

INTEGRITY MATTERS:

GHG Target Setting Guidance for Cities, States and Regions

Draft Version 1.0 for Public Consultation



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1. Introduction



1.1 Background

In 2022, the United Nations Secretary General-convened High Level Expert Group published *Integrity Matters: Net Zero Commitments by Businesses, Financial Institutions, Cities, and Regions*, a set of recommendations to strengthen integrity, transparency, and accountability around net zero commitments for non-state entities.

To support how *Integrity Matters* can be applied by local, state, and regional governments (hereafter referred to as “cities, states, and regions” and “subnational governments”), the Global Covenant of Mayors for Climate & Energy (GCoM) and WRI Ross Center for Sustainable Cities (WRI) convened experts from select net zero initiatives, alliances, and other partner institutions.

Their report, *Integrity Matters for Cities, States, and Regions* (hereafter “IM4CSTARs (2023)”), published in November 2023, sets forward recommendations that are fundamentally aligned with the *Integrity Matters* report while accounting for the varying capacity, resource, and knowledge considerations of cities, states and regions that are committed to a net zero future.

IM4CSTARs (2023) states that to be considered ‘net zero’ or ‘net zero aligned’, cities, states, and regions must have targets that are “consistent with limiting warming to 1.5°C with no or limited overshoot according to a fair-share approach” (GCOM and WRI, 2023).

Integrity Matters: GHG Target Setting Guidance for Cities, States and Regions builds on these recommendations and sets out what this means in practice. Drawing on good practice from cities, states and regions around the world, this document presents a high-integrity fair-share approach for setting, updating, or stress-testing emissions reduction targets, that align with the ambition, and principles, of the Paris Agreement.

1.2 What are emissions reduction targets for cities, states and regions?

An emissions reduction target (or mitigation goal) for a city, state or region, is a commitment to take action to reduce absolute emissions by a specified quantity, by a specific future date. Emissions reduction targets are typically associated with the administrative boundary of a city, state or region, and sometimes referred to as community-wide, territory-wide or jurisdiction-wide targets¹.

Such targets define the ambition for a whole community, including residents, businesses, and other institutions, and all their associated strategies and actions. Meeting these targets relies on the actions of multiple actors across the subnational administration and other levels of government as well as wider community stakeholders. This requires city, state or regional governments to use all available powers and responsibilities within, and beyond, their jurisdiction to influence the strategies, actions and commitments of other actors (see Box 1).

The powers and responsibilities of subnational governments vary significantly over different assets, functions, emissions sources and specific climate strategies and actions. This reflects the different ways in which powers and authorities are allocated to different bodies in different contexts, with varying levels of decentralisation and regulatory independence. Beyond their direct authorities, subnational governments also hold important indirect authority, strategic influence and convening powers. Coordination and collaboration between different levels of government, as well as with businesses and civil society, is therefore critical. Collaborative approaches – or multi-level partnerships – are needed to help achieve local targets as well as strengthening and supporting achievement of national climate goals.

¹ Note, targets can also be set for subnational government operational emissions, sometimes referred to as local government operations (LGO). These typically cover emissions sources owned and operated by the subnational government (such as administrative buildings and vehicle fleets). Operational emissions reduction targets are, however, not covered within the scope of this guidance.

Box 1: Powers and responsibilities of subnational governments

Figure 1 shows how subnational governments can drive climate action through multiple levers, from public procurement and strategic planning to service provision and partnerships. The capacity to collaborate with other cities, states and regions, national governments, civil society, the private sector and investors, is critical in accelerating subnational climate action and generating positive local outcomes.

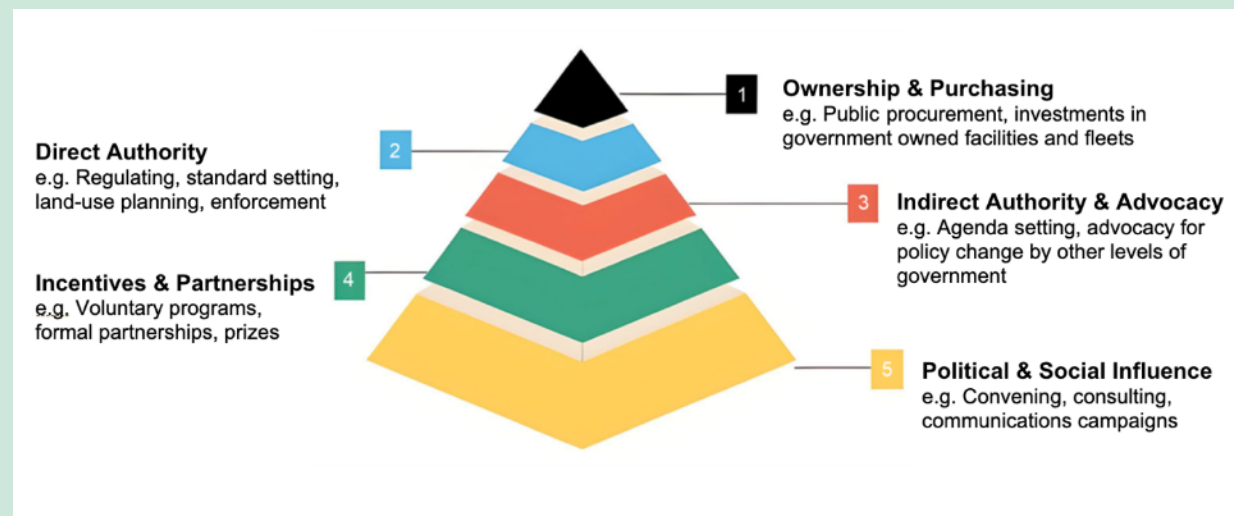


Figure 1: Powers and levers of influence of subnational governments on climate action (Adapted from C40 Cities (2023))

Targets can relate to different time periods. Longer-term targets (e.g. 2050) will often be supported by short- or near-term targets and medium-term targets². These near- and medium-term targets illustrate the emissions pathway to meet the longer-term target. They are important to help drive immediate action, preventing delays that could make longer-term targets unachievable. To be considered 'net zero aligned', IM4CSTARS (2023) calls for cities, states and regions to have near-term emissions reduction targets for periods of five years or less.

Setting emissions reduction targets is important for many reasons. It can help define and drive the scale and pace of climate action, guide strategic planning and decision making, demonstrate leadership, ensure accountability, enhance credibility, and influence and galvanise action by other actors (e.g. residents, businesses, other levels of government).

1.3 Existing publications and the role of this guidance

Over the past decade, guidelines and reports have been published offering recommendations, requirements, and methods for cities, states, and regions to develop their own emissions reduction targets. Figure 2 provides an overview of key publications that have informed the development of this guidance. This list is not exhaustive. Many of these documents contain information that goes beyond just emissions target setting to other aspects of climate action. Box 2 briefly outlines the aspects of these reports relevant to target setting.

² Also known as 'interim' targets (e.g. Science Based Target Network, 2020), or 'stepping stone' targets (e.g. UN HLEG, 2022). Note, IPCC AR6 WGIII refers to mid-term for 2050 and near-term for the period up to 2030.

