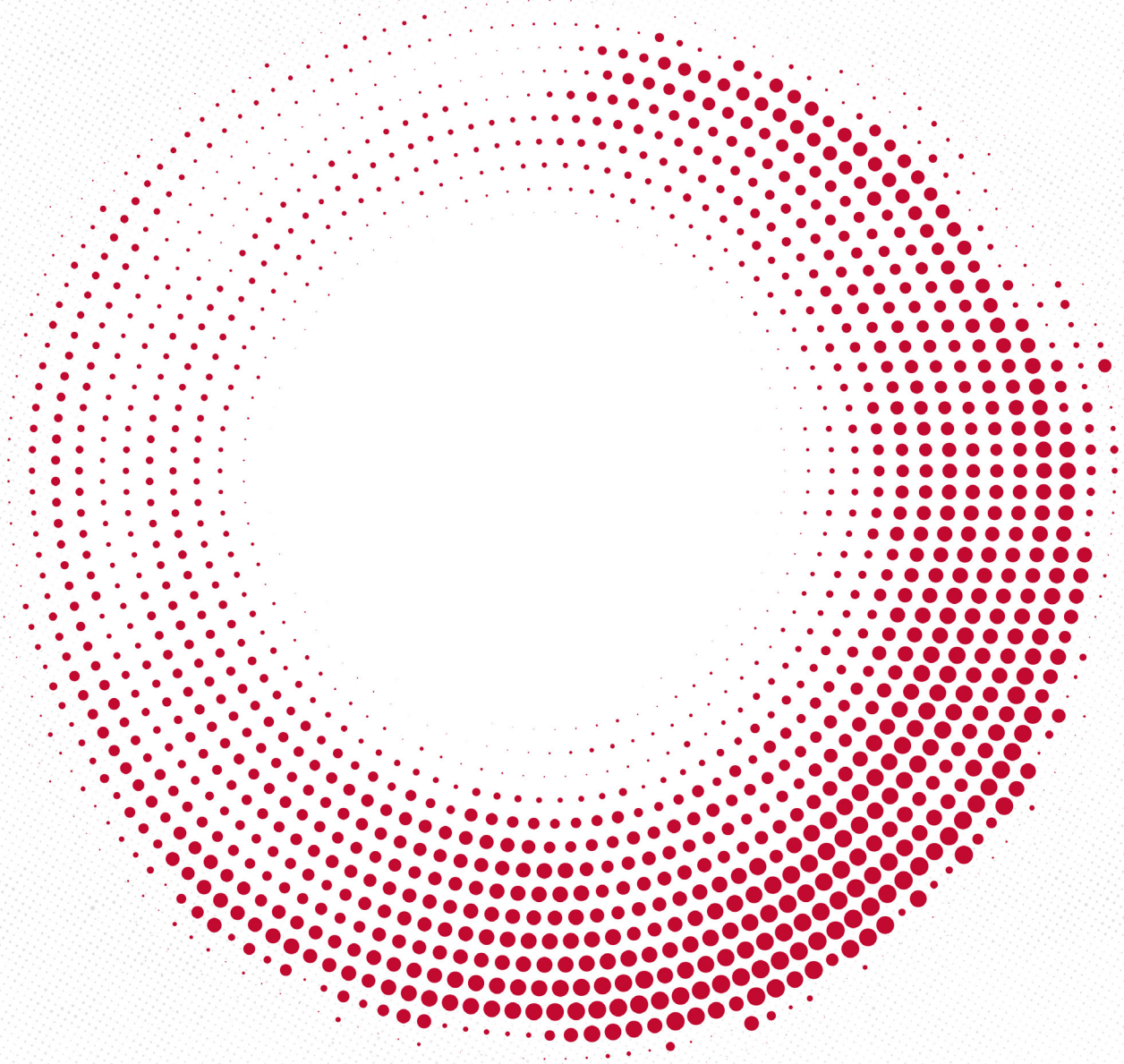
NET ZERO TRACKER

NET ZERO STOCKTAKE 2022

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

June 2022



A report by:

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Disclaimer

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Executive summary

In the last few years, interest in net zero target setting has exploded. National targets covered just 16% of global gross domestic product (GDP) as recently as mid-2019. Fast forward three years, and net zero coverage has expanded almost six-fold to encompass 91% of the global economy. Pledges at the sub-national government and corporate levels have also proliferated, overseen and encouraged by the UNFCCC's Race to Zero campaign, which now counts over 10,000 'real economy actors' under its umbrella including cities, regions, investors, universities and businesses.

As net zero targets have entered the mainstream, so too have efforts to track and govern them - in large part a response to concerns that many pledges have little substance behind them and so generate low confidence that they will be delivered. The Race to Zero, for example, has put forward a set of 'starting line' and 'leadership practice' criteria for non-state actors' net zero targets, which we draw upon in this report. Later this year, the UN Secretary-General's *High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities* will report back on how to strengthen, accelerate and operationalise the robustness of non-state pledges globally. Last month, the Asia Society Policy Institute announced the launch of a *High-Level Policy Commission on Getting Asia to Net Zero*. And at the corporate level specifically, there has been a proliferation of efforts to set standards for, and to measure, the private sector's alignment with net zero on timescales relevant to the Paris Agreement temperature goals.

At its core, the Net Zero Tracker takes stock of the scope of net zero targets globally and looks under the hood of individual targets to surface indications of target *credibility*. Of the 4,000+ entities we currently track, at least 1,180 have a net zero target of some description:

- 128 countries and self-governing territories
- 235 cities
- 115 states and regions
- 702 publicly listed companies from the Forbes Global 2000

Here we present our first comprehensive analysis of progress since our *Taking Stock* report was published 15 months ago, a period that included the 2021 UN climate summit in Glasgow where many political and business leaders made fresh carbon-cutting pledges. As then, and in line with the findings of other recently published literature on net zero, deeper analysis reveals a mixed and uncomfortable picture.

Driven by the fact that 19 members of the G20 now have net zero pledges, national government targets (including the European Union and Taiwan) represent:

- 91% of global GDP (PPP), up from 68% in *Taking Stock, 2021*
- 83% of global GHG emissions, up from 61%
- 80% of the global population, up from 52%

Overall, the transparency and integrity of existing net zero pledges are far from sufficient to ensure a timely transition to global net zero greenhouse gas emissions by mid-century. Net zero target setting momentum continues, but more net zero targets alone cannot deliver the temperature goals of the Paris Agreement; the focus needs to be on *better* targets and identifying the ones that are not credible. While we observe some increase in the robustness of commitments, especially at the national level, an alarming lack of credibility still pervades the entire landscape. This is problematic because if some of the targets disguise inaction it can create a false sense of progress.

Our Net Zero Tracker database draws on publicly available evidence of whether entities have components of a credible net zero target in place. We ask, for example, whether longer-term targets are supported with nearer-term interim goals; whether all greenhouse gas emissions are covered or, for companies, all value chain emissions; does a comprehensive plan and annual reporting mechanism exist; is clarity provided on the use of offsets – or, if an entity intends to use offsets, are any conditions stipulated? We do not however assess whether net zero targets are adequate or internally consistent - for example, whether interim targets are compatible with the eventual net zero date - or whether they are consistent with a global trajectory to the Paris Agreement targets.

At the country level, our analysis shows that the proportion of net zero targets set in domestic legislation or policy documents has increased from 10% of total greenhouse gas coverage in December 2020 to 65% in May 2022 — explained in large part by national submissions of updated long-term strategies (LTSs) to the UNFCCC. Nations with net zero targets enshrined in law have increased from seven to 16 across the same period. Only 10 countries have set target years after 2050, but they include some of the world's biggest emitters — for example, 2060 for China and 2070 for India — and so cover around 55% of all emissions by countries with net zero targets. In the run-up to this year's UN climate summit, attention turns to promises by nations to 'revisit and strengthen' their 2030 emission reduction targets and, for those that have not done so yet, to submit LTSs to 2050. As countries keep setting and strengthening commitments, the spotlight falls on those companies, regions and cities that are yet to pledge net zero or other ambitious long-term targets. Despite the number of large cities still without net zero targets (80%), momentum is building: the number with targets has doubled since December 2020, from 115 to 235.

Using the Race to Zero 'starting line' criteria as our benchmark—a minimum threshold that is necessary but by no means sufficient—we found that fewer than one-fifth of net zero targets set by national and sub-national governments currently meet minimum procedural standards. Concerningly, most national and sub-national governments still fail to clarify their intended use of offset credits and carbon dioxide removal (CDR) to meet their targets.

Target-setting momentum continues at the corporate level, which has seen the greatest focus of attention and activity since our *Taking Stock* report. More than one-third (702) of the world's largest publicly traded companies have net zero targets, up from one-fifth in December 2020. European-based companies are

outperforming other regions: 58% have net zero targets, some way ahead of companies in North America (36%) and East Asia (20%).

Considering G7 nations, the largest proportion of net zero-pledging companies is headquartered in the UK (72%), followed by France (70%), Germany (65%), Canada and Japan (41%), the US (36%) and Italy (27%). The share of Chinese companies with net zero targets is very low at only 4% (11 out of 265). Despite the UK and France 'leading' on the proportion of large companies with targets, this by no means indicates that these countries are doing better than others on quality: across companies in every region, quality net zero targets are not the norm.

Overall, we found that only around half of the companies with net zero targets have some type of interim greenhouse gas (GHG) emission reduction target. Given the scientific imperative of roughly halving global emissions by 2030 in order to give a reasonable chance of holding global warming to 1.5°C, this is unacceptably low. Moreover, about two-thirds (456 out of 702) of corporate pledges do not yet meet minimum procedural standards for target setting.

At the sectoral level, our results suggest that large and publicly visible companies with large emissions footprints are more likely to set net zero targets. For example, the fossil fuels industry has the second highest percentage of net zero targets (49%) among those industries with more than 10 companies in the Forbes 2000 list. The sectors with the third and fourth highest percentages, respectively, are also carbon-intensive: the materials industry (e.g. steel and cement) and transportation services (e.g. airlines and shipping). These companies may find it especially difficult to decarbonise their value chains entirely, and therefore need high quality targets and actions that not only look good at first sight.

It is clear that regulation will ultimately be needed to ensure near-term targets are put in place and procedural criteria satisfied across the whole global economy. Today, companies without any ambitious long-term targets look like the odd ones out. As scrutiny grows and the shadow of regulation lengthens, increasingly those companies without *credible* targets should become outliers. Indeed, a number of regulatory changes are already creating firm rules around net zero in large markets. Disclosure requirements are either currently mandatory or phasing in across the EU, the UK, and Japan, and are proposed in both the US and China.

Net zero targets are the dominant lens through which countries, states and regions, cities and companies approach decarbonisation. The big question is whether a sufficient proportion of targets acquire measures of quality and robustness quickly enough to keep the Paris Agreement 1.5°C target within reach. Thorough analysis and scrutiny provides an essential tool for holding entities setting net zero targets to account. This report shows that measures of quality are improving – but also that there is much, much further to go.

Acknowledgements

The Net Zero Tracker project is supported by the European Climate Foundation. NewClimate Institute also received support from IKEA Foundation.

We are grateful for the contributions to this report by Thomas Day, Victoria Fischdick (NewClimate Institute), Nick Hay (ECIU) and Dan Walsh (Enovate).

This analysis would not have been possible without the heroic efforts of our numerous student volunteers, mostly from the University of Oxford. Thank you Wallerand Bazin, Olivia Bisel, Amy Booth, Barasha Borthakur, Samuel Boyer, Macarena Carmona Schwartzmann, Abigail Chen, Fang Wei Chua, Judith Condor-Vidal, Robert Edge-Partington, Adriana Elera Tejada, Joshua Fearnett, Andrew Fletcher, Lyndsey Fowks, Rachel Hart, Kate Hulett, Camille Hulot, Diana Jaramillo, Kara Keenan-Wilson, Barry Lee, Agnes Liddell, Zilun Lin, Harry Linehan-Hill, Natasha Lutz , Charlotte Maddinson, Lucy Main, Ebba Mark, Hettie Moorcroft , Pippa Noble, Fergus O'Keeffe, Sze Ann Pang, Zelie Pelletier Hochart , Jocelyn Perry, Abigail Sheppard, Nayah Thu, Irene Trung, Simant Verma, Jan Vlcek, Audrey Wagner, Elisabeth Ward, Nicola Whittington and Valeska Yánez.

Abbreviations

ACS — Activity Classification System

CCRM — Climate Corporate Responsibility Monitor

CDR — Carbon Dioxide Removals

CO_2 — Carbon dioxide

ECIU — Energy & Climate Intelligence Unit

EU27 — 27 member states of the European Union

GDP PPP — Gross Domestic Product based on Purchasing Power Parity

GHG — Greenhouse gases

IPCC — Intergovernmental Panel on Climate Change

LTS — Long-Term low greenhouse gas development Strategies

LUCF — Land-use change and forestry

NDC — Nationally Determined Contribution

OECD — Organisation for Economic Co-operation and Development

RtZ — Race to Zero

SBTi — Science Based Targets initiative

TPI — Transition Pathway Initiative

UN — United Nations

UNFCCC — United Nations Framework Convention on Climate Change

WWF — World Wide Fund For Nature

1. Setting the scene and scientific underpinning

In April 2022, the Intergovernmental Panel on Climate Change (IPCC) confirmed that holding global warming to the 'guardrail' of 1.5°C requires our global economy to reach net zero carbon emissions around mid-century, just three decades from now (*IPCC, 2022*). It also confirmed that despite the vast number of entities pledging to bring their own emissions to net zero on this timescale, we are on course for global warming well above 1.5°C.

This apparent contradiction showcases the two prevailing ways of looking at the net zero goal in the real world. Science says we need net zero, and governments and companies say they are committed to delivering it. Scientists and environmental campaigners ask where the action is – a valid question because halving carbon emissions this decade is a key requirement of getting on track to 1.5°C – and few entities of any kind are committing to achieve this goal.

Interest in net zero targets, pathways and plans has exploded since mid-2019, when the handful of national targets then in existence covered 16% of global GDP (*ECIU, 2019*). In just three years, this number has risen almost six-fold, while pledges from sub-national governments and the corporate sector have also poured in. To optimists, this trend shows leaders in politics and business are responding rapidly to the scientific imperative. To sceptics, these growing numbers show leaders in full greenwash mode, adopting rhetorical commitments to 'tackle climate change' while electing not to take meaningful action during their time in office or in the boardroom.

How should we assess the value of this surge in net zero targets, while acknowledging that many entities are currently falling short? One approach is to examine how the robustness of an entity's commitment ratchets up over time. Put simply, if an entity initially sets a net zero target without giving details on how it will get there, does it follow up with a specific plan to implement? In other words, does the initial pledge turn into something more substantial? Ideally that original promise would gain status – for a country, a target would be translated into policy documents and then into law. The entity will be clear about what precisely is covered – which greenhouse gases (GHGs) and from which sources. It will set interim targets to drive near-term investment decisions, publish an annual progress report, and commit to achieving most of its progress through actually reducing emissions rather than paying for external offsets (carbon credits) or carbon removal. Tracking the extent to which robustness and near-term ambition ratchet up will be crucial in determining whether net zero is likely to be the lens through which the temperature goals of the Paris Agreement are achieved. Tracking the progress of individual entities or sectors will also provide essential information to citizens, campaigners, consumers, and investors, all of whom have the power to make entities move faster.

As individual countries and territories, regions, cities, and companies increasingly establish net zero pledges, another key metric is the extent to which greater action by one leads to greater action from

others. 'Ambition loops' form when pledges from leaders give greater confidence to—or put more pressure on—others to follow (*Dickerson et al., 2018*). For example, if many cities in a country get on the path to net zero, it makes it easier for that country to increase its own ambition. Or if investors align their portfolios to net zero, they create incentives for the companies they finance to follow suit by raising their own ambition. Following the rapid expansion of net zero pledges in recent years, to what extent can we expect a similar ambition loop dynamics to drive robustness commitments and implementation?

The Net Zero Tracker sets out to be the definitive global repository of information on the net zero pledges made by the most important entities. Our database includes:

- UNFCCC member states and selected self-governing territories
- states and regions in the 25 largest-emitting countries[1]
- every city with a population above 500,000
- all companies listed in the Forbes Global 2000 list.

The Tracker gathers information on these entities, totalling just over 4,000, from publicly available information of many kinds, including speeches by the head of state, policy documents, annual reports, and laws. We gather data using a mixture of automated website-scanning and manual searching in multiple languages (see Section 2 on methods).

