Emissions Gap Report 2025: Chapter 3 – Nationally determined contributions and long-term pledges: The global landscape and G20 member progress

[8-9 pages total, 5600-6300 words, excluding references]

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3.1 Introduction

The architects of the Paris Agreement envisioned that Parties would ratchet up the ambition of their mitigation efforts over time to close the emissions gap. A critical test of the Paris Agreement's ratchet mechanism is now underway. New nationally determined contributions (NDCs), formally due by 10 February 2025,[1] have begun to emerge, with additional submissions expected in the coming months. These NDCs, which set targets and measures for 2035, are the first to be informed by the outcomes of the inaugural global stocktake, concluded in 2023 (UNFCCC, 2023). They are also the first since a majority of Parties—and all of the G20—set targets to reach net-zero emissions. The extent to which Parties respond to this moment with enhanced ambition—grounded in the principle of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances—will shape the credibility of the Paris Agreement and the world's ability to close the emissions gap.

This chapter takes stock of the current state of play of NDCs. The chapter is structured as follows. Section 3.2 assesses the characteristics of current NDCs at the global level. It addresses elements related to fairness and ambition, emissions target form and coverage, sector-specific efforts called for in the global stocktake, and finance and conditionality. Where possible, it evaluates the evolution since the adoption of the Paris Agreement. Section 3.3 spotlights the new NDCs, which set targets for 2035. It quantifies their targeted emission levels and assesses the expected additional emission reductions collectively by 2035 compared to the 2030 NDCs. The second part of the chapter (Section 3.4) provides a deep dive into the emission trajectories of G20 countries under their current policies, NDCs, and net-zero targets. It examines the implications of NDCs for peaking, and their alignment with modelled trajectories to net zero.

[1] https://unfccc.int/sites/default/files/resource/PAICC_11_meeting_report.pdf

In addition to countries, the G20 includes the African Union and the European Union. Because the African Union has neither a collective NDC nor a net-zero target, the assessment does not include commitments by the African Union as a whole. Details regarding the NDCs of African Union members can be found in Appendix B.2. (The commitments of South Africa, which is a member of both the African Union and the G20, are assessed). The European Union has both a collective NDC and a net-zero target, so these are included in the assessment alongside those of EU and G20 members France, Germany, and Italy. The methodology and preliminary findings of this chapter were made available to the governments of the G20 members to provide them with the opportunity to comment on the findings.

Where the chapter refers to "new NDCs", it refers to NDCs that are listed on the NDC 3.0 tracker of the UNFCCC, submitted since November 6, 2024 (25 NDCs at the time of writing). Where it refers to "current NDCs", it refers to the most recent NDC of every Party to the Paris Agreement. The cut-off date for the literature and data assessed in this chapter is 1 July, 2025 except where otherwise noted. Country-level emissions represent territorial emissions unless otherwise noted. GHG emissions are expressed using the 100-year global warming potentials (GWPs) from the Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC). In contrast to Chapter 2, this chapter uses the latest national greenhouse gas inventories (NGHGIs) as compiled by the PRIMAP-hist project (Gütschow, Busch and Pflüger, 2025) for historical energy and industry emissions, supplemented by the harmonized NGHGI-based dataset for historical CO_2 emissions from land use, land-use change and forestry (LULUCF) (JRC, 2025). These methodological choices cause minor variation in country-level emissions estimates across Chapters 2 and 3.

3.2 Global overview of current NDCs

3.2.1 Emissions target characteristics

The first global stocktake encouraged Parties to submit "ambitious, economy-wide emission reduction targets, covering all GHGs, sectors and categories."[2] Figure 3.1 summarizes how the number of NDCs with GHG targets, as well as the form, sector coverage, and gas coverage, of those targets have evolved since the adoption of the Paris Agreement. Relative to the initial NDCs, more NDCs now contain GHG reduction targets (149 versus 123 initially). More targets (though still a minority) are absolute reduction targets relative to a base year (42 versus 35 initially). A substantial majority of these targets cover all sectors of the economy (94 versus 53 initially). While few NDCs cover all greenhouse gases, a majority cover the three main gases (CO_2, CH_4, and N_2O) (107 versus 80 initially). Finally, while several decisions since COP26 have requested countries to revisit and strengthen their 2030 targets, only about half of total NDCs have ever done so (85 out of 168), and only 5 have done so in the latest round of NDCs.

[2] The Paris Agreement stipulated that developed country NDCs are to have economy-wide, absolute emission reduction targets, while developing countries are to move over time towards economy-wide targets.

Figure 3.1: Evolution of GHG target form, sector coverage, and gas coverage since 2015

Source: Authors' analysis of Climate Watch (2025) data (Climate Watch, 2025a). Note: This analysis is based on each Party's most recent NDC available (whether or not it includes a 2035 target). It excludes NDCs without GHG targets. Cut-off date: 29 June 2025.

3.2.2 Fairness and ambition

Each successive NDC must represent a progression beyond the previous NDC and reflect each Party's highest possible ambition. Parties are to justify how their NDCs are fair and ambitious in the light of their national circumstances. Parties use a range of indicators to describe the fairness and ambition of their new NDCs (Figure 3.2). Nearly all (84 per cent) claim that their NDCs represent a progression beyond their previous NDCs. **[Note to reviewers: This text will be elaborated when more NDCs are submitted and trends are more clear]**

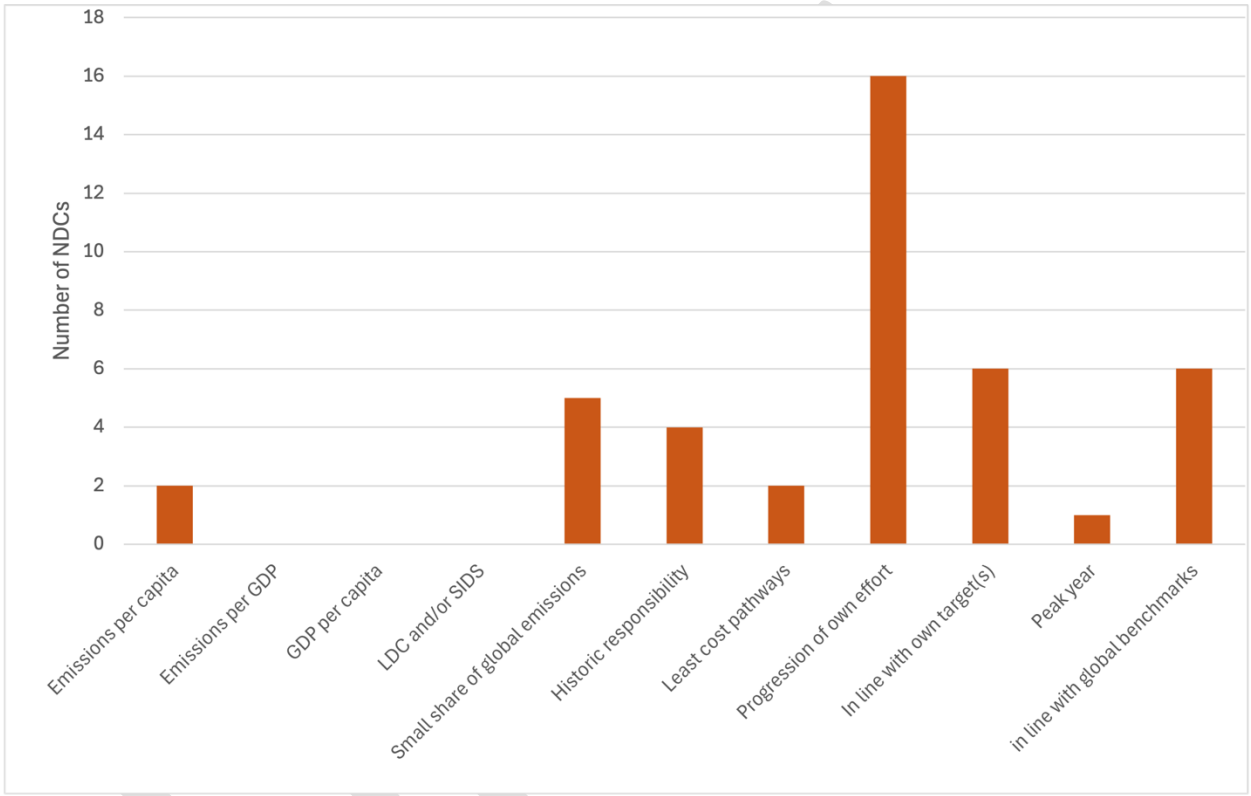

Figure 3.2: How Parties describe the fairness and ambition of their NDCs 3.0, by indicator

Source: Authors' analysis of Climate Watch (2025) data (Climate Watch, 2025a) building on indicators from (Rajamani *et al.*, 2021). The analysis includes only NDC 3.0, not previous NDCs, due to data availability. Cut-off date: April 2025.

3.2.3 Alignment with sectoral elements of the global stocktake outcome

The outcome of the first global stocktake concluded "calls on Parties to contribute… in a nationally determined manner" to a range of sector-specific "global efforts," as outlined in paragraph 28. These objectives, the number of current NDCs that contain targets and other measures related to them, and the collective impact of the targets and measures in the NDCs, where available, are presented in Table 3.1.