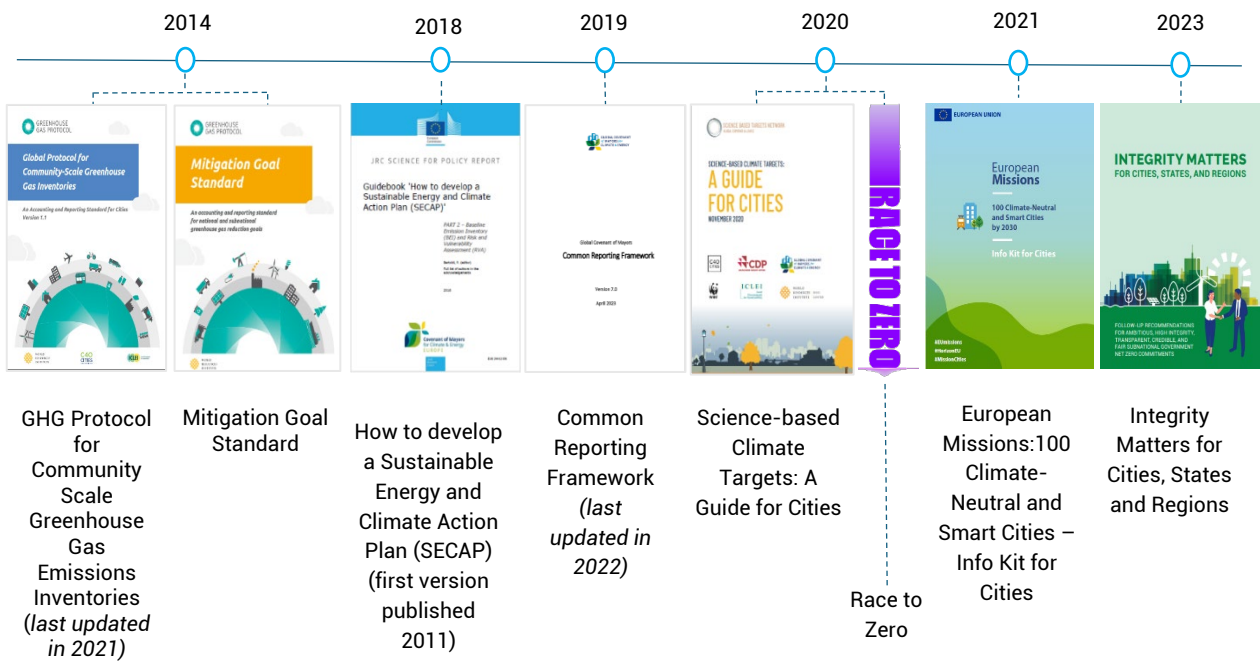


Figure 2: Timeline with key resources for emissions target setting

Box 2: Outline of key resources for emissions reduction target setting

The **Integrity Matters for Cities, States, and Regions** report, developed by an Expert Group convened by GCoM and WRI (2023), adapts the UN's *Integrity Matters* recommendations specifically to the subnational context, focusing on credibility, transparency, and accountability. The report, tailored for cities, states, regions, and their partners involved in net zero efforts, includes practical recommendations for cities, states, regions seeking to be considered 'net zero' or 'net zero aligned'. The report's recommendation for targets to be aligned with the latest science and fair-share approaches provides the basis for this guidance.

The document **European Missions: 100 Climate-Neutral and Smart Cities – Info Kit for Cities** by the European Commission (2021) was developed to provide European cities with the practical information needed to join the EU Mission: 100 Climate-Neutral and Smart Cities. It outlines in detail where and how cities can implement actions across various sectors, containing a subchapter that provides recommendations for setting a climate neutrality goal by 2030. Its definitions and examples cover target types, boundaries, base year and level of ambition. The document's annex contains suggestions of guidance and tools to support cities to take action across different sectors.

The guide **Science-based Climate Targets: A Guide for Cities**, authored by C40, CDP, ICLEI, WWF, GCoM, and WRI and developed under the Science Based Targets Network (2020), provides guidance for cities interested in setting science-based targets and focuses on three methods for determining the level of ambition of mitigation targets: C40's Deadline 2020, WWF's One Planet City Challenge 1.5 Alignment Method, and the Tyndall Local Carbon Budget Tool. It provides guidance on selecting a methodology for establishing interim targets by 2030 and net zero targets by 2050.

The **Common Reporting Framework (CRF)** (GCoM, 2023), was developed by GCoM and partners (2019, and most recently updated in 2023) and is intended for cities and local governments that are part of its alliance. The CRF's primary purpose is to outline which elements of a local government's climate change response should be publicly reported through platforms such as CDP-ICLEI Track or MyCovenant. It contains a chapter on target setting that provides both guidance and requirements on target boundary, type, base year, ambition, units, use of transferable emissions and conditionality.

The Guidebooks '**How to develop a Sustainable Energy and Climate Action Plan (SECAP)**', developed by JRC for the European Covenant of Mayors (Bertoldi, et al., 2011 and 2018, currently being updated) and subsequently adapted to other regional Covenants, provide detailed, step-by-step guidance to local authorities to develop effective action plans. While they address the entire process – from initial political commitment to implementation and monitoring of the plan – the guidebooks set out recommendations on how to develop emission inventories and set emission reduction targets.

The **Mitigation Goal Standard** by WRI (WRI, 2014) is a guide designed for national and subnational government agencies involved in setting and tracking GHG mitigation goals. It promotes consistency and transparency in the design and assessment of mitigation goals with explanations, requirements, and recommendations for GHG targets design, including goal types, boundaries, time frames, base year and target year, and the use of transferable emissions units. Note while this document uses the term 'goals', this is considered synonymous with 'targets'. The document does not address level of ambition.

The **GHG Protocol for Community Scale GHG Emissions Inventories** created by WRI, C40, and ICLEI (2014, and updated in 2021), is the global standard for cities and other subnational entities to calculate and report emissions inventories. It was developed under the GHG Protocol initiative and aims to help subnational governments develop robust GHG inventories for their jurisdictions to support climate action planning, target setting, progress tracking, and ensuring consistent and transparent reporting. Through maintaining alignment with national emissions accounting guidelines, it enables the aggregation of city-level data. It contains a short section on target setting, referencing content from the **Mitigation Goal Standard** (2014) document.

Race to Zero led by the UN Climate Change High Level Champions is a global campaign bringing together partners to mobilise non-state actors to set and implement credible net zero action. The Race to Zero framework (2022) includes 5 P's to define action – Pledge (target setting), Plan, Progress, Publish and Persuade. Launched ahead of COP26, subnational governments join the Race through Cities Race to Zero or Under 2° Coalition. As of 2024, 1162 cities and 52 states and regions are in the Race (Race to Zero, 2024).

New research on cities and regions in G20 countries shows a significant increase in cities, states and regions adopting medium- and longer-term emissions reduction, and net-zero, targets. The analysis, however, finds that the ambition falls short of aligning with the 1.5°C goal of the Paris Agreement (Song et al. 2024). Most subnational net-zero targets set around the year 2050 are also not accompanied by interim near- and medium-term targets, which are essential for the credibility of the longer-term targets (Song et al. 2014). These findings reinforce the need for additional efforts and guidance to strengthen target setting.

Existing target setting approaches are generally based around the definition of a single target (and interim target(s)) to guide planning and action. Some also seek to integrate concepts of science, fairness and political acceptability when guiding suitable levels of ambition. This document acknowledges, however, that a single target (and interim target(s)) may be insufficient to ensure adequate credibility, accountability and transparency. It recommends consideration of targets informed by science, concepts of equity and analysis of mitigation opportunities.

For many cities, states and regions, particularly those in higher emitting contexts, it is possible that the remaining science-driven equitable contribution of emissions reductions may be beyond what is considered currently feasible. This document proposes an approach that creates the opportunity for cities, states and regions to determine what is considered a fair contribution towards the global emissions reduction effort needed to achieve the goals of the Paris Agreement, whilst also assessing what is considered feasible on the ground.

In this context, the guidance seeks to provide a way forward for planning and implementing climate action. It aims to ensure that targets and action are ambitious and driven by science and considerations of equity, pragmatism and feasibility. In doing so, it aims to connect climate science and concepts of equity with practice and policy. This document does not present a method or tool for cities, states and regions to use to develop emissions reduction targets.

1.4 Using this document

This document was developed to support anyone working on emissions reductions and mitigation policy at the subnational level, as well as national policymakers engaged in multi-level governance on this topic. It is intended for city, state, and regional leaders and officials, as well as members of academia, NGO practitioners, and civil society who are committed to advancing climate action and ensuring the robustness of emissions reduction targets.

Setting emission reduction targets is an important component of effective climate action and underpins multiple practices, frameworks and initiatives focused on climate action planning and implementation, including C40's Climate Transition Framework (C40 Cities, 2023), Global Covenant of Mayors' City Journey (GCoM, 2023), Under 2°s Pathways Framework Toolkit (Climate Group, n.d.), European Union's Climate-Neutral and Smart Cities Mission (European Commission, 2021), the One Planet City Challenge (OPCC) Assessment Framework (WWF, 2023), and Race to Zero. All these practices, frameworks and initiatives acknowledge that emissions reduction target setting and mitigation planning and action should be one, critical, part of a more holistic and integrated response to climate change that must also address climate resilience and adaptation, nature and biodiversity as well as critical themes of inclusion, equity and climate justice.

Each of these note that emissions reduction targets need to be supported by action plans (or transition plans). Climate action planning is an iterative process, as exemplified by the circular approach presented in Cape Town's Climate Change Action Plan (see Figure 3). Setting emissions reduction targets is connected to all parts of the climate action planning process, drawing on the available evidence base, analysis of subnational powers and context, and the available strategies and actions.



