary functions in the broader net zero governance system. This convergence arrives at an inflection point for net zero-related regulation and policy which is increasing in scale and in breadth globally (Hale et al., 2024).

Credible net zero plans can underpin the next ratcheting of global climate efforts

In 2025, countries are expected to submit a new round of emissions-cutting Nationally Determined Contributions (NDCs) under the Paris Agreement, marking a pivotal moment on the path to net zero. Action by businesses, investors, cities, regions, and other entities will be vital to this next 'ratchet' of global climate efforts - but only if their plans are credible.

Encouragingly, concrete progress in emission reductions shows that the faster pace of action required to reach net zero by mid-century is feasible - with greater effort. Over the last decade, climate policies and clean energy deployment have put global emissions into a structural slowdown. From 2014 to 2023, global emissions grew at the slowest decadal rate since the 1920s. While a decreasing trend cannot yet be discerned, last year's emissions in advanced economies fell to the lowest level since 1973 (IEA, 2023); in 2024, global investment in clean technology is expected to reach \$2 trillion for the first time (IEA, 2024b). As the world, including China (the largest global emitter of GHGs) approaches the emissions tipping point, the capacity for all entities to slash emissions will expand, without the need to resort to implausible solutions like low-integrity carbon credits or unproven technologies like Carbon Capture and Storage (CCS).

³ ISSB is part of the International Financial Reporting Standards Foundation (IFRS). More than 20 jurisdictions — accounting for 55% of global GDP and including China — are taking steps to introduce or align with the new ISSB disclosure standards, IFRS 1 and IFRS 2. These standards seek to harmonise disclosures and transition plans.

⁴ See 'Creation of international standard on net zero gets underway' (ISO, 2024)

⁵ SBTi now has more than 5,000 member companies that collectively account for \$45 trillion of market capitalization, 39% of the total.

Recent analysis suggests that emission reduction potential over the next decade is substantial. The Energy Transitions Commission found that if national governments incorporate existing policy commitments and recent technological advances in their next NDCs ('NDCs 3.0')⁶ **ambition could nearly triple** (Energy Transitions Commission, 2024). Driven by steeper than expected cost reductions, insurgent low-carbon technologies are displacing fossil fuel-powered incumbents at a much faster pace than analysts anticipated, a trend that will continue.

New multilateral commitments recognise this potential. At COP28, 132 countries and the EU pledged to triple renewable energy capacity and double the rate of energy efficiency by 2030.⁷ Over the next year, the NDC 3.0 submissions should logically reflect these policy commitments as well as current and anticipated clean energy progress. However, ambition alone will not ensure short-term climate goals or net zero CO₂ by mid-century. NDCs 3.0 submissions must detail how updated targets will be *implemented*, especially at sectoral and subnational levels.

While the Net Zero Tracker does not monitor implementation,⁸ it does assess its prerequisites: **net zero intention and integrity**. The UN Expert Group's recommendations, while not a blueprint for national-level NDCs, provide a credible framework for subnational and private sector contributions to national goals.

Vertical alignment?

In addition to its usual review of annual net zero progress, last year's 'Net Zero Stocktake 2023' examined the alignment of voluntary corporate target-setting criteria — in other words, what 'good net zero' should look like for a given company (Net Zero Tracker, 2023b). This year we change focus. We investigate how **state and regional entities** in 14 major-emitting countries are doing on net zero, analysing their governance systems, targets, implementation plans, institutional power, and capacity to act.

To date, the climate accountability ecosystem has largely centred on countries and companies, often overlooking subnational governments. Few studies have concentrated on the vertical relationship of net zero target-setting *within nations*, particularly on whether varying national approaches to target-setting and climate governance help or hinder subnational efforts in delivering national net zero goals. Analysis on the net zero 'Ambition Loop' — the bidirectional relationship between climate ambition across different entity types — has largely focussed on the connection between national governments and companies,⁹ rather than between national governments and their subnational counterparts.

There is a risk that multilateral climate diplomacy could revert to the state seen between 2017 and 2021, when former US President Donald Trump withdrew his country from the Paris Agreement, disrupting climate coordination globally. During that period, climate action in the US shifted from the federal to state level through initiatives like 'We Are Still In' and the 'U.S. Climate Alliance'. Even if similar circumstances do not arise between 2025 and 2029, this analysis aims to highlight the relationships between different levels of government on net zero efforts, particularly in the US.

Three case studies on the 'how' of net zero target-setting

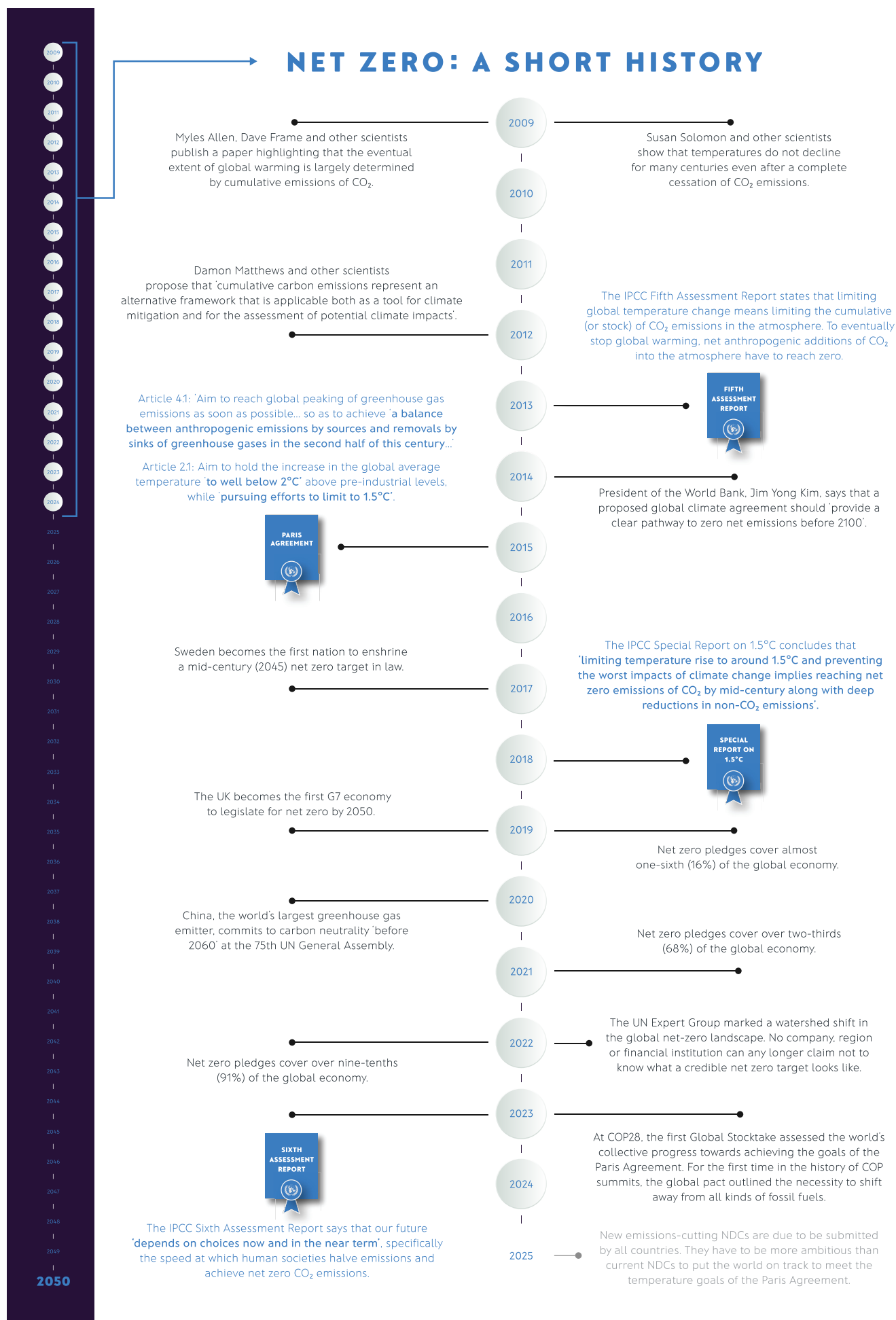
This year's report highlights three examples of emerging good practices in net zero target-setting: one country, Costa Rica, and two companies, Google (Alphabet) and Volvo Group. By showcasing these examples, we aim to demonstrate the practical steps being employed to operationalise net zero, which may inspire other entities to follow suit or identify areas for improvement in their own strategies.

⁶ Nationally Determined Contributions (NDCs) for 2025 are required to be submitted no later than February 2025.

⁷ Global Renewables and Energy Efficiency Pledge <https://www.cop28.com/en/global-renewables-and-energy-efficiency-pledge>

⁸ The Net Zero Tracker does not track implementation yet but is open to incorporating implementation tracking in the future.

⁹ See, for example, Eskander et al. (2024).



2. Summary of data and methods

The Net Zero Tracker is the most comprehensive and up-to-date database of net zero commitments made by nations, states & regions, cities and major companies. It includes:

- all UNFCCC member states and a selected number of territories
- subnational states & regions in the 25 largest emitting countries
- all cities around the world with populations over 500,000
- publicly listed companies that were listed in the Forbes Global 2000 in 2020
- 100 of the world's largest private companies.

It only uses information in the public domain, a decision taken in part to encourage entities to be open. Supplemented by automated web-scraping, manual data searching by volunteer analysts working in a range of languages allows the Tracker to gather and collate data on the status of net zero targets and robustness parameters across more than 4,100 entities. Parameters include the existence of **interim targets**, intentions regarding **offsetting**, the existence of **published plans**, and what the target covers in terms of **greenhouse gases** and **emission scopes**. There is a small degree of natural change and turnover in the entities in the database. For example, mergers and acquisitions sometimes change the mix at the company level. But these changes result in minor considerations.

Overall, our approach enables the Tracker not only to make snapshots in time, but to evaluate how the landscape is changing over time – in particular, whether entities are adding important robustness elements to their pledges, which in turn will increase confidence on delivery.

This report updates and expands the data and analysis presented in the 'Net Zero Stocktake 2023' report (Net Zero Tracker, 2023b). The data used for this report's analysis is drawn from the core Net Zero Tracker database, which is a 'living' data resource that is updated regularly (adapted from Hale et al., 2022). The data collection cut-off date for this report was 29 August 2024, but the underlying dataset on the Net Zero Tracker is continuously updated. The dataset used for this analysis is available on Zenodo (Hyslop et al., 2024). The assessment framework applied in this report updates that developed by and used in Hale et al. (2021) and updates the Net Zero Stocktake 2023 report. As with the previous reports, this analysis assesses the prevalence of targets and their robustness, but not implementation and progress. The information presented here therefore captures the first stages of the causal chain from targets to implementation to outcomes (Hale, 2021).

More details about the data collection process and the assessment of the entities recorded in the Net Zero Tracker database can be found in Appendix I.

Methodological note on case examples

The Net Zero Tracker regularly highlights specific case examples in its reports, analyses and social media postings. These case examples aim to provide detailed insights on how entities like companies, cities, states and regions, and countries follow and implement emerging *good practice* net zero target setting. The identification, selection, and contextualisation of case examples is informed by findings of external analyses, participation in high-ambition coalitions, and expert insights from the Net Zero Tracker team. The Table 1 below provides an overview across each of these, as of September 202

	Countries	Subnational governments (states, regions and cities)	Corporates
External analyses	<ul style="list-style-type: none"> - Climate Action Tracker net zero assessments - Country-specific analyses by researchers and think tanks (e.g. European Climate Neutrality Observatory) - Country-specific analyses by climate advisory councils (e.g. Climate Change Committee (CCC)) - Cross-country analyses (e.g. UNEP Emission Gap 2023 (Chapter 3)) 	<ul style="list-style-type: none"> - Urban Environment and Social Inclusion Index (UESI) - Forthcoming Cities Climate Action Report Card (CCARD) report 	<ul style="list-style-type: none"> - Company-specific analyses (e.g. Corporate Climate Responsibility Monitor) - Sector-specific analyses (e.g. World Benchmarking Alliance (WBA))
High-ambition networks	<ul style="list-style-type: none"> - Participation and commitments under the Carbon Neutrality Coalition 	<ul style="list-style-type: none"> - Participation and commitments under the Under2 Coalition - Participation and commitments under C40 	<ul style="list-style-type: none"> - Participation and commitments under the First Mover Coalition
Expert knowledge	<ul style="list-style-type: none"> - Consortium members of the Climate Action Tracker - Contributing authors to all cross-country net zero assessments covered in the UNEP Emission Gap since 2021 	<ul style="list-style-type: none"> - Lead authors of Cities Climate Action Report Card (forthcoming), and other analyses focused on city-level climate strategies - Contributing author to 'Integrity Matters for Cities, States, and Regions' 	<ul style="list-style-type: none"> - Lead authors of the Corporate Climate Responsibility Monitor - Involvement in different scientific, technical and expert advisory role in voluntary initiatives and orchestration campaigns

Table 1: Overview of external analyses, high-ambition networks and expert knowledge to identify, select, and contextualise case examples as of September 2024

Methodological note on our analysis of net zero target-setting by subnational governments

To assess target-setting status of subnational governments, we investigated the number of subnational regions with targets, as identified by the Net Zero Tracker, in 14 countries, as well as to what extent subnational governments can set and implement targets. For the latter question, we conducted a literature review of subnational regions' powers and capacities. Much of the information provided therefore rests on other analyses and official government documentation.

3. Key updates and findings

Net zero target-setting has consolidated across countries, regions, cities, and companies

NET ZERO COVERAGE OVER TIME (BY NUMBER)

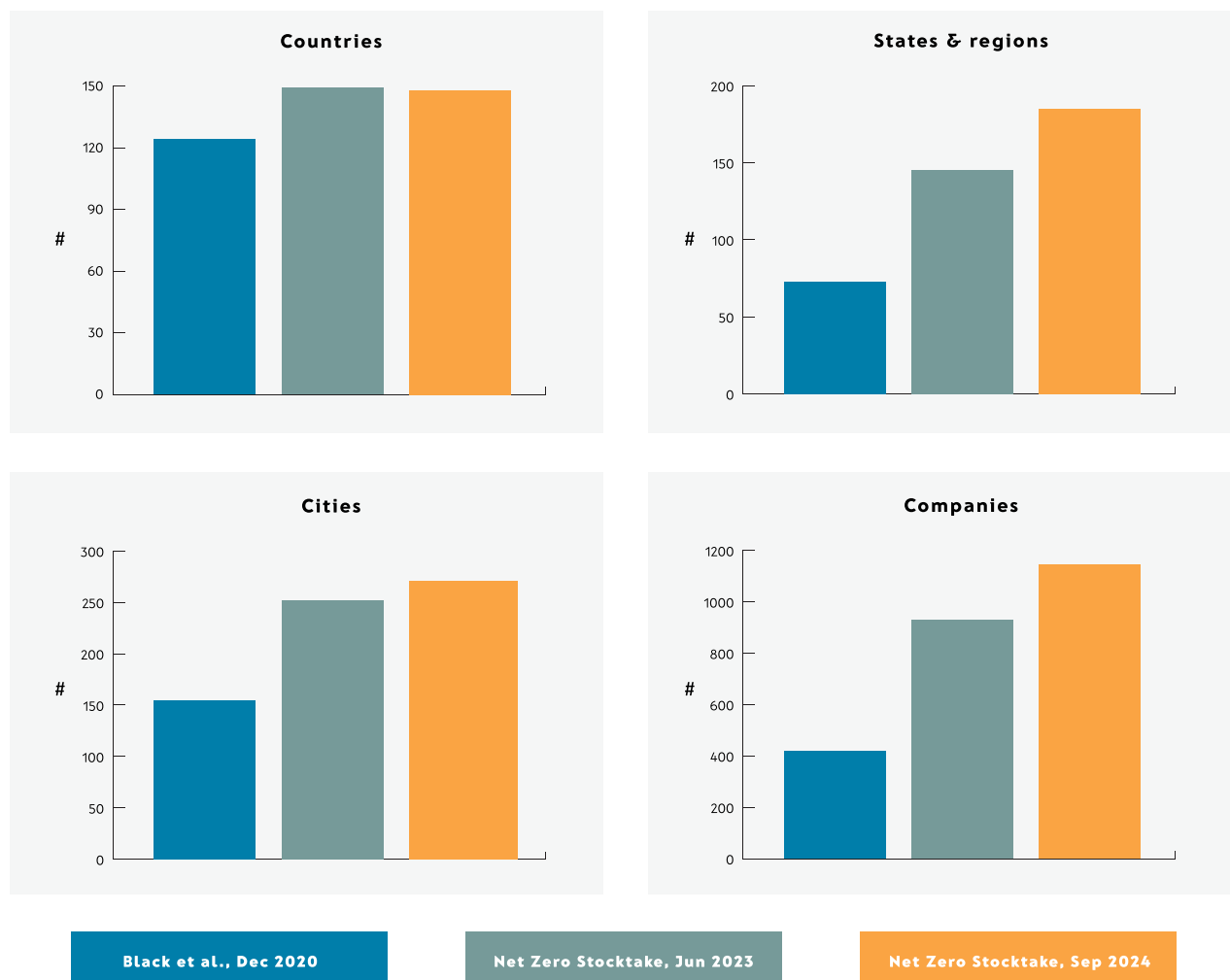


Figure 1: Number of net zero pledges per entity group covered by the Net Zero Tracker database and growth since December 2020. Data for December 2020 and June 2023 are taken from Black et al. (2021) and Net Zero Tracker (2023b).

Since the end of 2020, we have observed a considerable increase of net zero targets or their equivalents around the world across entity groups. The increase is due to both new target announcements over the course of nearly four years as well as enhanced data collection.¹⁰ In total, **1,750** of 4,069 entities in the Net Zero Tracker database now have net zero targets or similar.^{11 12}

¹⁰ Over the last eighteen months, the Net Zero Tracker's coding capacity became stronger mainly because of an increased number of volunteers and wider coverage of languages other than English.

¹¹ Excludes about 100 private-owned companies, for which regular data updates are not conducted.

¹² The following target names are considered in scope: net zero, zero emissions, zero carbon, climate neutral, climate positive, carbon neutral(ity), GHG neutral(ity), carbon negative, net negative.