Available data indicate that current NDCs are off track for every global stocktake effort for which assessments can be made (see Appendix B.3 for methodological details). This is the case even though most NDCs include measures related to most of the efforts, underscoring that the simple inclusion of such measures is not sufficient to ensure ambition or alignment with global goals. One bright spot are commitments to increase renewable capacity, which are reflected in 88 per cent of NDCs, and for which NDCs may achieve up to 90 per cent of the goal of tripling renewable capacity by 2030. Most remaining efforts, however, fall shorter of alignment with net zero or 1.5°C scenarios. Coal-fired power, for example, would remain 40 per cent higher under the NDCs than in IEA's net-zero scenario. Likewise, very few NDCs include measures related to phasing down unabated coal power or transitioning away from fossil fuels more broadly, with fewer than 25 per cent of NDCs referencing these objectives, compared to 49 to 88 per cent for the other sectoral outcomes.

Table 3.1: NDC commitments versus efforts specified in global stocktake outcome

Global effort (paragraph of global stocktake outcome)	**# NDCs with related measures**	**Current status, 2030 projections under NDCs, and 2030 benchmarks from GST and/or 1.5°C scenarios**
Tripling renewable energy capacity by 2030 (28a)	148	Current status: 4.4 TW renewable power capacity (IEA, 2024c) NDCs: 6.8 TW - 10.1 TW renewable power capacity (IEA, 2024d) (IRENA, 2024) Benchmark: 11.2-11.4 TW renewable power capacity (IRENA, 2024) (IEA 2024c)
Doubling global average annual rate of energy efficiency improvements by 2030 (28a)	142	Current status: 1.3 per cent/year decrease in primary energy supply per GDP (PPP) (IEA, 2024a) NDCs: 2.8 per cent/year decrease in primary energy supply per GDP (PPP) (IEA, 2024a) Benchmark: 3.8 per cent/year decrease in primary energy supply per GDP (PPP) (IEA, 2024b)
Accelerating efforts towards the phase-down of unabated coal power (28b)	41	Current status: 2.2 TW unabated coal-fired power capacity (IEA, 2024d) NDCs: 2.1 TW unabated coal-fired power capacity (IEA, 2024d) Benchmark: 1.5 TW unabated coal-fired power capacity (IEA, 2024d)

Global effort (paragraph of global stocktake outcome)	**# NDCs with related measures**	**Current status, 2030 projections under NDCs, and 2030 benchmarks from GST and/or 1.5°C scenarios**
Accelerating efforts globally towards net-zero emission energy systems (28c)	148	Current status: 37.7 GtCO2 from energy (IEA, 2024d) NDCs: 32.1 GtCO2 from energy (IEA, 2024d) Benchmark: 25.1 GtCO2 from energy (IEA, 2024d)
Transitioning away from fossil fuels in energy systems (28d)	33	Current status: 512 EJ primary energy supply of coal, oil and gas (IEA, 2024d) NDCs: 454 EJ primary energy supply of coal, oil and gas[3] (IEA, 2024d) Benchmark: 378 EJ primary energy supply of coal, oil and gas (IEA, 2024d)
Accelerating zero- and low-emission technologies, including, inter alia, renewables, nuclear, abatement and removal technologies (28e)	148	Current status: 109 EJ renewables, nuclear, and abated fossil fuels (IEA, 2024d) NDCs: 171 EJ renewables, nuclear, and abated fossil fuels (IEA, 2024d) Benchmark: 417 EJ renewables, nuclear, and abated fossil fuels (IEA, 2024d)
Accelerating the substantial reduction of non-CO_2 emissions globally (28f)	82	NDCs: 5 per cent reduction in methane emissions from 2019 levels (median) (Pathak *et al.*, 2022) Benchmark: 35 per cent reduction in methane emissions from 2019 levels (1.5oC (>50 per cent) no or limited overshoot scenarios; median) Global Methane Pledge: 30 per cent reduction from 2020 levels (Global Methane Pledge, 2025)

[3] The Production Gap Report 2025 (forthcoming) indicates that national plans – outside the context of NDCs – plan for even higher levels of fossil fuels than the NDCs (599 EJ vs 454 EJ).

Global effort (paragraph of global stocktake outcome)	**# NDCs with related measures**	**Current status, 2030 projections under NDCs, and 2030 benchmarks from GST and/or 1.5°C scenarios**
Accelerating the reduction of emissions from road transport (28g)	140	Current status: 6137 MtCO2 from road transport (IEA, 2024d) NDCs: 5804 MtCO2 from road transport (IEA, 2024d) Benchmark: 4585 MtCO2 from road transport (IEA, 2024d)
Phasing out inefficient fossil fuel subsidies (28h)	Data not available	Current status: 1.1 trillion USD in fossil fuel subsidies (IISD and OECD, no date) NDCs: Not available Benchmark: N/A
Conserving, protecting and restoring nature and ecosystems towards achieving the Paris Agreement temperature goal, including through enhanced efforts towards halting and reversing deforestation and forest degradation by 2030, and other terrestrial and marine ecosystems acting as sinks and reservoirs of GHGs (33)	134	Current status: 3.76-10.2 Mha/year deforestation (Forest Declaration Assessment, 2024) (FAO, no date) NDCs: Not available Benchmark: 0

Note: The middle column considers the relevance of NDC commitments to the corresponding global stocktake effort, but not the stringency of the NDC commitments. For instance, for the global effort to triple renewable energy capacity by 2030, any NDC containing a target or measure related to renewable energy capacity is counted, regardless of whether it would result in a tripling of the respective Party's capacity. NDC count sourced from Climate Watch (2025) with a cut-off date of May 31, 2025 (Climate Watch, 2025a).

3.2.4 Conditionality and finance

The Paris Agreement requires that support be provided to developing country Parties for mitigation, and many such Parties have proposed NDCs that are fully or partially conditional on such support. The Emissions Gap Report (2024) proposed that new NDCs should be "explicit about conditional and unconditional elements, with emerging market and developing economies providing details on the means of implementation they need, including institutional and policy change, as well as international support and finance required to achieve ambitious NDC targets for 2035." This section evaluates how NDC conditionality has evolved since 2015, as well as the finance needs identified in NDCs.

Since the adoption of the Paris Agreement, the share of NDCs that are at least partially unconditional has increased over time, both in absolute number and in the share of global emissions represented, while the share of NDCs that are fully conditional has decreased (Figure 3.3). As of May 31, 2025, NDCs identified $4.4 trillion in needs, of which $1.6 trillion was for conditional actions, and 74 per cent was for mitigation.

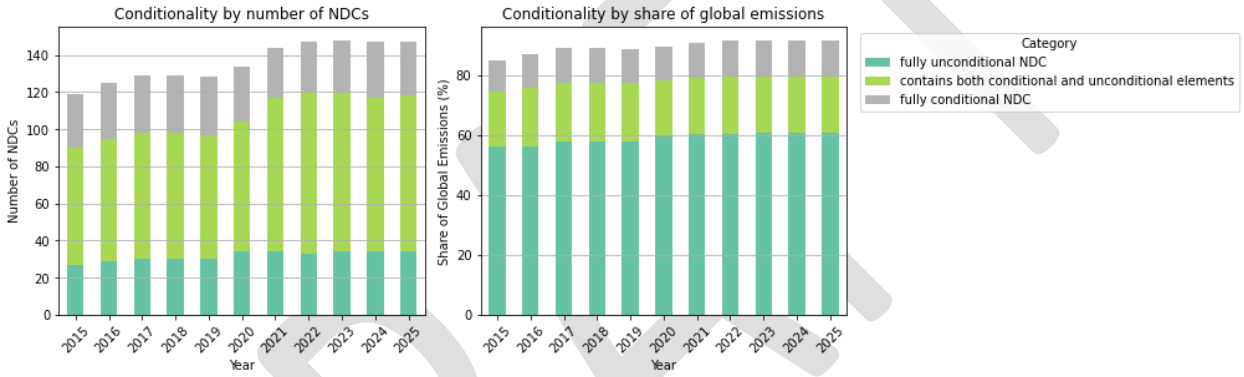

Figure 3.3: Conditionality of NDCs since 2015

Source: Authors' analysis of Climate Watch (2025) data (Climate Watch, 2025a). Note: This analysis is based on each Party's most recent NDC available (whether or not it includes a 2035 target). It excludes NDCs without GHG targets.

It is important that NDCs drive investment, particularly towards countries requiring conditional finance or seeking private investment. NDCs will require improved clarity on finance needs, thoughtful design to mobilize capital, and credible plans aligned with long-term priorities to attract needed investment (Box 3.1).

Box 3.1: Are NDCs investable?

The strength of investment signals in NDC scan be evaluated through the lens of clarity, credibility and financial readiness (CPI, forthcoming). These indicators examine finance components, such as scope, granularity, timeframe, conditionality, implementation, private sector mobilization, and policy alignment (see Appendix B.3), needed to attract finance and inform investment decisions.

An assessment of the 21 parties which had submitted new NDCs as of May 31, 2025 found that while seven parties enhanced both the scope and granularity of their needs, investment signals largely require improvement across most indicators.