In March 2021 we published our initial 'baseline' status report, Taking Stock, which we believe was the first systematic analysis of significant emitters looking at both the scope and robustness of net zero targets (*Black et al., 2021*). Among the headline findings were:

- 769 (19%) of these entities had a net zero target in place
- those pledges covered 61% of global emissions, 68% of GDP and 56% of the global population[2]
- 62% of entities had established a reporting mechanism, 60% had set interim targets, and 44% had published a plan to reach net zero[3]
- many pledges showed a troubling lack of clarity on essentials such as which greenhouse gases were included, (for businesses) which scopes of emissions were covered, and above all the degree to which entities were planning to use offsets to meet their targets.

While the Net Zero Tracker website provides a running tally, this report presents our first comprehensive analysis of progress over the year since then[4] – a year that included the UN climate summit in Glasgow, which saw political and business leaders alike making fresh pledges on cutting emissions. We have made a few small methodological changes (see Section 2 on methods); but this is the first opportunity to see the extent to which, across this important range of entities, ratchets and ambition loops are turning.

1. Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Iran, Italy, Japan, Kazakhstan, Malaysia, Mexico, Poland, Russia, Saudi Arabia, South Africa, South Korea, Spain, Taiwan, Thailand, Turkey, United Kingdom, and the United States.
2. Figures for emissions and GDP include only national pledges. The population figure also includes states and regions and cities (avoiding double counting). GDP is assessed on the Purchasing Power Parity (PPP) basis.
3. These basic criteria of robustness were derived from the 'Starting Line' criteria' of the Race to Zero, a process for encouraging all entities other than governments to set net zero targets initiated by the governments of Chile and the UK, hosts of the 2019 and 2021 UN climate summits (COP25 & COP26) under the High-Level Champions' Team.
4. Strictly speaking this is published 15 months after Taking Stock; but very little changed in the last three months, so this can be regarded as the first annual progress report.

If the number of entities setting net zero targets is increasing, one feature of the last year has been the rapidly increasing number of initiatives analysing and scrutinising them, particularly in the corporate sector. Scrutiny is extending to organisations setting standards, too, over concerns that some may be overly 'corporate-friendly'. The recent report from the Climate Corporate Responsibility Monitor (CCRM) cast doubt on the rigour of widely-used standards by showing that the net zero pledges of the 25 major multinational companies assessed would collectively reduce their value chain GHG emissions from 2019 levels by only 40% at most (*Day et al., 2022*). News of supposedly net zero tar sands producers, oil barrels and cargos of fossil gas exposed the fact that at the unabashedly greenwashing end of the scale, anyone can claim net zero with little standards or rigour.

Noting that 'tougher net zero standards and strengthened accountability' will be essential for delivering on climate targets, UN Secretary-General António Guterres established a *High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities* to scrutinise entities other than national governments. It promises to establish 'higher ambition and environmental integrity' in the net zero sphere and is expected to release its recommendations before the end of the year.

Right across the net zero landscape, from target-setting to scrutiny to standards-setting, the pace of change over the last year has been rapid. This report shows where it has been meaningful, and where the major gaps lie.

2. Summary of data and methods

This report updates and expands the data and analysis presented in *Black et al. (2021)*, which was based on the Net Zero Tracker data as of December 2020.[5] Primarily, these updates relate to the inclusion of a greater range of indicators and entities. As per the previous report, this analysis assesses the prevalence of targets and their robustness, but not implementation. The information presented in the report therefore captures the first stages of the causal chain from targets to implementation to outcomes (*Hale, 2021*).

The data are drawn from the core Net Zero Tracker database, which is a 'living' data resource updated regularly on a rolling basis. The data are freely available for download and use under a Creative Commons licence. The data collection cut-off date for this report was 1 June, 2022, but the underlying dataset on the Net Zero Tracker will continue to be updated.

2.1 Data collection

We expanded our existing database of net zero commitments 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*).

Given that the Net Zero Tracker database has already been established, for this report our data collection was primarily focused on searching for publicly available updates to the existing database. Further, most of the assumptions and decisions regarding calculation and analysis followed the process used in *Hale et al. (2022)*.

Gross domestic product (GDP, PPP in 2017 constant international dollar) and population data were taken from the World Development Indicators database (*World Bank, 2022b*). Country-level and world total GHG emissions data including land-use change and forestry (LUCF) were taken from *Climate Watch (2022)*. Data for Taiwan are taken from IMF (2022) for GDP PPP, national statistical yearbook (National Statistics of the Republic of China, 2021) for population, PRIMAP data (Gütschow et al., 2021) for GHG emissions excluding LUCF (country reported) and FAOSTAT (2022) for LULUCF emissions. Income country groups were based on the World Bank classification (*World Bank, 2022a*). A UN classification was used to group countries by geographic regions (*United Nations Statistics Division, 2022*).

Although we set out to capture in the Net Zero Tracker database all net zero targets set by states and regions, cities and companies, we may not have been totally successful due to a number of reasons,

5. A journal publication with updated data and detailed methodological description has been published as Hale et al. (2022).

including: net zero targets being communicated in languages other than English or other official UN languages; 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).

2.2 Analysis of net zero targets

The database includes all targets that use one of the following terms: carbon negative, carbon neutral(ity), climate neutral(ity), climate positive, GHG neutral(ity), net zero, zero carbon, zero emissions, 1.5°C compatible and science-based targets. This was done to account for often vaguely defined terminology, resulting in terms that equate to net zero being used interchangeably. Selection and coding of the targets was also not limited solely to CO_2 but allowed for a wider range of GHGs. In our assessment of national net zero targets, we considered the targets of individual Member States of the European Union (EU27) but excluded the EU27's collective target.

The indicators used for our assessment were informed in part by the criteria used by the UNFCCC Race to Zero campaign applied to candidate networks and initiatives (*Race to Zero, 2021*). We first assessed all net zero targets against the 'starting line' criteria, also referred to as the **'4P' criteria**, as minimum procedural steps for all sub-national and non-state actors committing to net zero (*Race to Zero, 2021*):

1. A specific net zero Pledge
2. A published Plan on how they intend to achieve their interim and long-term targets
3. Immediate action to Proceed on their commitments
4. Publishing progress reports on both their target achievements and measures undertaken annually.

The starting line criteria are the bare minimum expected from non-state actors at the start of their net zero journeys and in our opinion are the minimum that should be expected from national targets as well. Meeting all the criteria is necessary but by no means sufficient. Expectations are that, over time, all entities' net zero plans should become stronger and more concrete, as action toward net zero accelerates. We then also assessed the net zero targets against the Race to Zero 'leadership practice' criteria, which define three substantive areas where partner networks and initiatives should 'reach the current frontier of best practice' (*Race to Zero, 2021*).

Pledge

Target status: Given that the status of a target is a useful indicator of intent, we categorised targets by their location along on a continuum from non-existence to achievement. Broadly, this falls into four major stages—target has been proposed or is in discussion, target has been publicly declared, target is

included in official documentation, and target is claimed by the entity itself to have been achieved—but the exact categorisation varies across the type of entity. National targets can be found in government announcements, official policy documents (e.g. Nationally Determined Contributions), draft legislation, or existing statutes. Cities, states and regions are broadly similar but with variations depending on the entity's ability to draft its own laws. The coding of corporate entities, on the other hand, is more focused on analysing corporate documents such as sustainability reports, business strategy documents and press releases.

Net zero target timeline and interim targets: The coding of this indicator is based on what an entity communicates and does not include an assessment of whether the target is in line with global temperature goals. In this report, the Race to Zero 'Pledge' criterion requiring a net zero target year 'by 2050' is not applied to entities located or headquartered in non-OECD countries to account for their less mature economic development compared with OECD-based entities.

Emissions coverage: Assessing the coverage of the target requires a range of indicators that vary across the four types of entity. Targets may cover CO_2 only or may relate to all major greenhouse gases (CO_2, N_2O, CH_4 and F-gases). In general, nations tend to cover all sources and sinks relating to the full suite of gases, while other entities show more variation. Different entities provoke different questions relating to coverage. National targets, for example, must be scrutinised for the inclusion of international aviation and shipping emissions. In the case of companies, targets are assessed for coverage of scope 1, 2 and 3 emissions.

WHAT MINIMUM STANDARDS DO WE USE?

The minimum standards are based on the UNFCCC Race to Zero campaign's 'starting line' criteria: (1) a net zero target (we additionally expect 'by 2050' for OECD-based entities) either in law, policy document, corporate strategy or pledged at head of government level; (2) a plan for delivery; (3) an interim target; and (4) annual reporting on progress. We identify the presence or absence of these key procedural elements.

(1) PLEDGE

Leadership level pledge to reach net zero. (for OECD-based entities only, we expect 'by 2050' at the latest)

(2) PLAN

Explain what steps will be taken toward achieving net zero, especially in the near term. Set an interim target to achieve over this decade

(3) PROCEED

Take immediate action toward achieving net zero, consistent with delivering interim targets specified

(4) PUBLISH

Commit to report progress at least annually, including via platforms that feed into the UNFCCC Global Climate Action Portal

Offsetting: The nature of net zero means that many targets include an explicit or implicit reference to emission offsets; that is, avoided emissions, reductions or removals outside of an actor's activities. Coding of offset commitments categorises these into internal (i.e., removal within territorial or scope 1 and 2 boundaries) and external projects, and captures any conditions that might be attached.

Plan and Proceed

Publication of net zero implementation plan: During the coding process, we record whether the entity has published a plan for reaching the target. Clear plans with concrete operational ramifications are critical to the achievement of net zero. However, due to our model of representing only publicly available data, assessment of whether these plans are realistic and/or are in in line with international obligations is not carried out.

Interim targets: In addition, our process considers whether entities have included clear interim targets as part of the overarching final target.

Publish

Reporting mechanisms: Targets are further measured against whether an entity commits to reporting consistent and public information on its progress.

Fulfilment of the UNFCCC Race to Zero minimum criteria

Finally, we assessed how many entities with net zero targets would meet all of UNFCCC Race to Zero campaign's 4P minimum procedural 'starting line' criteria and two of the 'leadership practice' criteria (emission scope and the use of sinks and credits).[6] While the Race to Zero campaign formally only applies the 'starting line' criteria to sub-national and non-state actors, we also apply them to countries for comparison. We did not consider the criterion to reach '(net) zero GHGs as soon as possible, and by mid-century at the latest' for non-OECD countries to account for fairness and equity considerations. The tracking of wider empowerment and equity considerations also currently remains outside the scope of the Net Zero Tracker. The Race to Zero criteria are reviewed and updated annually, with the next iteration (criteria 3.0) to be announced in June 2022.

In many cases entities with net zero targets have not specified some of the criteria mentioned above. For example, many national targets do not specify whether they cover CO_2 only or all GHG emissions; many entities are not explicit about reliance on carbon removals. Our analysis captures this lack of clarity; if the 'ambition loop' model holds, clarity should improve over time.

6 This analysis is not a direct test of compliance with the Race to Zero criteria. Race to Zero is an umbrella campaign that brings together a diverse array of initiatives and networks that seek to mobilise climate action from cities, businesses, investors, states and regions, and other non-state actors. While the Race to Zero sets criteria for partner initiatives and approves them via an independent Expert Peer Review Group, it is the partner initiatives that are responsible for assessing the robustness of individual entities' net zero targets. To do this they operationalise the general Race to Zero criteria in more specific ways. For example, a partner initiative may be in the process of developing a target with an entity, but this information is not yet publicly available, or scope may be defined in a particular way for a given sector. Please refer to the Race to Zero partner initiative for the precise requirements they ask from their member entities.

3. Global landscape of net zero targets

Key takeaways

- A large majority of national governments have set their own net zero targets. This in turn indicates that these countries have at least begun to commit to the Paris Agreement's long-term goal, not only in abstract global terms but also via national target-setting.
- The long-term net zero goal has also been shared widely across sub-national governments and companies. However, our data suggests that net zero target-setting by sub-national governments and companies has not yet spread widely beyond high-income countries in North America, Europe and Asia.

We observe an overall increase in net zero targets in the Net Zero Tracker database since December 2020, as reported in the first *Taking Stock* report (*Black et al., 2021*). The increase is both due to new net zero target announcements over the course of last year and the enhanced data collection:

- 128 countries and self-governing territories (hereinafter abbreviated to 'countries')[7], up from 124[8]
- 235 cities, up from 115
- 115 states and regions, up from 73
- 702 companies from the Forbes 2000, up from 417.

In total, 1,181 entities (including the EU) of 4,088 entities in the Net Zero Tracker database have a net zero target. The database indicates that the net zero targets by governments (including the EU and Taiwan) represent at least 83% of global GHG emissions (up from 61% in December 2020)[9], 91% of global GDP (68%) and 80% of global population (52%) (see Figure 1).[10]

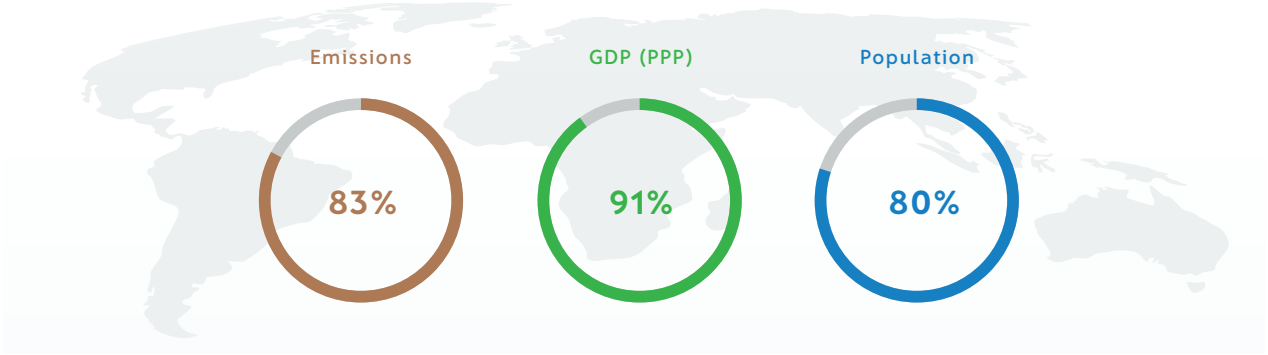

Figure 1: Percentage of greenhouse gas emissions (including land-use change and forestry), GDP (based on purchasing power parity, in 2017 constant international dollar), and population covered by net zero pledges of countries (status of these pledges includes proposed, in discussion, in policy document, in law and achieved). All figures based on 2019 data.

7. Excluding the European Union and Taiwan. Taiwan's national net zero target is currently not presented in the database.
8. The 124 countries reported in *Taking Stock* with net zero targets cannot be directly compared with this report due to different methodological approaches. In *Taking Stock*, we included at least 16 countries as having 'Achieved' a net zero target—even in the absence of an official announcement—if their latest NDC submission listed (a) their territory-wide emissions as a net carbon sink, and (b) an intent to maintain this emissions status. In this report we only count countries with declared net zero targets, irrespective of whether they claim in their NDC to be a net carbon sink or similar.
9. Note that the coverage of global GHG emissions estimated by organisations such as the Climate Action Tracker might be higher. Other organisations, for instance, may use different GHG emission data sources and/or treat countries with targets considered 'proposed / in discussion' differently.
10. All 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.

NET ZERO: A SHORT HISTORY

2009

Myles Allen, Dave Frame and other scientists publish a paper highlighting that the eventual extent of global warming is largely determined by cumulative emissions of CO_2

Susan Solomon and other scientists show that temperatures do not decline for many centuries even after a complete cessation of CO_2 emissions

2010

2011

Damon Matthews and other scientists propose that 'cumulative carbon emissions represent an alternative framework that is applicable both as a tool for climate mitigation and for the assessment of potential climate impacts'

2012

The IPCC Fifth Assessment Report states that limiting global temperature change means limiting the cumulative (or stock) of CO_2 emissions in the atmosphere. To eventually stop global warming, net anthropogenic additions of CO_2 into the atmosphere have to reach zero

2013

2014

Article 4.1 of the Paris Agreement stipulates 'Parties aim to reach global peaking of greenhouse gas emissions as soon as possible... so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century...'