Figure 3: The climate change action planning cycle showing stakeholder roles (Adapted from City of Cape Town, 2021)

This guidance has been designed to be relevant for all cities, states and regions around the world. It provides details of key principles that all subnational governments can use to ensure their targets are aligned with the recommendations set out in IM4CSTARs (2023). The guidance can be used for:

- ➔ Setting new targets
- ➔ Updating current targets
- ➔ Stress-testing current targets

The guidance introduces specific terms to support a common understanding of the concepts presented. It is important to note, however, that the guidance is not advocating for the adoption of specific language by cities, states and regions in public communications with their communities and other stakeholders.

2. A high-integrity fair-share approach to setting targets



To ensure high-integrity subnational net zero commitments, IM4CSTARs (2023) calls for subnational emissions reduction targets that are *science-driven, equitable* and *complete*. In the guidance, science-driven means that commitments are led by the latest climate science; equitable means that commitments account for the different historical contributions to levels of atmospheric GHGs and socio-economic development; and complete means that commitments cover all GHG emissions from all major sources of emissions within the scope of the city, state or region.

This section builds on these recommendations and presents a high-integrity fair-share approach for setting subnational emission reduction targets, drawing on examples of good practice from cities, states and regions around the world (see Figure 4).

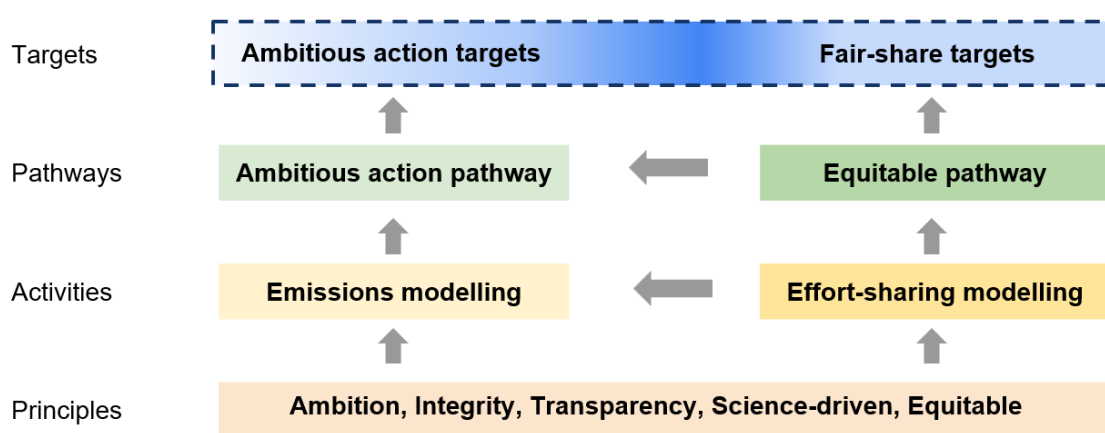


Figure 4: A high-integrity fair-share approach

A high-integrity fair-share approach to subnational emissions reduction target setting is underpinned by the same five principles used to define 'net zero' in IM4CSTARs (2023). These principles inform two parallel sets of activity to forecast future emissions, effort-sharing modelling and emissions modelling, which support the creation of two distinct emissions pathways: an equitable pathway and an ambitious action pathway³. These are then used to define two complementary sets of targets: fair-share targets and ambitious action targets.

The purpose of the ambitious action targets is to drive actions that the city, state or regional government will implement and collaborate with other actors on. It is based on emissions modelling and analysis of feasibility to quantify emissions reduction opportunities. The purpose of the fair-share targets is to set out what is a necessary and fair contribution to global mitigation efforts.

In some situations, fair-share and ambitious action targets will align. In other cases, where the fair-share targets call for greater reductions than the ambitious action targets, all efforts will need to be taken to minimise the gap between the two. If it is not possible to identify feasible strategies and actions that align the ambitious action targets with the fair-share targets, then the fair-share targets can be used to galvanise action to drive the wider political, social, technological, and institutional changes needed to align global climate action with the goals of the Paris Agreement. When presented together, ambitious action targets and fair-share targets represent a high-integrity fair-share approach to subnational GHG emissions reduction target setting.

³ Pathways (sometimes referred to as trajectories or reduction curves) represent the future path of emissions over a specific period, based on socio-economic scenarios. They start with a base year (or baseline) emissions, usually created through development of an initial GHG emissions inventory and show the projected changes in emissions over time and are usually supported by modelling or analysis (the different kinds of analysis or modelling are described further in Section 2.2 below). For more information on how to develop an emissions inventory, refer to the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (WRI, C40, and ICLEI, 2014) or to the guidebook "How to develop a Sustainable Energy and Climate Action Plan – Part II" (Bertoldi et al., 2018). The area under the emissions reduction pathway represents the cumulative emissions over the time period. From a global perspective it is the total cumulative global emissions, up to the point that global net zero is reached, that will determine the maximum global average temperature change. For this reason, at a local level it is important to establish not only a long-term target, but a local pathway supported by a series of interim targets that, where possible, prioritise nearer term reductions as it is the cumulative emissions that will determine a city, state or region's total contribution to global warming.

2.1 Target-setting principles

This guidance adopts the same principles as IM4CSTARs (2023), carried through from the original *Integrity Matters: Net Zero Commitments by Businesses, Financial Institutions, Cities, and Regions* report from the United Nations High-Level Expert Group on net zero commitments of non-state entities (see Box 3).

Box 3: Greenhouse gas target setting principles

1. **Ambition** which delivers significant near-, and medium-, term emissions reductions on a path to global net zero by 2050
2. Demonstrated **integrity** by aligning commitments with actions and investments
3. Radical **transparency** in sharing relevant, non-competitive, comparable data on plans and progress
4. Established **credibility** through plans based in science and third-party accountability
5. Demonstrable commitment to both **equity and justice** in all actions



Source: UN HLEG (2022), GCoM and WRI (2023)

The way in which these principles relate specifically to subnational emissions reduction target setting is set out below.

Ambition refers to ongoing commitments by cities, states and regions to increase their mitigation efforts over time to reduce GHG emissions at the pace and scale necessary to contribute to limiting global warming to well below 2°C, preferably 1.5°C, as set out in the Paris Agreement.

Integrity calls on cities, states and regions to act with honesty and ensure their commitments are supported by evidenced-based action plans (or transition plans). These should cover, at a minimum, the emissions sources outlined in Box 4, and containing concrete strategies and actions, and finance. This ensures that climate targets are supported by plans and action.

Transparency means cities, states and regions reporting accurately and openly on their emissions, targets, climate actions, and progress, as well as the methods and assumptions supporting such analyses. It plays an important role in building trust and accountability among citizens, policymakers, businesses, and investors, and makes a target more credible. Climate action requires broad support from a wide range of stakeholders. Transparency can make collaboration on implementing strategies and actions more effective.

A key aspect of transparency relates to the need for clarity around the emissions sources included within any target. IM4CSTARs (2023) provides clear recommendations related to the minimum boundary of an emissions reduction target for a city, state or region to ensure it is complete and can be considered 'net zero aligned' or 'net zero'. These are set out in Box 4.

Credibility is established through targets and plans based in science and robust analysis. **Science-driven** targets are generally defined as targets that use the latest scientific evidence⁴ to ensure climate ambition is aligned with the need to limit global warming within the goals of the Paris Agreement.

The scientific evidence is dynamic, meaning that our understanding of, and ability to meet, global climate goals will evolve over time. This evolution depends on two key factors: the success of global efforts to reduce emissions and the continuous advancements in our scientific understanding of the climate system. As new research emerges and global circumstances change, the benchmarks for science-driven targets may also need to be adjusted.

Two key components of the climate science published by the Intergovernmental Panel on Climate Change (IPCC) can help inform emissions reduction targets. These are the physical global budgets of remaining emissions and the global decarbonisation scenarios linked to different global average temperature outcomes. The scientific evidence also highlights that to achieve the goals of the Paris Agreement, global emissions need to reach net zero as soon as possible. In the longer-term, significant and sustained negative emissions will be needed globally – this highlights that at a global level net zero is not an end goal or destination, but rather a milestone on a global pathway to achieve sustained negative emissions (IPCC, 2021). This therefore also has relevance to the climate action targets and plans of cities, states and regions.

⁴ The term *scientific evidence* refers to outputs of the scientific community – research that has undergone scientific review, been published in peer-reviewed journals, and includes contributions from a wide range of scientific disciplines.