National governments: More net zero targets became formalised.

Net zero targets set by national governments and self-governing territories (including the EU and Taiwan) represent at least 87% of global GHG emissions, 93% of global GDP and 88% of global population (Figure 2).¹³ Many of the 40+ countries without net zero targets are low- or lower-middle income countries, which can justify longer timelines to achieve net zero emissions compared with wealthier (and historically more responsible) countries. More national net zero targets may be formulated in the next few months, as countries prepare to submit their post-2030 Nationally Determined Contributions (NDCs 3.0). The outcome of the first Global Stocktake under the Paris Agreement in 2023 'urges Parties that have not yet done so' to set long-term low-greenhouse gas emission development strategies (LT-LEDs) and 'invites all other Parties to communicate or revise' their LT-LEDs by COP29 later this year; as of December 2023, only 68 countries had submitted LT-LEDs (UNFCCC, 2023). The number of countries with net zero targets in law or official policy documents has increased over time, now covering more than 36 billion tonnes of CO₂e, or 73% of global emissions. Notably, Azerbaijan, the host of COP29, does not have a net zero target. (See **Box 1** for more information on emission reduction targets in Azerbaijan.)

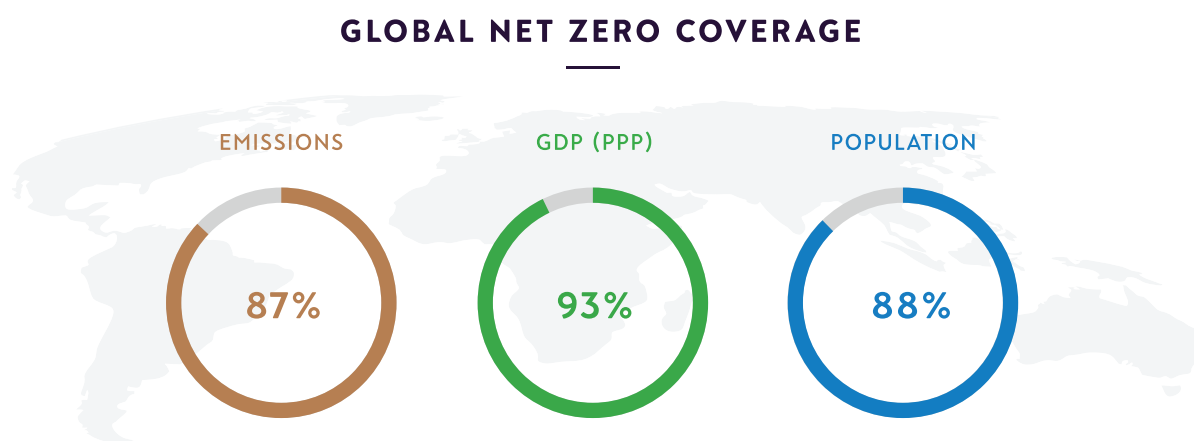


Figure 2: Percentage of GHG emissions (including land-use change and forestry), GDP (based on purchasing power parity, in 2021 constant international dollars), and population in 2021 covered by country-level net zero pledges. Coverage includes targets that are proposed, in discussion, in policy document, in law, and self-proclaimed as achieved). See Appendix I for data sources.

Subnational governments (states and regions, and cities): Modest increase in net zero target setting over the last two years.

States and regions' 186 net zero targets collectively cover a population of 2.3 billion, up from 497 million in December 2020. There is substantial variation in the adoption rates of net zero targets by subnational governments in different countries. Unsurprisingly, adoption rates are very low in the three countries without national-level net zero targets for which we track subnational regions: Iran, Mexico and Poland. In **Section 4**, we explore in detail the different roles that subnational governments are playing across 14 major emitting countries.

The total population covered by cities with net zero targets is now 793 million, up from 640 million in December 2020.¹⁴ This represents 23% of all the cities tracked in the Net Zero Tracker database. City-level

¹³ The majority of states and regions with net zero targets reported in the Net Zero Tracker database are in a country with a national net zero target. A few exceptions include regions in Mexico and Poland.

¹⁴ We cover all cities with populations more than 500,000.

net zero targets remain concentrated in the World Bank-defined “high income” countries (178 of total 271 city-level net zero targets). The percentage of cities with net zero targets is also considerably higher in high income countries (53%) compared with lower income countries (11%).

How is Azerbaijan doing on setting GHG emission targets?

The next UN Climate Change Conference, COP29, will be held in November 2024 in Baku, Azerbaijan. Azerbaijan is a fossil fuel producer country, although not among the largest in the world (25th in oil production, and 21st in gas) (EIA, 2024).

Neither Azerbaijan nor its capital city Baku have set net zero emission targets. Azerbaijan’s latest Nationally Determined Contribution (NDC), submitted in 2023, only commits to reduce emissions by 40% by 2050 compared with 1990 levels, conditional on international support on finance, technology transfer, and capacity building (Republic of Azerbaijan, 2024). The country appears to have disbanded its 2030 emission reduction target (its previous NDC included a 35% reduction target). It has, however, been reported that the nation will upgrade its NDC before COP29 (Reuters, 2024). Baku, the only city in Azerbaijan analysed in the Net Zero Tracker and host of COP29, does not even have an emissions reduction target; the city has never responded to the CDP climate questionnaire, an optional annual survey sent to large companies and city governments (CDP, 2024).

Despite its lack of ambition on climate mitigation, Azerbaijan has signed up to several COP declarations and initiatives in the past. For example, at COP26 in Glasgow in 2021, it was among the countries that signed up to most sector declarations (Kuramochi et al., 2024). At the COP28 UN climate summit in Dubai in 2023, Azerbaijan became a signatory to the Global Renewables and Energy Efficiency Pledge, UAE Declaration On Sustainable Agriculture, Resilient Food Systems, and Climate Action, as well as the Coalition for High Ambition Multilevel Partnerships (CHAMP) for Climate Action (COP28 UAE, 2023c, 2023b, 2023a). In March 2024, Azerbaijan also signed up to the Global Methane Pledge (COP29 Presidency, 2024); methane accounts for roughly 40% of the country’s total annual GHG emissions (Gütschow and Pflüger, 2023).

Box 1

Companies: Net zero target-setting momentum remains strong globally.

By number, nearly 60% of the 1,977 publicly listed companies we track have set net zero targets; weighted by revenue, 67% have set them. The aggregate annual revenue covered by net zero targets has increased from \$13.8 trillion in December 2020 to \$31 trillion in August 2024, nearly a 130% increase. We identified considerably more net zero targets among companies headquartered in Asia - in part because of increasing momentum for decarbonisation in the region and in part because of enhanced internal coding efforts, including broader coverage of non-English languages. The number of companies with net zero targets increased in the past eighteen months in Japan from 118 to 184, in China from 27 to 48, in South Korea from 22 to 41, in India from 20 to 29, in Taiwan from 12 to 26, and in Thailand from 5 to 11. Our findings are consistent with that of the latest SBTi report, which found strongest growth of companies with science-based targets in Asia (SBTi, 2024). Compared with past trends, the growth in the number of US-headquartered companies with net zero targets has largely stalled over the past eighteen months.

More than 40% of major non-state and subnational entities do not have an emissions reduction target.

Out of 3,870 subnational governments and companies assessed, we could not identify emission reduction targets for nearly 1,700 entities. These states and regions, cities, and companies should urgently set public-facing targets and take action to mitigate emissions. The number of subnational governments *without* emission reduction targets reduced marginally compared with last year to just below 1,200. As indicated above, this shortfall may stem from insufficient national guidance, including the absence of regulatory requirements that enforce net zero target-setting. As discussed in Section 4, although many governments mandate implementation plans from subnational governments, only Indonesia and Japan¹⁵ explicitly mandate their subnational regions to set targets.

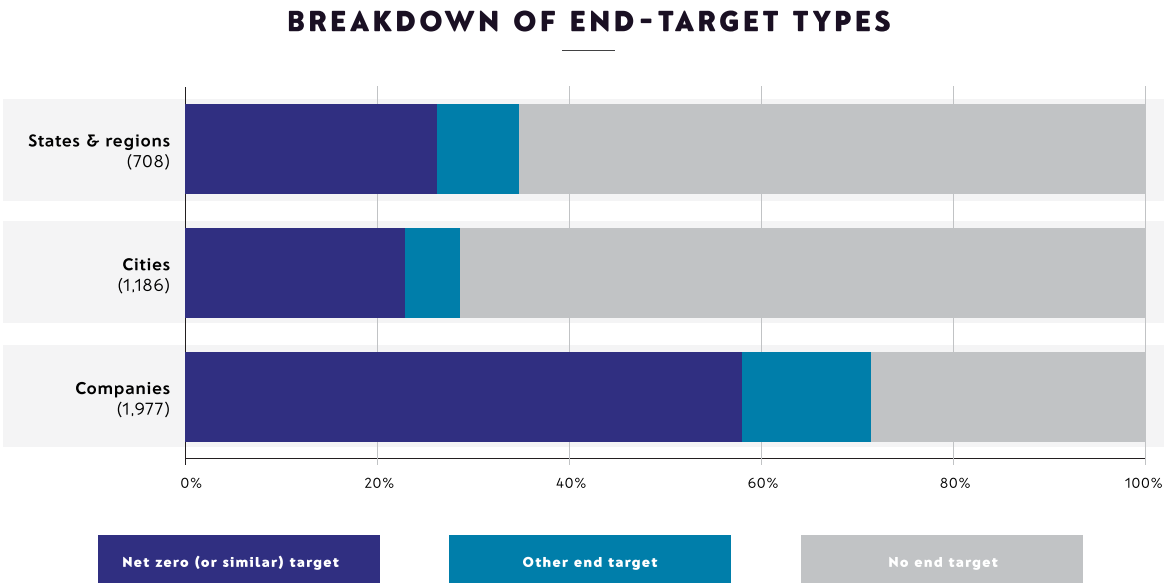


Figure 3: Breakdown of end-target types for subnational states and regions, cities, and companies registered in the Net Zero Tracker database.

¹⁵ From the countries assessed in this report.

Costa Rica

How does Costa Rica follow emerging 'good practice' in national-level net zero target setting?

Region: Central America

Population: 5.2 million

Emissions: 16 MtCO₂e (2022)

GDP (PPP): \$109bn

Climate Action Tracker (2024)

'Acceptable' evaluation for comprehensiveness of net zero target design

Carbon Neutrality Coalition (2024)

Signatory to CNC declaration in 2017 *

Target setting towards net zero UN Expert Group recommendations 1, 2 and 4

✓ 'Good practice' followed

! Room for improvement

Interim targets towards net zero pledge

- Climate Action Tracker considers 2030 target as 1.5°C compatible under equity considerations and <2°C compatible under least-cost considerations.

- Further improvement of 2030 (conditional) target, submission of 2035 targets and clarifications of required international support during 2025 NDC revision cycle.

2050 Net Zero Target

- Anchored in National Decarbonisation Plan policy document submitted to the UNFCCC.
- Target covers all GHG emissions and all sectors of the economy (excl. international bunkers).

- No regular review mechanism for the target.
- No explanation on why the target is a fair or equitable contribution to limiting global warming to 1.5°C.

Planning and corporate governance for the net zero transition UN EG recommendations 4, 5, 6, 7 and 9

Transition plan

- Defines targets, activities and sector-specific visions for decarbonisation for ten key sectors such as mobility and buildings
- Interim goals and activities are outlined for three distinct periods (2019–2022, 2023–2030, 2031–2050)
- Progress in some policy areas, e.g. the rapid increase in electric vehicle sales (12% of car sales in 2023).

- Proposed oil moratorium needs to be enshrined in law as stalled in the Legislative Assembly as of July 2024.
- Postponed publications of progress reports on the implementation of the National Decarbonisation Plan since 2021

Engagement with states and regions, cities, and corporates

Not assessed in detail but Costa Rica has involved sub-national actors like municipalities in the development and implementation of its National Decarbonisation Plan

Responsibility for unabated and residual emissions UN HLEG recommendations 3

Approach to residual emissions in net zero target year

- LULUCF sector has been a net-emissions sink since 2014, reaching - 3 MtCO₂e in 2017 (last data point available)
- Plans to reach net zero through domestic actions without use of international carbon credits.
- Transparent net zero pathway for agriculture, forestry, and other land uses, with expected removals of 5.5 MtCO₂e by 2050.

- Uncertainty surrounds whether currently proposed policies by the government will achieve doubling the LULUCF sector net-sink emissions by 2050 compared to 2017.

* No endorsement of Framework for Net zero Climate Action published in 2022

Sources: Climate Action Tracker ([2024](#)), Carbon Neutrality Coalition ([2023](#)), Costa Rica ([2019](#), [2022](#))

By contrast, the number of companies that do not have emission targets reduced substantially from 734 last year to 495 — 40% of them are Chinese companies. Companies without targets include Tesla, BYD, Fox Corporation, Shimano, Hertz, Nintendo, and Berkshire Hathaway. Some are drivers of the global low-carbon transition (Tesla and BYD for electric vehicles; Shimano for cycle components) but that should not exempt them from developing mitigation plans (Robiou du Pont et al., 2024). These companies, for example, have significant direct and electricity-related emissions from factories, and large proportions of emissions from their wider value chains (e.g. upstream emissions from purchased steel).

An increasing number of robust non-state net zero targets and implementation plans, but with persistent gaps

Several analyses over recent years, including from the Net Zero Tracker, have shown the vast majority of company emission targets lack key robustness features that ensure quality (Bjørn et al., 2022; Net Zero Tracker, 2022; Day et al., 2024). Since 2022, the Net Zero Tracker has regularly assessed all subnational and corporate net zero targets against selected **procedural and substantive integrity criteria** recommended by the UN Expert Group, International Organization for Standardization (ISO), and the Race to Zero (ISO, 2022; Race to Zero, 2022; UN HLEG, 2022). They are:

- 1. Formalise a net zero emissions target (i.e. not just propose to set one)
- 2. Net zero target year of 2050 or earlier¹⁶
- 3. Set an interim emissions reduction target
- 4. Publish a plan on how to achieve its interim and long-term targets
- 5. Publish annual progress reports on targets and measures undertaken to meet them
- 6. Clarify conditions on the use of offsetting with carbon credits
- 7. Cover all greenhouse gases (GHGs)
- 8. Include all value chain emission scopes (Scopes 1, 2 and 3)¹⁷

Our up-to-date assessment shows slow progress on integrity across all non-state entity groups: subnational states and regions, cities, and companies (Table 2).¹⁸ The number of companies that met all criteria, while very low in absolute terms, increased 62% compared with eighteen months ago. (This report features two case studies of companies demonstrating good practice.)

Entity group	% of entities meeting all integrity criteria
Regions	3% (5 of 186) No change from June 2023
Cities	4% (10 of 271) Up from 3% in June 2023
Companies	5% (61 of 1,145) Up from 4% in June 2023

Table 2: The percentage of net zero pledges by non-state entities that meet the procedural and substantive integrity criteria informed by the Race to Zero campaign’s ‘Starting Line’ criteria (version 3.0) and the UN Expert Group, as of 29 August 2024. The results are compared with the findings in last year’s Net Zero Stocktake 2023 report (Net Zero Tracker, 2023b).

¹⁶ Only for entities located or headquartered in OECD countries.
¹⁷ For companies only.
¹⁸ Up-to-date results can be found in our Net Zero Tracker Data Explorer: <https://zerotracker.net/>

According to the Net Zero Tracker database, subnational governments are performing well on some integrity criteria, including (i) formalising their net zero targets; (ii) setting interim targets; and (iii) developing implementation plans. However, performance on other integrity criteria is inadequate.

Nearly half of subnational net zero targets cover CO₂ emissions only, avoiding any mention of other greenhouse gases like methane and nitrous oxide. Almost two-thirds of targets do not have plans to annually report progress — a gap that could be due to a lack of capacity or resources, reporting fatigue, or intentional non-reporting. Subnational governments are also not setting clear, transparent conditions on the use of carbon credits (offsets). Cities as well as subnational states and regions show similar trends across all criteria. **Section 4** takes a closer look at subnational target-setting in 14 major emitting countries.

Like subnational governments, publicly listed companies perform relatively well on procedural criteria: (i) formalising net zero targets; (ii) setting interim targets; (iii) publishing annual progress reports; and (iv) developing implementation plans. The considerably higher relative percentage of companies (compared with subnational governments) publishing annual progress reports is likely due to a combination of Forbes 2000 listed companies having more financial resources, being more influenced by reputational and market pressures, and having preestablished reporting processes in place (e.g. annual corporate sustainability reports).

Publicly listed companies generally perform poorly on most substantive criteria. For example, a significant portion only address CO₂ emissions or only cover specific parts of their value chain (e.g. Scopes 1 and 2, but not Scope 3). Companies continue to lack transparency on how, and under what conditions, they intend to use voluntary carbon credits, including the extent of their reliance on them. The less transparent companies are about their intended use of carbon credits, the more difficult it is for analysts to assess the credibility of their net zero strategies.

Although the Net Zero Tracker does not look in depth at the credibility of individual company targets, this is covered in several recent studies (e.g. Day et al., 2024; Odawara and Hirata, 2023). These all highlight the fact that omissions, caveats and distortions often mean a company's commitment is far weaker than the headline target would indicate.

While our database analysis in this report focuses on publicly listed companies, it is also important to shed light on the performance of private firms. Our 2024 analysis, 'A Distinctly Private Pursuit', scrutinised the world's 100 largest private companies by revenue, showing that less accountable private firms are performing significantly worse on net zero target setting and measures of integrity compared with their publicly owned counterparts (Lang and Hyslop, 2024).

Members of the Race to Zero have work to do, but the bigger challenge lies with non-members.

The Race to Zero is a global campaign led by the UN Climate Change High-Level Champions, established in 2020 to rally the entire spectrum of non-state and subnational entities to 'take rigorous and immediate action to halve global emissions by 2030 and deliver a healthier, fairer, net zero world' (Climate Champions, 2024). Under the leadership of 26 partners, more than 14,500 non-state entities participate in Race to Zero, making it the largest alliance of non-state and subnational entities committed to taking urgent climate action (Climate Champions, 2023, 2024). The Net Zero Tracker database registers 655 non-state and subnational entities that participate in the Race to Zero campaign through partner networks and initiatives.