President of the World Bank, Jim Yong Kim, says that a proposed global climate agreement should 'provide a clear pathway to zero net emissions before 2100'

2015

2016

Sweden becomes the first nation to enshrine a mid-century net zero target (2045) in law

2017

The IPCC Special Report on 1.5°C concludes that 'limiting temperature rise to around 1.5°C and preventing the worst impacts of climate change implies reaching net zero emissions of CO_2 by mid-century along with deep reductions in non-CO_2 emissions'

2018

The UK becomes the first G7 economy to legislate for net zero by 2050

2019

Net zero pledges cover almost one-sixth (16%) of the global economy

2020

China, the world's largest greenhouse gas emitter, commits to carbon neutrality 'before 2060' at the 75th UN General Assembly

Net zero pledges cover over two-thirds (68%) of the global economy

2021

Net zero pledges cover over nine-tenths (91%) of the global economy

2022

The end of the beginning for net zero. The next chapter? From universal to universally robust — a target is only as good as the plans underpinning it

2050

2060

The majority of sub-national and corporate net zero targets are from East Asia, Europe and North America (Figure 2, left panel). The majority of the sub-national net zero targets are in high income countries (more than 80% for states and regions, more than 60% for cities); the significant share in East Asia is partly due to 40 prefectural net zero targets in Japan. For the 1,177 cities in the database, about half in OECD countries (160 out of 322) have net zero targets, while fewer than 10% (75 out of 855) of cities in non-OECD countries were found to have net zero targets.

Among the 702 Forbes 2000-listed companies with net zero targets, the largest number of companies are headquartered in the US (210), followed by Japan (89), the UK (57), France (40) and Germany (33) (Annex, Table A-1). The presence of companies headquartered in Europe is prominent (Figure 2, right panel): 58% of companies headquartered in Europe have net zero targets, compared with 36% for North American companies and 20% for East Asian companies; see Figure A-1 in Annex II for results on individual G7 members. The share of Chinese companies with net zero targets is very low at only 4% (11 out of 265), but this low number may be due to methodology limitations (see Section 3). It is also worth noting that we did not find any long-term emission reduction targets for more than half of Forbes 2000-listed companies.

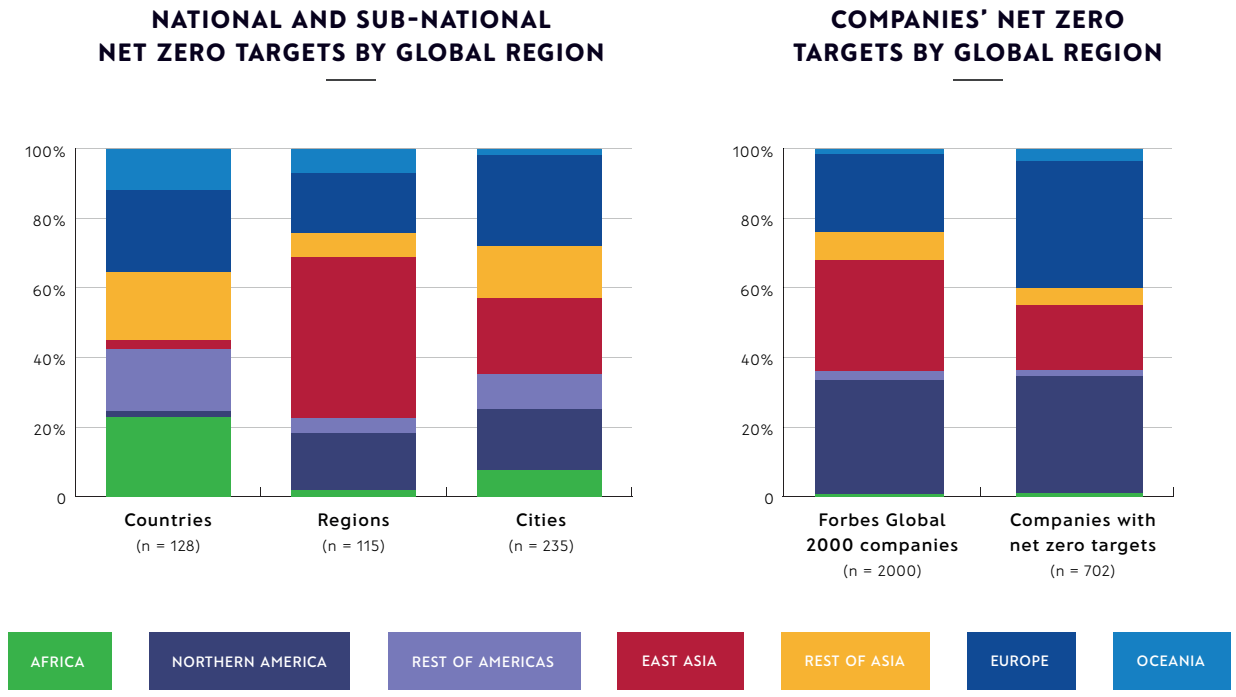

Figure 2: Breakdown of net zero targets by UN region classification for national and sub-national governments (left panel) and for companies (right panel). For companies, the breakdown of all Forbes 2000-listed companies by their headquarters location is also presented for comparison.

In the following sections, we evaluate the status and trends in net zero target setting by national and sub-national governments (Section 4) and corporates (Section 5.1). For the latter, we further summarise recently published literature on corporate long-term target setting and compare existing methodologies (Section 6). While an analysis of individual countries is outside the scope of this report, results for individual G7 members are provided in Annex II as supplementary materials: Figures A-1, A-2 and A-3.

4. Details of net zero targets by governments

Key takeaways

- For national governments, the greenhouse gas emissions share covered by countries with net zero targets enshrined in domestic legislation or policy documents has increased significantly from about 10% in December 2020 to about 65% in June 2022.
- Just under half of national and sub-national net zero targets in terms of GHGs and population explicitly cover both CO2 and other greenhouse gases such as methane. National and sub-national governments should further aim to cover all emissions of their respective jurisdictions while transparently communicating any omissions of specific gases or sectors.
- Most national and sub-national governments fail to transparently clarify their intended use of offset credits and carbon dioxide removal to meet their net zero targets, both in terms of total amounts and conditions applied. Governments should seize the opportunity to further clarify both aspects when enshrining their targets in law or policy documents.
- Less than one-fifth of national and sub-national governments currently meet minimum procedural 'starting line' criteria for net zero target setting. When considering additional 'leadership practice' criteria, this statistic further decreases to below 5% of national and sub-national governments. Governments appear to have missed an opportunity over the last months to ensure that their net zero pledges address necessary initial conditions for robust net zero target setting.

4.1 Target

4.1.1 Target year

Of the 128 countries with a net zero target, 104 commit to achieving net zero target between 2041 and 2050 (Figure 3; left panel). A few countries have committed to an earlier year, such as Finland (2035). Only 10 countries set target years after 2050, but they include some of the world's largest emitters (e.g. 2060 for China and 2070 for India) and thus cover around 55% of all emissions by countries committing to net zero targets.

Similarly, most cities with a net zero target commit to a target year between 2041 and 2050 (187 out of 235), representing close to 90% of the population under city-level targets. Sixteen cities in Europe commit to net zero as early as 2025 to 2030, such as Oslo (zero emissions by 2030) and Copenhagen (carbon neutral by 2025). A recent initiative by the European Commission launched in May 2022—not yet included in the Net Zero Tracker—has identified 100 European cities receiving special support to become climate neutral by 2030 (*European Commission, 2022*).

For states and regions, a higher share (based on population) with net zero targets for 2040 or earlier was observed than for cities and countries. This is largely due to the carbon neutrality targets of three Indian states; West Bengal commits to a carbon neutrality target for 2030, while Uttarakhand and Himachal Pradesh have 2020 carbon neutrality targets without any indication that they have been achieved.

4.1.2 Status of net zero targets

For national governments, the GHG emissions share of countries with net zero targets enshrined in domestic legislation or policy documents has increased significantly from about 10% in December 2020 to about 65% in June 2022. This increase is due in part to the submissions of updated long-term low greenhouse gas development strategies (LTSs) to the UNFCCC in 2021 (Figure 3; right panel). Net zero targets in law have increased from seven in December 2020 to 16 in June 2022.

The share of cities' net zero targets that are enshrined in domestic legislation or policy documents is lower than that for states and regions. This finding might partially be explained by the fact that many cities proposed or pledged a net zero target through the partner networks of the UNFCCC Race to Zero campaign (nearly two-thirds of the 235 cities are members) and they may have not yet passed relevant ordinances through their political processes. It also likely reflects the fact that in many jurisdictions, cities lack the ability to make binding rules equivalent to or akin to laws.

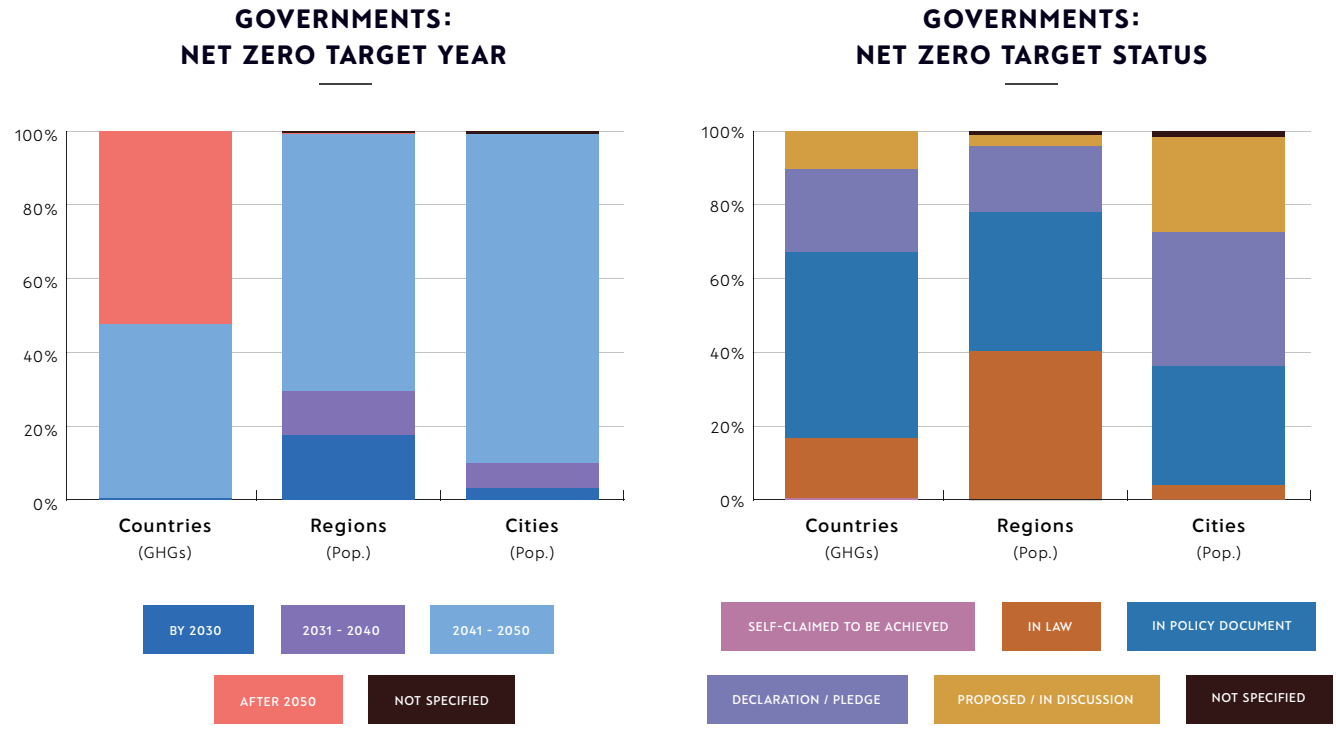

Figure 3: Target year of net zero targets (left panel) and status of net zero targets (right panel) across 128 countries, 235 cities, and 115 states and regions worldwide as of 1 June, 2022.

4.1.3 Coverage of greenhouse gases

Below 50% of national and sub-national net zero targets, in terms of GHGs and population covered, explicitly include both CO_2 and other GHGs such as methane (Figure 4). Many sub-national governments—representing almost 50% of the population covered by cities and 40% covered by states and regions—do not currently specify which emissions they include under their net zero pledges.

The exclusion of specific emission sources can be problematic both for reasons of transparency and mitigation ambition, which can undermine the meaning of the net zero terminology. For this reason, governments should generally aim to cover all emissions of their respective jurisdictions while transparently communicating if they leave certain emissions out entirely.

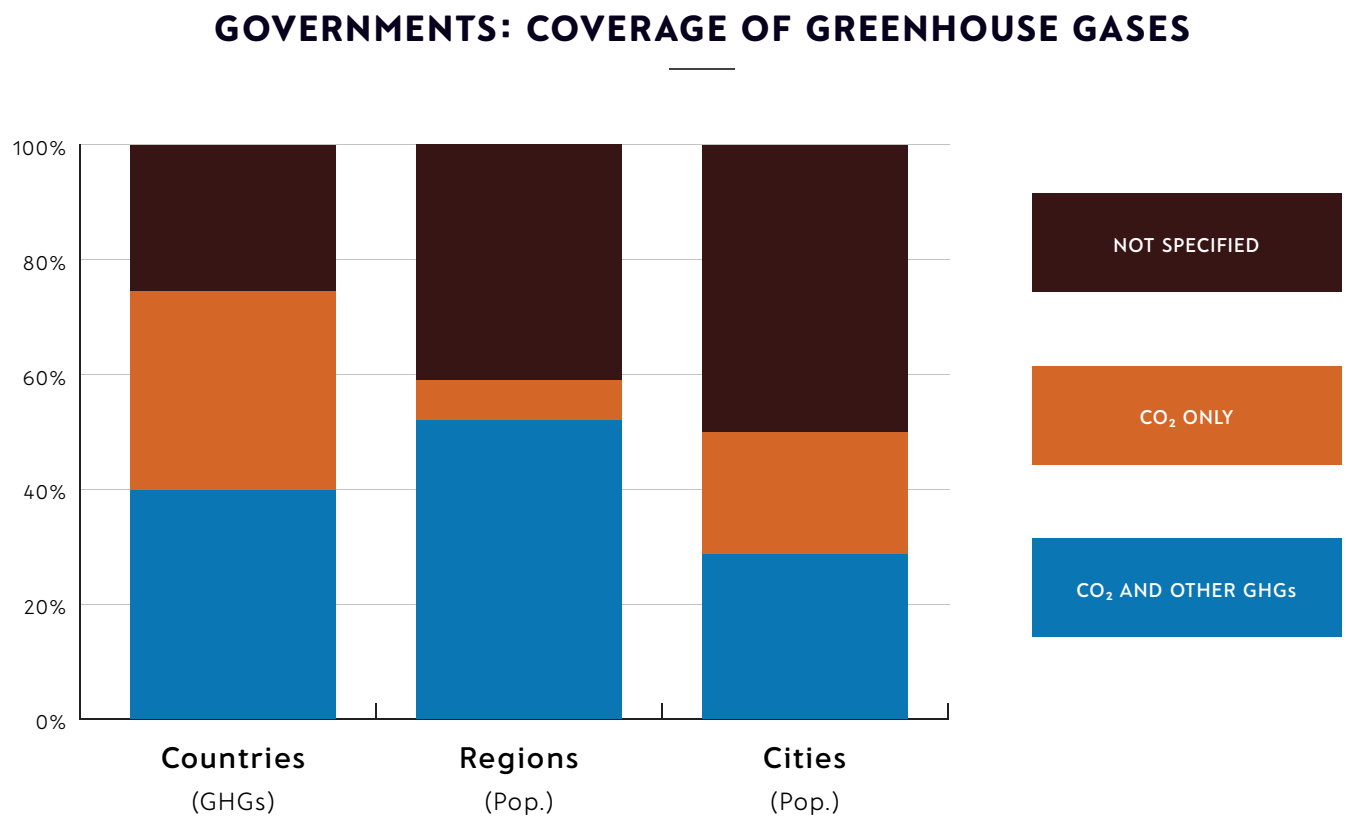

Figure 4: Coverage of greenhouse gases (GHG) by net zero targets across 128 countries, 235 cities, and 115 states and regions worldwide as of 1 June, 2022.