Equity and justice are central to the Paris Agreement, referenced both in Article 2 and Article 4. Article 2 states that the “agreement will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”. Article 4 reinforces this, noting that emissions reductions will be made “on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty” (UNFCCC, 2015). They establish the principle that the burden of mitigating climate change should be distributed fairly.

While the Paris Agreement is an agreement between nation states, these principles can be applied in the context of subnational climate action to help guide effort-sharing approaches on reducing emissions across cities, states and regions.

Box 4: IM4CSTARs (2023) recommendations related to the minimum boundary of emissions reduction targets

- IM4CSTARs (2023) uses the terms **shall** and **must** to indicate the fundamental requirements for a city, state, or region to be recognised as net zero or net zero aligned. The term **should** is used to indicate a recommendation, but not a requirement. The term **may** is used to indicate that something is permitted within the context of this report and its recommendations.
- Targets **must** account for all carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) emissions, and **should** include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃) emissions where these make a material contribution to aggregated GHG emissions.
- For cities, targets **must** include all scope 1 and 2 GHG emissions from stationary energy (buildings and facilities) and transport, and scope 1 and 3 GHG emissions from waste, and **should** include scope 1 GHG emissions from Agriculture, Forestry and Other Land Use (AFOLU) and Industrial Processes and Product Use (IPPU) (as defined by the city-induced framework in the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories) where these make a material contribution to aggregated GHG emissions.
- For states and regions, targets **must** include all scope 1 and 2 GHG emissions from stationary energy (buildings and facilities) and transport, scope 1 and 3 GHG emissions from waste, scope 1 GHG emissions from AFOLU and **should** include scope 1 GHG emissions from IPPU (as defined by the city-induced framework in the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories) where these make a material contribution to aggregated GHG emissions.
- Those that have the capacity to do so **should** disaggregate targets by sector, sub-sector, or group of sectors. Cities, states, and regions **should** include separate targets for non-CO₂ GHG emissions where these make a material contribution of ≥5% to aggregated GHG emissions based on the target boundary definition provided above.
- Additionally, cities, states, and regions **should** report territorial GHG emissions (as defined by the city-induced framework in the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories) and **may** set targets for these. Note, those that have the capacity **should** make every effort to report on, and reduce, scope 3 emissions generated from the consumption of goods and services.

2.2 Target setting pathways

A high-integrity fair-share approach to emissions reduction target setting for a city, state or region considers both the theoretical, equitable share of emissions reductions that a city, state or region should aim for, as well as what is feasible for them to deliver and/or influence. This necessitates that cities, states and regions develop two complementary emission reduction pathways:

- Equitable pathway
- Ambitious action pathway

2.2.1 Equitable pathway

An equitable pathway represents a pathway of future emissions for a particular city, state or region that can be considered a fair-share contribution to the overall mitigation effort needed to meet the goals of the Paris Agreement. It is developed using an equitable effort-sharing approach, and used as the basis for setting fair-share targets.

Effort-sharing, or burden-sharing, refers to the approach used to determine the contribution of different countries – and in this case cities, states and regions – to reducing emissions, in order to achieve global mitigation goals. Multiple approaches to model effort-sharing have been developed, primarily in the context of national emissions reduction targets.

The IPCC Fifth Assessment Report (IPCC, 2014) identifies several categories to represent different effort-sharing approaches. These include those that use historical emissions to derive future reduction goals (to represent the principle of responsibility); approaches that link reduction goals to GDP (to represent the capability to pay for emissions reduction); as well as a range of other factors.

Not all approaches to effort sharing, however, can be considered equitable. The equity principles referenced in Articles 2 and 4 of the Paris Agreement (see Section 2.1) can be used to guide the selection and/or design of *equitable* effort-sharing approaches. There are different ways of interpreting these principles and applying them to the selection and/or design of equitable effort-sharing approaches across different countries – and cities, states and regions – and the populations they represent. As a result, different approaches may establish different contributions.

Currently, most guidance is focused on effort-sharing and the application of equity principles for countries. There is limited research on how these approaches can be adapted and applied at the subnational scale. In addition, appropriate indicators to represent the various principles, and an acknowledgement of data availability challenges, are needed.

Cities, states and regions should therefore carefully examine what equitable effort-sharing approach (or approaches) is most suitable to their context, given data availability and other considerations, and transparently disclose how and why an approach was selected. In selecting an equitable effort-sharing approach, cities, states and regions are encouraged to consult relevant subnational networks and alliances as well as local and national research institutions.

A few initiatives have developed methods specifically to support cities, states and regions to calculate a fair-share contribution, including the One Planet City Challenge (OPCC), the Tyndall Local Carbon Budget Tool and Deadline 2020. These are collated in *Science-based Climate Targets: A Guide for Cities*, published in 2020 (see Box 2). They all include some aspect or a combination of the equity principles, balanced with other considerations regarding the practical use of the methods (see Box 5). For example, all methods use a grandfathering approach, where prior emissions inform entitlements to future emissions, which in many cases rewards high-emitters (and inaction) and may therefore not be considered equitable (Kartha et al., 2018; Knight, 2012; Schwanitz and Wierling, 2023).

Box 5: Available subnational effort-sharing methods

- OPCC partly accounts for the *capability* principle by using the national Human Development Index, therefore advocating for faster emissions reduction from cities, states and regions in countries with higher wealth, education and health scores. A grandfathering approach is then used for subnational entities.
- Tyndall Local Carbon Budget Tool was built to calculate the carbon budget for local to regional administrations in the UK. It accounts for *historical responsibilities* at a national level and then uses grandfathering on a subnational level.
- Deadline2020 was developed for C40 member cities to define their carbon budget and inform emissions reduction targets. It classifies emissions contributions based on contraction and convergence concepts. City typology is used to define pathways, based on GDP and current emissions levels to account for the *equality* principle.

These methods (and accompanying tools) have been useful in driving target-setting for numerous cities, states and regions to date. However, there is significant value in developing updated methods, or potentially a unified method, to account for the changing global emissions budget and more thoroughly integrate the equity principles while, potentially, enabling some flexibility for cities, states and regions to adapt and tailor methods to their contexts.

To advance this work and provide greater clarity to cities, states and regions on which effort-sharing approaches are considered suitable for developing equitable pathways, and how to apply them, this consultation process is seeking perspectives and input from stakeholders. Beyond recommending specific equitable effort-sharing approaches, it is also acknowledged that further support will be needed to guide the development of methods and tools to assist cities, states and regions in applying their preferred equitable effort sharing approaches in order to develop an equitable pathway and fair share targets.

Relevant questions included in consultation survey

- | | |
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| <p>➤ What kinds of effort sharing approaches are most suitable for cities, states and regions, to develop an equitable pathway that can be considered a fair-share contribution to the overall mitigation effort needed to meet the goals of the Paris Agreement?</p> | <p>approaches do you consider suitable for cities, states and regions, to develop an equitable pathway that can be considered a fair-share contribution to the overall mitigation effort needed to meet the goals of the Paris Agreement?</p> |
| <p>➤ Box 5 outlines three effort-sharing approaches that have already been developed to support cities, states and regions calculate a fair-share contribution. These include some aspect, or combination, of the equity principles (referenced in Articles 2 and 4 of the Paris Agreement), balanced with considerations other than equity principles regarding the practical use of the methods. All use a grandfathering approach. Which of these</p> | <p>➤ Different equitable effort-sharing approaches are likely to produce different equitable pathways. Should cities, states and regions be encouraged to use the same equitable effort-sharing approach(es) or should cities, states and regions be able to choose an equitable effort-sharing approach most suitable to their context, given data availability and other considerations?</p> |

2.2.2 Ambitious action pathway

To complement the equitable pathway, a series of action pathways can demonstrate how specific emissions reduction strategies and actions will impact jurisdiction-wide emissions over time. This involves emissions modelling to identify and analyse the specific strategies and actions that a city, state, or region and other actors could implement and the corresponding emission reductions that could be achieved (see Figure 5). The output of this activity is a set of action pathways and, critically, an ambitious action pathway.