We find that the fraction of corporate and subnational net zero targets meeting the integrity criteria is **considerably higher among Race to Zero members** for states and regions, cities, and companies. All those cities that met all robustness criteria were found among Race to Zero members. The breakdown of net

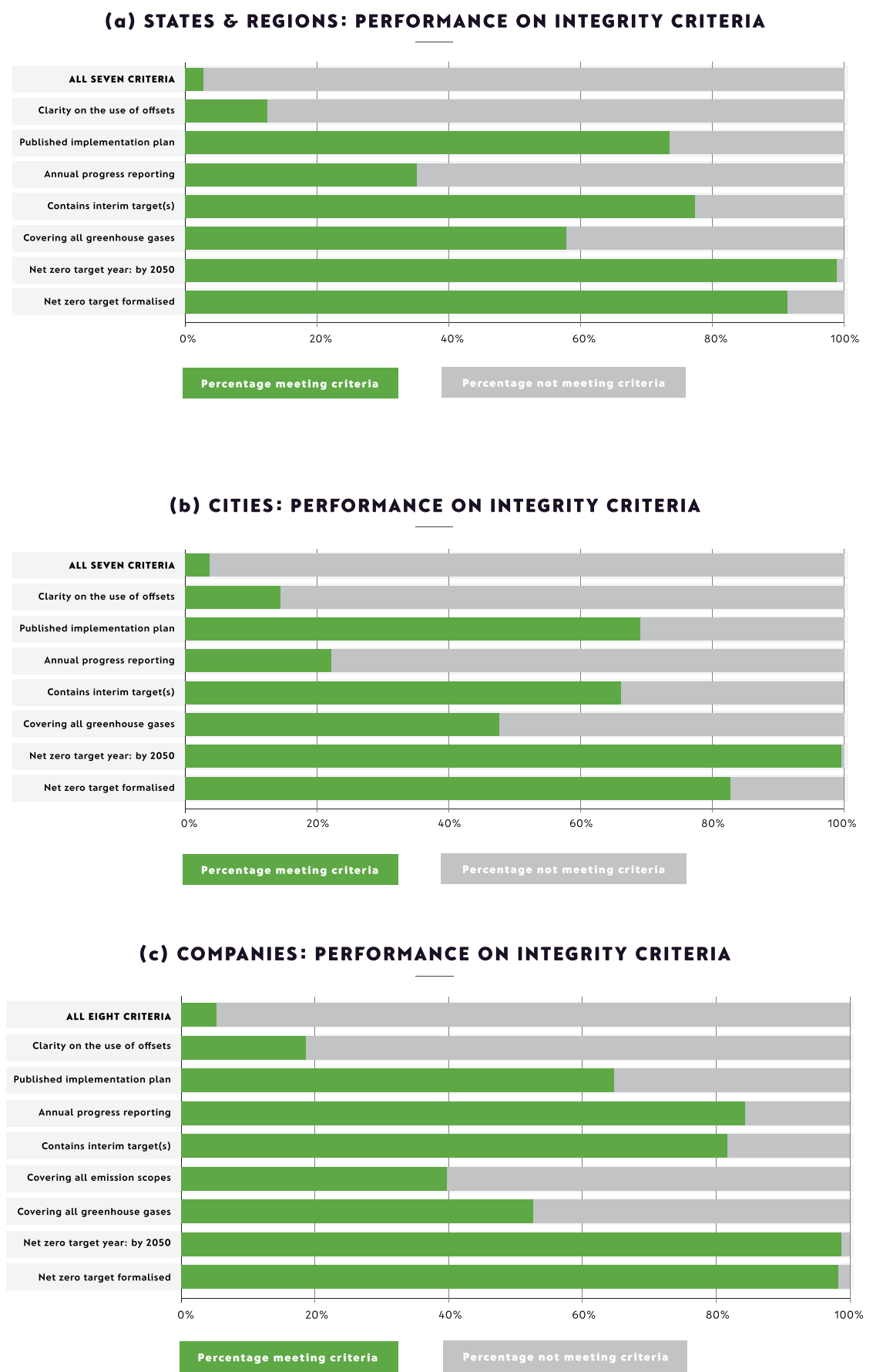


Figure 4: Share of net zero targets that meet procedural and substantive integrity criteria for (a) subnational states and regions, (b) cities, and (c) companies.

Google (Alphabet Inc.)

How does Google follow emerging 'good practice' in corporate net zero target setting?

HQ: USA

Sector: Technology & Services

Emissions: 20 MtCO₂e (2023)

Revenue: \$283bn (2022)

Corporate Climate Responsibility Monitor (2023)

First Mover Coalition (2024)

Influence Map (2023)

'Moderate integrity' evaluation for climate strategy

Signature to 2030 pledges on [carbon dioxide removal](#)

'B' performance score for climate policy engagement

Target setting towards net zero UN Expert Group recommendations 1, 2 and 4

✓ 'Good practice' followed

! Room for improvement

Interim targets towards net zero pledge

- None identified

- No interim target for 2025 set within five-year interval.

2030 Net Zero Target

- Target covers all emission scopes (scope 1, 2 and 3)

- Target commit to only reduce 37% of all value chain emissions (location-based scope 2), not >90% for a meaningful net zero terminology.

- No post-2030 emission reduction targets communicated.

Planning and corporate governance for the net zero transition UN EG recommendations 4, 5, 6, 7 and 9

Transition plan

- Ambitious 100% target of 24/7 carbon-free energy by 2030; 64% reached by 2023.

- Range of measures to reduce emissions across most emission sources (e.g. energy efficiency in datacentres or supplier engagement on renewable energy projects in the local grid)

- Unclear sufficiency of scope 3 emission reduction measures due to the lack of information and limited granularity of GHG emission data on scope 3 emission sources (most grouped into a single data point for 'business reasons').

Policy engagement

- Positive global climate policy engagement, especially on electricity decarbonisation.

- Positive global climate policy engagement, especially on electricity decarbonisation.

Responsibility for unabated and residual emissions UN HLEG recommendations 3

Approach to address present-day emissions

- Announcement in 2024 to stop claiming 'carbon neutrality' for operations through purchase of carbon credits (which it had done since 2007)

- Limited detail on mitigation projects funded through Google.org (\$70m in 2022) and relation to unabated emissions.

Approach to residual emissions in net zero target year

- Google signed up on First Mover Coalition's carbon dioxide removal (CDR) commitment to purchase at least 0.05MtCO₂ of durable and scalable CDR.- Google plans to offset 67% of its emissions by 2030. Little information on the future portfolio apart announced purchase of around 0.06 MtCO₂ of removal credits for delivery by 2030.

zero targets **by the number of criteria met** are presented for both Race to Zero members and non-members in Appendix II. The percentage values for Race to Zero members remain low overall at 10% or less across all entity groups, even four years after the launch of the campaign.

RACE TO ZERO MEMBERS' RELATIVE PERFORMANCE ON INTEGRITY CRITERIA

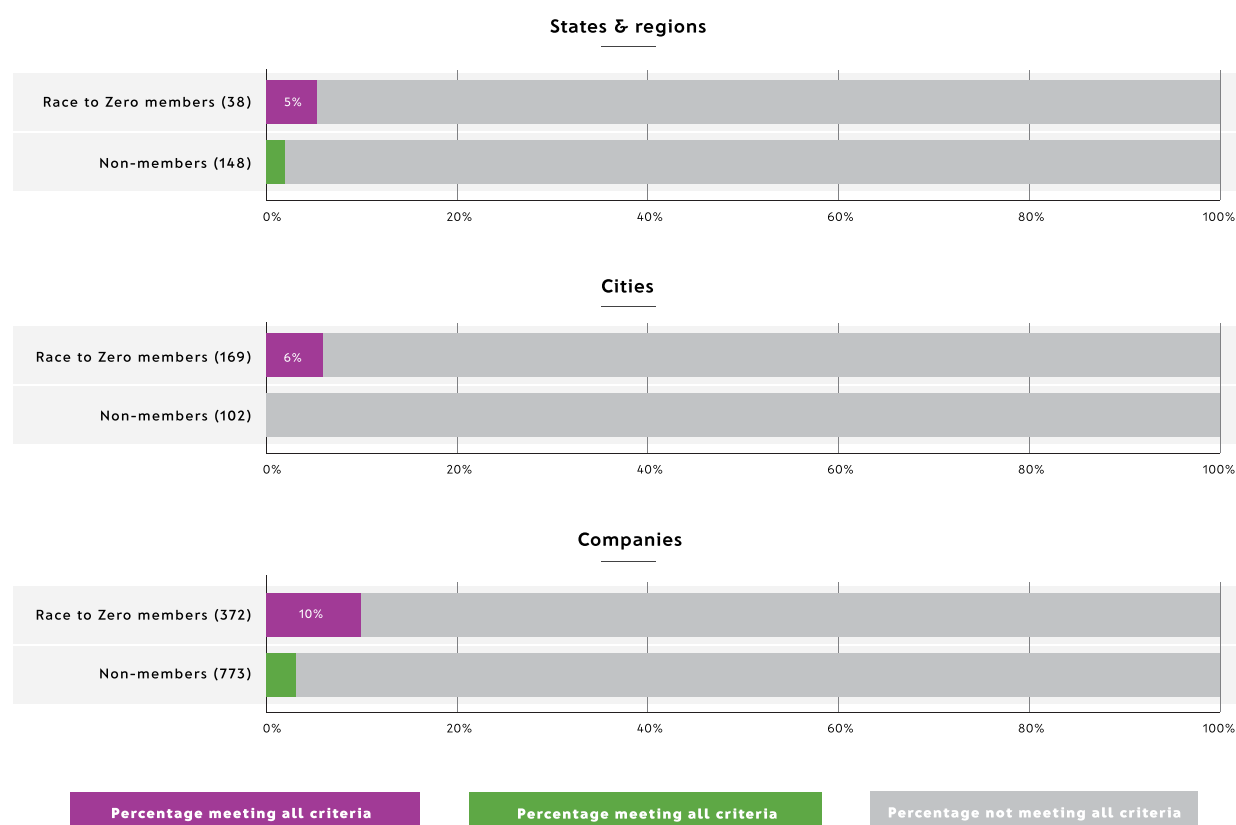


Figure 5: Shares of net zero targets meeting all integrity criteria informed by the Race to Zero and UN Expert Group, by entity group and by their membership to Race to Zero partner initiatives.

A significantly larger challenge exists outside Race to Zero membership. We show that the fraction of company and subnational entities without any emission targets is very high among those that are not part of the Race to Zero. For companies, the lack of emission targets is even worse for private companies, as our recent analysis showed (Lang and Hyslop, 2024). It is encouraging to see Race to Zero membership growing rapidly outside Europe and North America, where about 80% of its members are headquartered (Climate Champions, 2023).

Subnational governments and companies need to act on the global sectoral targets set in response to the Global Stocktake at COP28

At COP28 in November 2023, countries approved three sectoral goals in response to the first Global Stocktake: tripling renewable energy capacity and doubling the annual rate of energy efficiency by 2030, transitioning away from fossil fuels in energy systems to achieve net zero by 2050, and accelerating the reduction of methane emissions by 2030 (UNFCCC, 2023).

COMPARISON OF END-TARGET TYPES BETWEEN RACE TO ZERO MEMBERS AND NON-MEMBERS

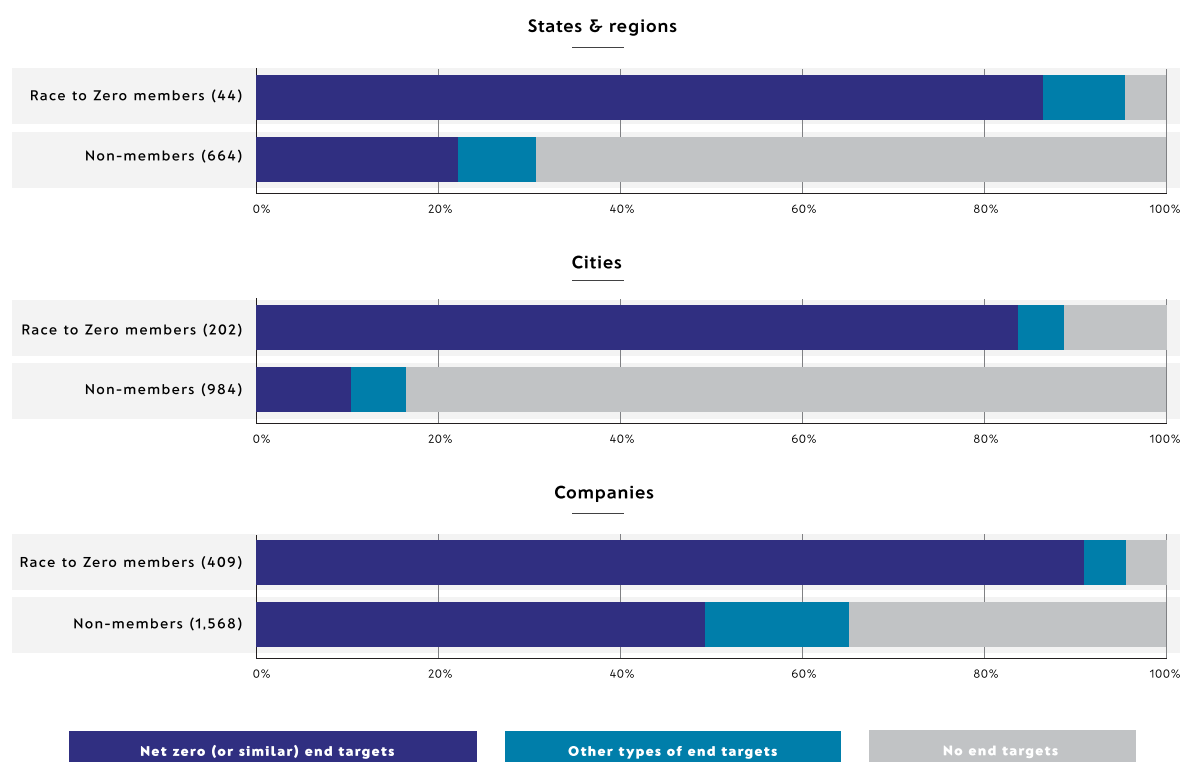


Figure 6: Breakdown of end-target types for (a) subnational states and regions, (b) cities, and (c) companies registered in the Net Zero Tracker database, by their membership to Race to Zero partner initiatives.

Our 2023 analysis, *In the Pipeline*, showed that - across (i) national and non-state entities; (ii) all fuel types; and (iii) exploration, production, and use - the global transition away from fossil fuels this century is still in its infancy (Net Zero Tracker, 2023a). On the reduction of methane emissions, which need to be reduced by about one-third by 2030 from 2019 levels to keep warming below 1.5 °C (IPCC, 2023),¹⁹ the Net Zero Tracker database shows that only about half of subnational and company net zero pledges cover both CO₂ and other greenhouse gases (Figure 4).

The above findings show that all non-state and subnational entities should urgently strengthen the robustness of their net zero targets and plans. The record levels of global investment in clean-energy technology makes strengthening both ambition and action not just possible and necessary, but attractive and feasible. As we outline in **Section 1**, NDC ambition is trailing existing national-level multilateral commitments and clean energy deployment projections by a factor of as much as three (Energy Transitions Commission, 2024).

¹⁹ More than a 50% likelihood, no or limited overshoot.

Volvo Group

How does Volvo Group follow emerging 'good practice' in corporate net zero target setting?

HQ: Sweden

Sector: Heavy-duty vehicles

Emissions: 299 MtCO₂e (2022)

Revenue: \$7bn (2022)

Corporate Climate Responsibility Monitor (2024)

First Mover Coalition (2024)

Influence Map (2023)

'Moderate integrity' evaluation for climate strategy

Signature to 2030 pledges on [aluminium](#), [steel](#), and [trucking](#)

'C' performance score for climate policy engagement

Target setting towards net zero UN EG recommendations 1, 2 and 4

✓ 'Good practice' followed

! Room for improvement

Interim targets towards net zero pledge

- Transparent 2030 targets cover all key vehicle types.
- 1.5°C-aligned target for 35% zero-vehicles sales globally by 2030
- 'Reasonable integrity' for 2030 targets by the Corporate Climate Responsibility Monitor 2024.

- No coverage of upstream scope 3 emissions in interim targets
- More detailed breakdown needed to understand 2030 sales targets for buses and other vehicles.
- No interim targets at five-year intervals (i.e. for 2035).

2040 Net Zero Target

- Target covers all emission scopes (scope 1, 2 and 3)

- No reduction pledge with the 2040 net zero target; only aspirational ZEV sales under 'illustrative 1.5°C scenario'.

Planning and corporate governance for the net zero transition UN EG recommendations 4, 5, 6, 7 and 9

Transition plan

- Comprehensive measures to reduce use-phase emissions, incl. the transition to zero emissions vehicles and charging infrastructure.
- Procurement targets for low-carbon steel and aluminium (min. 10% each by 2030) with purchase agreements.

- Continued sale of internal combustion engines by 2040, with unclear sustainability of bio- and e-fuels.
- No other measures for upstream emissions identified, particularly low-carbon battery procurement.

Policy engagement

- Positive engagement positions on high-level climate policy (e.g. EU Green Deal).

- Negative engagement positions on key truck-related regulation globally (e.g. US and EU GHG emission standards).

Responsibility for unabated and residual emissions UN HLEG recommendations 3

Approach to address present-day emissions

- No misleading offsetting claim at product-level or company-level identified.

- No climate contributions (beyond-value-chain mitigation) identified.

Approach to residual emissions in net zero target year

- None identified

- Unclear reliance on CDR for 2040 net zero target.

4. Net zero target setting by subnational governments in 14 major emitting nations

Key takeaways

This section provides an overview of net zero target-setting by the subnational states and regions in 14 major emitting countries: **Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, South Africa, the United Kingdom (UK), and the United States of America (US)**. These present a geographically broad set of nations at different stages of economic development, as well as a diverse mix of federal and unitary governance approaches.

The 14 countries analysed here collectively represent:

- **4.3 billion people** or 54% of the global population
- **\$99 trillion of GDP (PPP)²⁰** or 64% of the global total
- **30 billion tonnes of GHG emissions (CO₂e)** or 61% of total global emissions.