4.1.4 Consideration of offset credits and carbon dioxide removals

More than 75% of national and sub-national governments do not transparently specify whether they intend to use offset credits to meet their net zero targets (Figure 5; left panel). Only a few governments explicitly aim to use offset credits outside of their jurisdiction to meet their net zero targets or reserve the right to do so: 17 out of 128 countries; 15 out of 115 states and regions; 39 out of 235 cities. At the same time, many governments currently do not communicate whether and to what extent they will rely on carbon dioxide removals (CDR) within their own jurisdiction to meet their net zero targets (53 out of 128 countries; 75 out of 115 states and regions; 184 out of 235 cities). Among countries, more than half intend to use CDR, representing around 60% of all emissions covered by countries with net zero targets (Figure 5; right panel). Many countries currently identified as not communicating their intentions on CDR have a net zero target currently proposed or under discussion (21 out of 51 countries), so not yet enshrined in a policy document or law.

Governments should communicate whether and to what extent they intend to rely on offset credits outside of their jurisdiction and CDR within their jurisdiction to meet their net zero targets, to increase target transparency and robustness (*Climate Action Tracker, 2021a; Rogelj, Geden, et al., 2021; Smith, 2021*). The data suggest that when a government sets a target in law or in a formal policy document, it clarifies its intentions in this area, which is another reason to encourage this strengthening. We note that the Net Zero Tracker currently only tracks whether a country intends to rely on offset credits or CDR to meet its target. However, it does not capture to what extent governments plan to use them.

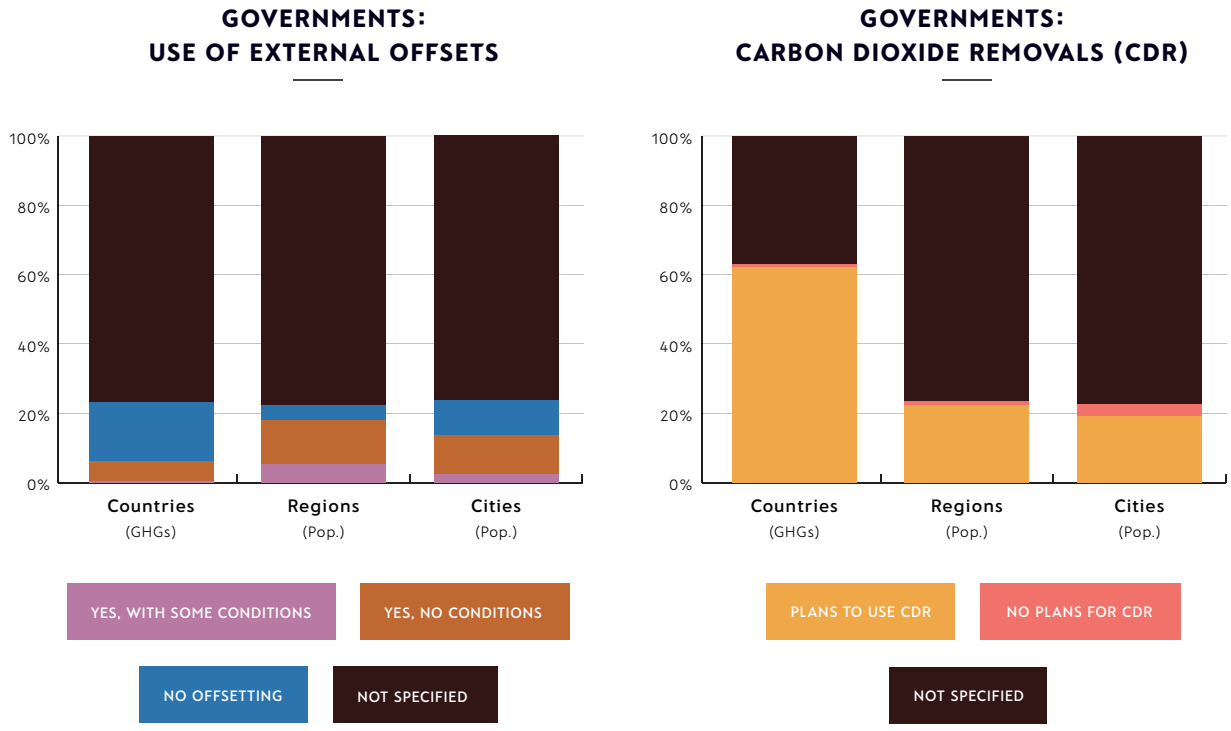

Figure 5: Use of offset credits (left panel) and carbon dioxide removals (right panel) in the net zero target year across 128 countries, 235 cities, and 115 states and regions worldwide as of 1 June, 2022.

4.2 Governance: Plan, Proceed and Publish

Roughly half of the cities with net zero targets in terms of the population covered have neither set interim targets (Figure 6) nor have published planning documents to achieve their long-term targets (Figure 7). This finding remains similar to those in our previous assessments (*Black et al., 2021; Hale et al., 2022*). Almost all national governments setting interim targets do so through their Nationally Determined Contributions (NDCs), while more than 60% (in terms of GHG emissions) have published specific planning documents on how to achieve their net zero targets. States and regions fare better on the publication of plans than on interim targets, but this is partly due to a few states and regions with large populations that have not set interim targets (see Figure 7 on the next page). A comprehensive plan provides a net zero target with credibility and helps to ensure timely implementation of deep decarbonisation.

Credible and ambitious interim targets are of utmost importance for reasons of robust net zero delivery and to limit cumulative emissions. Interim targets give confidence that an entity is on a path towards net zero emissions (*Climate Action Tracker, 2021a; Rogelj, Geden, et al., 2021; Smith, 2021*). Interim targets set in 5-to-10-year intervals towards the target year allow for transparent and independent evaluation of action. Lower emissions in the near-term will also lead to less warming for any given net zero year, given global temperature rise is driven primarily by cumulative CO_2 emissions over time (*Rogelj, Smith, et al., 2021*).

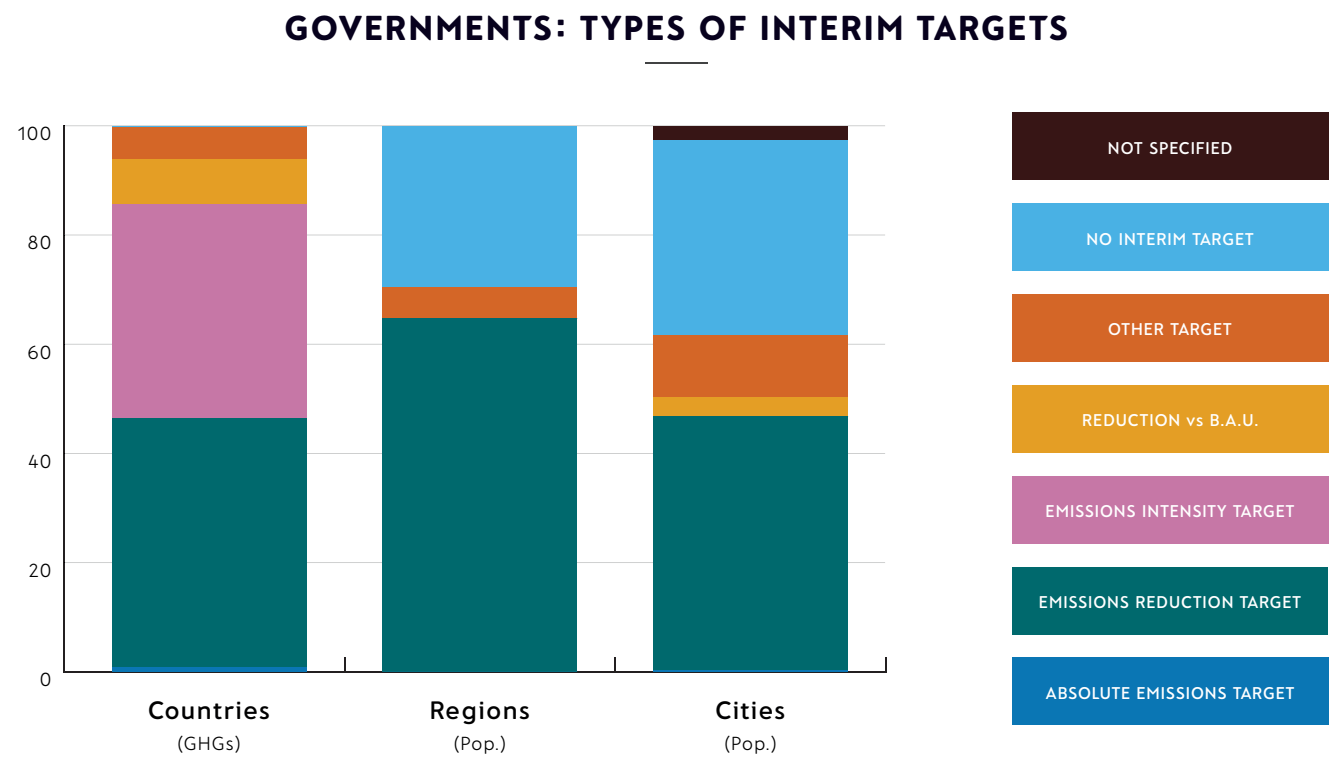

Figure 6: Existing interim GHG emissions reduction targets from net zero targets across 128 countries, 235 cities, and 115 states and regions worldwide as of 1 June, 2022.

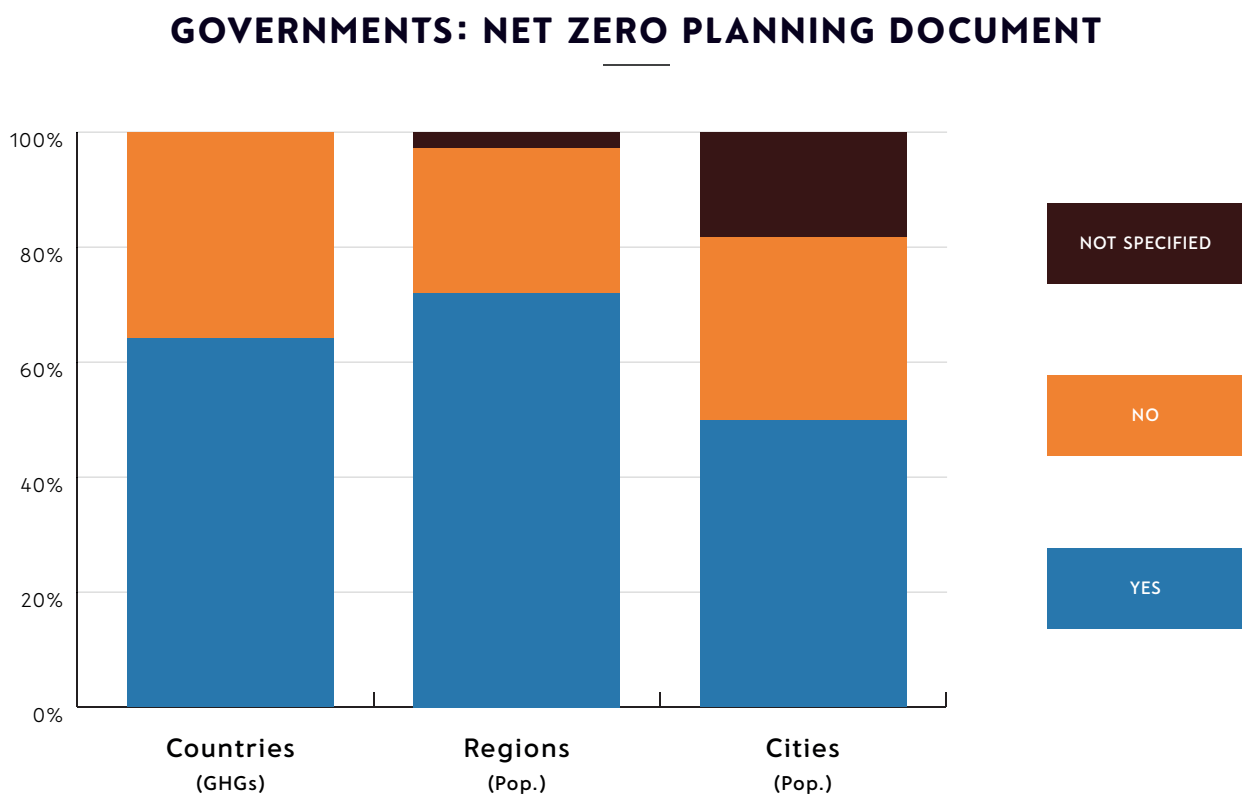

Figure 7: Planning documents underpinning net zero targets across 128 countries, 235 cities, and 115 states and regions worldwide as of 1 June, 2022.

All countries with net zero targets have some form of regular progress reporting, which is partly due to the requirement under the UNFCCC process to submit national GHG inventories and Biennial Reports or Biennial Update Reports (see Figure A-4 in Annex II). For subnational governments, states and regions perform significantly better than cities (see Figure A-4 in Annex II). These trends remain unchanged from our previous assessments (*Black et al., 2021; Hale et al., 2022*).

4.3. Comparing governments' net zero pledges with Race to Zero's 'starting line' and 'leadership criteria'

Less than one-fifth of national and sub-national governments currently meet the minimum procedural 'starting line' criteria for net zero target setting (see Table 1). National and sub-national governments have not put sufficient effort in over the last months to make their net zero targets more robust (see *Black et al., 2021* for comparision). The overall picture looks even grimmer when further considering two of the Race to Zero's 'leadership practices', namely that pledges (1) cover all territorial emissions and (2) prioritise the entity's own emission reductions while using carbon sinks and credits only as a last resort under the highest sustainability, performance, transparency, and integrity criteria.

Overall, we currently identify less than 5% of all national and sub-national governments that meet both 'starting line' and 'leadership practice' criteria.

	Taking Stock Report March 2021 (Data collection cut-off: 12 December, 2020)		**Net Zero Stocktake 2022** June 2022 (Data collection cut-off: 1 June, 2022)	
			Note: The condition to commit to '(net) zero GHGs as soon as possible, and by mid-century at the latest' is not applied on non-OECD entities to account for fairness and equity considerations.	
	Starting line (meeting all 4Ps) with 2050 criteria	**Starting line** and **leadership practices** with 2050 criteria	**Starting line** (meeting all 4Ps) with adjusted 2050 criteria	**Starting line** and **leadership practices** with adjusted 2050 criteria
Countries (number)	**12%** (15 of 124)	**4%** (5 of 124)	**17%** (**22** of 128)	**5%** (**7** of 128)
Regions (number)	**19%** (14 of 73)	**5%** (4 of 73)	**13%** (**15** of 115)	**3%** (**3** of 115)
Cities (number)	**5%** (8 of 155)	**3%** (4 of 155)	**17%** (**40** of 235)	**2%** (**5** of 235)

Table 1: Comparison of net zero pledges by national and sub-national governments with the Race to Zero campaign's 'starting line' and 'leadership practice' criteria as of 1 June, 2022, and comparison with previous findings by *Black et al. (2021)*

5. Details of net zero targets by companies

Key takeaways

- A large portion of Forbes 2000 companies with sizeable emissions footprints, such as fossil fuel companies, have set net zero targets. This likely reflects the societal pressure on these industries to align with long-term emissions goals, and perhaps represents symbolic behaviour—or even flat-out greenwashing—rather than corporate climate leadership.
- About half of the 700+ company net zero targets are embedded in corporate strategy documents or annual reports, while most other companies have only announced—in some cases have just declared a vague intention to set—net zero targets. This provides an opening for companies to better specify their targets in the near future, to ensure both transparency and integrity.
- Nearly 40% of all Forbes 2000 companies with net zero targets intend to use offsets, and close to 60% for those companies with targets for 2030 or earlier. The integrity of such offsetting remains contentious relating to problems such as additionality, permanence, avoidance of double counting, leakage, and the accuracy of quantified impacts.
- Only one-third of all corporates pledging net zero currently meet the minimum procedural 'starting line' criteria; less than 5% meet the additional 'leadership practice' criteria. The vast majority of corporates have so far not managed to meet necessary initial conditions for robust net zero target setting.

The Net Zero Tracker contains data on net zero targets of 702 out of the Forbes 2000 companies as of 1 June, 2022. In this report, we present our findings using the share of the total number of companies with net zero targets. Therefore, the results presented here are not directly comparable to those presented in the previous analyses using the share of annual sales of companies with net zero targets (Black et al., 2021; Hale et al., 2022).

5.1 Target

We grouped the 702 companies with net zero targets based on the CDP Activity Classification System (ACS), which identifies 13 industries (*CDP, 2022*); see Table A-3 for more details per industry group. We assessed industry groups with more than 10 companies in the Forbes 2000 list. The largest number of companies was found in the Services industry (253), followed by 80 in the Materials industry, 73 in the Manufacturing industry and 56 in the Infrastructure industry (including electric utilities). These industries also had the largest number of companies in the Forbes 2000 list overall.