Key findings:

- **Scope and granularity of needs:** Only six of 21 updated NDCs costed finance needs for both mitigation and adaptation, with four costing mitigation only. Even fewer identify specific, granular investment needs. Critically, 30 per cent of parties did not quantify climate finance needs. It is difficult to attract investment if capital requirements remain unclear.
- **Private sector mobilization strategies:** While 80 per cent (17) of updated NDCs referenced the private sector, most (11) only vaguely mention its importance with just six including more detailed mobilization strategies. Nine countries improved their strategies, while four countries had weaker or less specific strategies. Better-articulated strategies are crucial to signal concrete investment pathways for to investors, given 90 per cent non-Annex I countries indicated the need for conditional finance in their updated NDCs.
- **Conditionality:** Most non-Annex I countries include conditionality but, specificity on conditionality decreased for four countries since previous NDCs. Clearly defined conditionality is critical for determining which commitments depend on international versus domestic resources.
- **Implementability:** Only 48 per cent (10) included general implementation plans, while three demonstrated more detailed implementation planning. Seven countries showed improvement, identifying implementing bodies, outlining timelines and clarifying expected outcomes for specific measures, but many NDCs still lack a clear, actionable delivery roadmaps essential for coordinating implementation and building investor trust.
- **Alignment with national and sectoral plans:** while 18 parties mentioned integration with other plans, most provided only vague linkages rather than detailed. Alignment helps to reduce duplication, streamline coordination, and signal policy coherence to investors. Without such alignment, climate investments risk fragmentation and weak integration into broader development priorities.

The findings highlight the need for more advanced investment and implementation planning in forthcoming NDCs and updates. Given data gaps and capacity constraints in many countries, especially EMDEs, increased international cooperation and support is needed not only for finance provision, but also for the NDC preparation. Development finance institutions and private advisory groups can provide increased technical expertise, data infrastructure, and capacity-building programs to improve countries' investment planning capabilities. Countries should centre investment signalling as a core component of forthcoming NDCs to better attract and guide climate finance aligned with development priorities.

Source: CPI (forthcoming)

---------- END BOX 3.1 ----------

3.3 New NDCs and 2035 targets

3.3.1 2035 mitigation pledges by G20 members

The 2035 NDC targets submitted by G20 members, standardized to reductions from 2019 levels, are presented in Table 3.2 in comparison with the 2030 NDC targets. Similar data on the African Union can be found in the Appendix B.1.

Table 3.2: Summary of greenhouse gas mitigation pledges in previous and new NDCs by G20 members

G20 member	2030 NDC (* denote updates in NDC 3.0)	2035 NDC
Argentina	Cap 2030 net emissions at 349 $MtCO_2e$ (unconditional) (about 3 per cent above 2019 levels)	
Australia	Reduce GHG emissions by 43 per cent from 2005 levels by 2030 (28 per cent below 2019 levels)	
Brazil	Reduce GHG emissions by 53 per cent from 2005 levels by 2030 (30 per cent below 2019 levels)	Reduction on the range of 59 to 67 per cent compared to 2005 emissions (about 38-49 per cent below 2019 levels)
Canada	Reduce GHG emissions by 40-45 per cent from 2005 levels by 2030 (about 39-45 per cent below 2019 levels)	Reduce GHG emissions by 45-50 per cent from 2005 levels by 2035 (about 45-50 per cent below 2019 levels)
China	Peak CO_2 emissions before 2030 Reduce CO_2/GDP by 65 per cent from 2005 levels by 2030 Share of non-fossil fuels in primary energy consumption to around 25 per cent in 2030 Increase forest stock volume by around 6 billion cubic meters in 2030 Increase the installed capacity of wind and solar power to 1,200 GW by 2030 (about -9 per cent to 20 per cent relative to 2019 levels)*	

G20 member	2030 NDC (* denote updates in NDC 3.0)	2035 NDC
European Union	Reduce net GHG emissions by at least 55 per cent from 1990 levels by 2030 (about 36 per cent below 2019 levels)	
India	Reduce GHG/GDP by 45 per cent from 2005 levels by 2030 Increase in the share of non-fossil energy in total power capacity to around 40 per cent by 2030 (conditional, depending on finance) Increase the carbon sink volume with 2.5 to 3 $GtCO_2e$ (about 30 per cent to 70 per cent above 2019 levels)*	
Indonesia	Reduce GHG emissions by 29 per cent (unconditional) and 41 per cent (conditional) relative to BAU by 2030 (about 3 per cent above 2019 levels and 15 per cent below 2019 levels, respectively)	
Japan [1)]	Reduce GHG emissions by 46 per cent from 2013 levels by 2030 (about 32 per cent below 2019 levels)	Reduce GHG emissions by 60 per cent from 2013 levels by 2035 (about 49 per cent below 2019 levels)
Mexico	Reduce GHG emissions by 22 per cent (unconditional) and 36 per cent (conditional) from BAU by 2030 (about 25 per cent below 2019 levels)	
Republic of Korea	Reduce GHG emissions by 35 per cent from 2018 levels by 2030 (about 35 per cent below 2019 levels)	
Russian Federation	Limit 2030 emissions to 70 per cent of 1990 level (about 36 per cent below 2019 levels)	
South Africa	Limit 2030 emissions to 350 - 420 MtCO2e (about 14-28 per cent below 2019 levels)	
Saudi Arabia	Reduce emissions by 278 MtCO2e annually by 2030, with 2019 as the base year	

G20 member	2030 NDC (* denote updates in NDC 3.0)	2035 NDC
	(about 10 per cent to 45 per cent above 2019 levels)*	
Türkiye	41 per cent reduction in GHG emissions from the BAU level by 2030 (about 55 per cent above 2019 levels)	
United Kingdom of Great Britain and Northern Ireland (United Kingdom)	Reduce GHG emissions by at least 68 per cent from 1990 levels by 2030 (about 43 per cent below 2019 levels)	Reduce GHG emissions by at least 81 per cent from 1990 levels by 2035 (about 66 per cent below 2019 levels)
United States of America [2)]	Reduce GHG emissions by 50-52 per cent from 2005 levels by 2030 (about 42-44 per cent below 2019 levels)	Reduce GHG emissions by 61-66 per cent from 2005 levels by 2035 (about 55-61 per cent below 2019 levels)

Notes: 1) Japan also communicated a 2040 target to reduce its emissions by 73 per cent below 2013 levels. 2) The implication of the withdrawal from the Paris Agreement by the United States of America is that when the withdrawal takes effect (on January 27, 2026), the NDC will no longer be operative.* Based on a range of model studies, see Section 3.4.1.

3.3.2 Global ambition-raising in new NDCs compared to 2030 NDCs

Here we report the aggregated impact of the new NDCs on countries' emissions and assess the extent to which they represent a progression beyond the prior NDCs and current policies. We focus only on the G20 economies that have submitted a new NDCs by 1 July 2025 (Table 3.2), in particular Brazil, Canada, Japan, United Kingdom and the United States of America (Figure 3.4). The total 2035 emissions for the new NDCs for these selected G20 economies[4] are projected to be approximately 1.4 $GtCO_2e$ (range of 1.1–1.7) lower than the 2030 emissions levels from the NDCs submitted by 1 September 2024 (Figure 3.4).5 Without the contribution of the United States of America, the total emissions reduction could be cut by more than half—assuming the United States of America would have met its NDC target. However, given the United

[4] The impact of the 2035 emissions of the group of non-G20 economies with a new NDC is very limited, and even a small increase with range of 0–0.05 $GtCO_2e$ compared to the 2030 emissions levels from the earlier NDCs.

[5] The calculations will be updated as soon as more 2035 NDC submissions come in, and will be based on updated estimates from four modelling exercises conducted by Climate Action Tracker (2025b), PBL (den Elzen *et al.*, 2022, 2024; Nascimento, Scheewel, *et al.*, 2024), Joint Research Centre, European Commission (Keramidas *et al.*, 2025) and Climate Resource (Meinshausen *et al.*, 2023). In addition, scenario estimates of a recent study by the World Resource Institute (Climate Watch, 2025a) were also added.

States of America's implementation gap of 0.6 GtCO2e for its 2030 NDC target (see Section 3.4.1), it is more likely that the additional emissions reduction will drop to zero. For countries with no new NDC submission, emissions are assumed to remain constant at 2030 NDC levels through 2035—a conservative choice for most countries that have peaked or will peak by 2030, more ambitious for others, and the most transparent option until 2035 targets are submitted.