Multiple pathways can be plotted on a graph. This can be used to represent the planned or necessary reductions in emissions needed to meet specific targets. Emissions modelling begins with the development of a base year GHG emissions inventory. This is followed by:

- ➔ A **business-as-usual** emissions forecast, which describes a pathway where no additional mitigation efforts are implemented by a subnational government or other actors. The business-as-usual pathway serves as a reference from which the impact of emissions reduction strategies and actions can be quantified.
- ➔ An **existing and planned action pathway** includes actions (e.g., policies, projects, etc.) already defined in strategies or climate action plans that are expected to reduce emissions in future years. This pathway may also include non-policy driven market trends when there is adequate evidence that such a trend is likely to occur.
- ➔ An **ambitious action pathway** builds on the existing and planned action pathway and identifies new strategies and actions that reduce additional sources of emissions to narrow/close the gap to the equitable pathway, or even exceed the equitable pathway. The strategies and actions contained in the ambitious action pathway are deemed ambitious but feasible, but their successful implementation may depend on external factors (or conditions). It is along this pathway that ambitious action targets can be set.

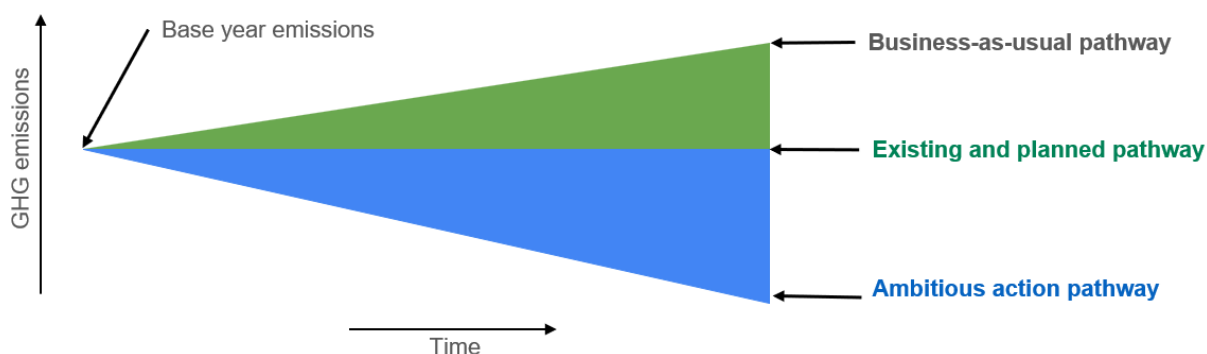


Figure 5: Action pathways (illustrative)

When developing the ambitious action pathway, it is important to consider two related concepts: feasibility (see Box 6) and conditionality (see Box 7). Feasibility defines if a strategy or action is realistic. Conditionality defines if a strategy or action is dependent on external support. An unconditional strategy or action is one that can be achieved solely through a subnational government's own efforts. On the other hand, the outcome of a conditional strategy or action is dependent on external factors beyond the direct control of a city, state or regional government.

Outlining an ambitious action pathway can help define what is required to reduce emissions in line with the equitable pathway previously described. This will likely involve some strategies and actions that are conditional on some form of external support. This approach also supports strategy development and action planning by identifying priority areas for action and collaboration.

To ensure the credibility of both conditional and unconditional strategies and actions, cities, states and regions should identify and document the associated barriers and engage with relevant stakeholders to explore how these barriers can be overcome (see Box 8). It is important to emphasize that the commitment to the emissions reduction target's ambition itself cannot be conditional; however, achieving the conditional targets depends on specific external factors being met.

Box 6: Feasibility

When setting emissions reduction targets, it is important to evaluate whether proposed strategies and actions can be successfully implemented. This involves an analysis of the emissions context, available mitigation strategies and actions, market trends and wider social, economic and policy context. Combined with an analysis of powers and levers of influence, as well as barriers to implementation, this evidence base can help cities, states and regions determine if their proposed strategies and actions are realistic and likely to deliver on the intended outcomes.

Box 7: Conditionality

Cities, states and regions do not have full control over all sources of emissions within their administrative boundary. Achieving subnational emissions reduction targets is, therefore, conditional on the successful collaboration, coordination and implementation of strategies and actions by other actors such as national government, businesses and other institutions, and residents. These multi-level partnerships could, for example, involve support to create the enabling conditions for action, such as finance, legislation etc. The conditionality associated with particular strategies and actions represents a risk to achieving emission reduction targets and should be identified, documented, and communicated transparently.

Unconditional actions are those made by a city, state or region to reduce emissions using their own resources, policies, and capabilities. Conditional actions are those that depend on external factors, such as national, international, or private finance, as well as legislation.

It is essential not to limit exploring mitigation options to what is currently possible or fundable. The exercise of identifying the most ambitious level of possible interventions, and then defining what would be required for that to be possible, is a valuable tool to advocate for further investment and support from national government and other stakeholders.

Box 8: Barriers

Emissions reduction strategies and actions will inevitably face a range of barriers. Barriers for specific strategies and action will ultimately influence whether a target can be met and reflect the overall level of influence and control a city, state or regional government has over their target. These barriers may fall into different categories such as practical and technological, political and social, legal and institutional, and economic and financial.

Cities, states, and regions should identify these barriers and collaborate with other actors to stimulate financial flows, unlock policy reform and help create the enabling conditions needed to address any obstacles. Cities, states and regions can work collectively to remove barriers, both locally and globally; an example of this at a global scale being the Cities Climate Finance Leadership Alliance⁵.

Clearly documenting these barriers (see Table 1 for an example from Chennai's Climate Action Plan) can play an important role in building awareness of the challenges that need to be overcome with support from other actors and assessing how these barriers change over time and how this influences the perceived feasibility of particular strategies and actions.

Goal	High-level description types of barriers			
	Practical & technological	Political & social	Legal & institutional	Financial & economic
Achieve 100 percent de-carbonisation of electric grid by 2050	<ul style="list-style-type: none"> • Insufficient energy storage capacity • Negative co-impacts of hydroelectric generation and storage systems • Aging thermal power-generation infrastructure 	<ul style="list-style-type: none"> • Political and administrative differences in prioritisation 	<ul style="list-style-type: none"> • Widespread reform not politically supported • Dependence on state-owned energy 	<ul style="list-style-type: none"> • Requirement of state-level financial support • Local support only possible for distribution infrastructure

Table 1: Example of barriers analysis (Chennai, 2023)

Relevant questions included in consultation survey

- The guidance describes that it is important to consider 'conditionality', 'feasibility' and 'barriers' to action when developing the ambitious action pathway. Do you agree that these three concepts are clearly described in the guidance?

2.3 Target-setting recommendations

2.3.1 Fair-share and ambitious action targets

The equitable and ambitious action pathways guide the setting of emission reduction targets. It is recommended that cities, states and regions adopt two complementary sets of targets:

- ➔ Fair-share targets based on the equitable pathway
- ➔ Ambitious action targets based on the ambitious action pathway

The level of emissions reduction required by the equitable pathway at key milestones should guide the setting of the fair-share targets. Similarly, the level of emissions reduction achieved by the ambitious action pathway at those same milestones should guide the setting of the ambitious action targets (see Table 2). IM4CSTARs (2023) calls for cities, states and regions to adopt near- and medium-term emissions reduction targets of five years or less so as to guide and monitor progress along the way.

Target type	Relevant Pathway	Description of target type
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⁵ Cities Climate Finance Leadership Alliance. See: <https://citiesclimatefinance.org/>

Fair-share targets	Equitable pathway	Fair-share targets are informed by the equitable pathway derived from the selected equitable effort sharing approach(es) and modelling. They represent a fair contribution towards the global emissions reduction effort needed to achieve the goals of the Paris Agreement. If applicable, they can be accompanied by details of any barriers, and enabling actions required by other actors (national government, business, etc) to achieving fair-share emissions reduction.
Ambitious action targets	Ambitious action pathway	<p>Ambitious action targets are informed by the emissions reductions estimated by the ambitious action pathway and may include both conditional and unconditional strategies and actions. They demonstrate the highest possible ambition that is considered feasible by the city, state or region setting the target(s). Some strategies and actions needed to achieve the ambitious action pathway and ambitious action targets may be beyond the direct control of a city, state or regional government and will require varying levels of external support and coordination for their successful delivery. Documenting such conditions and barriers <i>and</i> taking action to engage stakeholders to overcome barriers and create the enabling conditions is critical.</p> <p>Note, use of the term 'ambitious' reflects the ambition of the local or regional government setting the target, and does not – in any way – comment on the level of emissions reduction required by the fair-share target or imply that this may not be ambitious.</p>

Table 2: Fair-share targets and ambitious action targets

The ambitious action pathway, and therefore the ambitious action targets, should aim to align, as much as possible, with the equitable pathway and fair-share targets. In some cases, the two pathways may align. For any particular city, state and region, however, a gap (referred to here as the “fair-share-ambitious action gap”) may remain between the equitable pathway and the ambitious action pathway.