We mainly focus on national mandates for subnational target-setting, and to what extent national governments and subnational governments interact. Based on various variables, such as the date of target-setting, the level of ambition of targets, and vertical interactions, we shed light on potential past and future areas of 'Ambition Loop' dynamics — the bidirectional relationship between climate ambition across different entity types.

In general, national-level net zero (or other mitigation) targets serve as a 'ceiling' of ambition for subnational governments, but some go above and beyond. For example, three of Australia's eight self-governing states, seven of Germany's 16 states, and 14 of India's 46 states have set earlier net zero targets than their national governments. In Mexico, which does not have a national-level net zero target, 11 of its 32 states have long-term climate goals, three of which are net zero targets.

Many subnational regions align directly with the level of national climate ambition. This is important for both implementation and credibility: multilateral and national ambitions tend to percolate down to lower levels of government, which are closer to the practical implementation of policies. In countries such as China, France, Italy and Indonesia, national targets clearly shape subnational actions. For example, China's central government determines the climate ambition of provinces, and the Indonesian government requires provinces to set targets in line with its overarching target within six months of formalising it. In several cases, subnational regions are expected to match the ambition of national-level targets.

There are instances where subnational regions may have influenced national net zero target-setting. For example, in Australia and Japan several subnational governments published net zero targets before their national governments. While more investigation is warranted, these examples could represent an 'Ambition Loop' dynamic, whereby climate ambition or action in one entity group (e.g. subnational governments or companies) spurs greater ambition by another (e.g. national governments). We also found that Brazilian states have likely exerted influence on federal climate policy.

Subnational governments are often explicitly responsible for implementing national targets. In France, for instance, regions must publish mitigation plans aligned with national objectives, suggesting regional targets are in sync with national ones. In China, provincial government officials are evaluated based in part on their provinces' climate performance. South Africa's recent Climate Change Act mandates provinces to develop an implementation assessment, and in Italy, while regions are responsible for climate policy

²⁰ Purchasing power parity, in 2021 constant international dollars.

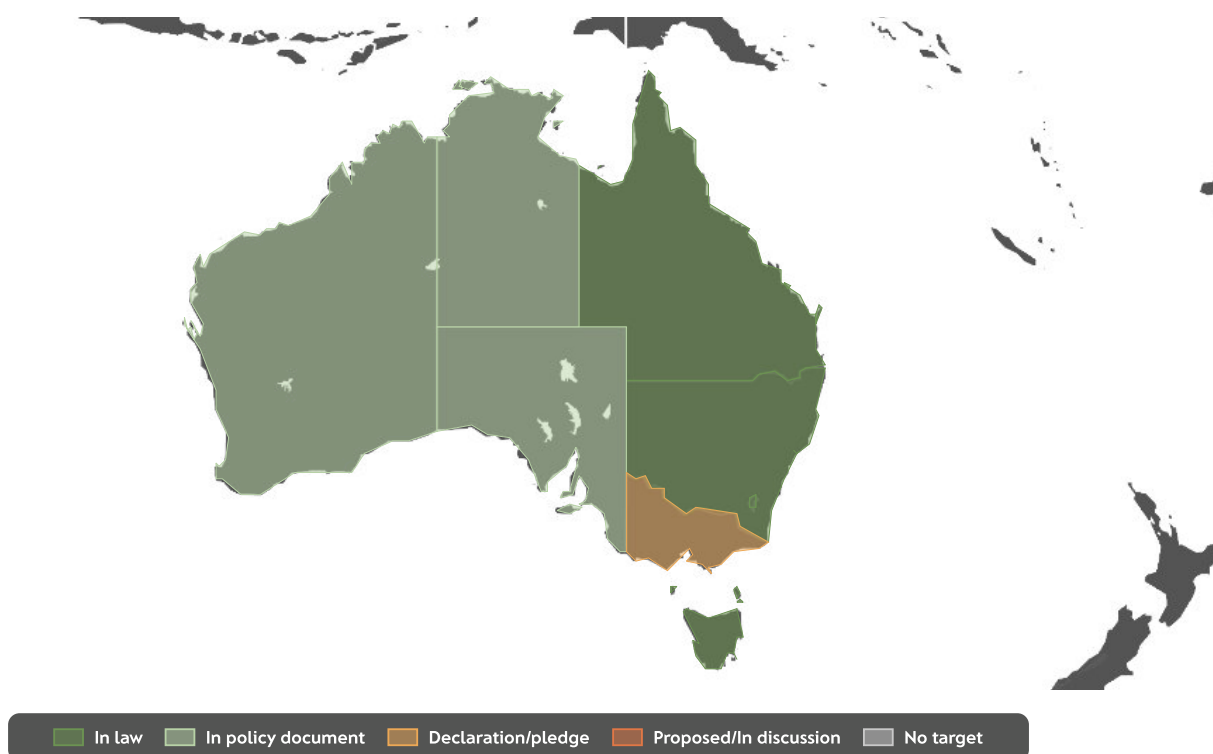
implementation, this is not reflected in publicly available targets and plans. In general, implementation plans, whether mandatory or not, often lack detail or are not easily accessible to the public.

Subnational governments that can have some degree of autonomy in climate policy have demonstrated encouraging progress, especially in sectors like transport and buildings. In the US, where states have significant freedom to implement local policies, several states go beyond the ambition of federal policies. Similarly, in Canada, some provinces have exceeded national goals, especially in areas such as transport and carbon pricing.

Federal governance systems show divergent trends in subnational target-setting - sometimes more ambitious, sometimes less. Subnational regions that have considerable autonomy over climate-relevant topics generally provide more information on their climate policies. They can show higher rates of ambition, and climate policy sometimes exceeds what is required at the federal level. However, subnational ambition often reflects local political preferences, including in Germany and the US.

In unitary states, subnational regions tend to align more closely with national climate goals. In some cases, these regions bear significant responsibility for local implementation, as seen in China, while in other cases, public targets and plans are not always shared, as in Italy. In the UK, a unitary state with substantial devolved authority, there have been calls for greater collaboration between its four countries to implement ambitious targets.

I. Australia



Australia is a federal state comprised of *six federal states* and *ten federal territories*. Eight Australian subnational regions are self-governing. These six states and two territories — the Australian Capital Territory (ACT), New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria, Western Australia — have their own independent executive government, legislative branch and judicial system. A law passed by a territory can be overturned by the federal government according to The Australian Constitution (Parliamentary Education Office, 2024), but there is no provision allowing the federal government to directly overturn state laws. While the federal government can legislate on national climate change policies, states and territories hold considerable authority to implement climate measures within their own jurisdictions across sectors, including energy, transport, buildings, industry, land use, and waste (OECD, 2022b).

In 2022, Australia formally committed to achieving net zero emissions by 2050 through the passage of the Climate Change Act, which includes an interim target to reduce emissions by 43% by 2030 compared with 2005 levels²¹ (Parliament of Australia, 2022). The Act does not directly affect decision making by state governments or self-governing territories (Clause 6) and is designed to avoid interfering with existing state or territory laws on emission reductions (Subclause 10(3)) (Parliament of Australia, 2022; Australian Government, 2023).

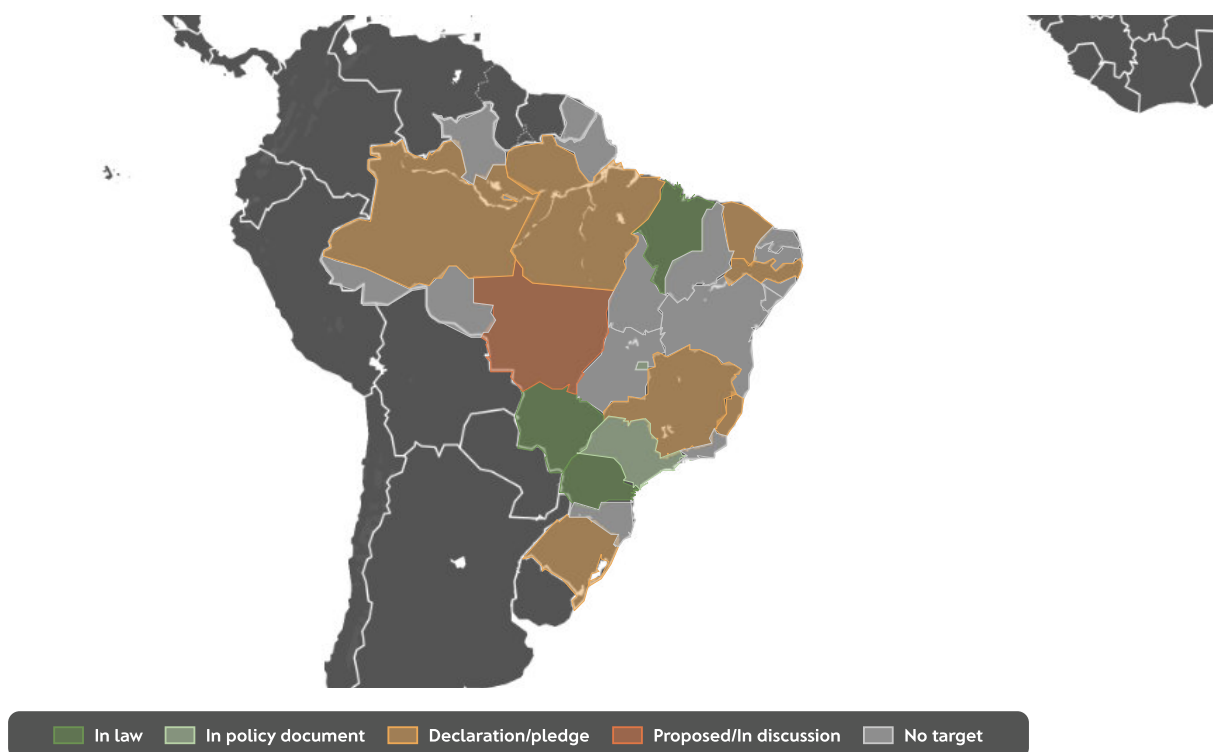
The Net Zero Tracker shows that all eight self-governing Australian states and territories have committed to achieving net zero before or by 2050. Tasmania (2030), Victoria (2045) and ACT (2045) have earlier target years than 2050. Five regions have net zero targets in policy documents, two have enshrined targets into law. Victoria has only *pledged* a net zero target. Despite all states having set long-term targets, only five have set interim emission reduction targets, ranging between 30 and 75% by 2030.

²¹Including Land Use, Land-Use Change, and Forestry (LULUCF).

Australian regions have wide ranging powers to act on targets and implement measures within their jurisdictions, including setting renewable energy targets and regulations, establishing energy efficiency standards for buildings and industries, planning transport and setting emissions standards, formulating land use, forestry, and agriculture policies, and enforcing waste management regulations (Parliament of Australia, no date). The eight states and territories seem motivated to implement their targets and have already invested billions of dollars to support emission reduction initiatives across various sectors (ClimateWorks Australia, 2021). Australia's two most populous states – New South Wales and Victoria – are leading on electric vehicles strategies. Alongside Queensland, these two states have also increased their renewable electricity ambition considerably since 2020 (ClimateWorks Australia, 2021).

Most Australian states and territories set net zero targets before the federal government introduced the Climate Change Bill (ClimateWorks Australia, 2021). While not conclusive, it is possible that these subnational governments influenced the federal government's decision to legislate for net zero, indicating a potential 'Ambition Loop' dynamic. They may have also played a role in the federal government's June 2022 decision to raise its interim emissions reduction target from 26-28% to 43% by 2030. The new interim target aligns with the interim targets set by the states and territories, which, when aggregated prior to 2022, effectively gave Australia a de facto national emissions reduction target of 37-42% by 2030 (ClimateWorks Australia, 2021).

II. Brazil



Brazil is a federal republic with 26 states and one Federal District. Each Brazilian state has its own government with its own constitution, a governor, a legislative assembly and a judicial authority. Governors represent the head of state executive power, elected for four-year terms (Piancastelli, no date). They are responsible for policy implementation, state budget management, police and public safety. Governors also represent states in dealings with the federal government and other states, advocating for state interests and seeking federal resources (Afonso, 2004; Milton Schneider et al., 2024).

On climate policy, states in Brazil have significant responsibilities in several sectors, including environmental management, transportation, and infrastructure (including energy infrastructure) (Barbi and da Costa Ferreira, 2017). Environmental protection is under concurrent power – both the federal government and states can legislate on it. Hence, Brazilian states can complement or go beyond federal regulations on climate policy, but only if the regulations are complementary and do not conflict with federal laws.

Governors and state-level politicians can advocate for or against federal regulation, meaning when states and governors coordinate advocacy efforts, they can considerably influence national climate policies. Brazilian cities have influenced state-level climate policy in the past, and states have exerted influence on the federal level (Barbi and da Costa Ferreira, 2017). One official way of influence is through the State Forums of Climate Change: their approval was deemed fundamental for the implementation of federal climate change policies (Barbi and da Costa Ferreira, 2017). Through these Forums, states also have instruments to engage civil society and others in the process of policy design.

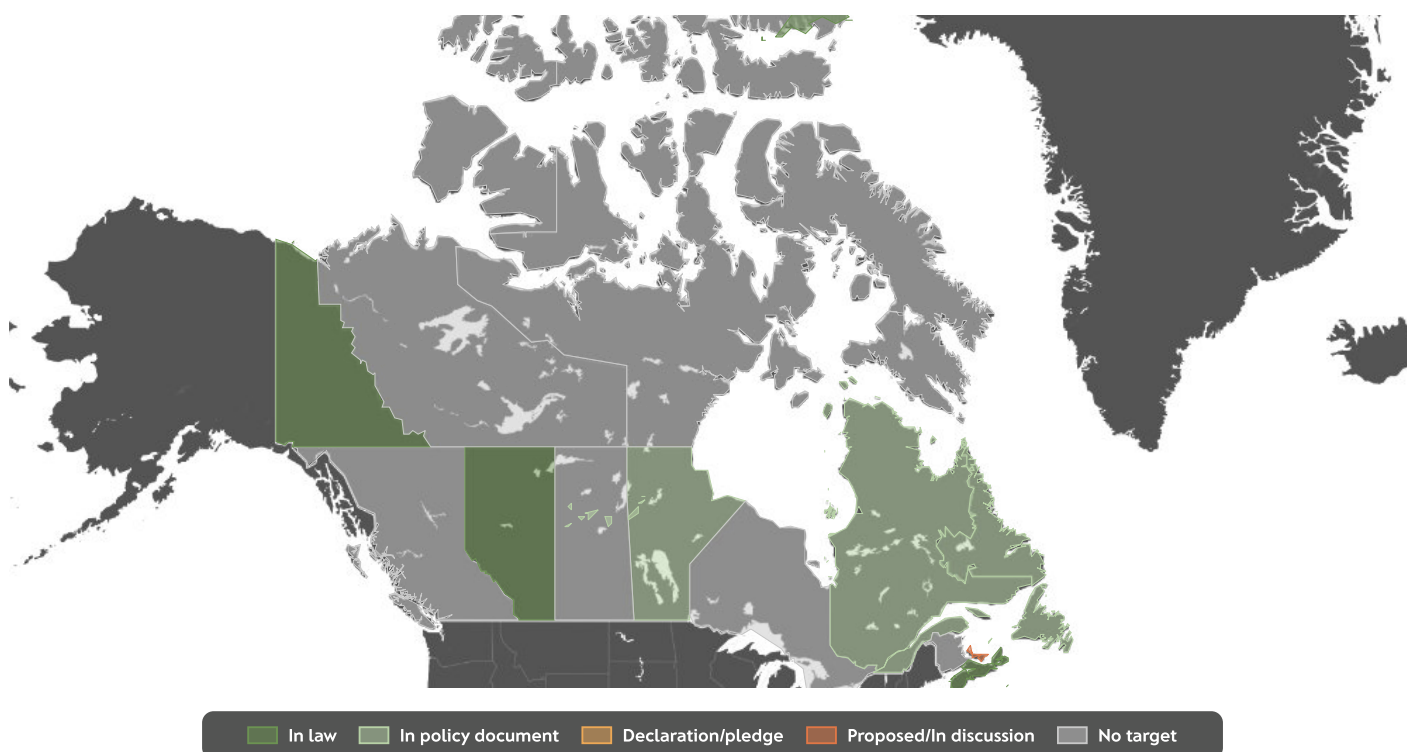
Besides influencing federal policies, states and municipalities have an important role of ensuring the enforcement of federal level policies on deforestation – a particularly important topic because land use and forestry-related emissions have historically been the biggest source of Brazilian emissions (Barbi and da Costa Ferreira, 2017).

In 2021, former Brazilian president Jair Bolsonaro announced a net zero target for 2050. While Bolsonaro's administration reduced the ambition of its NDC significantly, Brazil recently reverted back to the NDC targets it had when it signed the Paris Agreement in 2016. Brazil has unconditional, absolute emission targets, translating to reductions of 7% by 2030 compared with 2005 levels ²² (CAT, 2024a).

The Net Zero Tracker database shows that 12 of 27 Brazilian subnational entities have net zero targets or equivalents. Three of those 12 have interim targets and three have implementation plans. Only one state, Minas Gerais, has published both an interim target and an implementation plan.

²² Excluding LULUCF emissions

III. Canada



Canada is a federal country, made up of ten autonomous provinces and three territories. Provinces and territories have their own legislative assemblies, but do not have their own constitutions. Province-like powers are increasingly being devolved to territorial governments. Territories receive significant amounts of funding from the federal government (Government of Canada).

Legislative powers for government action on environmental protection, including climate policy, are split between Canada's federal government and provincial governments. Decentralised governance allowed for provinces to tailor climate action to their own needs and therefore created patchy and inconsistent policies, but this changed with the advent of more ambitious federal climate policies since 2016 (Harrison, 2023). In recent years, the federal government has taken a larger role in climate policy, including carbon pricing and the regulation of methane emissions from oil and gas extraction (Conigrave, 2023; Harrison, 2023). For some policies like carbon pricing, provinces can either design their own pricing systems or they can choose the federal pricing system (Government of Canada).