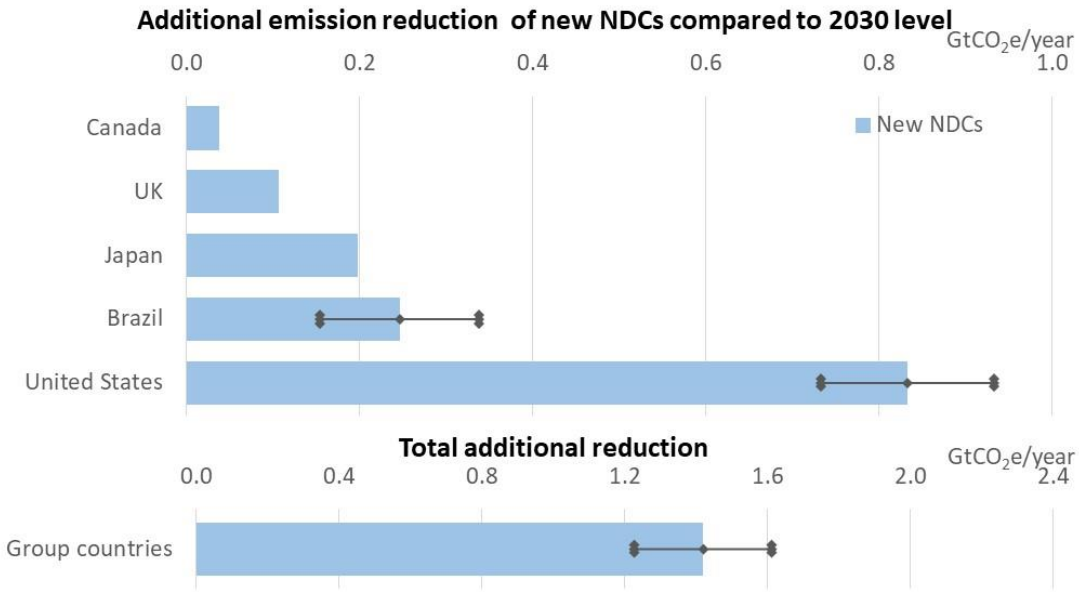

Figure 3.4: Impact of new unconditional NDCs on 2035 emissions compared to the median 2030 levels for the countries with new NDCs (upper figure) and aggregated for the group (lower figure). The ranges represent the pledged reduction ranges from the new NDCs.

3.4 G20 emissions pathways: A deep dive

This section assesses the GHG trajectories of G20 member economies under their targets (NDCs, long-term low-emission development strategies) and current policies to obtain insights. We first assess the projected progress under current policies of G20 members toward their 2030 NDC targets (Section 3.4.1). Then we discuss the projected emission trends of G20 members up to 2035, both under current policies and new NDC targets if already submitted, to obtain insights into the possible emission trajectories toward peaking, for countries that have not already peaked, and toward countries' net zero emission goals (Sections 3.4.2). The assessment presented here is based on the synthesis of emission scenarios published in independent studies mostly after 2023. Throughout the section, we refer to Figure 3.5, which shows for each G20 member the historical emissions 2000-2023 based on national GHG inventories (NGHGIs), emission trajectories under current policies (up to 2035), target emission levels (2030 and 2035 NDCs, net-zero targets), and benchmarks for 2030 and 2035 associated with countries' net-zero targets (in brackets). The African Union was not assessed as it does not have an organization-wide emission reduction target like the European Union.

Figure 3.5: G20 emission pathways: Historical emissions (2000-2023 based on national inventories), projected emissions under current policies (central estimates of independent studies), targets, and net-zero transition-compatible benchmarks for 2030 and 2035. All figures include land use, land-use change and forestry (LULUCF). Notes to reviewers: The net-zero transition compatible benchmarks (informed by the literature) are subject to change in the subsequent revisions. Benchmarks are not available for all G20 members (currently appear as zero value). Zero values also appear (as a lower range) when there's only one estimate available. For more detailed explanation, please see sextion 3.4.3

3.4.1 2030 NDC target achievement outlook

To assess the collective and individual progress of G20 members in bridging the NDC implementation gap in 2030, we reviewed GHG projections from two scenarios: (i) current policy scenario which quantifies the

anticipated emission reduction impact of adopted policies, and (ii) NDC scenario, which assumes the full implementation of unconditional and/or conditional NDC targets. Our assessment considered studies that are published between 2023 and 1 July 2025 to ensure that the most recent historical GHG emissions and recently adopted policies are considered. A list of the studies as well as the criteria for their inclusion and other assumptions used for the assessment are available in Appendix B.4 (available online).

Note that the studies reviewed in this assessment do not consider the potential impact of the recent trade tariff announcements by the the United States of America. Since the publication of the 2024 report, no G20 member has updated its 2030 NDC target (Climate Watch, 2025a). This chapter also considers the NDCs of the United States of America submitted by the previous administration; the current administration has announced to withdraw from the Paris Agreement (The White House, 2025) but the withdrawal takes effect only one year after the notification. The assessment presented here also does not consider the possible impact of the recent tariff announcements by the Government of the United States of America.

Similar to the findings in the 2024 assessment, 11 G20 members are assessed to fall short of achieving their NDC targets with existing policies while six are projected achieve them (Figure 3.6). Figure 3.5 shows the central estimates (also in case of an NDC with a range) of the emission projections from the literature. Some of the G20 members that are projected to meet their 2030 NDC target are those that have not strengthened, or only moderately strengthened, their target levels in the previous NDC update opportunities (section 3.1, as well as den Elzen et al. (2022) and Nascimento et al. (2024)). As for three G20 members - Mexico, the Russian Federation and Türkiye - the projected emissions under their current policies are considerably below unconditional NDC target levels (15 per cent or more, Figure 3.5). If the projected overachievement of these NDCs is excluded, then the G20 members' implementation gap increases by 0.8 $GtCO_2e$. The conditional NDCs of India, Indonesia, and Mexico would lower the G20 aggregate emissions by roughly 0.5 $GtCO_2e$/year in 2030; this year's assessment suggest that the current policies scenario projections fall short of their conditional NDCs.

258 **Figure 3.6: Assessment of progress towards achieving the current 2030 NDC targets**

Projected progress towards the latest unconditional NDC target for 2030 **([x/y] denotes *x* studies out of *y* studies project that the target will be achieved)**	
Likely to meet the target with existing policies ***(Indicated by bold font, if overachieved by more than 15 per cent)***	***Less likely to meet the target with existing policies***
China [6/7] **European Union (27 United Nations Member States) [2/3] [1)]** India [4/5] **Türkiye [3/3]** **Russian Federation [3/4][1)]** **Mexico [4/4]**	Argentina [0/3] Australia [1/3] [1)] Brazil [0/3] Canada [0/4][1)] Indonesia [0/3, two within reach] Japan [1/4] Republic of Korea [0/4] Saudi Arabia [0/3] South Africa [conditional: 1/4, one within reach] United Kingdom [0/2][1)] United States of America [1/8][1)]

259 Notes: All NDCs considered in this assessment are unconditional NDCs, unless otherwise mentioned. The
260 assessment is based on independent studies mainly published in 2021 or later. See Appendix B.4 for the
261 list of studies reviewed. The number of independent studies that project a country to meet its current
262 NDC target are compared to the total number of studies and indicated in brackets. The assessment is
263 based on the middle of the projection range for each independent study. "Within reach" for one study is
264 applied when the lower bound estimate of a current policies scenario projection is within the NDC target
265 range, even though the assessment based on the middle of the projection range suggests that the country
266 will not achieve its target.

267 [1)] Current policies scenario projections from official publications were also examined. The official
268 publications for three G20 members (Canada, European Union, United Kingdom) show that they do not
269 project yet to meet their 'point in time' NDC target under their current policies scenarios (EEA, 2024; UK
270 Department for Energy Security and Net Zero, 2024; Environment and Climate Change Canada, 2025)
271 while for Australia projected that they are very close to achieving the target (Australian Government,
272 2024). For the European Union, the official projections by EEA do not fully account for the member state-
273 level implementation of European Union-wide policies.

3.4.2 Projected emission trends up to 2035

For 2030, the G20 members are collectively projected to emit 34 $GtCO_2e$ annually under unconditional NDCs (central estimate). The aggregate of current policies scenario projections is estimated at 35 $GtCO_2e$ (central estimate), which is about 1 $GtCO_2e$ lower than the 2019 levels and falling less than a $GtCO_2e$ short of achieving the unconditional NDCs. The aggregate of current policies scenario projections for 2030 reduced slightly compared to last year (see country-specific emission projections and their literature range in Figure 3.5 and Appendix B.4).

While the results were largely similar to last year's both on aggregate and country levels, we note significant changes in projected emission trajectories up to 2030 for China (Figure 3.5). In their latest projections, all three annually updated studies (Climate Action Tracker (2025b), Joint Research Centre (Keramidas *et al.*, 2025), and PBL (den Elzen *et al.*, 2024; Nascimento, Scheewel, *et al.*, 2024)) show peaking around 2025 (at higher emission levels than previously projected) followed by a reduction of 0.3-1.4 $GtCO_2e$ by 2030, where they previously projected continued growth until 2030 (also implied by the central estimates in Figure 3.5). This new projected trend is mainly explained by the continued strong growth of renewable electricity finally outpacing demand growth. A recent survey on climate and energy experts also showed their increasing confidence in China peaking its CO_2 emissions by 2025 (Myllyvirta *et al.*, 2024).

Nearly all current policies scenario projections reviewed in 3.4.1 offered projections up to 2035. In 2035, the G20 members' total annual emissions under current policies are expected to reduce by 2 $GtCO_2e$ from 2030 to 33 $GtCO_2e$ (central estimate). The largest contributor to the emission reductions is China, which is projected (based on the central estimates) to reduce emissions by another 1 $GtCO_2e$ from 2030 (Figure 3.5). For other countries, the Republic of Korea is the only country besides the G7 members projected to be on a clear declining path by 2035; a few more countries might peak or plateau between 2030 and 2035 under current policies. Others are projected to continue increasing their emissions up to 2035.