In some contexts, the equitable pathway will indicate greater emissions reductions than the ambitious action pathway. For example, higher income and historically high-emitting cities, states and regions will likely see the equitable pathway sharply decrease to net zero in the near future or even in the near past. In other contexts, it is also possible that the ambitious action pathway may yield greater emissions reductions than the equitable pathway. Seeking the highest possible ambition is encouraged.

Relevant questions included in consultation survey

- It is clear why a 'fair-share-ambitious action gap' may exist between the equitable pathway and ambitious action pathway. *(When answering the survey, you can select 'agree' / 'disagree').*
- In situations where there is a gap between the fair-share target and ambitious action target, cities, states and regions should adopt *both* a fair-share target and an ambitious action target, and report the fair-share-ambitious action gap that may exist. *(When answering the survey, you can select 'agree' / 'disagree').*

2.3.2 Fair-share-ambitious action gap

The fair-share-ambitious action gap highlights the difference between the level of emissions a city, state or region can achieve based on their own emissions modelling and analysis, compared to what is required using an equitable effort-sharing approach (see Figure 6). The gap is only relevant where the equitable pathway indicates emissions reductions that are greater than the ambitious action pathway.

Where this occurs, the fair-share-ambitious action gap may contain some emissions that cannot be eliminated or reduced further because barriers to action cannot feasibly be overcome (such as economic, technological, institutional, socio-cultural, ecological and/or geophysical (IPCC, 2018)). For example, an emissions source for which there is no known mitigation technology, or for which an action is so cost prohibitive that it is considered economically unviable in any context. These may be referred to as 'residual emissions'.

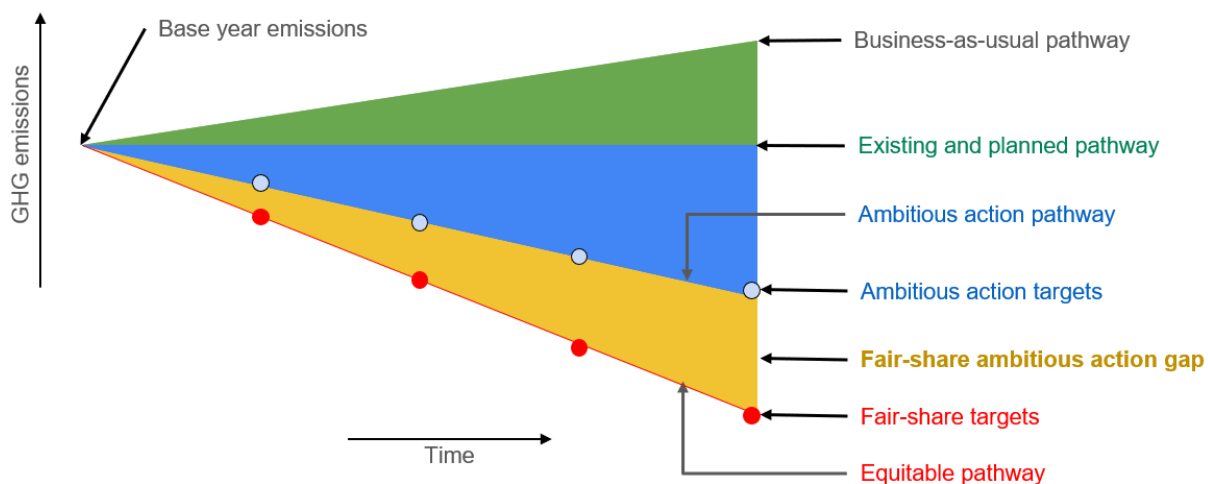


Figure 6: The fair-share-ambitious action gap (illustrative)⁶

Residual emissions should be reduced to the minimum possible in any ambitious action pathway and should be reviewed on a regular basis to determine if new strategies and actions can help overcome previously identified barriers. Various subnational climate action planning frameworks recommend a threshold for residual emissions⁷. In any case, considering the assessment of feasibility outlined in Section 2.2.2, and the principle of transparency (see Section 2.1), cities, states and regions will need to justify why each source of emissions that is considered 'residual' is unavoidable in their contexts and disclose this transparently for the target to remain credible⁸.

Any gap between the equitable and ambitious action pathways could be addressed in part through efforts by cities, states and regions to engage with other levels of government, and other actors, to advocate for an enabling environment (particularly in terms of policy and finance) to support implementation of ambitious action. It could also be addressed through contributions to global mitigation efforts such as international flows of financial and other support (Schwanitz and Wierling, 2023). This could involve finance from contexts with higher capability and responsibility to those with lower capability and responsibility. While this theory can be applied to cities, states, and regions, it is important to note that subnational governments will likely not have the same financing capabilities or sovereign responsibility for the population that they represent compared to their national government. There are still actions that subnational governments can take, however, to address the fair-share-ambitious action gap.

This guidance recommends that cities, states, and regions with a fair-share-ambitious action gap:

- ▶ Implement fully the actions in their plans using all available powers
- ▶ Publicly acknowledge the fair-share-ambitious action gap, and communicate their commitment to equitable approaches to global emissions reductions
- ▶ Take action, including through advocacy, to encourage other actors, such as national government, to remove barriers and help create the enabling conditions for more ambitious action
- ▶ Advocate for national governments to ensure adequate financial flows for global emissions mitigation efforts
- ▶ Take steps to accelerate negative emissions within the administrative boundary of a city, state or region (see Section 2.3.2)
- ▶ Provide, or receive, technical or financial support to, or from, other cities, states, and regions
- ▶ Mobilize their residents, businesses, and other institutions to drive climate action in other cities, states or regions.

Relevant questions included in consultation survey

- ▶ I agree with the suggestions made in the guidance for acknowledging and addressing a fair-share-ambitious action gap. (When answering the survey, you can select 'agree' / 'disagree').

⁶ Figure is illustrative only. Note some effort sharing approaches may result in the equitable pathway not aligning with base year emissions.

⁷ For example, the European Commission's Joint Research Centre, which reviews all targets submitted by cities in the European Union, proposes a recommended maximum residual emissions of 20% of total baseline emissions (European Commission, 2021).

⁸ Ulpiani et al. (2024) propose a framework to support this.

2.3.3 Negative emissions

While the main focus on mitigation efforts should be on absolute emission reductions, net zero will only be achieved by addressing residual emissions through carbon removals. Cities, states and regions may choose to address residual emissions by adopting strategies and actions that result in negative emissions (see Box 9). To be considered 'net zero' or 'net zero aligned' IM4CSTARs (2023) states that cities, states and regions that choose to fund mitigation or removals outside of their emissions boundary (see Box 4) through the purchase of carbon credits, cannot use these credits to demonstrate progress toward their emissions reduction targets and pathway (GCoM and WRI, 2023).

Box 9: Negative emissions

There are two main forms of generating negative emissions:

- Natural carbon sinks, such as ocean ecosystems and forests, sequester carbon. The enlargement or enhancement of these ecological areas can result in negative emissions (European Commission, 2021). Protecting, maintaining and expanding natural carbon sinks is also beneficial for a range of non-GHG related outcomes such as access to green spaces, mental health, pollution and emission-related diseases.
- Emissions removal technologies, also known as negative emission technologies, such as Direct Air Capture and storage, must capture and permanently sequester emissions from the atmosphere. Most emissions removal technologies are still being tested for viability at scale, so applicability is currently limited. Additionally, the risk of potential ecological and ethical effects of these technologies is not fully known, so subnational governments should follow precautionary principles when considering these activities (European Commission, 2021).

2.3.4 Target types

There are two main types of emissions reduction targets that are recommended for fair-share and ambitious target setting:

- A fixed level target specifies an absolute emissions level by a target year. This does not relate to a historical base year or a future projected scenario. This includes targets aiming for emissions neutrality or net zero emissions by a certain date.
- A base year emission target specifies a percentage reduction relative to emissions in a historical base year. This type of target limits absolute emissions rather than emissions intensity.⁹

It is recommended that cities, states and regions use both types of targets. A fixed level target can be used to strive for an ambitious shared goal (e.g. net zero by 2050), whereas base year emissions targets are necessary as interim targets along the pathway to reaching this goal (e.g. 70% reduction in total emissions from 2010 levels by 2030), and then going beyond it.