Our results suggest that large and publicly visible companies with large emission footprints are more likely to set net zero targets. The Fossil Fuels industry had the second highest percentage of net zero targets (49%) among those industries with more than 10 companies in the Forbes 2000 list (Figure 8). The sectors with the third and fourth highest percentages, respectively, are also GHG-intensive: the Materials industry (e.g. steel, chemicals and cement) and Transportation Services (e.g. airlines and shipping).

While an in-depth analysis on the drivers of corporate net zero target setting and the quality of these targets remains outside the scope of this study, recent literature suggest that these targets are often only symbolic in nature — at worst, flat-out greenwashing — rather than signs of genuine corporate climate leadership (*Bjørn et al., 2022; Day et al., 2022; Li et al., 2022*). Yet even if the bulk of these targets are not being set in good faith, societal expectations are being created and accountability cycles generated. As scrutiny by civil society, researchers, and policy makers grows ever louder, gone are the days when misleading net zero targets remain unchallenged.

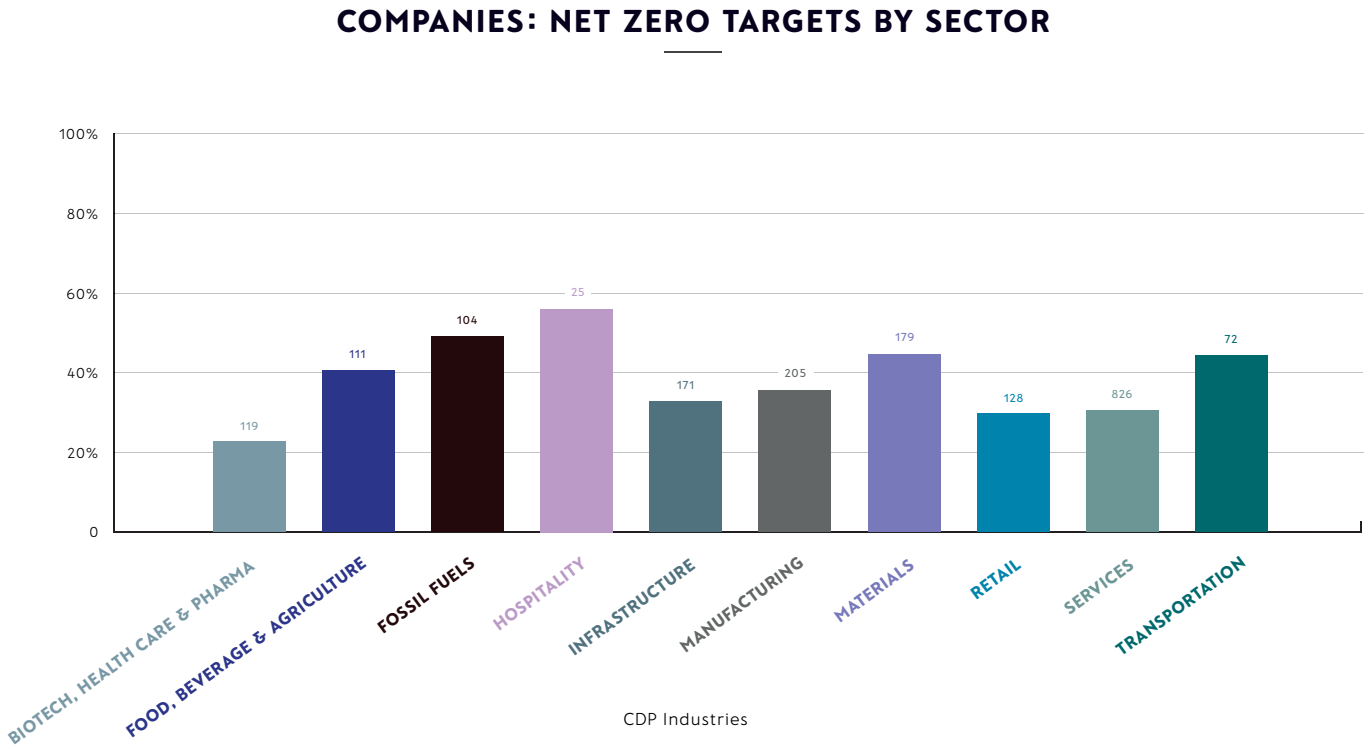

Figure 8: Percentage of Forbes 2000 companies with net zero targets (n=702) per CDP-ACS industry group. The industry groups with more than 10 companies in the Forbes 2000 list are shown.

5.1.1 Status of net zero targets

About half of the 700+ targets are embedded in the companies' corporate strategy documents or annual reports, while most other companies have only announced—in some cases have only declared their intention to set—net zero targets (Figure 9). For the latter group, more than 200 companies announced their net zero targets in 2021. Some of them may have incorporated those targets in their annual sustainability reports since then; however, we did not include any documents published after May 2022 in our analysis.

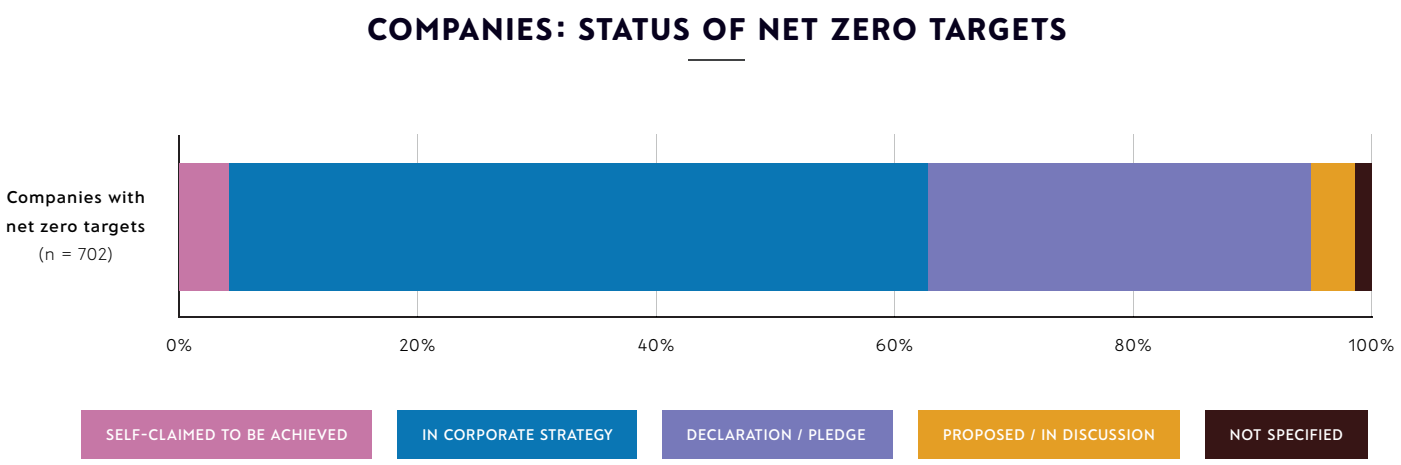

Figure 9: Status of net zero targets across 702 Forbes Global 2000 companies as of 1 June, 2022.

5.1.2 Target year

Around one-third of all companies committing to net zero aim for 2040 or earlier (see Figure 10). Around 20% aim to achieve net zero before or by 2030; companies that claim to have net zero emissions today are included in this group (Figure 10). Companies with net zero targets by 2040 or earlier are not necessarily aiming to reduce their own value chain emissions faster than others—if at all—given they may be expecting to use a substantial number of offset credits obtained outside their value chain (see next section; Figure 11).

Some companies make self-reported claims to have achieved net zero emissions already, mostly relying on contentious offsetting practices without necessarily decarbonising their business operations. Twenty-eight companies claim to have achieved net zero, but 23 explicitly rely on offsetting and the offsetting practice of the remaining five could not be identified by us. None of these claims has been externally validated to date.

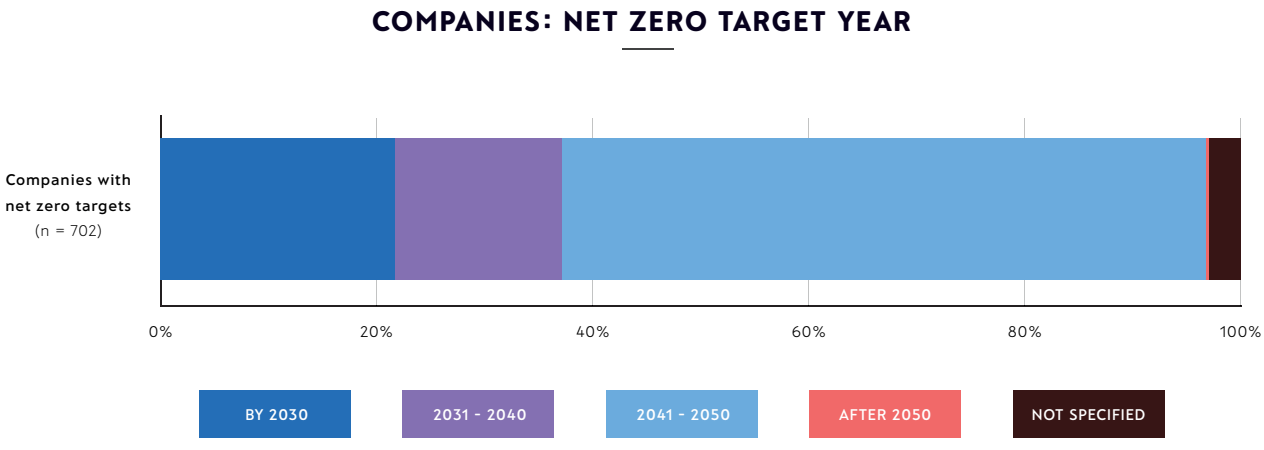

Figure 10: Target year of net zero targets across 702 Forbes Global 2000 companies as of 1 June, 2022.

5.1.3 Consideration of offset credits and carbon dioxide removals

Nearly 40% of the companies intend to use offsets to achieve net zero, with less than 2% explicitly ruling out their use. That leaves close to 60% that have not specified whether or not they plan to rely on offsetting (Figure 11; left panel). Most of the latter do not specify quality conditions under which any offsets would be used. The practice of using offset credits to compensate or neutralise an entity's own emissions—especially if committing to no conditions on quality—is highly problematic considering questions over the integrity of such offset claims relating to additionality, permanence, avoidance of double counting, leakage, and the accuracy of quantified impacts (see Section 4.2 in: *Day et al., 2022*). Credits from carbon removals have limited technical potential and should only be used by societies to neutralise emissions that cannot feasibly be abated.

The percentage of companies that explicitly consider the use of offsets and removals is considerably higher for companies targeting net zero by 2030 (57% of 151 companies) than companies with later target dates (45% of 109 companies for 2030–2040 and 35% of 419 companies for 2040–2050) (Figure 11; right panel). These findings indicate that companies setting net zero targets for earlier dates may plan to meet their goals by relying on offsetting practices rather than making effective and deep emission cuts.

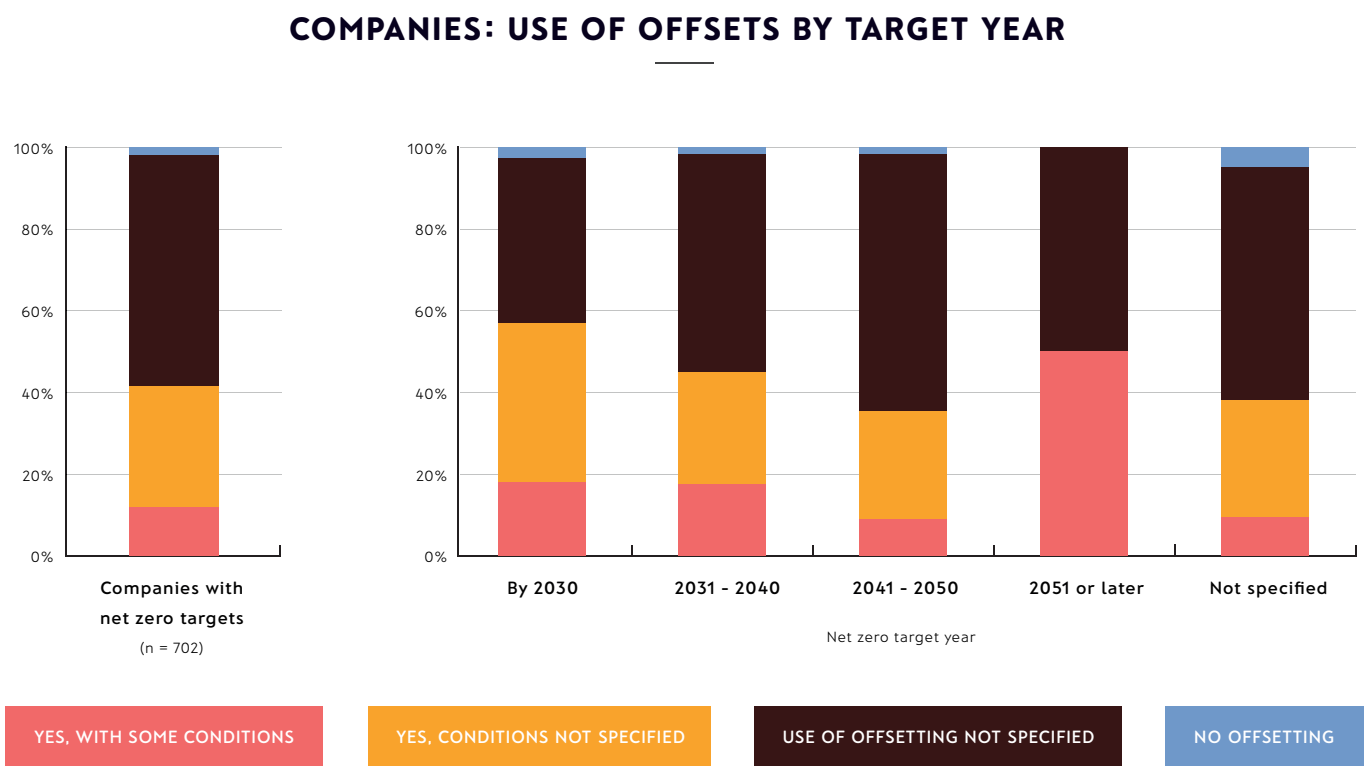

Figure 11: Use of offset credits across 702 Forbes Global 2000 companies as of 1 June, 2022 (left panel) and according to the net zero target year (right panel).

5.1.4 Coverage of emission scopes (scope 1, scope 2 and scope 3)

About 80% of the companies with net zero targets clarify their emission coverage, but only a few explicitly cover all emission scopes. Virtually all companies that report emission scope coverage in their published documents claim that their net zero targets cover full scope 1 and 2 emissions (Figure 12). For scope 3 emissions, by contrast, we identify just over a third (38%) of the companies that include all scope 3 emissions. The other 60% of the companies' targets either only partially cover or do not cover any of their scope 3 emissions.

It is important to note that inventories of self-reported scope 3 emissions are not necessarily validated by third parties. Underreporting of scope 3 emissions could be significant, especially in meat and dairy companies for which land use-related emissions account for a large majority of total value chain emissions (*GRAIN and IATP, 2018; Sharma, 2021*).

Company net zero and carbon neutrality pledges should generally and explicitly cover all emissions scopes to increase transparency, maximise impact and avoid misleading communication (*SBTi, 2021; Section 2.1 in Day et al., 2022*).