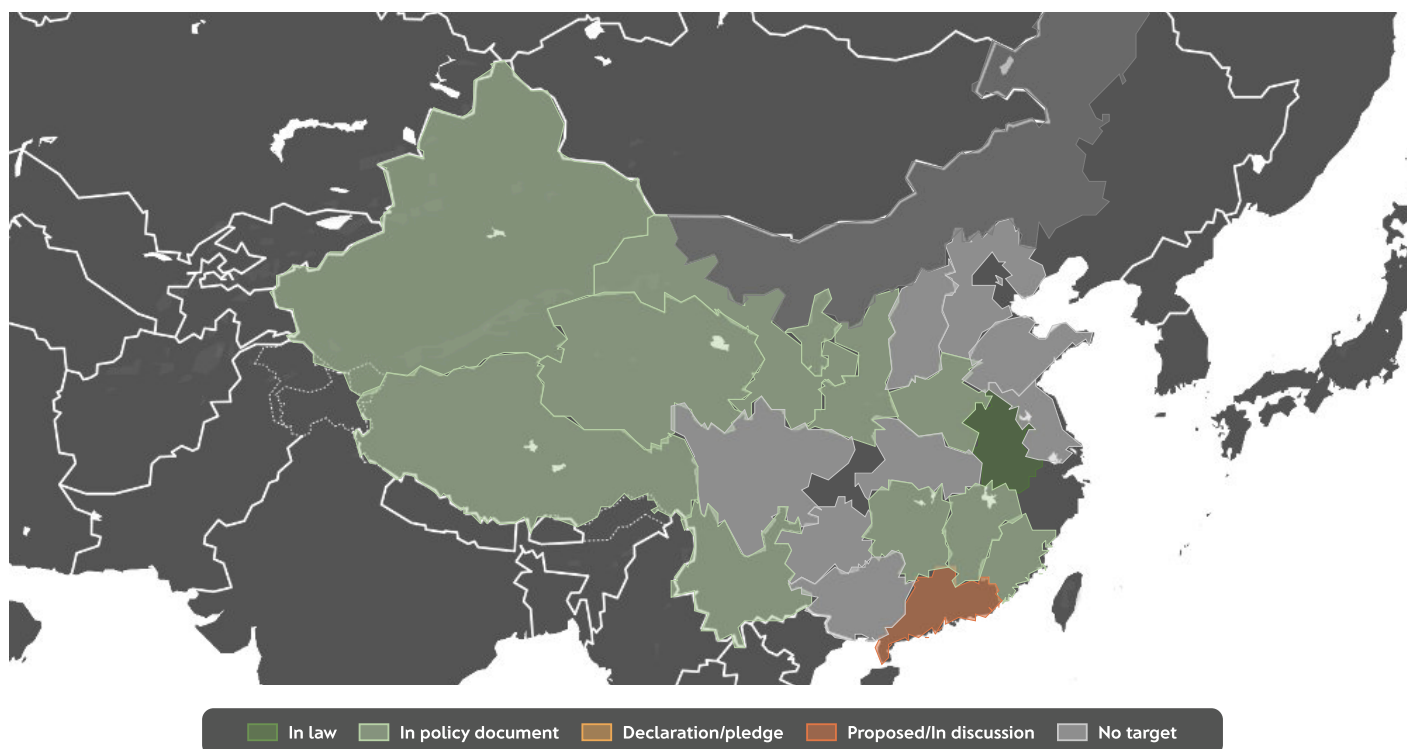
Canada's provinces and territories hold considerable jurisdiction over energy policy and regulation (IEA, 2022), and electricity is almost exclusively regulated by provincial and territorial governments. The Constitution of Canada explicitly recognises the provincial and territorial rights to explore, develop, conserve and manage their own non-renewable natural resources, forestry resources, and electrical energy. However, projects related to natural resources – such as oil pipelines and transmission lines – that cross international or provincial boundaries are automatically under federal governance. Some provinces have actively resisted what they assert is federal overreach in climate policy. For example, Alberta, Saskatchewan, and Ontario challenged the constitutional legality of the federal Greenhouse Gas Pollution Pricing Act, though they did not win the case (Climate Case Chart, 2019).

Canada has a target of net zero emissions by 2050 and has pledged to cut emissions by at least 40-45% by 2030 compared with 2005 levels (CAT, 2024b). Provinces and territories are not required to set their own net zero targets or publish transition plans. Yet, five out of Canada's ten provinces and all of Canada's three territories have set net zero targets, according to the Net Zero Tracker database. All targets aim for net

zero by 2050 except Prince Edward Island, which aims for 2040. British Columbia, a province, has an emissions reduction target of 80% by 2050. All other provinces have interim emission reduction targets. Nova Scotia, a province, and Northwest Territories, a territory, have interim targets that are more ambitious than the federal target. They respectively plan to achieve reductions of 53% and 50% by 2030 compared with 2005 levels. One province, Alberta, aims to reduce emissions by 45% by 2025 compared with 2014 levels. All provinces and territories with targets have also published climate action plans. In most cases, plans do not seem compatible with targets; for instance, British Columbia's 2030 transition plan allows for an expansion of natural gas production (Cruickshank, 2021).

Until 2015, some provinces have led on specific climate policies but for the most part these provinces have had the lowest per capita emissions in Canada (Harrison, 2023). Provinces with the highest carbon emissions have historically resisted both federal actions and collaboration with leading climate provinces. British Columbia and Quebec were early leaders in developing carbon pricing systems, zero-emission-vehicle mandates, and low-carbon fuel standards (Arnold et al., 2022), and they partly led the foundation for federal climate policy since 2016 (Harrison, 2023). British Columbia's strict building codes have also helped develop a market for advanced building technology companies (Arnold et al., 2022). The costs and opportunities of the energy transition are likely to fall unevenly in Canada because some provinces have significant fossil fuel energy resources and infrastructure, such as Alberta and Saskatchewan, while others have very little (Conigrave, 2023). Quebec and British Columbia, for example, have abundant hydroelectric resources and limited fossil fuel infrastructure (Conigrave, 2023).

IV. China



Besides the national government, China has provincial and other local governments. The Chinese mainland has 31 jurisdictions that operate on the same governance ranking and enjoy equal power. Twenty-two of those are provinces; four are large and important cities and the other five are autonomous regions (Nilsson *et al.*, 2021). China is often described as a top-down governmental structure. It is a one-party state, with a hierarchical character where tasks are delegated. However, lower levels of government have substantial authority, and China is referred to 'quasi-federalist' or 'fragmented authoritarian' (Nilsson *et al.*, 2021; Hongtao and Shuai, 2023).

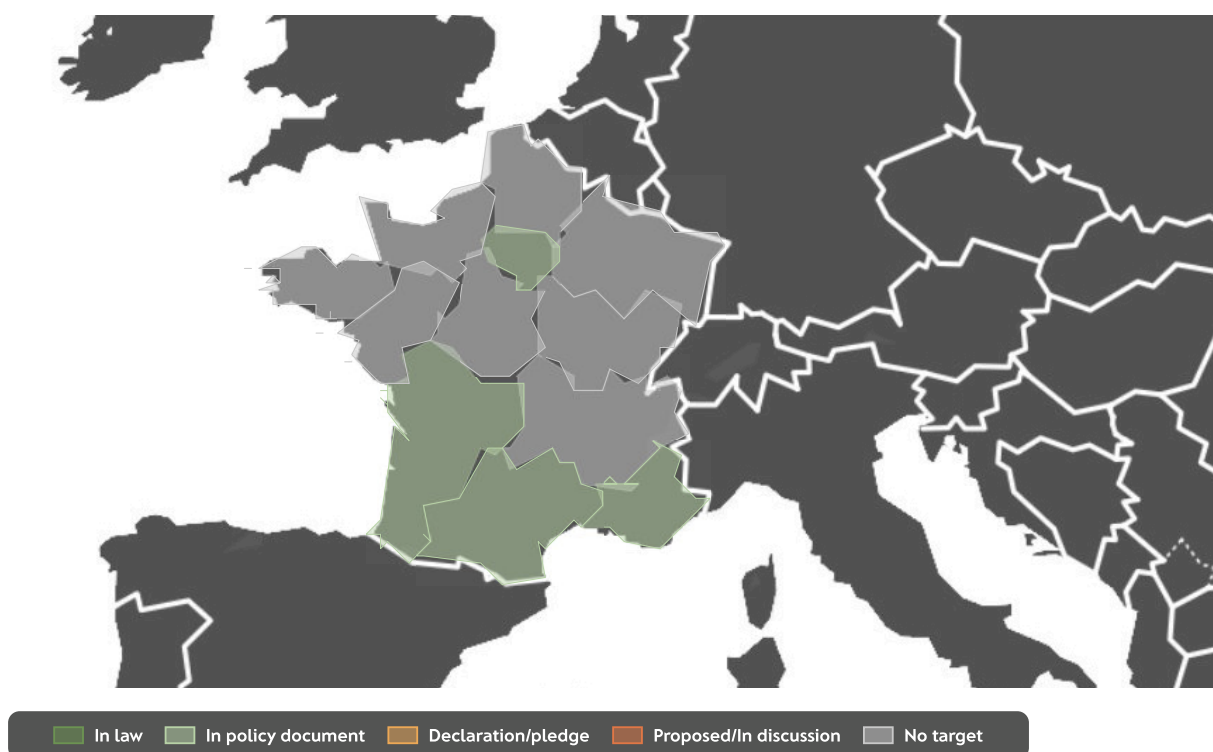
The central government sets climate goals under its Five-Year Plans (FYPs), which are strategic plans that describe China's economic and socioeconomic development goals for five-year periods. The FYPs are closely linked to the Target Responsibility System (TRS) that delegates specific targets to other levels of government, including provinces and state-owned enterprises (SOEs), and are usually related to economic growth, social stability, environmental protection, and other priorities (You, 2022; Hongtao and Shuai, 2023). The targets described in the TRS include legally binding ones, such as the carbon emissions peaking time, carbon-intensity reduction rates and energy-intensity reduction rates. The TRS also includes non-binding indicators, such as total energy consumption and total carbon emissions. Provinces create their own sources of income and allocate budgets and other resources to implement national policies. Chinese provinces therefore have little autonomy in *setting* targets, but significant responsibility in *implementing* actions to achieve both delegated and national targets (Nilsson *et al.*, 2021; You, 2022).

Provincial governments hold actual authority over the provincial branches of ministries, rather than the ministries themselves. They can negotiate and engage in discussions with the central government regarding the implementation of climate and energy policies, which could influence the pace of China's decarbonisation (Nilsson *et al.*, 2021; You, 2022). Provinces create their own sources of income and allocate budgets and other resources to implement national policies. In addition, provinces run the SOEs, many of which operate in heavily polluting industries, and approve (or deny) applications for new coal-fired power plants (Nilsson *et al.*, 2021; You, 2022). In sum, despite China's top-down governmental structure, there is

significant room for subnational governments to accelerate climate action. Provinces are the primary bodies responsible for implementing climate policies.

China has a national level target of 'carbon neutrality before 2060'. The Net Zero Tracker database shows that 17 of the 31 provincial-level jurisdictions have net zero targets or equivalents. Provinces without specific targets often mention they aim to align with the national government's commitment to 'have CO₂ emissions peak before 2030 and achieve carbon neutrality before 2060'. The Net Zero Tracker identifies interim targets in 14 of the 16 provinces with net zero targets. But these interim targets are not all emission reduction goals; they include emissions intensity and peak emissions targets.

V. France



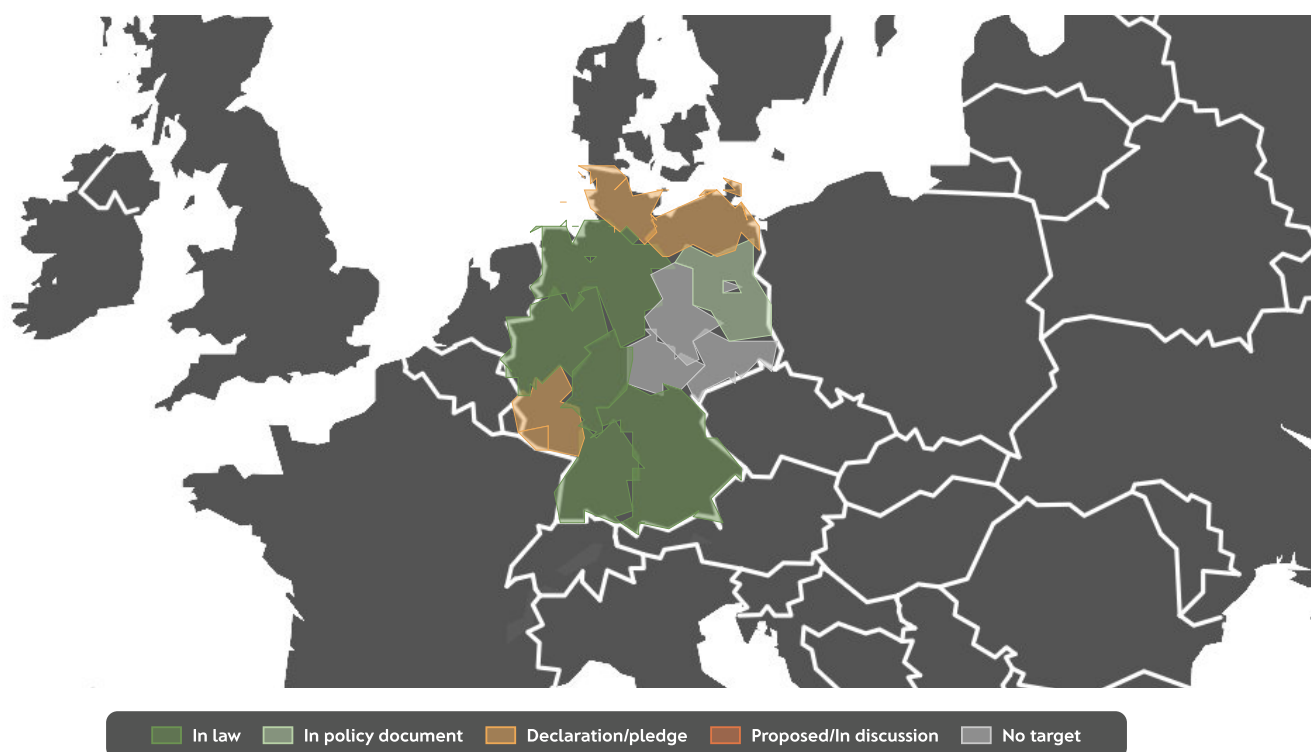
France is a unitary country and has 18 regions. Thirteen are on the French mainland, five are overseas regions. The French governance system has been described as one with co-operative regions. The regions have their own deliberative assemblies that are directly elected (OECD, 2022c). They hold several responsibilities with regards biodiversity, climate, air quality, energy, sustainable development and waste (IEA, 2021).

In general, regions have little autonomy to develop independent climate policy, but are expected to meet national objectives in regional planning frameworks. France's main climate objectives are described in the National Low-Carbon Strategy (Stratégie Nationale Bas-Carbone, SNBC) (Ministère de l'Économie et des Finances, 2023). Regional strategies for energy, transport, and other sectors must align with the emission reduction targets and pathways set out in the SNBC. The Nouvelle Organisation Territoriale de la République (NOTRe) law, introduced in 2016, delegated more strategic powers to regions. Under the law, regions must present a regional planning document called a SRADDET (Schémas régionaux d'aménagement, de développement durable et d'égalité des territoires) which translates into English as 'Regional Planning, Sustainable Development, and Territorial Equality Schemes' (IEA, 2021).

Eleven of the 18 French regions are required to use the SRADDET as a strategic framework to plan and coordinate various aspects of regional development. These plans cover topics such as energy transition, urban planning, and environmental protection (Ministère de l'Écologie, 2021). The SRADDETs should ensure that regional development aligns with national and EU climate goals, while addressing the specific needs and challenges of each region. The process involves consultation with local authorities, stakeholders, and the public to create a comprehensive and cohesive strategy. The state intervenes before and after the development of the SRADDET, meaning regions do not have complete autonomy over the process (Ministère de l'Écologie, 2021). Despite the requirement to publish SRADDETs, no French regions publish complete, comprehensive plans describing how they aim to achieve climate objectives, according to the Net Zero Tracker database.

France aims to achieve net zero emissions by 2050 and reduce emissions by 55% by 2030 compared with 1990 levels. Before France enshrined its long-term target in law in 2019, regions were required to have plans aligned with France's previous commitment of 75% by 2050. Regions are now required to update their plans – the SRADDETs – to align with net zero by 2050 (Ministère de la transition écologique et de la cohésion des territoires, 2017; Région Haut-de-France, 2024). According to the Net Zero Tracker database, five of 18 French regions published net zero targets or equivalents. Of France's five overseas regions, only Martinique has a net zero target. Martinique is also the only region to have enshrined its target into law; all other regions have their net zero targets in policy documents. Two other regions still have targets in line with France's previous 75% reduction target by 2050, but these are expected to be updated soon in official publications. As of June 2024, only six regions have set interim emission reduction targets, and only Martinique has a target in line with France's 55% by 2030 reduction target.

VI. Germany



Germany is a federal republic comprised of 16 states known as Bundesländer or Länder and operates with a dual system of legislation and responsibilities. Germany has three levels of government: the national level (Bund), the state level, and municipal level (OECD, 2022c).

The German Basic Law defines which legislative topics are under sole influence of the federal government. Of those, climate-relevant topics are nuclear energy and federal railways. The list of matters that are under concurrent legislation is however much longer. Climate-relevant topics on that list include policy areas such as energy, industry, agriculture, road transport, and environmental protection (Wong et al., 2023). In areas where both the federal government and the states (Länder) can make laws, the states are allowed to pass their own laws if the federal government has not made laws in that same area (Deutscher Bundestag). In general, the federal government provides the policy framework, while the operationalisation and implementation lie with the states (Eckersley et al., 2023). Since implementation of environmental policies and programmes is mainly managed by the German states, the results vary. Currently, performance above and beyond what is required in federal laws is insufficiently enabled by the federal government (OECD, 2023).

Germany has a federal-level climate protection law (Klimaschutzgesetzes or 'KSG') that describes the country's GHG neutrality target for 2045, interim targets of 65% by 2030 and 88% by 2040, compared with 1990 levels²³ and sector-specific targets (OECD, 2023; CAT, 2024c). German states have the freedom to set climate targets as well but are not obliged to. Article 14 of the KSG ensures that states retain autonomy over climate policies, provided the state legislation aligns with federal law and contributes to national targets (Bundesministerium der Justiz, 2019). State-level laws generally resemble and follow the structure of the KSG.