For the G20 members that submitted their 2035 NDC (Brazil, Canada, Japan, United Kingdom, United States of America, [more to be added as submitted]), their collective emission estimates under current policies are about 2.5 $GtCO_2e$/yr short of their unconditional target; most of this is attributable to two countries: Brazil and the United States of America (Figure 3.7).

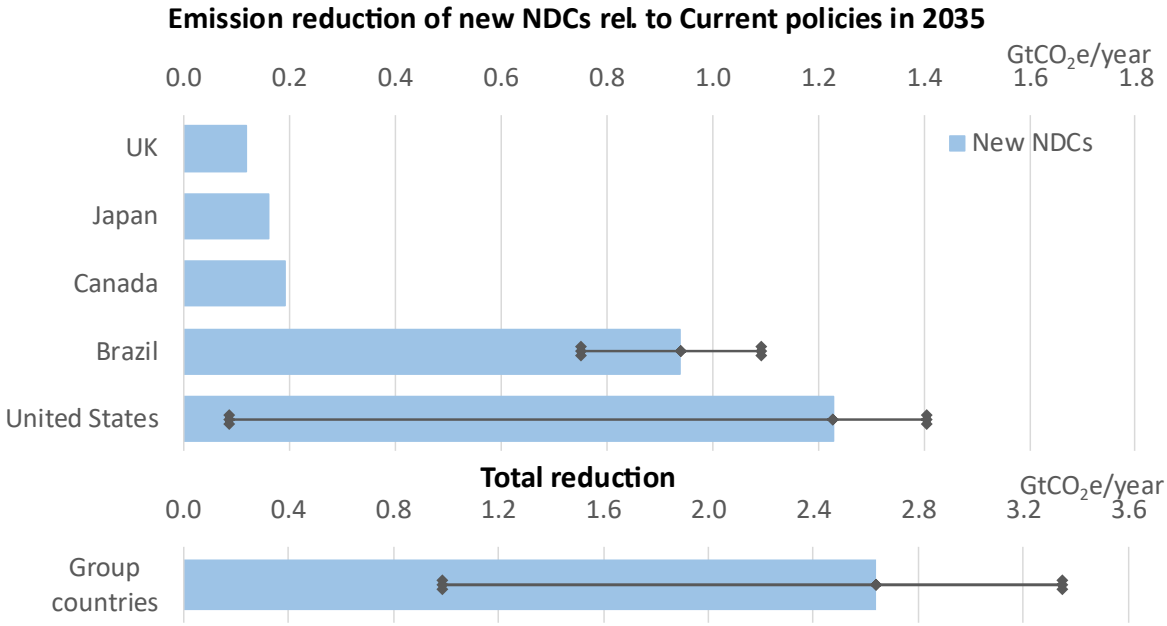

Figure 3.7: Impact of new and updated unconditional NDCs on 2035 emissions compared to the median 2035 levels of the Current Policies scenario based on a wide range of studies (Section 3.4.1.). The ranges represent the reduction relative to the minimum and maximum level of the current policies scenario. Note to reviewers: country names will be updated in line with United Nations official country names.

To supplement the aforementioned findings and complement Chapter 2 on economy-wide emissions, per capita GHG emissions in 2019 and projections under current NDC targets and policies scenario are also presented; all projections are central estimates of the studies reviewed). High income G20 member countries (as per World Bank definition) are all expected to reduce their per capita emissions steadily toward 2035, but the projected 2035 levels range widely from above 15 tCO_2e/capita to less than 3 tCO_2e/capita. Such a declining trend is less apparent for middle income G20 member countries, but it should be considered a positive sign that many of these countries are projected to keep their per capita emissions not so much higher from the current levels, despite their need for further economic development.

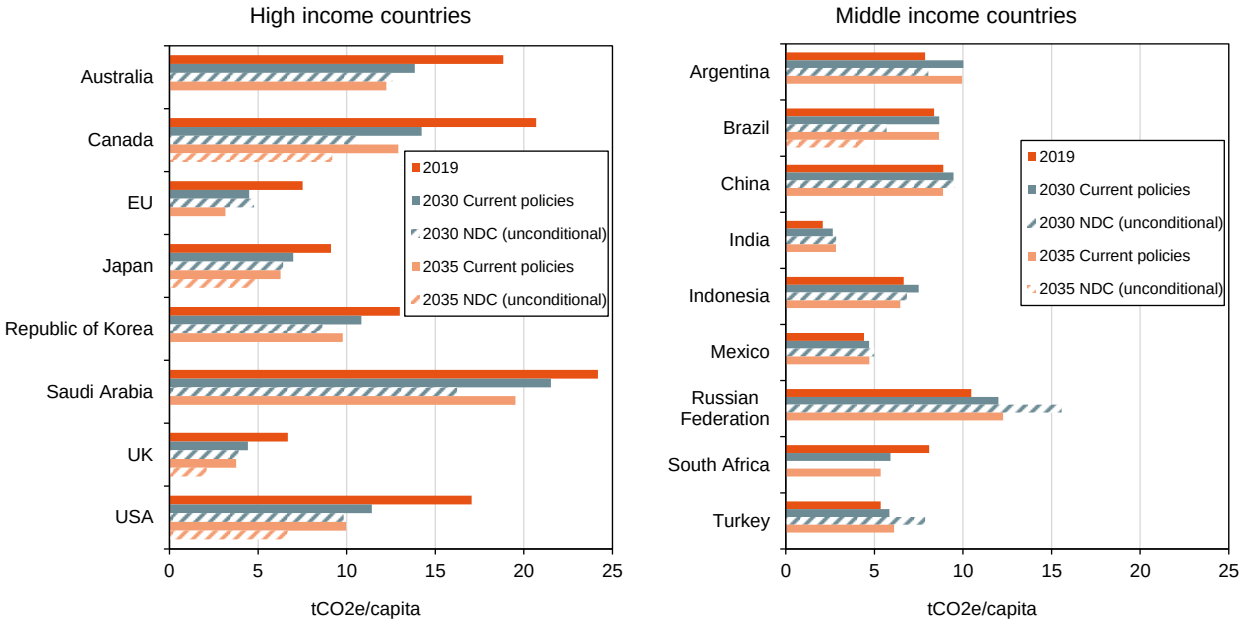

Figure 3.8: G20 member per capita emissions (including LULUCF) implied by current policies and NDCs (both 2030 and 2035).

Notes: (i) Conditional NDC is presented for South Africa. (ii) For 2030 and 2035 projections, only the central estimates are presented (median values when five or more studies were available, otherwise they are average values, following the approach in den Elzen et al. (2019)); see Appendix B.4 for data sources and assumptions. (iii) Data on historical and projected (medium fertility variant) population per country are taken from the UN World Population Prospects 2024 (UN DESA, 2024) . (iv) Historical emission data for 2019 were compiled from the latest national greenhouse gas inventories (Gütschow, Busch and Pflüger, 2025; JRC, 2025). **Note to reviewers: country names will be updated in line with United Nations official country names.**

3.4.3 Implications of G20 NDCs for peaking emissions and achieving net-zero targets

The outcome of the first global stocktake encourages Parties to align their NDCs with 1.5°C, "as informed by science, in the light of different national circumstances" (UNFCCC, 2023). It also notes the importance of aligning them with long-term, low-emissions development strategies, which in turn are to be "towards just transitions to net-zero emissions." It recognizes that in scenarios that limit warming to 1.5°C (>50 per cent), global emissions reach their peak between 2020 and 2025, while noting that "this does not imply peaking in all countries within this time frame, and that time frames for peaking may be shaped by sustainable development, poverty eradication needs and equity and be in line with different national circumstances."

This section assesses G20[6] NDCs with regard to their implications for peaking emissions and achieving countries' self-defined net-zero targets (Table 3.3 and Figure 3.5). With regard to peaking, it identifies which countries have already peaked emissions, which countries have not, and for which countries this assessment is sensitive to the methodology chosen. For countries not yet peaked, it determines whether they commit to peak timing in their NDCs and/or LT-LEDS. With regard to net-zero targets, it first identifies from the literature a benchmark range for 2030 and 2035 (shown as 'net zero-compatible' in Figure 3.5) that is consistent with each country's net-zero target, and then determines whether the country's target falls within the benchmark range.

We assessed countries' peaking status using four standards: whether the year of maximum emissions occurred at least five years ago and at least 10 years ago, including and excluding LULUCF. For 11 of the 17 countries, their status is insensitive to the standard, while for six it is sensitive. Canada, the European Union, Japan, South Africa, the United Kingdom, and the United States of America have definitively peaked emissions by all four standards. China, India, Mexico, Saudia Arabia, and Türkiye have not yet peaked by any standard. Argentina, Australia, Brazil, and Indonesia are sensitive to the inclusion of LULUCF (they have peaked including LULUCF, but not yet definitively peaked excluding it). The Republic of Korea has peaked applying a five-year standard but not yet a ten-year standard. The Russian Federation is anomalous, as its year of maximum emissions occurred in 1990, but emissions have been steadily rising throughout the twenty-first century.