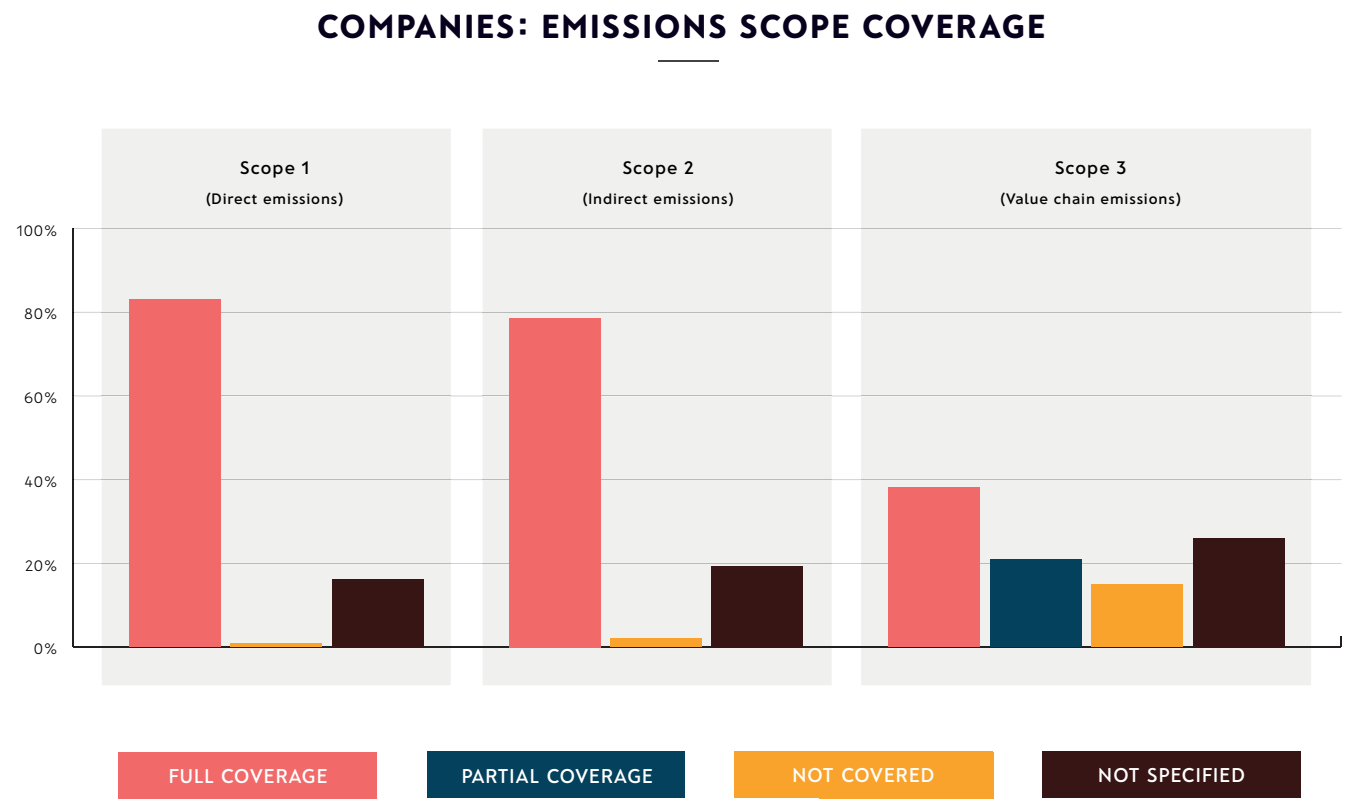

Figure 12: Reporting on emissions scope coverage by net zero targets across 702 Forbes Global 2000 companies as of 1 June, 2022.

5.2 Governance: Plan, Proceed and Publish

Only around half of the companies with net zero targets have any type of interim GHG emission reduction target, while about 20% instead have an interim non-GHG target such as procuring 100% renewable electricity by 2030 (Figure 13; left panel). Around 25% of the companies with net zero targets do not have any type of interim target. The existence of interim targets in the short- and mid-term is crucial to the integrity of net zero targets (see Section 2.3 in NewClimate Institute, 2022). Interim targets, if representing ambitious emission reduction commitments by 2025 or 2030, require companies to implement immediate action and provide accountability. Net zero targets that are not substantiated by ambitious interim targets have the potential to be misleading and to allow the entity concerned to avoid accountability.

The percentage of companies with net zero targets that have published implementation plans (close to 60%, Figure 13; right panel) is slightly lower than the percentage of companies annually reporting progress in emission reduction actions (66%; Figure A-4 in Annex II). This finding may partially be explained by the fact that many companies have announced their net zero targets in the last several months and have not yet published their net zero implementation plans.

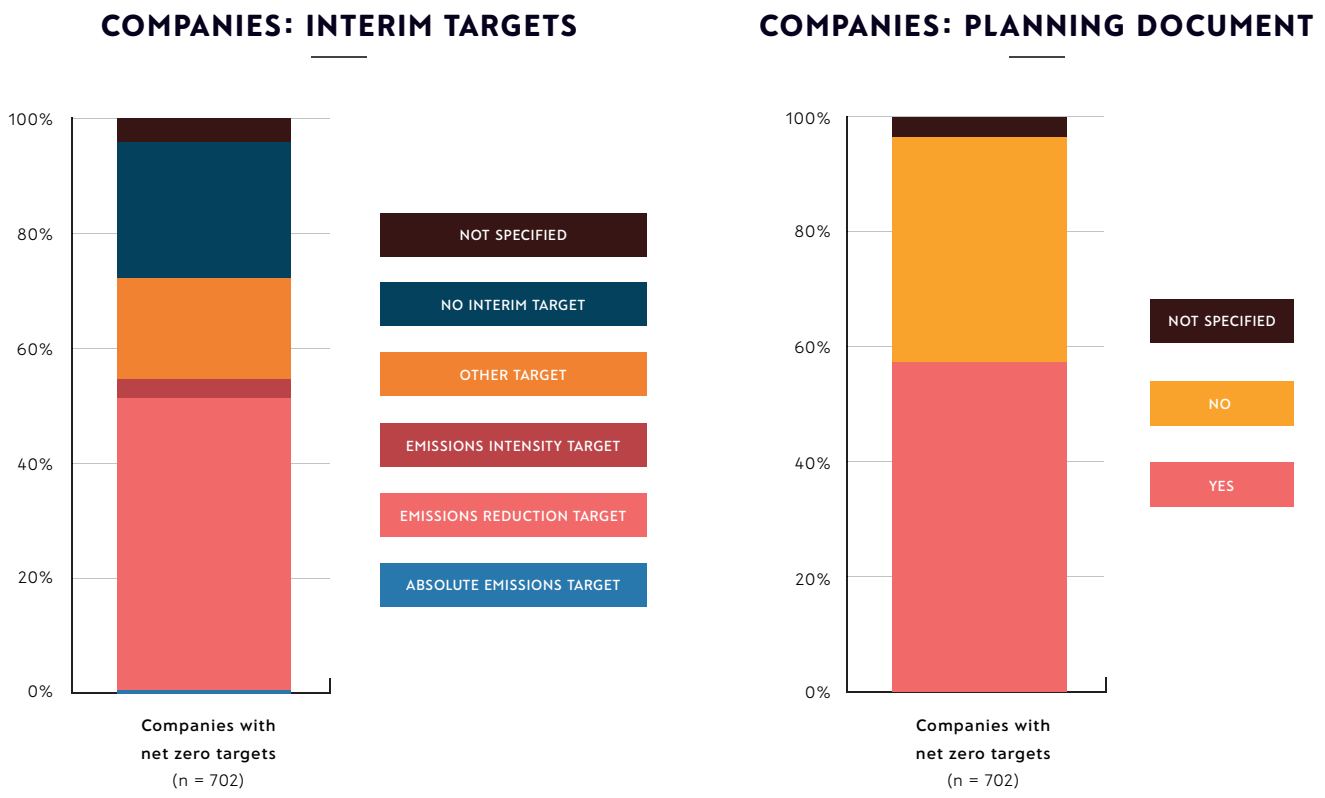

Figure 13: Percentage of 702 Forbes Global 2000 companies with net zero targets that have interim targets (left panel) and the published planning documents to achieve net zero (right panel) as of 1 June, 2022.

About two-thirds of companies with net zero targets annually report their progress in emission reduction actions through, for example, corporate sustainability reports. By contrast, about 25% do not have a regular reporting mechanism. The percentage of companies with regular progress reporting mechanisms was somewhat lower than in our previous assessment (*Black et al., 2021*). New companies that set net zero targets from December 2020 might be less advanced on progress reporting compared with the earlier movers covered in the previous assessment.

5.3 Comparing companies' net zero pledges with Race to Zero's 'starting line' and 'leadership criteria'

Only one-third of all companies with net zero targets currently meet the minimum procedural 'starting line' criteria (Table 2). This shows that most companies have so far not managed to implement the necessary initial conditions for robust net zero target setting (see Section 4.3 for a more detailed introduction of the 'starting line' criteria). We currently identify **less than 5% of companies that additionally meet 'leadership practice' criteria** by (1) covering all scope 1, 2 and 3 emissions and (2) prioritising emission reductions while using carbon sinks and credits only as a last resort and under the highest sustainability, performance, transparency, and integrity criteria. Companies urgently need to meet these initial procedural conditions as a first step.

Taking Stock Report March 2021 (Data collection cut-off: 12 December, 2020)		**Net Zero Stocktake 2022** June 2022 (Data collection cut-off: 1 June, 2022)	
Starting line (meeting all 4Ps) with 2050 criteria	**Starting line** and **leadership practices** with 2050 criteria	**Starting line** (meeting all 4Ps) with adjusted 2050 criteria	**Starting line** and **leadership practices** with adjusted 2050 criteria
26% of companies (110 of 417)	**3% of companies** (11 of 417)	**35% of companies** (248 of 702)	**3% of companies** (23 of 702)

Table 2: Comparison of net zero pledges by companies with the Race to Zero campaign's 'starting line' and 'leadership practice' criteria as of 1 June, 2022, and comparison with previous findings by *Black et al. (2021)*

6. Toward high-quality company net zero target setting: key findings from recent studies

Key takeaways

- Recently published methodologies to evaluate corporate long-term target setting identify common considerations for transparency, comprehensiveness, and mitigation ambition, but differ in specific benchmarks applied to evaluate companies.
- Users interested in (or directly relying on) nuanced evaluations of corporate long-term targets should be mindful that methodological differences between existing publications can result in divergent evaluations of the same companies.
- Despite these differences, all publications remain critical of the quality and integrity of existing corporate net zero and carbon neutrality targets.

The recent wave of corporate long-term target setting (net zero, carbon neutrality, and others) has been accompanied by an increasing number of analyses and methodologies to assess or verify such targets. This section compares their characteristics and identifies some key methodological differences. For this purpose, we summarise five recent assessments by think tanks and NGOs that assess the integrity of corporate net zero targets in the light of the global long-term goal of limiting warming to 1.5°C (Table 3).

The analyses of corporate long-term target setting and their underlying methodologies emphasise common considerations for transparency, comprehensiveness, and mitigation ambition, but differ in specific benchmarks used to evaluate companies. We compare two key areas for consideration in more detail: the emission reductions in headline target and the coverage of scope 3 emissions. An in-depth comparison of methodologies remains outside the scope of this study and is an avenue for future analysis.

#1 Emission reductions in headline target

All publications emphasise the need for *deep* emission reduction targets alongside net zero or carbon neutrality pledges to align these targets with the Paris Agreement 1.5°C limit. Companies need to make the reduction of their own emissions across their value chains the core focus of their long-term target setting, rather than relying on offset credits or carbon dioxide removals within or outside of their value chain.

The publications, however, differ in terms of the ambition levels in their benchmarks. For example, whereas the Corporate Climate Responsibility Monitor (CCRM) 2022 (*Day et al., 2022*) defines absolute emission reduction levels across all emission scopes, the Climate Action 100+ (*Climate Action 100+, 2022a, 2022b*) defines intensity levels for selected emission scopes.

Analysis / Publication	Objective	Number of companies assessed	Methodology applied for evaluation	Assessment and sources publicly disclosed	Independently commissioned?[11]
SBTi Net Zero Standard approved companies (*SBTi, 2022*)	Continuous review and approval of corporate net zero targets	Net zero targets of 15 companies approved (as of June 2022), and 1,118 submitted net zero targets awaiting approval	Assessment and approvals of net zero targets according to SBTi Net Zero Standard (SBTi, 2021b)	No	No
Climate Corporate Responsibility Monitor (CCRM) 2022 (*Day et al., 2022*)	Annual evaluation of selected corporates' headline targets, and identification of good practice cases / frontrunners	Total of 25 companies with net zero and carbon neutrality targets	Assessment based publicly available information according to CCRM methodology (NewClimate Institute, 2022)	Yes	Yes
Climate Action 100+ Net Zero Company Benchmarks 2021 status report (*Climate Action 100+, 2022a, 2022b*)	Annual evaluation of all companies covered under the Climate Action 100+ initiative	Total of 159 companies covered by Climate Action 100+ assessed	Assessment based on Climate Action 100+ methodology (Climate Action 100+, 2021), directly using external assessments of advisory group members for certain aspects (e.g., as Transition Pathway Initiative for 1.5°C alignment analysis for long-term GHG targets)	Partially	Yes
Transition Pathway Initiative (TPI) sectoral overview for corporate 2050 targets (*TPI, 2022*)	Continuous evaluation of companies' preparedness and efforts towards a transition to a low-carbon economy	Total of 492 companies covered by TPI assessed, for which a Carbon Performance assessment done for 325 companies	Assessment based on management quality and carbon intensity benchmarks applied for the so-called Carbon Performance assessment (Dietz et al., 2021, 2022)	Yes	Yes
WWF's review of FTSE100 net zero commitments (*WWF, 2021*)	Evaluation of net zero targets by the UK's 100 biggest companies (FTSE100)	Total of 100 companies listed in the Financial Times Stock Exchange 100 Index as of Oct 2021	Assessment based on assessment framework by ECIU and Oxford Net Zero (Black et al., 2021)	No	Yes

Table 3: Overview of recent analyses on corporate long-term targets including net zero, carbon neutrality, and other long-term GHG reduction targets as of 1 June 2022 (*WWF-UK, 2021; Climate Action 100+, 2022a, 2022b; Day et al., 2022; SBTi, 2022; TPI, 2022*)

11. This column discloses whether individual company verifications / assessments have been directly commissioned by the respective company or have been externally and independently commissioned.

The CCRM 2022 requires any net zero target—if the company chooses to set one as its long-term target—to be accompanied by an absolute reduction commitment of its own emissions of at least 90% below 2019 levels within the same timeline across all emission scopes (*NewClimate Institute, 2022*). This absolute reduction commitment alongside a net zero target represents a mandatory requirement for the CCRM but does not represent a measurement of sufficiency. For sufficiency, the company needs to align its net zero pledge with sector-specific 1.5°C compatible benchmarks and pathways.

By contrast, the Climate Action 100+ methodology requires all long-term GHG reduction targets (2036-2050) alongside net zero targets to comply with intensity benchmarks provided by the Transition Pathway Initiative (TPI) covering certain emission scopes defined per sector; no benchmarks were set for absolute emission reductions below a base year (*Climate Action 100+, 2021*). See Footnote 12 for more information on the TPI's carbon intensity benchmarks.

Evaluation area	SBTi Net Zero Standard	CCRM 2022	Climate Action 100+	Transition Pathway Initiative	WWF's review of FTSE100
Evaluation of net zero and long-term targets	Yes	Yes	Yes	Yes	Partially
Evaluation of short and interim targets	Yes	Yes	Yes	Yes	Yes
Target coverage of emission scopes	Yes	Yes	Yes	Yes	Yes
Recent emission inventories	No	Yes	No	Yes	No
Emission reduction measures to achieve reduction targets	No	Yes	Yes	No	Partially
Evaluation of offsetting and climate contribution practice today and in the future	No, only indirectly through long-term target reduction requirement	Yes	No	No	Partially
Climate governance	No	No	Yes	Yes	Partially
Policy engagement	No	No	Yes	Yes	No
Other evaluation areas			Just transition plan; TCFD disclosure; Capital allocation alignment	Internal carbon pricing	

Table 4: Categorical and simplified overview of assessment elements going into the evaluation of corporate long-term targets including net zero, carbon neutrality, and other long-term GHG reduction targets as of June 2022 (*WWF-UK, 2021; Climate Action 100+, 2022a, 2022b; Day et al., 2022; SBTi, 2022; TPI, 2022*)

#2 Coverage of scope 3 emissions

The publications differ considerably in terms of benchmarks for scope 3 coverage within net zero and carbon neutrality pledges. The CCRM 2022 requires the full coverage of upstream and downstream scope 3 emissions (*NewClimate Institute, 2022*), while the SBTi Net Zero Standard requires coverage of at least 90% of upstream and downstream scope 3 emissions (*SBTi, 2021*). The Climate Action 100+ only evaluates whether companies include relevant scope 3 emissions without clarifying what they comprise (*Climate Action 100+, 2021*). Only three of the 10 sectoral benchmarks used by TPI include some downstream scope 3 emissions (*Dietz et al., 2022*), while all of them exclude upstream scope 3 emissions.