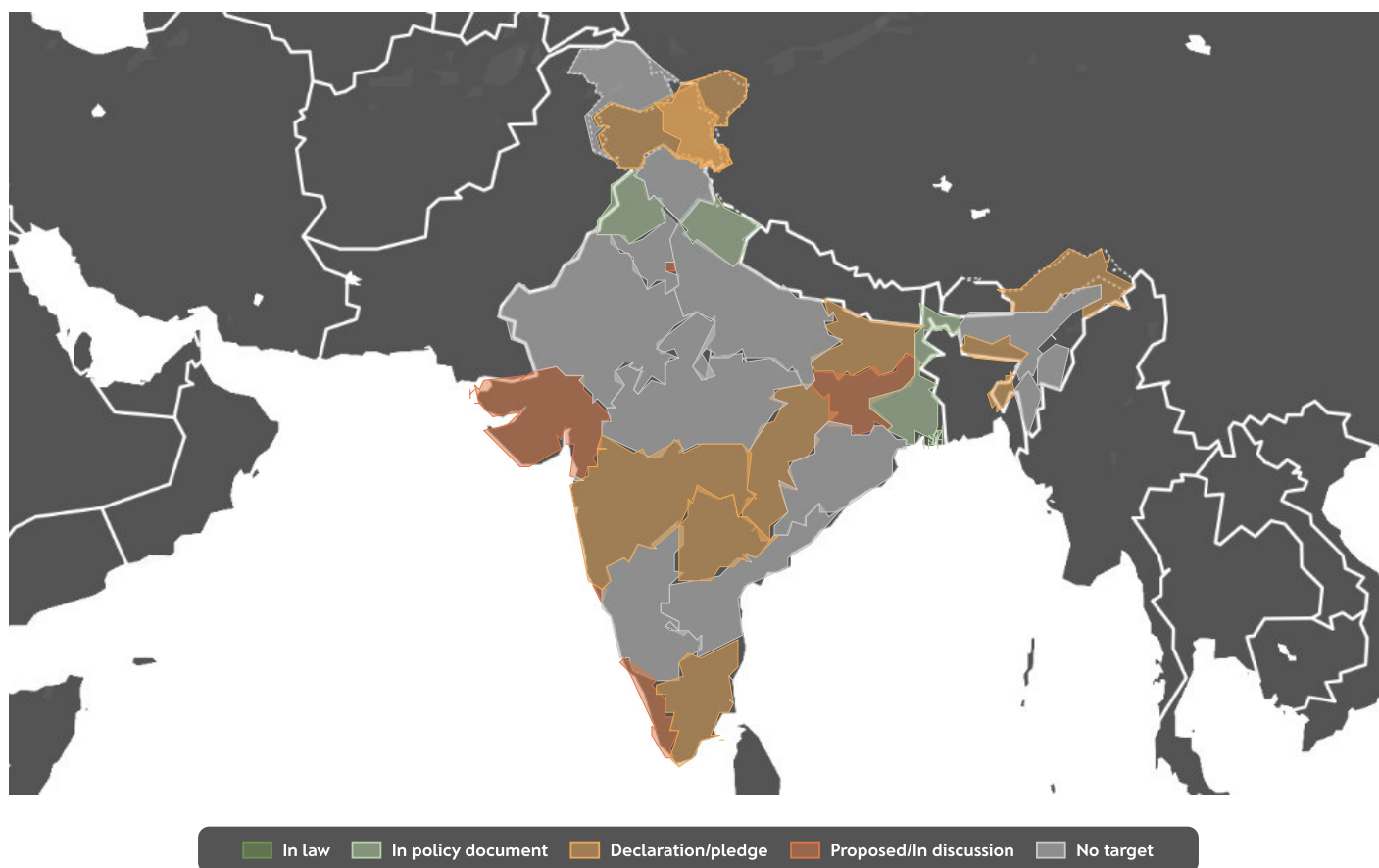
²³ Excluding LULUCF.

The Net Zero Tracker database shows that out of the 16 states, 12 have net zero targets or similar, but only six have the targets in their state law. Five aim to reach the end target in 2045, in line with the national target. Seven states have an earlier net zero target year than the national government: six (Baden-Württemberg, Bavaria, Lower Saxony, Mecklenburg-Vorpommern, Rhineland-Palatinate and Schleswig-Holstein) have 2040 as their net zero target year, and Bremen targets 2038.²⁴ Only two German states do not have climate targets: Saxony and Saxony-Anhalt. The two states declare the support for the national targets, but the wording remains vague. The states Berlin and Thuringia have set emission reduction targets rather than net zero targets, but with levels that may be considered ambitious: 95% and 90% below 1990 levels, respectively.

The mix of targets, ranging from earlier target years to no targets at all, highlight the regional disparities within Germany's decentralised governance structure, but also potential opportunities for ambition-raising at the federal level. All but two German states have published a plan that describes how they want to achieve their targets. However, they vary in quality and are often presented in vague terms. We found that only one plan, Bremen's, can be considered 'complete'. Five states allow or are considering the use of carbon credits for target realisation, none of which specify conditions.

²⁴ These targets are not necessarily more ambitious, because net zero ambition depends on various factors, such as the reduction component of the targets and the proportion of high-emitting sectors in those specific regions.

VII. India



India is a federal country, comprising 28 states and 8 union territories. Each Indian state has its own government, whereas a union territory is governed by the central government. Due to federalism, state governments hold substantial influence over decision-making on topics such as emission targets, public order, public health, and agriculture. The national government significantly influences regional action and climate policy, holding substantial control over state finances and bureaucratic capacity. However, states can also shape national policy through their autonomy in areas such as mitigation and adaptation, as well as by expressing their interests in national forums. (Pillai and Dubash, 2023).

In 2008, the Indian government's National Action Plan on Climate Change required states to draft State Action Plans on Climate Change (SAPCC). But the SAPCCs were focused more on adaptation measures and were published prior to India establishing its net zero goal, therefore the central repository does not include the states' most recent climate plans (Ministry of Environment Forest and Climate Change). India's central government remains the primary driver of the country's climate policy, but there is a growing trend of states taking on responsibility for setting net zero targets and implementing them across sectors like energy, agriculture, forestry, industry, and transportation (Pillai and Dubash, 2023).

The national net zero target of 2070 was set in 2021, with an interim GDP emissions intensity reduction target of 45% by 2030, compared with 2005 levels²⁵ (CAT, 2023a). Subsequently, several states made notable progress in adopting emission targets. According to our database, 20 out of India's 36 regions have established net zero targets or equivalent, though two have yet to specify target years.

²⁵ Excluding LULUCF

Fourteen of the 20 regions with net zero targets have set deadlines that are earlier than India's national target. While these states have established targets, many have yet to present a comprehensive plan to achieve them. At present, regional target setting does not appear to impact the national target but rather reflects an effort to harness the strengths and competitive advantages of different states. Nonetheless, it demonstrates a commitment to aligning ambitions and developing mechanisms for implementing change. Overall, according to our database, 13 out of 36 states still lack any targets whatsoever.

Currently, Indian state policies prioritise concerns such as water, sanitation, health, and education (Sandhani and Khan, 2023). As a result, securing funding for climate action is challenging, as it necessitates either reallocating existing resources or acquiring additional funds. Meanwhile, states in the east — Chhattisgarh, Jharkhand, Odisha, and West Bengal — are rich in fossil fuels and heavily rely on their associated benefits. With the declining costs of renewable energy, these states are facing substantial competitive pressures. For instance, Jharkhand has established a task force to address the economic and social impacts of the energy transition (Habib *et al.*, 2023).

VIII. Indonesia



Indonesia is a unitary state with five levels of administration: 38 provinces, regencies and cities, sub-districts and villages (Di Gregorio and Moeliono, 2023). Although unitary, the governance structure is characterised by significant decentralisation, with substantial responsibilities, personnel, assets and resources devolved to lower levels of government. Each province has its own local government, consisting of a governor, mayor, or regent and a regional legislative body, elected by popular vote for five-year terms. Five provinces have special autonomous status, which grants them more autonomous powers, which includes Aceh, Jakarta, Yogyakarta, Papua, and West Papua. Indonesia is one of the most decentralised countries in the world (OECD, 2022a).

The central government retains exclusive control over topics such as national security, foreign affairs and monetary policy. A law introduced in 2014 shifted authority from municipalities to provinces in several policy areas, including coastal management, mining and forestry. For other topics, there is often no clear-cut separation of responsibilities between provinces and other local governments, leading to governance overlaps (OECD, 2022a; Di Gregorio and Moeliono, 2023). Provincial governments have the authority to implement local regulations in sectors relevant to climate action, such as land use planning, building codes, transportation, and waste management, if these regulations do not conflict with national law. Central government departments share responsibility for climate change policymaking, while provincial governments focus primarily on implementation (Di Gregorio and Moeliono, 2023).

In its Long-Term Strategy for Low Carbon and Climate Resilience (LTS-LCCR) 2050, Indonesia states that it wants to explore the opportunity to rapidly progress towards net zero emissions by 2060 or sooner (CAT, 2023c). By 2030, the country aims to reduce emissions by 31.89% below the Business as Usual (BAU) scenario, unconditionally. It also has a conditional target of 43.20% below the BAU scenario (CAT, 2023c).²⁶ Provinces are required to develop their climate mitigation targets while considering provincial baseline emissions, national and sectoral climate mitigation targets, local economic and social aspects,

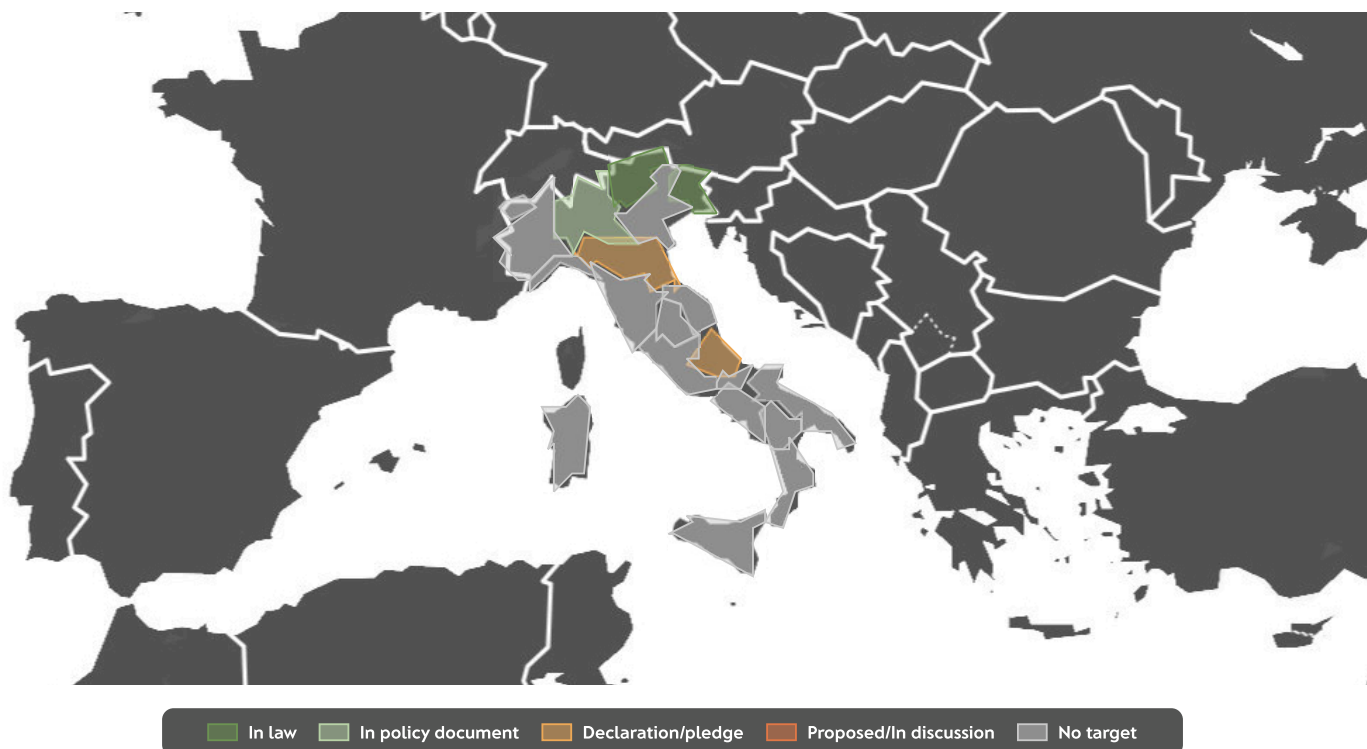
²⁶ Both targets are including LULUCF

effectiveness of mitigation actions and resource capacity. Provinces must develop their targets within six months after national climate targets are set, following the guidelines established by the Minister (President of the Republic of Indonesia, 2021).

In addition to setting targets, provinces are required to create local action plans for reducing GHGs emissions, known as RAD-GRK. These plans must be integrated into the provinces' medium-term development strategies (Nidasari and Gaol, 2020). The Ministry of National Development Planning (BAPPENAS) is responsible for including climate change in development planning and overseeing provincial climate plans and reports. It also manages national climate policies, including adaptation and mitigation plans, and helps secure international funding for climate projects. BAPPENAS plays a key role in coordinating climate policies both across different ministries and between national and local governments (Di Gregorio and Moeliono, 2023).

Despite the requirement to set climate targets, only 5 out of 38 provinces in Indonesia have established one, and just three provinces have set net zero targets, according to our database. These three net zero targets have deadlines earlier than the national target. Although the number of provinces with public mitigation targets is low, some provinces are involved in pilot projects, such as state-led initiatives aimed at increasing carbon dioxide removals from forests and land use (Aqil, 2023).

IX. Italy

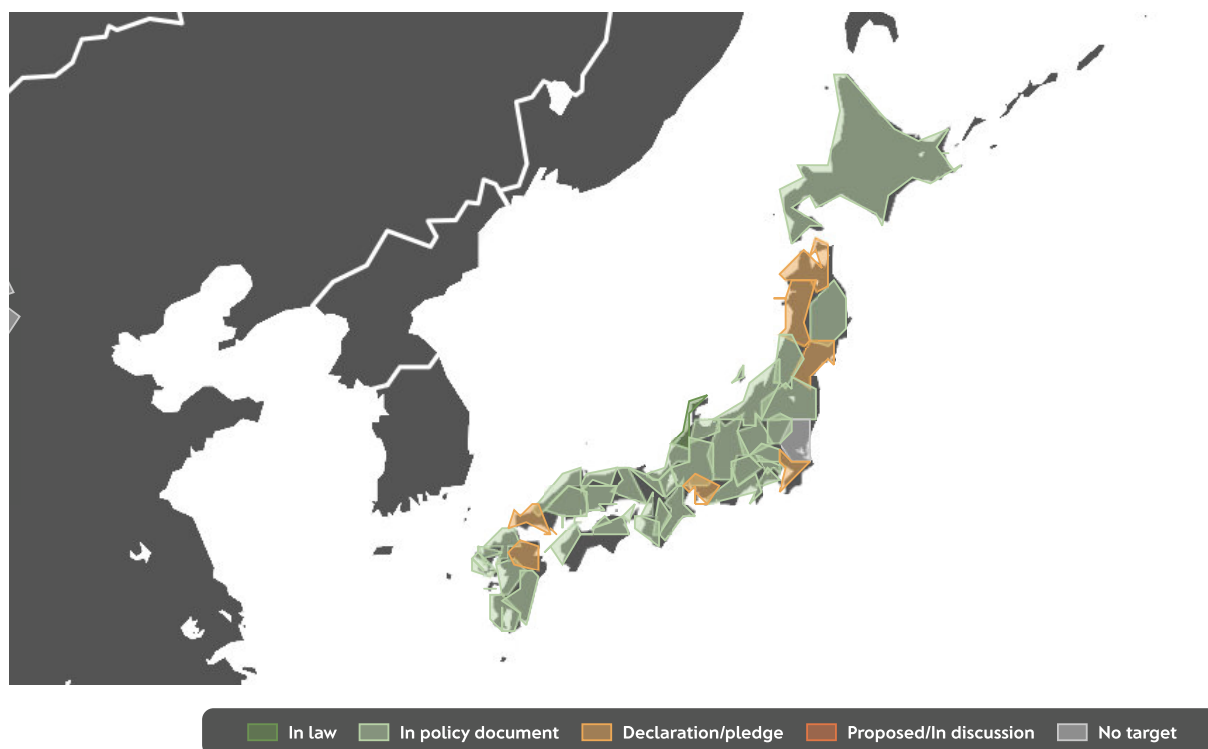


Italy is a unitary state and divided into 20 regions. Each region has an elected body, the 'Consiglio Regionale,' which has legislative authority within its territory. While environmental protection is under the exclusive jurisdiction of the state (as stipulated in Article 117 of the Constitution), regions are allowed to regulate the matter if it aligns with national law and EU obligations. This enables regions to customise legislation to address local needs. This flexibility is crucial for managing local environmental and developmental issues. In climate policy, regions play a central role in defining and executing policies related to energy, transportation, and buildings. As a result, Italian regions are crucial for achieving national climate objectives (*La corsa delle Regioni verso la neutralità climatica*, 2022).

At the national level, Italy aligns with EU and Paris Agreement targets, aiming for a 55% reduction in GHG emissions by 2030 and climate neutrality by 2050. At the regional level, however, targets vary significantly. As of August 2024, only five out of Italy's 20 regions have set net zero targets. Two additional regions set deep decarbonisation targets without explicitly aiming for climate neutrality. There appears to be a clear pattern in target-setting, with northern regions typically setting targets while southern regions are not. This discrepancy is likely influenced by historical disparities that date back to Italy's unification in 1861, as well as the prevailing political orientations in those regions (Fernández-Villaverde et al., 2023).