For countries that have not yet peaked, or have peaked less than five years ago, including LULUCF, we assessed stated or implied commitments to peaking in NDCs and LT-LEDS. Of these countries, three (Indonesia, Mexico, and the Republic of Korea) either explicitly or implicitly commit to peak GHG emissions by 2030, while China commits to peaking CO_2 emissions before 2030. One (Türkiye) commits to peak between 2030 and 2040 (in 2038). The remaining countries (India, the Russian Federation and Saudi Arabia) would not peak by 2030 according to their NDCs and do not specify post-2030 emissions trajectories other than their net-zero commitments. To achieve their net-zero goals, the countries in this group would transition from peak to net-zero emissions in much less time than the countries that have already peaked – in 15 to 40 years, versus 37 to more than 60 years.

We also assessed NDC alignment with net-zero targets based on a review of modelling studies that present emissions pathways consistent with achieving each country's net-zero emissions target.[7] From those

[6] This analysis excludes the following G20 members: the African Union, because it does not have a collective NDC or net-zero target; as well as France, Germany, and Italy, because they share an NDC with the European Union.

[7] When identifying net zero scenarios for each G20 member, we selected those in which all GHGs that are covered by the members' explicitly stated targets reach net zero. In most countries, these targets include all Kyoto-recognized GHGs. However, in cases where countries have communicated net-zero targets that only apply to a subset of Kyoto-recognized GHGs (e.g., South Africa's 2050 net zero target covers CO2 emissions only), we identified scenarios that reach net zero for those gases but may not achieve net zero for all GHG emissions. For G20 members that have yet to clarify which GHG emissions are covered by their net-zero pledge (i.e., China, India, Mexico, Saudi Arabia, and the Republic of Korea), we included modelled pathways

pathways, we identify 2030 and 2035 emissions and then use those emissions to create a net-zero benchmark range for both years for each country. The full methodology and modelling studies included are detailed in Appendix B.5. **Note to reviewers: The benchmark ranges are subject to change in the subsequent revisions.**

Ten G20 member states have unconditional 2030 targets within their net-zero benchmark range, while one additional country has a conditional target within the range. Five have set targets above the benchmark range. Most countries have not yet set 2035 targets. Of those who have, three are out of range and two are within range. Only two countries – the United Kingdom and the United States of America – have targets in the net-zero range for both 2030 and 2035, though the United States of America has initiated withdrawal from the Paris Agreement and is dismantling climate policies.

While the national modelling studies compiled for this meta-analysis can provide a helpful indication of near-term alignment with long-term targets, several caveats are in order. First, the extent of modelling scenarios aligned with G20 members' net-zero targets that our literature review yielded varied by country. Due to the limited number of studies identified for some countries (see Appendix B.5), we derived benchmarks from the minimum and maximum values of each identified range, rather than from other summary statistics. As a result, the ranges we present here are quite wide for some G20 members for which the scenarios that define our minimum and maximum bounds yield significantly different emissions values in 2030 and 2035 (e.g., China, the Russian Federation). A larger range should not imply that a particular G20 member has flexibility to stall near-term mitigation efforts. Rather, it reflects that modelling studies that have been conducted for these countries rely on fundamentally different assumptions (e.g., amount of CDR deployed later in the century to reach net zero) that allow for relatively higher/lower emissions in 2030 and 2035 resultantly.

Critically, the non-existence of modelling studies that show that a G20 member's NDC is aligned with a pathway to achieving its net-zero target does not mean that such a pathway is impossible. Similarly, the existence of one or more pathways that do indicate that a particular G20 member's NDC is aligned with that member's net-zero target does not mean that such a pathway will certainly prove feasible in reality. Inaccurate macroeconomic or other underlying assumptions, as well as financial and political constraints faced by countries may ultimately inhibit such realization.

Table 3.3: Implied NDC emissions trajectories compared to net-zero-derived benchmarks for 2030 and 2035 in G20 members.

Country		Peak year	Net-zero year	Years from	2030 NDC target relative to net-zero	2035 NDC target relative to net-zero

that reach net-zero CO2 emissions, as well as modelled pathways that reach net-zero GHG emissions. Relatedly, because the GHGs not covered within Indonesia's net-zero pledge (i.e., HFCs and SF_6) have historically been negligible, we selected scenarios that reach net-zero GHG emissions for this G20 member.

				peak to net zero	**range (also see Figure 3.5)**	**range (also see Figure 3.5)**
Peaked at least 5 years ago (including LULUCF)						
Argentina		2007	2050	43	N/A – no range identified from literature	No target submitted
Australia		2007	2050	43	Within range	No target submitted
Brazil		2004	2050	46	Not within range	Not within range
Canada		1999	2050	51	Within range	Not within range
European Union		<=1990	2050	>=60	Within range	No target submitted
Japan		2013	2050	37	Not within range	Not within range
South Africa		2009	2050	N/A	Within range	No target submitted
United Kingdom		1991	2050	59	Within range	Within range
United States of America		2007	2050	43	Within range	Within range
Peaked <5 years ago or not yet peaked (including LULUCF)						
China	Stated (NDC, LTS)	<2030	<2060	38	Within range	No target submitted
India	No	>2030	2070	<40	Within range	No target submitted
Indonesia	Stated (LTS)	2030	2060	30	Unconditional target not within range; conditional target within range	No target submitted

Mexico	Stated (LTS)	2026	2050	24	Not within range	No target submitted
Saudi Arabia	No	>2030	2060	<30	Not within range	No target submitted
Republic of Korea	Implied (NDC)	<=2030	2050	32	Within range	No target submitted
Russian Federation	[1990]	[1990]	2060	70	Within range	No target submitted
Türkiye	Stated (NDC)	2038	2053	15	Not within range	No target submitted

398

399

400 **Box 3.2: Net-zero target quality and implementation indicators**

401 Responsible for three quarters of current global emissions, G20 members will largely determine when
402 global emissions reach net zero. With Mexico's November 2024 commitment to reach net-zero emissions
403 by 2050, all G20 Parties to the Paris Agreement have officially communicated net-zero targets.[8] The past
404 year also saw Indonesia commit via a government announcement to move Indonesia's previously
405 articulated 2060 net-zero target forward by 10 years to 2050. In spite of these important milestones,
406 limited progress has been made on key indicators of confidence in net-zero implementation across G20
407 members, including legal status, the existence and quality of implementation plans and the alignment of
408 near-term emission trajectories with net-zero targets (Rogelj *et al.*, 2023). For global developments in
409 net-zero targets and long-term pledges, see Appendix B.6.

410

411 The figure presents a meta-analysis of the key characteristics of G20 members' net-zero targets, based on
412 three independent trackers (Climate Action Tracker, 2025a; Climate Watch, 2025b; Net Zero Tracker,
413 2025) (The criterion for inclusion in this analysis is that a tracker must track the net-zero targets of a
414 majority of G20 members; see Appendix B.7 for detailed methodology)

415

416 **G20 net-zero target status and details**

[8] Although the African Union became a member of the G20 in 2023, the region is not a Party to the Paris Agreement. Accordingly, the body has not submitted a collective net-zero target, although many of its members have submitted targets of their own.

Countries	Source	Target year	Covers all sectors and gases	Transparent information on carbon removal	Published plan	Review process	Annual reporting
Peaked at least 5 years ago (including LULUCF)							
Argentina	in policy document	2050	✓	x	x	?	x
Australia	in law	2050	✓	✓	inconclusive	✓	✓
Brazil	in policy document	2050	✓	x	x	?	x
Canada	in law	2050	✓	✓	✓	✓	✓
European Union	in law	2050	✓	✓	✓	✓	✓
France	in law	2050	✓	✓	✓	✓	✓
Germany	in law	2045	✓	✓	✓	✓	✓
Italy	in policy document	2050	✓	✓	✓	not evaluated	✓
Japan	in law	2050	✓	x	✓	✓	✓
South Africa	in policy document	2050	✓	x	x	?	x
United Kingdom	in law	2050	✓	✓	✓	✓	✓
United States of America	in policy document	2050	✓	✓	✓	✓	✓
Peaked <5 years ago or not yet peaked (including LULUCF)							
African Union	no net-zero target; not Party to the Paris Agreement						
China	in policy document	2060	?	x	✓	✓	✓

India	in policy document	2070	?	x	x	?	x
Indonesia	in policy document	2060	✓	x	inconclusive	?	x
Mexico	announcement by a high-level government official	2050	?	x	✓	not evaluated	x
Republic of Korea	in law	2050	✓	✓	✓	✓	✓
Russian Federation	in law	2060	✓	✓	✓	✓	x
Saudi Arabia	government announcement	2060	?	x	x	?	x
Türkiye	in policy document	2053	✓	x	✓	?	x

✓	✓	x	?
Fulfilled	Partially fulfilled	Not fulfilled	No information

----------END BOX3.2 ----------

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Appendix B

Supplementary material for Chapter 3: *Nationally determined contributions and long-term pledges: The global landscape and G20 member progress*

- B.1 Mitigation pledges of African Union members that are parties to the UNFCCC

Table B.1: NDC mitigation pledges of members of the African Union that are parties to the UNFCCC

African Union Member State	**Mitigation pledge in current NDC**
Algeria	Reduce GHG emissions by 7% (with domestic means) or 22% (conditional) compared to BAU by 2030.
Angola	Reduce emissions by 14% (unconditional) and an additional 10% (conditional) by 2025, compared to BAU.
Benin	Implement measures estimated to reduce emissions by 20.15% compared to BAU by 2030.
Botswana	Reduce emissions by 15% compared to BAU by 2030.
Burkina Faso	Reduce emissions by 29.42% (19.6% unconditional, 9.8% conditional) compared to BAU by 2030.
Burundi	Reduce GHG emissions by 1.58% (unconditional) and 11.40% (unconditional) by 2025 compared to BAU, and by 3.04% (unconditional) and 12.61% (conditional) by 2030 compared to BAU.
Cabo Verde	Reduce GHG emissions by 18% (unconditional) and 24% (conditional) compared to BAU by 2030.
Cameroon	Reduce emissions by 35% (12% unconditional, 23% conditional) compared to BAU by 2030.
Central African Republic	Reduce emissions by 9.03% (unconditional) or 14.64% (conditional) compared to BAU by 2025 and 11.82% (unconditional) or 24.28% (conditional) compared to BAU by 2030.
Chad	Reduce emissions by 0.5% (unconditional) and 19.3% (conditional) compared to BAU by 2030.
Comoros	Reduce GHG emissions excluding LULUCF by 23% compared to BAU and increase CO2 removals by 47% compared to BAU by 2030.
Democratic Republic of the Congo	Reduce GHG emissions by up to 21% (19% conditional and 2% unconditional) compared to BAU by 2030.
Djibouti	Reduce GHG emissions by 40% (unconditional) and by an additional 20% (conditional) by 2030 compared to BAU.