Baseline scenario targets, where emissions are reduced relative to a projected emissions scenario, also known as business-as-usual (BAU) targets, and intensity-based targets, where emissions are reduced relative to another variable such as GDP, are considered less transparent and therefore not recommended.

⁹ Both types of targets are fully described in the GHG Protocol Mitigation Goal Standard (WRI, 2014)

2.4 Other target setting considerations

2.4.1 Sectoral emission reduction targets

For cities, states and regions which have capacity, emission reduction targets should also be disaggregated by sub-sector, sector, or group of sectors, as recommended in IM4CSTARs (2023). Such targets can help focus efforts on specific high-emitting sectors or activities. It can also be a helpful exercise in breaking down a community-wide target whilst identifying interventions, and reduction pathways, for particular sectors. Specific targets may also be set for emissions removals. Any disaggregation of targets should be accompanied by actions that seek to maintain an integrated and holistic approach and avoid siloed planning. This includes careful consideration of the interconnections between sectors and actions and any synergies or trade-offs.

2.4.2 Non-CO₂ emission reduction targets

IM4CSTARs (2023) recommends that cities, states and regions include separate targets for non-CO₂ emissions where these make a material contribution of $\geq 5\%$ to total baseline emissions. This is particularly important for subnational jurisdictions with agriculture and fossil fuel infrastructure due to the related methane emissions. Cities, states and regions should consider alignment with the Global Methane Pledge (2024). As noted above (Section 2.4.1) these targets should serve to focus action whilst retaining an integrated approach that is able to identify synergies, trade-offs and cross-sectoral opportunities

2.4.3 Non-GHG emission reduction targets

Cities states and regions may also find it valuable to set non-GHG targets alongside the fair-share and ambitious action targets. These can be based on a diverse set of indicators related to specific strategies and actions, e.g. deployment of renewable energy, rates of energy poverty, use of fossil fuels, or lengths of bike lanes.

2.4.4 Local government operations

This guidance does not cover the setting of specific GHG emissions reduction targets for local government operations. Such targets represent a subset of community-wide GHG emissions coming from operations, activities and facilities that are owned or operated by city, state or regional governments. Further guidance on this can be found in the GHG Protocol for Community Scale GHG Emissions Inventories (WRI, C40 and ICLEI, 2021).

2.4.5 Guidance for new cities

Newly, or rapidly expanding cities have the unique opportunity to adopt low-emission urban development policies and practices from the outset, potentially allowing for a faster and shorter pathway to net zero than that of an established city. The city can mainstream integrated climate action from the beginning, prioritizing low-emission technologies, natural carbon sinks and infrastructure that avoid emissions. Setting emissions targets during the design stages can guide the development of different economic sectors, providing a clear intended pathway of emissions in the following years. Future approaches to developing equitable effort sharing approaches and models should consider specific guidance for new, or rapidly expanding, cities.

3. Communicating, monitoring, and reporting targets

An effective system for communicating, monitoring and reporting targets is essential to ensure targets are transparent and credible.



3.1 Transparent communication

Transparently communicating targets, the analysis used in setting targets, and progress towards targets, is a vital step in building trust and confidence with stakeholders and showing the benefits of climate action. This is often incorporated in climate action plans (or transition plans) and associated communications. It is recommended that such communication includes:

- ➔ The fair-share and ambitious action targets (see Section 2.3.1), with information on methods and assumptions involved in their development (see Lecocq et al. 2024)
- ➔ An overview of feasibility, conditionality and barriers assessed to develop target pathways (see Section 2.2.2)
- ➔ The fair-share-ambitious action gap (see Section 2.3.2) and any residual emissions
- ➔ Sectoral, non-CO₂ and non-GHG emission reduction targets where these have been adopted (see Section 2.4.1 – 2.4.3)
- ➔ Details of how the subnational government is utilising its powers and responsibilities to take action, and the steps it is taking to influence, convene and collaborate with other actors to overcome barriers and achieve their community-wide targets (such content often forms the core of climate action plans or transition plans)
- ➔ Barrier to addressing residual emissions and the strategy to overcome and address them.

In the context of the equity principles of the Paris Agreement, it is important to acknowledge the various costs associated with developing, monitoring and reporting on the multiple aspects of emissions reduction targets. Expectations on the detail of analysis and completeness of reporting may also need to reflect the local context.

3.2 Uncertainties and assumptions

The analysis that supports emissions reduction target setting (both the equitable pathway and the action pathways) involves assumptions about the future, which are inherently uncertain, as well as value judgements. Being transparent about these assumptions and judgements can, in many contexts, help the intended audience interpret the targets, and supports the building of trust and confidence among stakeholders.

An additional source of uncertainty relates to the assumptions and judgements used to determine feasibility, conditionality and barriers (as part of the action pathways development). Therefore, it is recommended that all assumptions, data and rationale are clearly documented and made available publicly to allow for external scrutiny. Acknowledging these factors enables continuous improvement and adaptation of strategies in response to changing policy and economic context.

3.3 Monitoring systems

Monitoring is necessary for assessing progress towards emissions reduction targets and providing an opportunity to reflect on the success of climate action activities. Regular monitoring can support reprioritisation of interventions and maximise emissions reduction efforts by identifying what works best. Integrating the process of monitoring progress towards emissions reduction targets into other monitoring systems in the city, state or regional government, can help create an efficient and effective process that mainstreams climate monitoring and measures progress on the full climate action plan.

3.4 Reporting platforms

There are several reporting platforms which can be used to formally report and track progress against emissions reduction targets. Examples include CDP-ICLEI (Cities) Track, CDP States and Regions questionnaire, and My Covenant. Reporting through a public reporting platform is beneficial for increasing public awareness of emissions reduction targets and the progress towards them and can contribute positively to regional or global movements and networks working collaboratively by facilitating the sharing of information.

Relevant questions included in consultation survey

- I agree with the emphasis on transparency and public disclosure of targets and assumptions throughout the guidance. *(When answering the survey, you can select 'agree' / 'disagree').*
- When cities, states and regions report on their targets, they should specify the role of external actors in delivering on their targets; and detail how they are utilizing their powers to influence and convene these external actors. *(When answering the survey, you can select 'agree' / 'disagree').*

4. Public Consultation

This guidance will be available for public consultation until 28 February 2025 via an online [survey](#). GCoM and WRI are seeking perspectives and input from a wide range of stakeholders including subnational governments of all sizes and in all countries, net zero initiatives and alliances, NGOs, consultants, academia and other practitioners working in the climate action space. Additional comments may be sent to info@globalcovenantofmayors.org.

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Annex III: Glossary of Selected Terms

Term	Proposed definition
Cities, states and regions	Any geographically discernible subnational entity, such as a community, town, city, metropolitan authority, or province, and covers all levels of subnational jurisdiction as well as local government as legal entities of public administration (GCoM and WRI, 2023).
Effort-sharing, or burden-sharing	Refers to approaches to determining the emission reduction contribution of different countries – and cities, states and regions – to reducing emissions to achieve global climate goals.
Emissions pathways	Sometimes referred to as emissions trajectories or reduction curves, they represent the possible paths of emissions over a specific period based on different assumptions about the future. Pathways can be developed at a global level or for specific countries or cities, states or regions.
Emissions reduction target	An emissions reduction target (or mitigation goal) establishes a timebound desired outcome. It is a commitment to take action to reduce, or limit the increase of, GHG emissions by a specified quantity, by a specific future date, and provides the basis against which GHG emissions and GHG emissions reductions are tracked and reported.
Global carbon budget	Budget that represents the total net amount of CO ₂ that can still be emitted into the atmosphere while limiting global warming to specific thresholds, such as 1.5°C or 2°C above pre-industrial levels.
Greenhouse gases (GHG)	For the purpose of this report, GHG are the seven gases covered by the UNFCCC: carbon dioxide (CO ₂); methane (CH ₄); nitrous oxide (N ₂ O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); sulphur hexafluoride (SF ₆); and nitrogen trifluoride (NF ₃) (Fong et al., 2021).
Material contribution to aggregated emissions	Unless otherwise defined, any activity or source that contributes ≥2% to the aggregated GHG emissions of a city, state or region (GCoM and WRI, 2023).
National Determined Contribution (NDC)	Nationally Determined Contribution is a climate action plan to cut emissions and adapt to climate impacts. Each Party to the Paris Agreement is required to establish an NDC and update it every five years, with an increase in ambition. NDCs are where countries set targets for mitigating the greenhouse gas emissions that cause climate change and for adapting to climate impacts (United Nations, n.d.).
Negative emissions	Emissions are negative when more emissions are being removed than produced. Negative emissions can be achieved through the removal of GHGs from the atmosphere by deliberate human activities.
Net zero	Condition in which metric-weighted anthropogenic emissions are balanced by metric-weighted anthropogenic GHG removals over a specified period (GCoM and WRI 2023).
Non-GHG targets	Targets that are not set in terms of GHG reduction, but also contribute to it. Usually adopted when considering mitigation-related actions.
Residual emissions	Emissions whose abatement remains uneconomical or technically infeasible under the assumptions of a specific model and mitigation scenario. These emissions cannot be eliminated or reduced further either because there is no known mitigation technology, or the technology is so cost prohibitive that it is considered economically unviable in any context.
Scope 1 (territorial) emissions	Emissions from sources located within the city, state or region's boundary (Fong et al., 2021).
Scope 2 emissions	Emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the city, state or region's boundary (Fong et al., 2021).
Scope 3 emissions	All other emissions that occur outside the city, state or region's boundary as a result of activities taking place within the city, state or region's boundary (Fong et al., 2021).