The autonomous province of South Tyrol is notable for its more ambitious target than the national government, aiming for climate neutrality by 2040. The Trentino-South Tyrol region, governed under a special statute, consists of two autonomous provinces: Trentino and South Tyrol. Each province has its own distinct set of powers and administrative structures, leading to them adopting different targets. In 2013, Trentino became the first Italian region to set a net zero target for 2050 (Clima Trentino, 2013). A decade later, South Tyrol topped this by setting its own net zero target for 2040. Other Italian regions with net zero or emission reduction targets have set goals that are either less ambitious or equivalent to the national target. This suggests that regional ambition may be influenced more by the national effort and commitment to international agreements than the other way around.

X. Japan



Japan is a unitary state with three levels of government: the national government, 47 prefectural governments (including the Tokyo Metropolitan Government), and over 1,700 municipal governments. Japanese prefectures are allowed to manage local affairs within the boundaries described by national law. The central government delegates many functions, such as education and police force, to prefectures and municipalities, but retains the overall right to control them (OECD, 2022c).

Historically, subnational governments did not play a proactive role in climate policy making, which were dominated by the Liberal Democratic Party (the long-time ruling party post-WW2), the Ministry of Economy, Trade and Industry (METI) and industry associations (Kameyama, 2021). Subnational governments and companies often followed suit once decisions were made at the national governmental level (Kameyama, 2021). Non-state and subnational actors' behaviour only started changing after the adoption of the Paris Agreement in 2015, when they started setting voluntary climate action plans independent of national policy (Kameyama, 2021). As many as 166 local governments (including 23 prefectures) — which together account for more than 60% of the Japanese population — had already announced their intent to achieve net zero CO₂ emissions by 2050 when the then-Prime Minister announced the economy-wide net zero target in October 2020 (MOEJ, 2020).

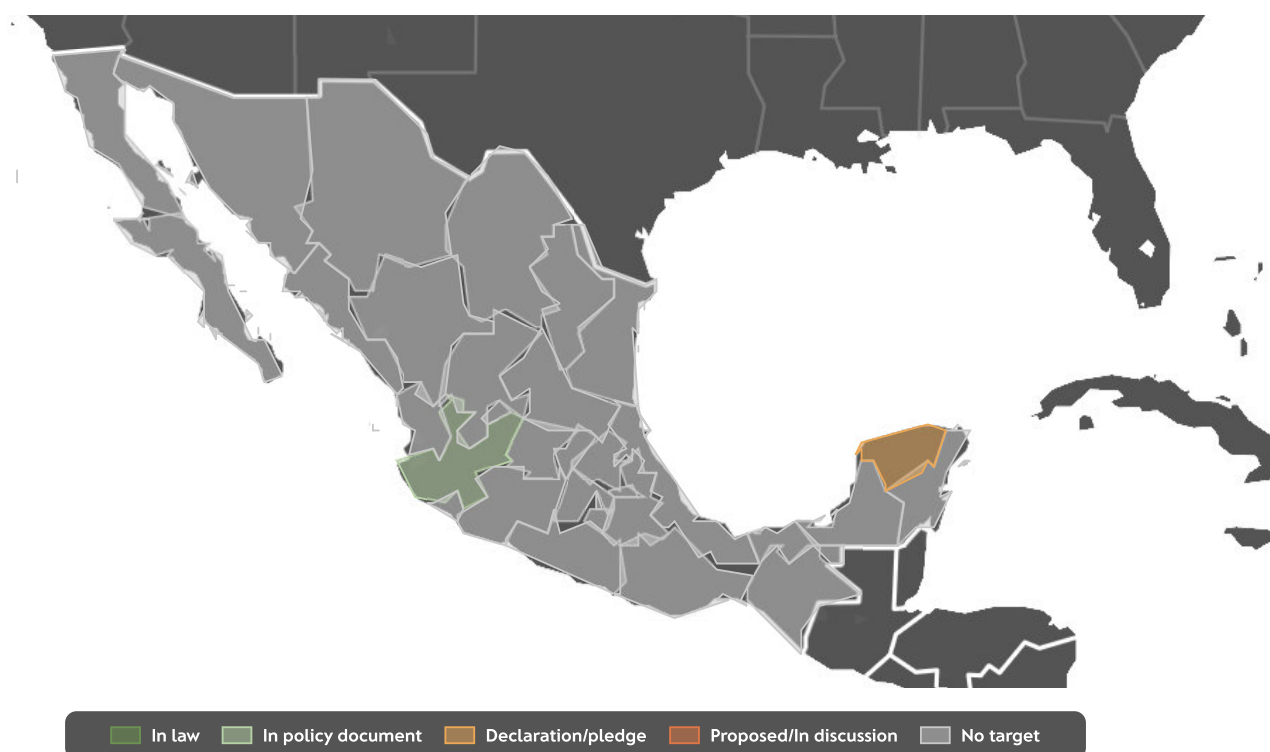
Following the announcements of the national-level net zero target and the updated 2030 emission reduction target (46% reduction below 2013 levels) (Government of Japan, 2021), 46 out of 47 prefectures have set net zero targets or equivalents as of July 2024. While no prefecture has a net zero target year earlier than 2050, 20 prefectures have set 2030 targets with reduction rates higher than 46% below 2013 levels, with 15 aiming for reductions more than 50%. There are also 16 prefectures with 2030 reduction target levels lower than 46% below 2013 levels.

The Global Warming Countermeasures Act stipulates that prefectures and municipalities must develop their GHG emission reduction plans and targets in line with the national plan ('Plan for Global Warming Countermeasures'). We found that of the 46 prefectures with net zero targets, 40 published accompanying plans. In general, the level of detail provided in the prefectural plans is limited. Seven specify their

intentions to use carbon credits (offsets), but we could not identify under which conditions this would be implemented. Furthermore, 34 of the 46 prefectures with net zero targets have emission removal targets, and nature-based removals play a significant role across the board.

On the implementation of subnational decarbonisation plans, the lack of prefectural governments' own financial resources and the lack of human resources have been identified as the biggest challenges by a large majority of the prefectural governments (WWF Japan, 2023). In 2021, the Regional Decarbonisation Roadmap was launched to strengthen various types of support for local decarbonisation. The Roadmap has since identified 74 leadership (or good practice) cases for focused support with the aim of replicating them across the country (MOEJ, 2024).

XI. Mexico



Mexico is a federal republic with 32 federal entities: 31 states and the capital Mexico City (OECD, 2022c). Each state is headed by a governor, elected by popular vote for a six-year term. States are divided into municipalities, each governed by a municipal president (mayor) and a municipal council. States have unicameral legislatures (Congress of the State), which are elected for three-year terms. The Congresses are responsible for making state laws, approving budgets, and supervising the executive branch. Each state has its own judiciary, which operates independently from the federal judiciary. Such state courts handle most legal matters, except those that are specifically designated to federal jurisdiction (OECD, 2022c; Heredia and Corral, 2023).

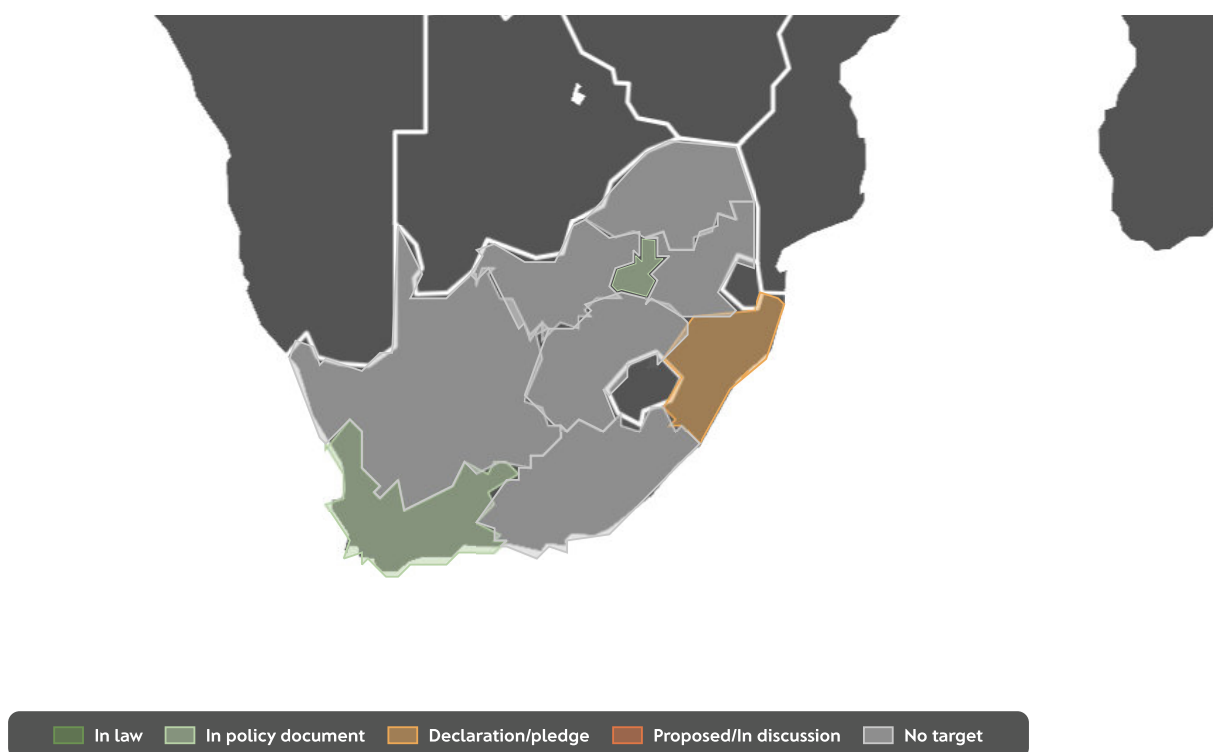
Mexican states are responsible for implementing federal climate policies and regulations within their own jurisdictions. The General Law on Climate Change states federal entities and municipalities should contribute to achieving federal targets and that they are required to develop and implement their own climate initiatives and programs, tailored to local needs and circumstances (INECC, no date; Heredia and Corral, 2023). Yet, Mexican states have limited influence on national climate targets of the federal government: federal government is the primary actor to set and achieve targets. States do however have significant autonomy to manage their internal affairs, including climate-relevant topics, within the framework of the federal constitution (Heredia and Corral, 2023). They have the authority to address specific local issues such as deforestation, water management and urban planning. If they do not conflict with federal law, states can enact their own laws. In sum, Mexican federal entities have the authority and mandate to *act* on climate change, but their powers are generally more focused on implementation and local initiatives.

Mexico does not have a national-level net zero target. At COP27, it did announce a commitment to achieve net zero emissions by 2050, but this has not been rectified in any official documentation yet (Secretaría de Relaciones Exteriores, 2022). The country's NDC specifies an unconditional emission reduction target of 30% by 2030 compared with a BAU emissions trajectory and does not mention any long-term targets (CAT, 2022).

Despite the lack of a national long-term target, the Net Zero Tracker database finds that 11 of the 32 federal entities have published a climate-related target for 2050. Three subnational entities – the Federal District, Jalisco and Yucatán – have a net zero target or an equivalent and three states – Campeche, Nueve León and Sonora – adopted emission reduction targets of 80% or more, below 1990 levels. These six ambitious subnational targets should set a precedent for other Mexican states and send a signal to the federal government to publish a long-term climate commitment.

Six of the 11 states with targets for 2050 have published plans that describe how they will achieve their targets, but with varying levels of completeness. The lack of publicly available plans is potentially in contrast with the states' obligation to contribute to the federal targets.

XII. South Africa



South Africa is a quasi-federal state: it is a unitary state with federal characteristics. The national government holds the most power, while all governance levels have their own legislative and executive authority. The country's governance structure consists of three levels: national government, nine provinces, and local governments (OECD, 2022b). Provincial powers are limited to specific areas outlined in the national Constitution (De Visser and du Plessis, 2023), including agriculture, education, health, and public housing. In some areas, provincial powers are shared with the national government, which can set uniform standards and frameworks for provinces to follow. In other areas, provinces have exclusive authority (De Visser and du Plessis, 2023). All provinces have their own governments that can create and implement laws and policies specific to their regions, but they must align with national policies and the Constitution (De Visser and du Plessis, 2023).

Each province is represented in the National Council of Provinces (NCOP). The NCOP is the upper house of the South African Parliament, the other house being the National Assembly. The NCOP reviews and debates legislation passed by the National Assembly, especially when it concerns provincial matters. It has the power to approve, amend, or reject bills. For certain types of legislation, especially those that involve the provinces' interests, the NCOP's approval is essential before a bill can become law.

The Net Zero Tracker recognises South Africa's commitment to move towards net zero carbon emissions by 2050. In addition to this long-term commitment, in its updated 2021 NDC, South Africa committed to absolute emissions target levels by 2030²⁷, translating to a reduction of 19 - 32% below 2010 levels²⁸ (CAT, 2023c). In line with the country's net zero pledge, we identify three of South Africa's provinces aiming for net zero emissions by 2050: Western Cape, Gauteng, and KwaZulu-Natal. Western Cape and Gauteng have formalised their 2050 targets in policy documents, while KwaZulu-Natal has only pledged to achieve its target. For all other provinces, we did not identify any mitigation targets. Gauteng is the only province with

²⁷ Including emissions from LULUCF

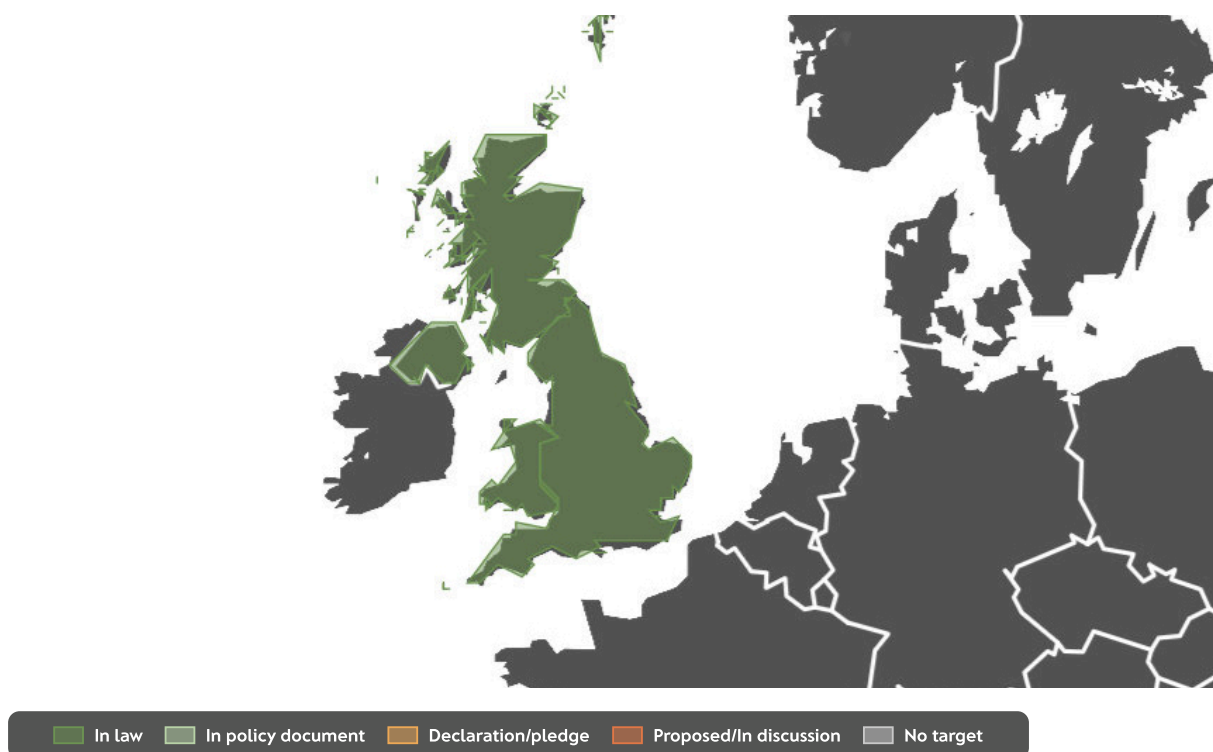
²⁸ Excluding emissions from LULUCF

an interim target, aiming to reduce emissions by 30% compared to 2000 levels by 2025. None of the other provinces set short-term goals. Limpopo has set a goal to peak its GHG emissions around 2025.

The 2024 Climate Change Act does not mandate provinces to set specific climate targets, but does mandate an implementation assessment (Government of South Africa, 2024). It also requires provincial governments to align with national legislation and participate in coordinated mitigation, adaptation, and resilience efforts through an established intergovernmental forum (UNFCCC, 2020; Government of South Africa, 2024).

The extent to which regional targets have influenced national policy remains unclear, as the provinces established their targets around the same time as or after the national government's announcement.

XIII. United Kingdom



The UK is a unitary system, consisting of four constituent countries: England, Northern Ireland, Scotland, and Wales. The latter three have devolved administrations with their own governments and are elected assemblies. Decarbonisation challenges vary across the UK. For example, transport accounts for the largest share of emissions in both England and Scotland, whereas agriculture and energy supply dominate in Northern Ireland and Wales, respectively. Certain topics — such as energy security, housing, and transport — are subject to central policymaking, although most decarbonisation decisions are devolved (UK Parliament, 2017). The UK government’s financial choices affect the devolved budgets and their ability to implement policies. In 2020, the ‘Interministerial Group for Net Zero, Energy and Climate Change’ was established to ensure coordination across governments (AuditScotland *et al.*, 2023).

In 2019, the UK legally committed to net zero by 2050 across all sectors, with an interim target of 78% by 2035 compared with 1990 levels. Northern Ireland and Wales aligned with this 2050 goal, while Scotland targets net zero by 2045 across all sectors, with an interim target for 2040.

The Climate Change Committee (CCC), the UK’s independent climate body, regularly assesses progress. Established by the 2008 UK Climate Change Act, the CCC reflects the UK’s bipartisan climate approach. The relative effectiveness of the UK’s approach is best illustrated by the fact it has met all its carbon budgets to date and halved emissions already. The past, however, is no indication of the future.

In 2023, the CCC questioned Northern Ireland’s ability to reach net zero by 2050, citing its large agriculture sector and the social and technical challenges of radical action (Climate Change Committee, 2023). Scotland’s leadership on net zero and the just transition is notable, but its 2030 interim target was abandoned this year, in part because the CCC deemed it ‘beyond what is credible’ (Climate Change Committee, 2024). While Wales achieved its First Carbon Budget (2016–2020), the CCC recently found it off-track for future budgets.