African Union Member State	**Mitigation pledge in current NDC**
Egypt	Reduce electricity emissions by 37%, oil and gas emissions by 65%, and transport emissions by 7% compared to BAU by 2030.
Equatorial Guinea	Reduce emissions by 35% by 2030 and by 50% by 2050, compared to 2019 levels, conditional on international support.
Eritrea	Reduce CO2 emissions from fossil fuels by 4.2% (unconditional) or 12.6% (conditional) compared to BAU by 2020, 6.2% (unconditional) or 24.9% (conditional) compared to BAU by 2025 and 12.0% (unconditional) or 38.5% (conditional) compared to BAU by 2030.
Eswatini	Reduce emissions by 5% (unconditional) and 14% (conditional) compared to BAU by 2030.
Ethiopia	Reduce economy-wide emissions by at least 14% (unconditional) or 68.8% (conditional) compared to BAU by 2030.
Gabon	Remain carbon neutral beyond 2050 (unconditional) and do everything possible to maintain net removals at 100 million tCO2eq per year (conditional) beyond 2050.
Gambia	Reduce GHG emissions by 49.7% compared to BAU by 2030.
Ghana	Implement 34 mitigation measures (9 unconditional, 25 conditional) to achieve an absolute reduction in emissions of 64 MtCO2e compared to 2020-2030 cumulative emissions by 2030.
Guinea	Reduce GHG emissions by 9.7% (unconditional) and 17% (conditional) compared to BAU by 2030.
Guinea Bissau	Reduce emissions by 10% (unconditional) or 30% (conditional) compared to BAU by 2030.
Côte d'Ivoire	Reduce GHG emissions by 30.41% (unconditional) or 98.95% (conditional) compared to BAU by 2030.
Kenya	Reduce emissions by 75 MtCO2e (15 unconditional, 60 conditional), compared to BAU by 2035.
Lesotho	Reduce emissions by 6% (unconditional) or 18% (conditional) compared to BAU by 2030.

African Union Member State	**Mitigation pledge in current NDC**
Liberia	Reduce economy-wide GHG emissions by 64% (10% unconditional, 54% conditional) compared to BAU by 2030.
Madagascar	Reduce emissions by 48.4 MtCO2e by 2030, a 28% decrease from BAU, and strengthen GHG sinks by around 20% (-37,809 gg CO2e).
Malawi	Reduce GHG emissions by 6% (unconditional) or 51% (conditional) compared to BAU by 2040.
Mali	Reduce emissions by 31% for energy, 25% for agriculture, 39% for land use and forestry, and 31% for waste, compared to BAU by 2030.
Mauritania	Reduce emissions by 11% (unconditional) or 92.49% (conditional) compared to BAU by 2030
Mauritius	Reduce emissions by 40% compared to BAU by 2030
Morocco	Reduce GHG emissions by 18.3% (unconditional) or 45.5% (conditional) compared to BAU by 2030.
Mozambique	Reduce cumulative GHG emissions by about 40 MtCO2e between 2020 and 2025.
Namibia	Reduce emissions by 11.9 MtCO2e compared to BAU by 2030 (conditional).
Niger	Reduce AFOLU emissions by 4.5% (unconditional) or 14.6% (conditional) by 2025 and 12.57% (unconditional) or 22.75% (conditional) compared to BAU by 2030; reduce energy emissions by 11.2% (unconditional) or 48% (conditional) compared to BAU by 2025 and 10.6% (unconditional) or 45% (conditional) compared to BAU by 2030.
Nigeria	Reduce GHG emissions by 20% (unconditional) and 47% (conditional) compared to BAU by 2030.
The Congo	Reduce GHG emissions by 17.09% (unconditional) and 39.88% (conditional) compared to BAU by 2025, and 21.46% (unconditional) and 32.19% (conditional) compared to BAU by 2030.
Rwanda	Reduce emissions by 16% (unconditional) and 38% (conditional) compared to BAU by 2030.

African Union Member State	**Mitigation pledge in current NDC**
Sao Tome and Principe	Implement measures estimated to reduce GHG emissions by 109 ktCO2e, or 27% compared to BAU, by 2030.
Senegal	Reduce GHG emissions by 5% (unconditional) or 23.7% (conditional) compared to BAU by 2025, and 7% (unconditional) or 29.5% (conditional) compared to BAU by 2030.
Seychelles	Reduce GHG emissions by 293.8 ktCO2e (26.4%) compared to BAU by 2030.
Sierra Leone	Reduce GHG emissions by 5% by 2025, 10% by 2030, and 25% by 2050 compared to BAU.
Somalia	Reduce emissions by 34% (5% unconditional and 29% conditional) compared to BAU by 2035.
South Africa	Reduce GHG emissions to 398-510 MtCO2e by 2025 and to 350-420 MtCO2e by 2030.
South Sudan	Implement strategies resulting in 109.87 MtCO2e emissions reduction and 45.06 MtCO2 sequestration by 2030.
Sudan	Limit 2030 emissions to 12,458,008 tCO2e for energy, 13,384,246 tCO2e for forestry, and 1,278,822 tCO2e for waste.
United Republic of Tanzania	Reduce emissions by 30-35% compared to BAU by 2030.
Togo	Reduce emissions by 20.51% (unconditional) and a further 30.06% (conditional) compared to BAU by 2030.
Tunisia	Reduce carbon intensity by 45% (27% unconditional, 18% conditional) compared to 2010 levels by 2030.
Uganda	Reduce emissions by 24.7% (5.9% conditional) compared to BAU by 2030
Zambia	Reduce emissions by 25% (with limited international support) and by 47% (conditional) compared to 2010 levels by 2030.
Zimbabwe	Reduce emissions by at least 40% per capita compared to BAU by 2035.

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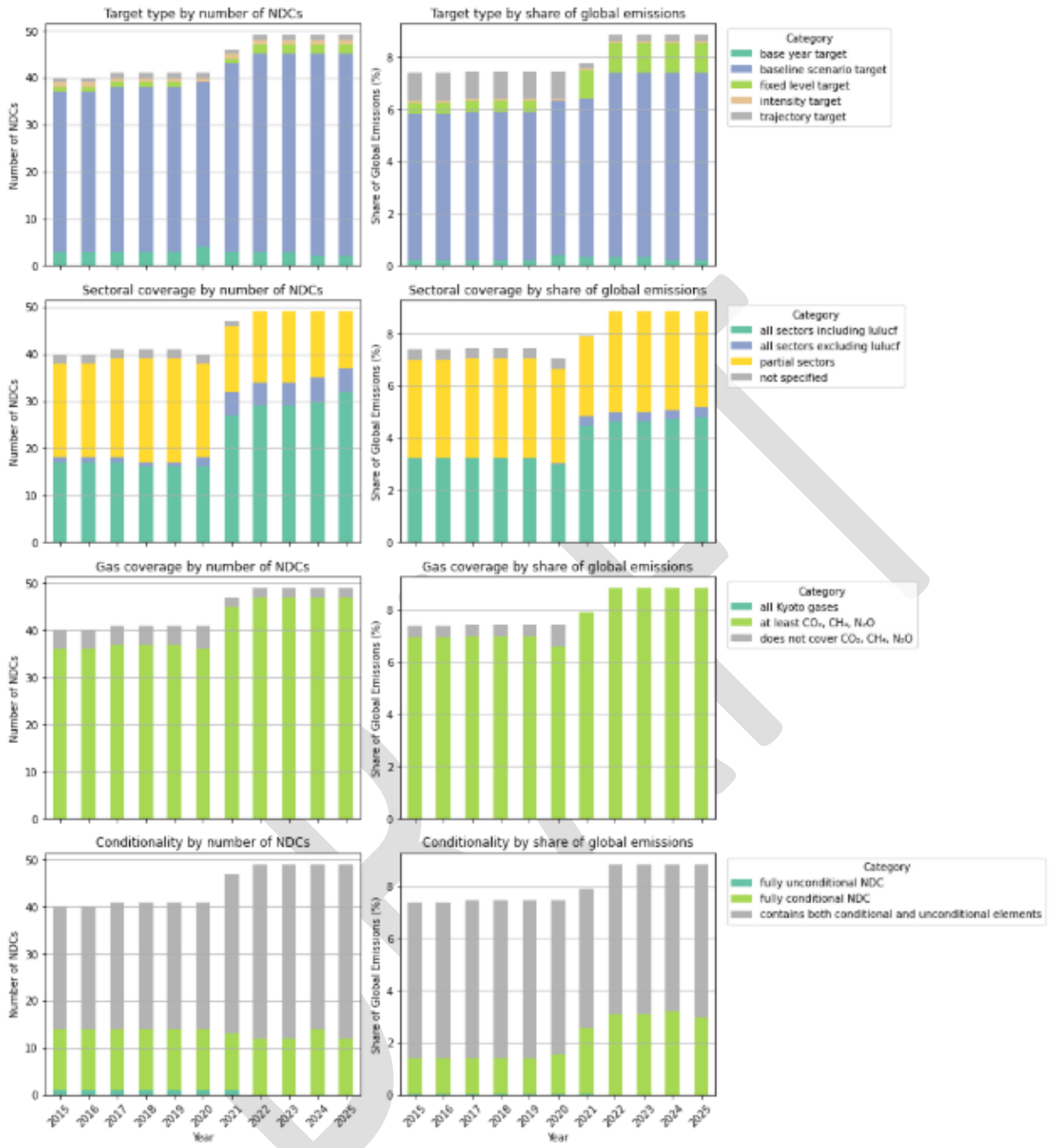