Annex IV: References

- CDP (n.d.) States and regions – CDP: www.cdp.net/en/states-and-regions
- Chennai (2023) Chennai Climate Action Plan: <https://chennaicorporation.gov.in/gcc/CCAP>
- City of Cape Town (2021) City of Cape Town Climate Change Action Plan: www.capetown.gov.za/ClimateChangeActionPlan
- Climate Group. (n.d.) Pathways Framework | Climate Group: www.theclimategroup.org/pathways-framework
- C40 Cities (2023) Cities Climate Transition Framework: www.c40knowledgehub.org/s/article/Cities-Climate-Transition-Framework
- C40 Cities and Arup (2016) Deadline 2020 – How cities will get the job done: www.c40.org/wp-content/uploads/2021/07/Deadline_2020.pdf
- European Commission (2021) European Missions:100 Climate-Neutral and Smart Cities by 2030 - Info Kit for Cities: https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/mission-climate-neutral-and-smart-cities-info-kit-cities-now-available-2021-10-29_en
- European Commission: Joint Research Centre (2018), Iancu, A., Monni, S., Muntean, M., Lah, O. et al., *Guidebook 'How to develop a Sustainable Energy and Climate Action Plan (SECAP)'. Part 2, Baseline Emission Inventory (BEI) and Risk and Vulnerability Assessment (RVA)*, Bertoldi, P.(editor), Publications Office, <https://data.europa.eu/doi/10.2760/118857>
- Global Covenant of Mayors (2023) Journey – Global Covenant of Mayors: www.globalcovenantofmayors.org/journey
- Global Covenant of Mayors for Climate & Energy (GCoM) (2023) Global Covenant of Mayors - Common Reporting Framework. Version 7.0, 2023: www.globalcovenantofmayors.org/wp-content/uploads/2023/11/CRF7-0-2023-09-14-final.pdf
- GCoM and WRI (2023) Integrity Matters for Cities, States, and Regions: Follow-up recommendations for ambitious, high integrity, transparent, credible, and fair subnational government net zero commitments: www.globalcovenantofmayors.org/wp-content/uploads/2023/12/Integrity-Matters-Report-Final3.pdf
- Global Methane Pledge (2024): <https://www.globalmethanepledge.org/>
- Höhne N, M.G.J. den Elzen, & D. Escalante (2014) Regional GHG reduction targets based on effort sharing: a comparison of studies. *Climate Policy* 14, 122 – 147. DOI: 10.1080 / 14693062.2014.849452
- IPCC (2014) *Climate Change 2014: Mitigation of Climate Change*. Cambridge University Press
- IPCC (2018) *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. Cambridge University Press.
- IPCC (2021) *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.
- Kartha, S. et al. (2018) Cascading biases against poorer countries. *Nature Climate Change* 8, 348–349: <https://doi.org/10.1038/s41558-018-0152-7>
- Knight, C. (2012) What is grandfathering? *Environmental Politics*, 22(3), 410–427. <https://doi.org/10.1080/09644016.2012.740937>
- Lecocq, F., & Winkler, H. (2024). Questionable at best: why links between mitigation by single actors and global temperature goals must be made more robust. *Climate Policy*, 1–8. <https://doi.org/10.1080/14693062.2024.2362847>
- Liu, C., Huang, S., Peng, Z. and Xu, P. (2017) Exploring an integrated urban carbon dioxide (CO₂) emission model and mitigation plan for new cities. *Environment and Planning B: Urban Analytics and City Science* 2018, Vol. 45(5) 821–841. DOI: 10.1177/0265813516686972
- Race to Zero (2022) Criteria: <https://racetozero.unfccc.int/system/criteria/>
- Race to Zero (2024) Progress Report 2023, https://climatechampions.unfccc.int/wp-content/uploads/2023/12/Race-to-Zero-2023-Progress-Report_29112023_-pdf.pdf
- Schwanitz, V. and Wierling, A. (2023) The interpretation of science-based targets for cities – Validating Deadline 2020, One Planet City Challenge, and Tyndall Local Carbon Budget Tool. Manuscript unpublished. <https://doi.org/10.21203/rs.3.rs-3627480/v1>

Science Based Targets Network (2020) Science-based climate targets: A Guide for Cities:
<https://sciencebasedtargetsnetwork.org/wp-content/uploads/2021/04/SBTs-for-cities-guide.pdf>

Song, K, Burley Farr, K., Hsu, A. (2024). Assessing subnational climate action in G20 cities and regions: Progress and ambition, One Earth. <https://doi.org/10.1016/j.oneear.2024.10.001>

The University of Manchester & Tyndall Centre for Climate Change Research (n.d.) Tyndall Carbon Budget Reports:
<https://carbonbudget.manchester.ac.uk/reports/>

Ulpiani, G., Veters, N., Bertoldi, P., and Thiel, C. (2024) Shining light on residual emissions for cities. Nature Climate Change, 14(4), 302-305. <https://doi.org/10.1038/s41558-024-01961-z>

UNFCCC (2015) United Nations Framework Convention on Climate Change – Adoption of the Paris Agreement. U.N. Doc. FCCC/CP/2015/L.9/Rev/1 (Dec. 12, 2015): <https://unfccc.int/sites/default/files/l09r01.pdf>

United Nations (n.d.). All about the NDCs: www.un.org/en/climatechange/all-about-ndcs

United Nations High Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities (UN HLEG) (2022) Integrity Matters: Net Zero Commitments by Businesses, Financial Institutions, Cities and Regions

WRI (2014). GHG Protocol – Mitigation Goal Standard: An Accounting and Reporting Standard for National and Subnational Greenhouse Gas Reduction Goals:
https://ghgprotocol.org/sites/default/files/standards/Mitigation_Goal_Standard.pdf

WRI, C40, ICLEI (2021). Greenhouse Gas Protocol: Global Protocol for Community-Scale Greenhouse Gas Inventories – An Accounting and Reporting Standard for Cities. Version 1.1:
https://ghgprotocol.org/sites/default/files/standards/Mitigation_Goal_Standard.pdf

WWF (2023) One Planet City Challenge (OPCC) Assessment Framework:
https://wwfint.awsassets.panda.org/downloads/opcc2023_assessment_framework_and_technical_details_step2.pdf

Co-convenors

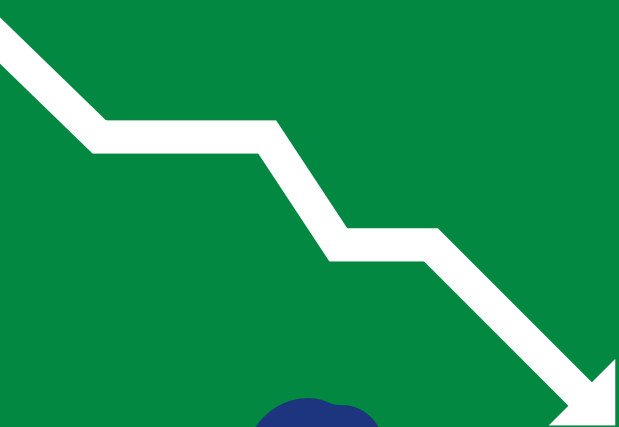


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INTEGRITY MATTERS:

GHG Target Setting Guidance for Cities, States and Regions

Draft Guidance Version 1.0 for Public Consultation