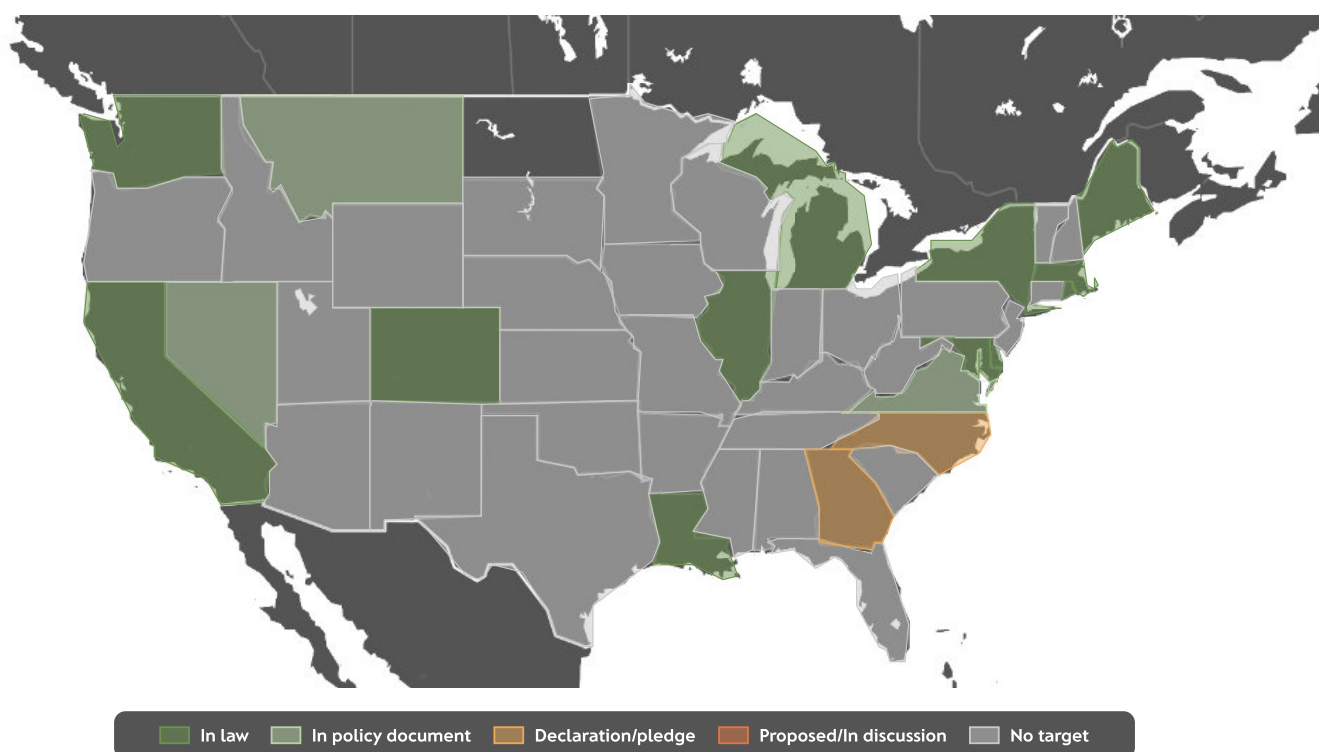
As for local governments such as councils, most have set voluntary net zero targets by 2050, some two decades before. The UK government claims 82% of emissions are ‘within the scope of influence of local

authorities,' but public bodies such as the National Audit Office point to barriers such as fragmented funding and unclear roles and responsibilities between national and local governments (Rankl et al., 2023).

While the UK statutory target applies all four constituents, Scotland's decision to aim for a net zero target five years earlier than the UK's national ambition demonstrates its regional autonomy and ambition. But Scotland's inability to meet its interim 2030 target suggests challenges in translating ambitious goals into tangible progress. This may act to disincentivise the UK government from considering an earlier net zero target. Nonetheless, the variation at the devolved level highlight both the potential for more ambitious action and equity concerns on the pace of regional decarbonisation.

Achieving net zero in the UK by 2050 requires coordinated action. The new Labour-led government's 'Mission Control' initiative, aimed at clean power by 2030, will be critical to scaling renewable energy and diversifying energy storage firming options. But this should be supplemented by, and coordinated with, urgent action in Northern Ireland, Scotland, and Wales on issues like planning and energy efficiency (AuditScotland *et al.*, 2023).

XIV. United States of America



The US is a federal republic where power is divided between the national government and its 50 states. States have their own governments with executive, legislative, and judicial branches, and their own constitutions (Rabe and Smith, 2023). The federal government has exclusive authority over national defence, interstate commerce, foreign policy, and constitutional rights. States retain powers not explicitly granted to the federal government by the Constitution, known as 'reserved powers', which are guaranteed by the 10th Amendment. These include regulating education, public safety, health, and local governance. States must comply with federal policies but can establish independent energy and climate policies, giving them substantial autonomy over energy development and transit within their territories, while still needing to adhere to federal standards (IEA, 2019).

The Supreme Court generally interprets the Constitution of the United States in case of disputes over power. Although federal laws typically supersede state laws, states can challenge federal regulations if they determine federal authority has overreached. This ongoing interaction helps maintain a balance of power between the federal government and the states, while safeguarding individual rights. Both the federal level and the state level of governance have the constitutional powers to pursue independent climate policy if they choose (Rabe and Smith, 2023).

The American system of separation of powers often complicates the process of passing federal laws or ratifying international treaties, as both require approval from Congress and the President. Additionally, hyper-partisanship has caused significant uncertainty and conflict within the US political system, leading to inconsistent federal and state policies with no clear path to meet the Paris Agreement targets. As a result, presidents often bypass Congress through unilateral executive action, such as reinterpreting air quality laws to address climate issues.²⁹ However, such policies are vulnerable to reversals under new administrations, as executive actions can be easily undone (Rabe and Smith, 2023).

²⁹ See, for example, Executive Order 13990, The White House (2021)

When former President Donald Trump withdrew from the Paris Agreement in 2017, many subnational leaders protested, leading to the We Are Still In movement and the creation of the U.S. Climate Alliance, where governors from 13 states pledged to meet Paris-aligned climate goals. The alliance eventually grew to 24 states after 2019 when Democratic candidates performed well in local, state, and federal elections.

After his inauguration in 2021, President Biden immediately rejoined the Paris Agreement and set new federal emission reduction goals. His election, coupled with the Democrats' slim majority in Congress, opened the door for executive actions and legislation aimed at increasing federal involvement in climate mitigation and adaptation, notably through his flagship Inflation Reduction Act (IRA). States, particularly Republican-governed ones, play a crucial role in implementing the IRA and realizing its full potential (Chyung et al., 2022). Before the IRA, the federal government had not significantly transferred revenue to states to support energy transition policies (Rabe and Smith, 2023). Now, multiple sources of IRA funding support state, local and indigenous government climate programmes (Smith, 2022).

The US aims to reduce GHG emissions by 50-52% below 2005 levels by 2030³⁰ and reach net zero by 2050 (CAT, 2023e). The Net Zero Tracker identifies 19 states with net zero targets, five of which aim for earlier years than the federal government: four target 2045, and one targets 2030. Twelve states have enshrined their net zero targets into law and two states include net zero targets in policy documents. All state-level net zero targets are accompanied by interim goals. Of those states without net zero targets, nine have emission reduction targets of 80% for 2050.

Despite shifting federal politics, US states demonstrate significant cooperation and ambition on climate action. For example, the Regional Greenhouse Gas Initiative (RGGI), a group of nine states, operates a joint cap-and-trade system to limit emissions from the electricity sector (Rabe and Smith, 2023). Since Iowa introduced renewable electricity standards in 1991, they have spread to at least 30 states, with seven others adopting voluntary versions. Historically, California has led the nation with ambitious climate policies (Rabe and Smith, 2023), but other states have also taken bold steps. In 2024, Vermont became the first state to enact a law that requires oil companies to pay for climate change damages (Carbon Brief, 2024), while Maryland committed to 100% clean energy by 2035 (CBS News, 2023). In the same year, Massachusetts announced a 'green bank' for climate-friendly housing (Wasser, 2023), and Minnesota passed a comprehensive environment and climate bill (Kraker, 2023). Meanwhile, by early 2024, more than 20 states had adopted zero-emission vehicle mandates (Fletcher, 2024).

While most states have implemented their own climate targets and policies to compensate for federal inaction, these efforts remain inconsistent and often reflect local political preferences. Many states, especially those endowed in fossil fuel resources, such as Texas and Pennsylvania, continue to resist meaningful climate policies. Furthermore, the divisive hyper-partisanship in the US complicates efforts to develop cohesive, effective climate policies at the national scale.

³⁰Including LULUCF emissions

5. Conclusion: A key moment to ratchet up credibility

As the world approaches the halfway point of this critical decade in the fight against climate change, the net zero journey has reached a moment of truth. On the one hand, countries, regions, cities, and companies have made enormous strides to adopt net zero targets and to enshrine these targets in laws, policy documents, and corporate strategies. Simultaneously, practitioners and experts have largely clarified what credible net zero targets and plans should look like, creating a clear, UN-endorsed playbook for policymakers and decision makers to follow. On the other hand, most entities with net zero targets have not yet made them credible with clear and detailed plans, ambitious scopes, transparent reporting processes, and other elements that undergird delivery. While progress in key sectors like renewable energy, electric vehicles, and batteries has exceeded expectations, fossil fuel production and consumption continue to expand. Regulatory efforts to weave net zero goals into the rules that structure the economy are emerging rapidly, but remain fragmented and heterogeneous. Mixed signals from the market and from political leaders has slowed progress, though the direction of travel remains clear.

This Stocktake report has found several key updates since June 2023:

1. Most countries that contribute significantly to global emissions have set net zero targets, though notable exceptions include COP29 host Azerbaijan. Further and strengthened targets may emerge in the 2025 'ratchet' of the Paris Agreement, when countries submit new emissions-cutting NDCs.
2. The number of states and regions, cities, and companies setting net zero targets continues to grow, rising 28%, 8%, and 23% respectively from the 2023 stocktake report. However, an extraordinary 40% of entities evaluated by the Net Zero Tracker continue to lack targets, including wealthy corporations like Tesla, Nintendo, or Berkshire Hathaway.
3. Two years after the UN Secretary General's 'Integrity Matters' report, countries, regions, cities, and companies have made limited progress in enhancing the credibility of their net zero targets. In most cases, less than 5% of entities meet all minimum levels of integrity.
4. Race to Zero members perform considerably better than non-members on procedural and substantive elements of integrity, and the absolute number of companies following good practice has increased by more than 60% since 'Net Zero Stocktake 2023'.
5. In general, national-level net zero (or other mitigation) targets serve as a 'ceiling' of ambition for subnational governments, but some go above and beyond. Many subnational regions align directly with the level of national climate ambition, while there are instances where subnational regions may have influenced national net zero target-setting, illustrating an 'Ambition Loop' dynamic.
6. Subnational governments in major emitting countries are key to delivering global climate targets, but differ considerably in the powers they hold and the climate ambition they set. National governments can unlock progress by, for example, supporting regions through policy guidance and enhanced coordination. Further support would not only help achieve current targets but also foster the conditions and consensus needed for goals and policies that align with national objectives.

The overall picture that emerges from this report is a world on the road to net zero, but in urgent need of strong, rapid and sustained action to translate targets into robust plans that drive credible implementation. The third ratchet of the Paris Agreement, culminating at COP30 in Brazil in 2025, creates a vital moment to deliver this step change.

With the wave of 2024 elections passing into the rear-view mirror, it is time for governments and companies to deliver. Those that have targets must bring them up to the minimum standard of credibility; those without targets risk being left behind in a transition that is speeding up. As breakthrough trends in

clean energy and transportation reach scale, and as net zero regulations and litigation increasingly bite, hedging becomes a less attractive strategy. Companies and governments that ratchet up their credibility will reap the financial, reputational and political benefits of 'walking the talk', while those that remain on the fence will look increasingly out of step. The time to ratchet credibility is now.

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Appendix I: Summary of data and methods

This section updates the description presented in the previous Net Zero Stocktake reports (Net Zero Tracker, 2022, 2023b).

The Net Zero Tracker database has been updated regularly through continuous coding, led by the University of Oxford with support from all Net Zero Tracker project partners, and occasional code-a-thon events at the University of Oxford. Students, from across a range of disciplines and speaking a variety of languages, were trained in coding information on targets into a set of standardised metrics. Information on these metrics is further set out in our codebook (Net Zero Tracker, 2021). The efforts of the coders were supported by web-scraping for net zero targets, led by the Data-Driven EnviroLab and Arboretica.

For national and global totals, gross domestic product (GDP, PPP in 2021 constant international dollar) and population data were taken from the World Development Indicators database (World Bank, 2024b). Country-level and world total GHG emissions data including land-use change and forestry (LUCF) were taken from Climate Watch (2024). Data for Taiwan are taken from IMF (2022) for GDP PPP, national statistical yearbook (National Statistics of the Republic of China, 2022) for population, PRIMAP data (Gütschow et al., 2021) for GHG emissions excluding LULUCF (country reported) and FAOSTAT (2022) for LULUCF emissions. Income country groups were based on the World Bank classification (World Bank, 2024a). A UN classification was used to group countries by geographic regions (United Nations Statistics Division, 2022).

Subnational population data was taken from CDP (2021) and estimates derived from the Global Human Settlement Layer (Schiavina et al., 2023) for the year 2020. GDP data was taken from CDP (CDP, 2021) and from Kummu et al. (2024) for the year 2020. Corporate data (e.g. annual revenue, number of employees) were taken from Forbes (Forbes, 2023). Population data for cities were taken from multiple sources including the CDP-ICLEI Unified Reporting System (CDP, 2022) and city-specific sources.

Although we set out to capture in the Net Zero Tracker database all publicly-communicated net zero targets set by states and regions, cities and companies, we may not have been totally successful due to a number of reasons, including: net zero targets being communicated in languages other than English or another major language; or limited participation in the networks of non-state and sub-national climate action, which facilitates coders finding relevant information (see, e.g. Chan et al. (2018) and Chan and Hale (2015) for more discussions). Our data on countries may differ slightly to other similar country tracking initiatives (e.g. the World Resources Institute's Climate Watch) because of slightly different methodologies.

Appendix II: Supplementary figures on the procedural and substantive integrity criteria assessment

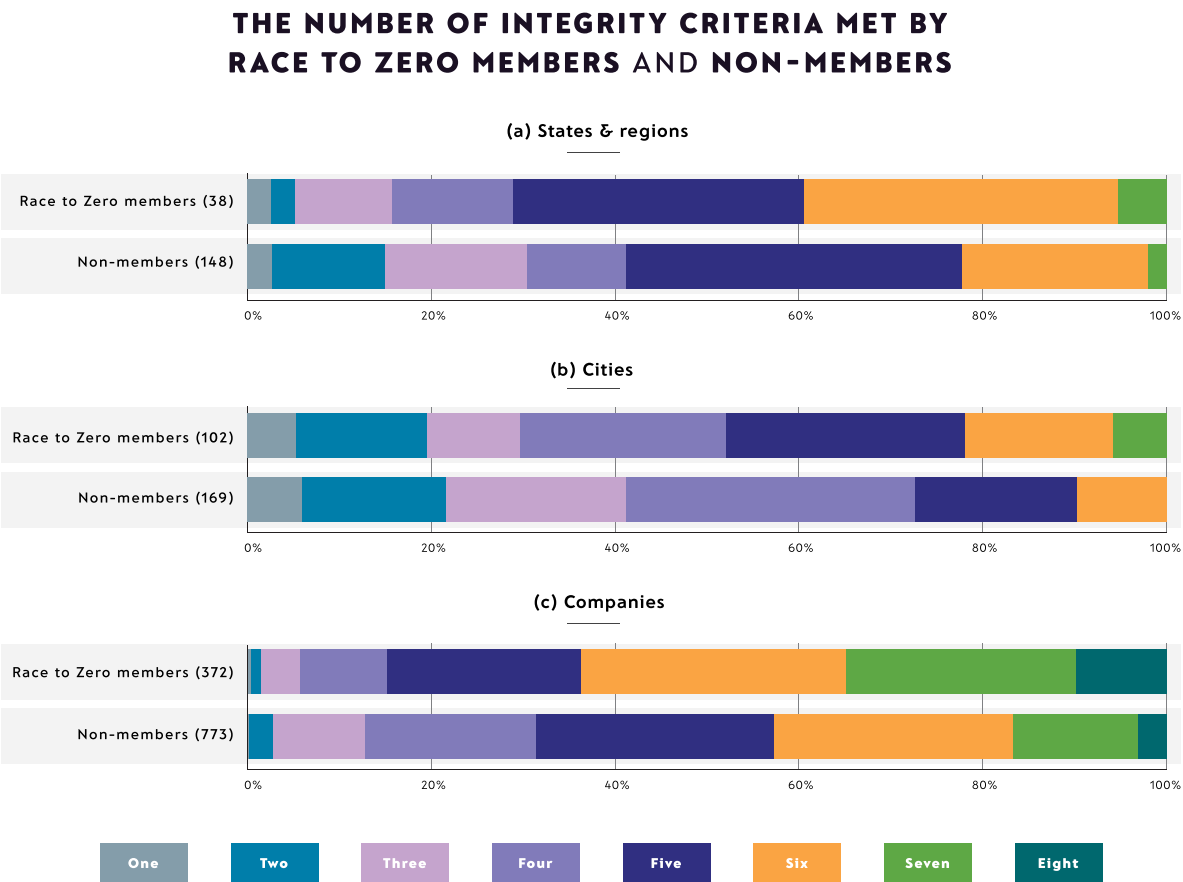


Figure A-1: The number of procedural and substantive robustness criteria met by those with net zero targets: a comparison of Race to Zero members and non-members. (a) subnational states and regions (seven criteria), (b) cities (seven criteria), and (c) companies (eight criteria). For the criterion of net zero target year by 2050 or earlier, non-OECD country-based entities are counted as meeting it even though the criterion does not apply.