We present a categorical and simplified overview of assessment elements going into the evaluation of corporate long-term targets across all five publications in Table 4.

Despite differences in methodology and benchmarks applied, all publications are critical of the quality of existing corporate net zero and carbon neutrality targets. While the analyses identify some emerging frontrunners on long-term corporate target setting, those companies remain a clear minority across the respective corporate samples assessed. Our Net Zero Tracker's updated analysis for June 2022 presented in Section 5 is consistent with the findings of these external assessments.

- SBTi Net Zero Standard approved companies: SBTi validated **15 of 1,133** submitted net zero targets against its SBTi Net Zero Standard as of June 2022 (*SBTi, 2022*). SBTi neither provides publicly available information on its assessments of single companies, nor updates on the timeline for the verification of submitted targets.
- Climate Corporate Responsibility Monitor (CCRM) 2022: **None of 25** companies with net zero and carbon neutrality targets was evaluated as having high integrity by the CCRM 2022, and only **four out of 25** companies showed reasonable integrity or medium integrity (*Day et al., 2022*). **Twenty-one out of 25** companies were evaluated as having low integrity or even very low integrity.
- Climate Action 100+: **39 of 159** companies meet all Climate Action 100+ assessment criteria for net zero targets, and **30 of 159** companies meet all Climate Action 100+ assessment criteria for long-term GHG reduction targets (*Climate Action 100+, 2022a*).
- Transition Pathway Initiative (TPI): **33 of 492** companies meet the TPI's definition of a 1.5°C benchmark by 2050 for selected emission scopes in the respective sectors[12], **54 of 492** companies meet a 2°C benchmark (*TPI, 2022*).
- WWF Net Zero Scorecard: of the **100 FTSE companies** assessed, **three** fully meet all eight criteria and **one** at least partially meets all eight criteria (*WWF, 2021*). All remaining companies fail to meet at least one of the eight criteria.

12. The TPI derives carbon intensity benchmarks using Sectoral Decarbonisation Approaches (SDAs) for ten sectors that cover different emission scopes per sector (*TPI, 2022*). The benchmarks for electricity utilities, airlines, shipping companies, and cement companies cover scope 1 emissions only. The benchmarks for steel makers, aluminium makers, and pulp & paper producers cover scope 1 and scope 2 emissions. The benchmarks for automobile producers cover selected downstream scope 3 emissions only. The benchmarks for oil & gas producers and diversified mining companies cover scope 1, scope 2 and selected downstream scope 3 emissions.

The methodological differences of recent analyses can result in divergent evaluations of the same companies. It is of utmost importance for those interested in—or directly relying upon—nuanced evaluations of corporate long-term target setting to understand these methodological differences and take the research and verification objectives into consideration.

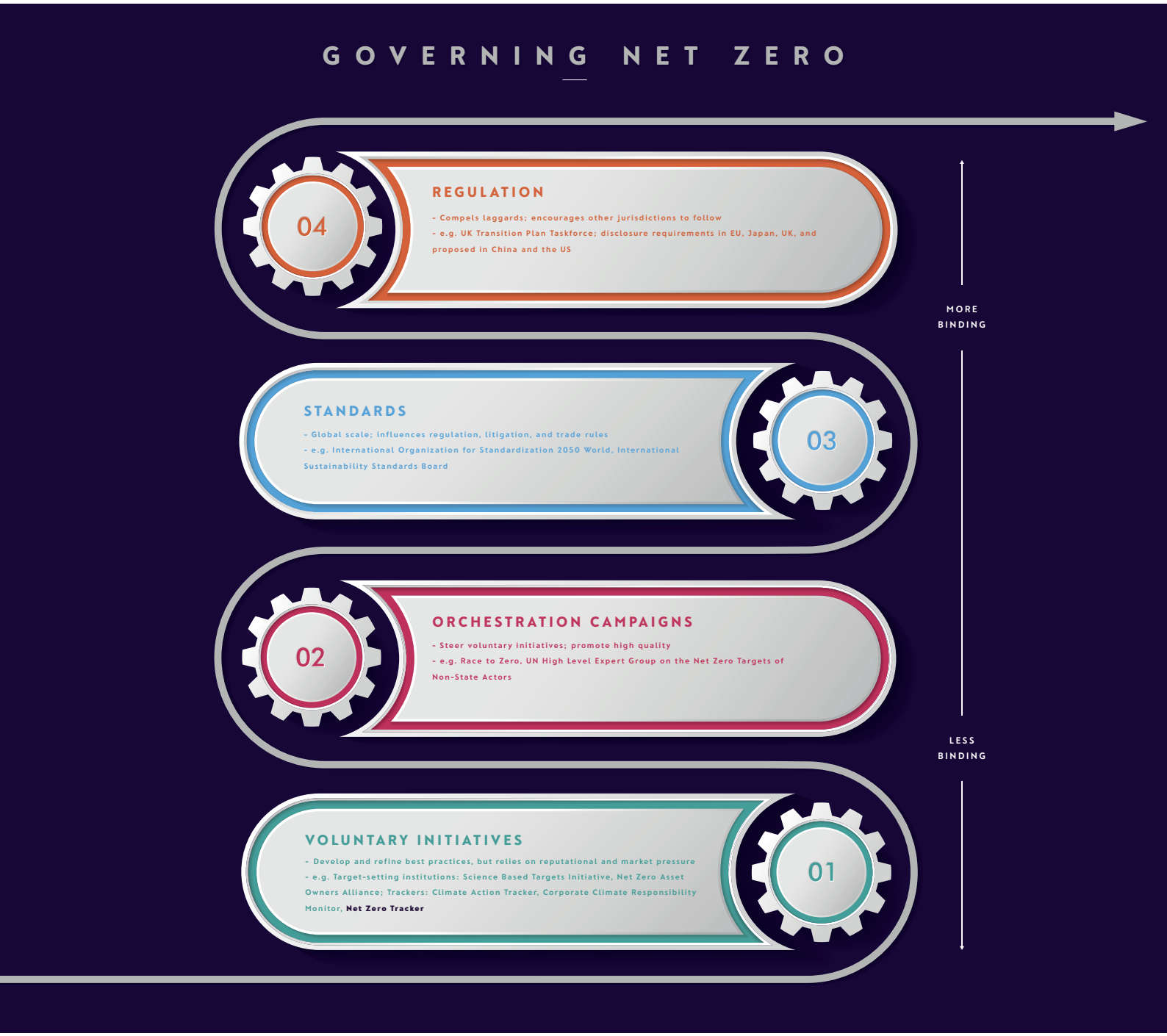

Figure 14: To date, most private sector net zero commitments and the standards that shape them are voluntary. Because we need to mainstream net zero across the whole economy to achieve global decarbonization goals, stronger governance for net zero alignment will ultimately be needed, and indeed is rapidly developing (see Section 7 conclusion). We can envision different types of governance creating a 'conveyor belt' from the groundswell of voluntary efforts by leaders to binding regulations that make net zero alignment a ground rule for the economy overall. Different tools play complementary roles in driving this outcome. Voluntary standards can mobilize leaders and experiment with best practices to advance the frontier of ambition. Orchestration campaigns can reinforce high quality voluntary efforts and call out greenwashing, while consolidating best practices into general norms. International standards can then draw on these norms to lay out broadly agreed ground rules for mass adoption, while also drawing on third-party auditing and certification to ensure integrity. Finally, binding regulations, when aligned to strong standards, can create a level playing field around rigorous net zero alignment. (*Hale, 2021*)

7. Conclusions and way forward

The momentum of net zero target setting has remained unbroken since our previous stocktake report, and was especially marked in the run-up to COP26 in Glasgow in November 2022. Against the backdrop of the unprecedented number of announced net zero targets, the quality, robustness and integrity of pledges must be put into focus even more urgently to ensure that these pledges reflect credible and ambitious mitigation commitments.

This report—in line with the findings of other recently published literature—reveals many ongoing and pressing concerns with current net zero target setting practice across all entities. We see some progress in the robustness of commitments, but in 2022 it is imperative to ask how any country, company, city or region can justify not having both a robust commitment and a plan for aligning its emissions with globally agreed climate goals. The concerns highlighted in this report require close attention from both the target-setting entities themselves and from civil society, policymakers and researchers.

As net zero targets have grown, so too have efforts to track and govern them. As discussed above, the UN Race to Zero has put forward a set of 'starting line' and 'leadership practice' criteria for non-state actors' net zero targets, which have been developed through a series of annual public consultations (the next iteration will be launched in June 2022). A number of academic and expert observers have articulated principles for what robust net zero targets should look like (*Levin et al., 2020; Climate Action Tracker, 2021a; Rogelj, Geden, et al., 2021; Fankhauser et al., 2022*).

Alongside the Net Zero Tracker, tracking and, to some degree, assessment of net zero targets has expanded for countries (*Climate Action Tracker, 2021b; Climate Watch, 2021*), states and regions (*Under2 Coalition, 2022*). However, the greatest focus of attention and activity since our last stocktaking report has been on companies and investors. There has been a proliferation of efforts to set standards for, and to measure, the private sector's alignment with net zero (*Climate Action 100+, 2022a, 2022b; Day et al., 2022; SBTi, 2022*). The Science Based Targets Initiative occupies a prominent position for corporate entities, at least in the developed world, while the alliances that make up the Glasgow Financial Alliance for Net Zero (itself a part of the Race to Zero) capture large swaths of the financial sectors. Many efforts are underway to define additional standards for specific sectors and entities, and across specific geographies. The International Organization for Standardization (ISO) and related bodies are also moving to articulate clear norms in this space. As indicated in Section 6, the robustness of these (emerging) standards vis-à-vis Paris-consistent emission pathways has not been scrutinised enough. Alongside standard setting, tracking corporate climate action has become a major growth area for commercial data providers, though these sources are not always transparent and robust. Initiatives like the Transition Pathways Initiative are seeking to provide greater clarity in this crowded field (*TPI, 2022*).

As the analysis of Net Zero Tracker data and the review of recent literature presented above show, the transparency and integrity of existing net zero pledges are overall far from sufficient to ensure transition to global net zero GHG emissions to achieve the Paris Agreement's long-term temperature goal. Therefore, there is an enormous need for greater standardisation and operationalisation of net zero targets.

For cities, regions, and countries in the Global South, capacity building and access to finance is critical for transforming net zero pledges into concrete commitments and plans. For the private sector, regulation will ultimately be needed to ensure robustness across the entire economy, and indeed a number of regulatory changes are creating firm rules around net zero in large markets. For example, disclosure requirements are either currently mandatory or phasing in across the EU, the UK, and Japan, and are proposed in both the US and China. At the same time the more voluntary mobilisation, orchestration, and standardisation efforts that characterise the current ecosystem around net zero can play an important role by experimenting with best practices and forging leadership coalitions that build support for stronger regulations in the future. Indeed, we can envision a 'conveyor belt' linking different elements of the emerging net zero governance ecosystem (*Hale, 2021*).

Looking ahead, the UN Secretary-General's *High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities*, launched in March 2022 (*UN Secretary-General, 2022*), provides an important opportunity to accelerate robust operationalisation of net zero targets. The panel marks an important step forward – raising the robustness of net zero targets to the highest political level, creating a mechanism to endorse robust principles for net zero alignment, calling out those that are falling short, and charting a course toward the more robust standardisation and governance that will ultimately be needed.

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Annex I – Data summary tables

Table A-1 compares the data and analysis results between *Taking Stock* (*Black et al., 2021*) and this report. Note that the numbers in the table between the two reports are not fully comparable for a number of reasons, including: (1) the assessment methodology has been partially updated and refined (*Net Zero Tracker, 2021*); (2) enhanced capacity for data collection enabled us to include information sources that were not captured before; (3) for the footprint analysis (GDP, GHG emissions and population), the data sources and/or the data year differ (as described in Section 2). For GHG emissions, the data used in this report cover land-use emissions whereas the data used in *Taking Stock* did not.

COUNTRIES	Indicator	*Taking Stock, 2021*	*Net Zero Stocktake 2022*
Net Zero Targets	Number of targets	124	128
	GDP (PPP; $bn)	84,575	112,249
	GHG emissions ($MtCO_2e$)	28,890	40,433
	GHG emissions (% of global)	61%	83%
	Population (millions)	3,937	6,128
Target Year	By 2030 (#)	23	9
	2031 - 2040 (#)	2	3
	2041 - 2050 (#)	96	105
	2051 or later (#)	1	10
	Not specified (#)	2	1
Target Status	Achieved (#)	21	5
	In Law (#)	7	16
	In policy document (#)	20	34
	In corporate strategy (#)	N/A	N/A
	Declaration/Pledged (#)	N/A	18
	Proposed/ In discussion (#)	69	55
	Not specified (#)	7	0
GHG Coverage	CO_2 and other GHGs (#)	46	86
	CO_2 only (#)	60	9
	Not specified (#)	5	33
Governance	Annual Reporting (#)	18	36
	Less than annual reporting (#)	76	91
	No reporting mechanism (#)	0	1
	Published plan (#)	25	73
Offsetting	Yes, with some conditions (#)	7	7
	Yes, conditions not specified (#)	14	10
	No offsetting (#)	1	20
	Not specified (#)	68	90

CITIES	Indicator	*Taking Stock, 2021*	*Net Zero Stocktake 2022*
Net Zero Targets	Number of targets	155	235
	Population (millions)	640	706
Target Year	By 2030 (#)	26	20
	2031 - 2040 (#)	14	24
	2041 - 2050 (#)	105	187
	2051 or later (#)	0	0
	Not specified (#)	10	4
Target Status	Achieved (#)	0	0
	In Law (#)	5	5
	In policy document (#)	63	89
	In corporate strategy (#)	N/A	N/A
	Declaration/Pledged (#)	N/A	89
	Proposed/ In discussion (#)	70	49
	Not specified (#)	17	3
GHG Coverage	CO_2 and other GHGs (#)	47	72
	CO_2 only (#)	70	64
	Not specified (#)	15	99
Governance	Annual Reporting (#)	47	52
	Less than annual reporting (#)	21	40
	No reporting mechanism (#)	28	75
	Published plan (#)	65	119
Offsetting	Yes, with some conditions (#)	15	9
	Yes, conditions not specified (#)	42	30
	No offsetting (#)	11	25
	Not specified (#)	52	112

STATES & REGIONS	Indicator	*Taking Stock, 2021*	*Net Zero Stocktake 2022*
Net Zero Targets	Number of targets	73	115
	Population (millions)	497	727
Target Year	By 2030 (#)	10	8
	2031 - 2040 (#)	1	3
	2041 - 2050 (#)	50	99
	2051 or later (#)	1	1
	Not specified (#)	11	4
Target Status	Achieved (#)	1	1
	In Law (#)	15	20
	In policy document (#)	36	52
	In corporate strategy (#)	N/A	N/A
	Declaration/Pledged (#)	N/A	32
	Proposed/ In discussion (#)	12	7
	Not specified (#)	9	3
GHG Coverage	CO_2 and other GHGs (#)	42	59
	CO_2 only (#)	13	21
	Not specified (#)	11	35
Governance	Annual Reporting (#)	34	23
	Less than annual reporting (#)	12	42
	No reporting mechanism (#)	14	29
	Published plan (#)	41	65
Offsetting	Yes, with some conditions (#)	8	5
	Yes, conditions not specified (#)	19	9
	No offsetting (#)	8	8
	Not specified (#)	40	75

COMPANIES	Indicator	*Taking Stock, 2021*	*Net Zero Stocktake 2022*
Net Zero Targets	Number of targets	417	702
	Revenue ($bn)	13,834	21,609
Target Year	By 2030 (#)	153	151
	2031 - 2040 (#)	37	109
	2041 - 2050 (#)	179	419
	2051 or later (#)	3	2
	Not specified (#)	45	21
Target Status	Achieved (#)	44	30
	In Law (#)	N/A	N/A
	In policy document (#)	N/A	N/A
	In corporate strategy (#)	255	412
	Declaration/Pledged (#)	NA	224
	Proposed/ In discussion (#)	77	26
	Not specified (#)	41	10
GHG Coverage	CO_2 and other GHGs (#)	143	274
	CO_2 only (#)	181	133
	Not specified (#)	75	292
Governance	Annual Reporting (#)	263	466
	Less than annual reporting (#)	14	29
	No reporting mechanism (#)	105	158
	Published plan (#)	210	404
Offsetting	Yes, with some conditions (#)	69	86
	Yes, conditions not specified (#)	183	206
	No offsetting (#)	33	14
	Not specified (#)	188	377

Annex II – Supplementary information

Table A-2: Number of Forbes 2000-listed companies with net zero targets per headquartered country.

Country	No net zero target	Net zero target	Grand total	Percentage
USA	377	210	587	36%
JPN	129	210	218	41%
GBR	22	57	79	72%
FRA	17	40	57	70%
DEU	18	33	51	65%
CAN	36	25	61	41%
AUS	8	24	32	75%
CHE	20	21	41	51%
ESP	9	16	25	64%
IRL	5	16	21	76%
KOR	43	15	58	26%
SWE	11	15	26	58%
IND	35	15	50	30%
NLD	12	13	25	52%
CHN	254	11	265	4%
FIN	2	8	10	80%
DNK	3	8	11	73%
TWN	35	8	43	19%
HKG	50	7	57	12%
ITA	19	7	26	27%
BEL	2	6	8	75%
SGP	6	6	12	50%
ZAF	4	6	10	60%
NOR	2	6	8	75%
THA	10	5	15	33%
BRA	13	5	18	28%
TUR	5	3	8	38%
AUT	6	3	9	33%
MYS	7	3	10	30%
MEX	9	3	12	25%
POL	4	2	6	33%
CHL	4	2	6	33%
PRT	2	2	4	50%
LUX	5	2	7	29%
COL	3	2	5	40%

Country	No net zero target	Net zero target	Grand total	Percentage
BMU	6	1	7	14%
SAU	13	1	14	7%
RUS	22	1	23	4%
PHL	6	1	7	14%
CYP		1	1	100%
KEN		1	1	100%
CZE		1	1	100%
IDN	6		6	0%
CYM	1		1	0%
LBN	2		2	0%
NGA	1		1	0%
KAZ	1		1	0%
EGY	1		1	0%
BHR	1		1	0%
VEN	1		1	0%
QAT	6		6	0%
MAR	2		2	0%
MCO	1		1	0%
PER	2		2	0%
HUN	2		2	0%
JOR	1		1	0%
ARG	2		2	0%
KWT	3		3	0%
ARE	9		9	0%
PRI	1		1	0%
VNM	4		4	0%
GRC	5		5	0%
ISR	12		12	0%
OMN	1		1	0%
Total	**1295**	**702**	**2000**	

Table A-3 notes the CDP industry classification (CDP, 2022) and the relevant Forbes sector(s) for each industry. Sector information was collected from the Forbes Global 2000 list before being mapped onto the relevant CDP industry based on the business activities of the company. For companies identified as Conglomerates in the Forbes 2000 list, the most relevant CDP industry was applied.

CDP industry	Activities (as per CDP activity group)	Relevant Forbes sector
Apparel	Textiles & fabric goods	Retailing
Biotech, health care & pharma	Biotech & pharma, Health care provision, Medical equipment & supplies	Drugs & Biotechnology; Health Care Equipment & Services
Food, beverage & agriculture	Crop farming, Fish & animal farming, Food & beverage processing, Logging & rubber tapping, Tobacco	Food, Drink & Tobacco; Food Markets
Fossil fuels	Coal mining, oil & gas extraction & production, Oil & gas processing, Oil & gas retailing, Oil & gas storage & transportation	Oil & Gas Operations; Retailing
Hospitality	Bars, hotels & restaurants, Entertainment facilities	Hotels, Restaurants & Leisure; Retailing
Infrastructure	Construction, Energy utility networks, Land & property ownership & development, Non-energy utilities	Construction; Utilities
International bodies	Government agencies, Government banks, Government bodies, International bodies	
Manufacturing	Electrical & electronic equipment, Leisure & home manufacturing, Light manufacturing, Metal products manufacturing, Paper products & packaging, Plastic product manufacturing, Powered machinery, Renewable energy equipment, Transportation equipment, Wood & rubber products	Aerospace & Defense; Consumer Durables; Semiconductors; Capital Goods; Retailing
Materials	Cement & concrete, Chemicals, Metal smelting, Refining & forming, Metallic mineral mining, Other materials, Other mineral mining, Wood & paper materials	Chemicals; Materials; Household & Personal Products
Power generation	Nuclear power generation, Renewable power generation, Thermal power generation, Waste power generation	Utilities
Retail	Convenience retail, Discretionary retail, Trading, wholesale, distribution, rental & leasing	Consumer Durables; Technology Hardware & Equipment; Retailing
Services	Commercial & consumer services, Financial services, Industrial support services, IT & software development, Media, telecommunications & data services, Other services, Print & publishing services, Specialised professional services, Web & marketing services	Media; Telecommunication Services; IT Software & Services; Business Services & Supplies; Consumer Durables; Insurance; Diversified Financials; Banking; Trading companies; Retailing
Transportation services	Air transport, Intermodal transport & logistics, Marine transport, Rail transport, Road transport	Transportation

FORBES GLOBAL 2000 COMPANIES' NET ZERO TARGETS IN G7 NATIONS

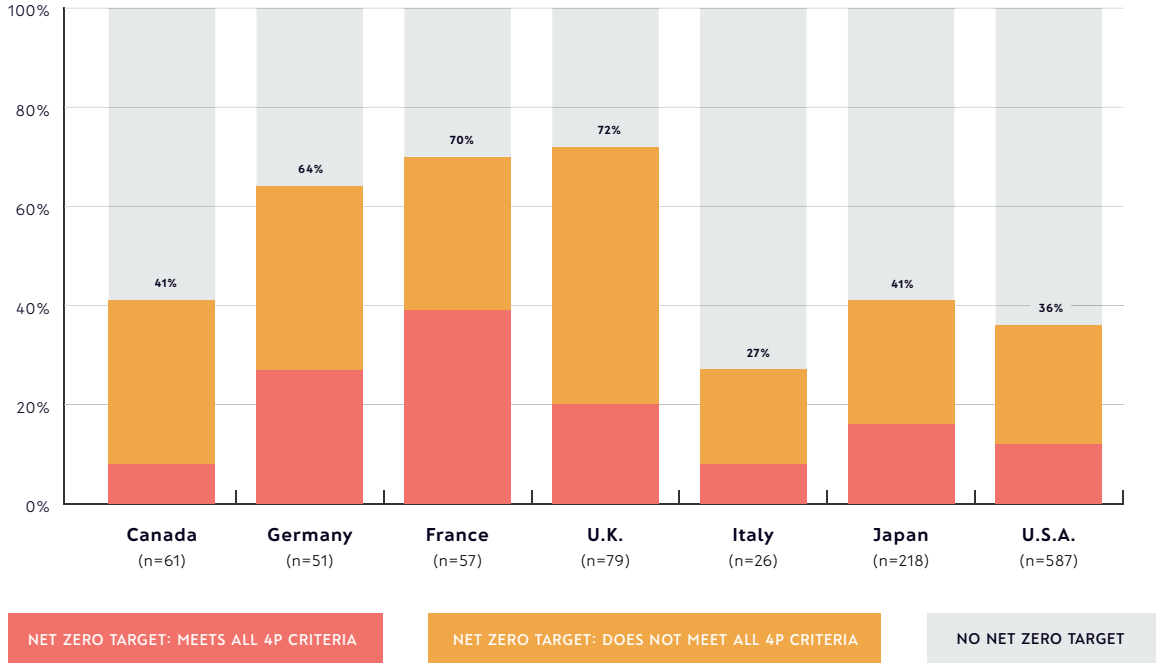

Figure A-1: Breakdown of Global 2000 publicly listed companies with net zero targets across the G7, a bloc of wealthy nations, including the proportion of companies that meet the Race to Zero 4P 'starting line' criteria and the proportion that do not. Refer to Section 2 for more details. Overall percentages of the share of companies with net zero targets are displayed above the bars. Results would differ if all publicly listed companies across the G7 were assessed or if companies were assessed by where their principal operations are, as opposed to where they are headquartered.

STATE AND REGION NET ZERO TARGETS IN G7 NATIONS

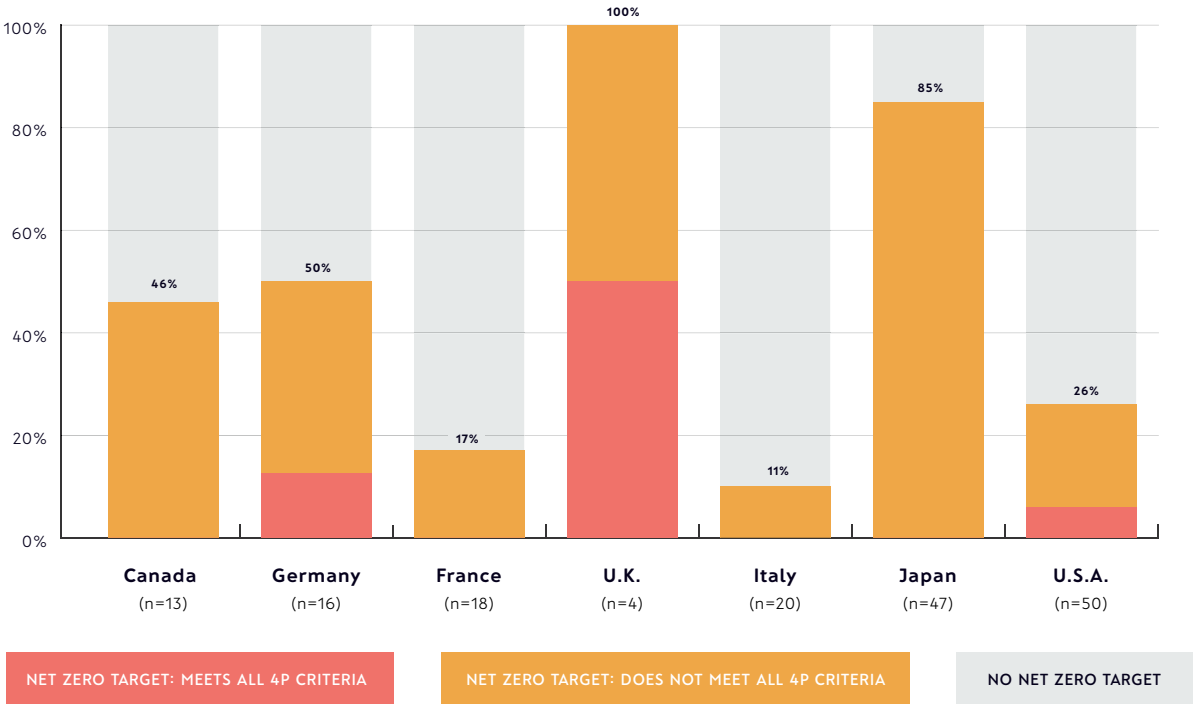

Figure A-2: Breakdown of states and regions with net zero targets across the G7 including the proportion that meet the Race to Zero 4P 'starting line' criteria and the proportion that do not. For the UK, the 'regions' are countries; England, Scotland, Wales and Northern Ireland. Overall percentages of the share of states and regions with net zero targets are displayed above the bars.

CITY NET ZERO TARGETS IN G7 NATIONS

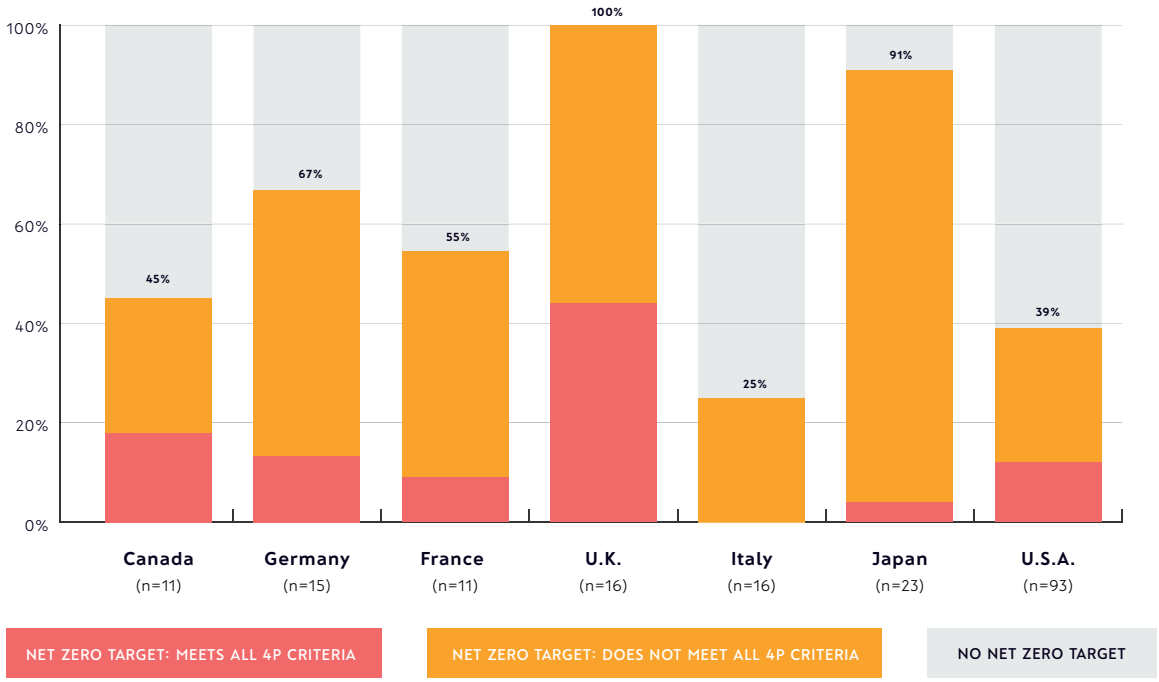

Figure A-3: Breakdown of cities with net zero targets across the G7 including the proportion that meet the Race to Zero 4P 'starting line' criteria and the proportion that do not. Overall percentages of the share of cities with net zero targets are displayed above the bars.

ALL ENTITIES: REPORTING FREQUENCY

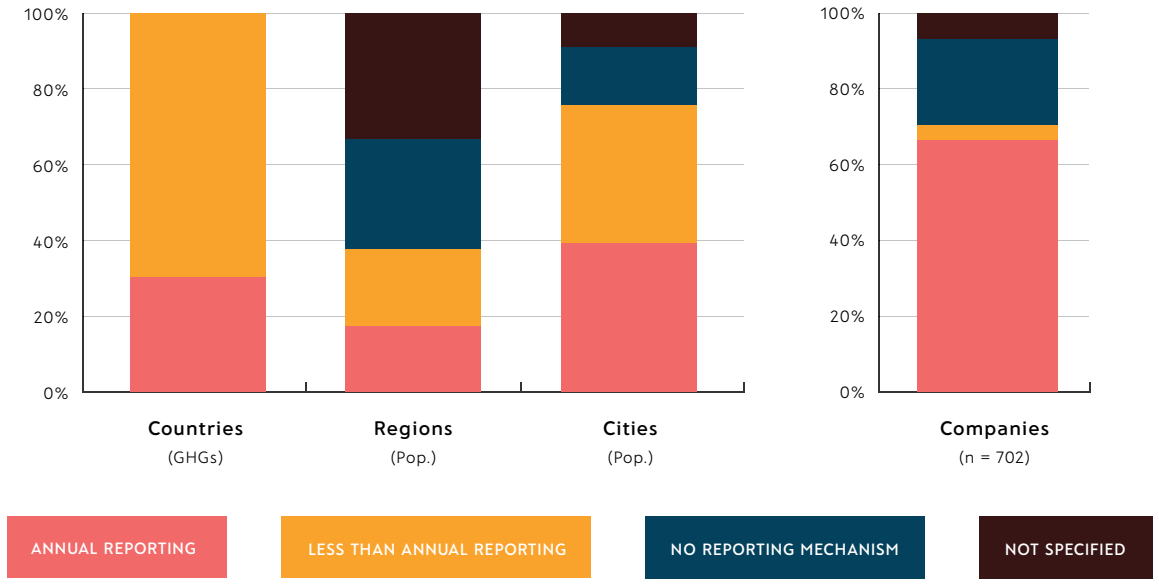

Figure A-4: Public reporting mechanism and their related reporting frequency on net zero targets across 128 countries, 235 cities, and 115 states and regions (left panel) and across 702 Forbes Global 2000 companies (right panel) worldwide as of 1 June, 2022.