Figure B.1: Evolution of GHG target form, sector coverage, and gas coverage since 2015 for the African Union .

- B.2 Methods underlying the Global Stocktake and NDCs categorization (section 3.2.3)

For Table 3.1 under 3.2.3 "The Global Stocktake and sectoral NDC measures," we identified a list of subsectors in the Climate Watch dataset on sectoral mitigation measures in NDCs that were relevant to each of the global efforts listed in the first column. We then determined how many NDCs contained at least one measure related to at least one of the subsectors related to that effort according to the Climate Watch data. Climate Watch gathers this data directly from NDC documents by identifying all measures, targets, and policies within each NDC and coding the sectors and subsectors that each of these measures are related to. This dataset can be accessed through the Explore NDCs page or the Data Explorer at https://www.climatewatchdata.org/. We did not assess the stringency or impact of these measures directly. Instead, we reviewed the literature to identify the collective impact of all NDCs on indicators related to each effort.

Table B.2: Global effort items identified in the Global Stocktake and the indicators

Global effort (Global Stocktake)	**Notes and indicators used**
Tripling renewable energy capacity by 2030 (28a)	All Energy/Renewable Energy indicators
Doubling global average annual rate of energy efficiency improvements by 2030 (28a)	All Energy/End Use indicators
Accelerating efforts towards the phase-down of unabated coal power (28b)	Energy/Fossil Fuels/Coal Energy/Fossil Fuels/Phase-out/down
Accelerating efforts globally towards net zero emission energy systems (28c)	Energy/Renewable Energy Energy/Other/Nuclear Energy/Other/CCS Energy/Other/Hydrogen Hydrogen (Industries)
Transitioning away from fossil fuels in energy systems (28d)	Energy/Fossil Fuels/Phase-out/down
Accelerating zero- and low-emission technologies, including, inter alia, renewables, nuclear, abatement and removal technologies (28e)	Energy/Renewable Energy Energy/Other/Nuclear Energy/Other/CCS Energy/Other/Hydrogen Hydrogen (Industries)

Global effort (Global Stocktake)	**Notes and indicators used**
Accelerating and substantially reducing non-carbon-dioxide emissions globally (28f)	Economy-wide/Gas/Methane Economy-wide/Gas/SLCPs Economy-wide/Gas/N2O Economy-wide/Gas/F-gases
Accelerating the reduction of emissions from road transport (28g)	Energy/End use/Transport Transport/General Transport/Other All Transport/Action indicators Road Transport infrastructure Improve: Electrification
Phasing out inefficient fossil fuel subsidies (28h)	No relevant indicators available
Conserving, protecting and restoring nature and ecosystems towards achieving the Paris Agreement temperature goal, including through enhanced efforts towards halting and reversing deforestation and forest degradation by 2030, and other terrestrial and marine ecosystems acting as sinks and reservoirs of greenhouse gases (33)	LULUCF/Conservation LULUCF/Restoration LULUCF/REDD+

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- B.3: Indicators for assessing investment signals in NDCs (Box 3.1, section 3.2.4)

In order to measure progress and inform the development of more investable NDCs, CPI has developed a framework for assessing the quality of the finance components of NDCs across seven key indicators, described in the table below (CPI, forthcoming in July 2025).

Table B.3: Key indicators for assessing investment signals in NDCs.

Indicator	Description	Relevance
KEY INDICATORS		
1 Needs Scope	The inclusion of climate finance needs for implementing the NDC, and the extent to which they are quantified (e.g. no needs included vs. fully or partially costed needs)	Clearly defined finance needs in NDCs: • enables effective resource mobilization and allocation planning • demonstrates financial planning maturity to potential investors • provides clarity on investment scale required for implementation
2 Needs granularity	The level of detail in cost estimates, ranging from high-level aggregate figures to detailed breakdowns by project, program, policy measure, or specific intervention	The availability of more granular climate finance needs estimates enables climate investment by: • identifying specific and implementable investment opportunities • facilitating more accurate budgeting and resources allocation • increasing investor confidence by demonstrating more advanced financial planning
3 Timeframe	The temporal scope of the NDC targets and associated finance needs, including short-, medium-, and long-term horizons where applicable	More forward looking NDCs with long-term targets enable strategic long-term investment planning and help identify financing needs and gaps across different time periods

Indicator	Description	Relevance
4 Conditionality	The distinction between unconditional commitments (financed through domestic resources) and conditional commitments (requiring international support) for quantified climate finance needs	Defining conditional finance targets clarifies expectations for international support and helps international investors to target support more effectively. In addition, inclusion of unconditional finance needs can demonstrate national commitment to achieving NDC targets, and supports accountability for domestic and international investors.
5 Implementability	The inclusion of clear implementation mechanisms, responsible entities, existing funding commitments, implementation timelines, and specific actions required to mobilize the identified finance needs	Inclusion of implementation plans and mechanisms in the NDCs demonstrates readiness to deploy resources effectively and supports coordination between implementing partners
6 Private sector mobilization strategy	The inclusion of explicit strategies for engaging and mobilizing private sector finance, including identification of specific financial instruments, risk-sharing mechanisms, and public-private partnership opportunities that will be used to attract private investment for NDC implementation	Inclusion of private sector mobilization strategies signals to private investors that there are concrete pathways for their participation in climate finance and demonstrates understanding of private sector investment requirements and constraints
7 Alignment with national and sectoral plans	The degree to which climate finance needs link to or integrate with national development strategies, sectoral policies, existing climate investment plans, and concrete project pipelines.	Alignment with national and sectoral plans: • leverages existing institutional arrangements and processes and reduces coordination costs and policy fragmentation • ensures climate finance contributes to broader development goals

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- B.4: G20 member progress assessment methods (sections 3.4.1 and 3.4.2)
- Overview

The updated assessment of progress towards 2030 targets is based on a synthesis of emissions projection studies by independent research groups.[9] The studies considered in the assessment are mostly published in 2024 or later; older studies were removed from the dataset. A list of the studies as well as the criteria for their inclusion is available in the following subsections. In line with previous Emissions Gap Reports, the assessment follows the methodology of den Elzen *et al*. (2019). NDC targets are compared to emission projections under a current policies scenario, which reflects all policies adopted and implemented up to specific cut-off dates, and which for this report are defined as legislative decisions, executive orders or their equivalent. This implies that officially announced plans or strategies alone would not qualify, while individual executive orders to implement such plans or strategies would qualify. Policies that are adopted most recently, some of which are presented in Section 3.3.3, may not be considered in the scenario studies reviewed as they were prepared before their adoption.

To evaluate the conditionality of NDCs, we adapted the categorization of World Resources Institute (Climate Watch, 2022): India, Indonesia, and Mexico have both unconditional and conditional NDCs, while South Africa has only a conditional NDC. For the G20 aggregate of unconditional NDCs, we used conditional NDCs for South Africa.

The assessment based on independent studies is also compared to official projections published by national governments. Many of the "With existing measures" scenario projections in the latest UNFCCC submissions are considered as current policies scenario projections. Methodological limitations of the assessment are similar to those described in previous Emissions Gap Reports. The assessment is based on 'point in time' emissions projections for the NDC target year.[10] European Union Member States are not assessed individually. The assessment is based on emissions including LULUCF.

- Projections assessed

Official and independent sources for emissions data in 2030 under the NDC and current policies scenarios for G20 members are presented in Table B.4.

Three main considerations informed the selection of studies projecting 2030 emissions: 1) take into account of the most recent societal, economic and policy developments, 2) include peer-reviewed studies to the extent possible, 3) include studies published by national experts, and 4) covering all GHGs and sectors. On the first point, to take account of the most recent emission trends, the potential impact of recently implemented policies, and other global social and economic circumstances, we considered studies that were published in 2024 or later. Exceptions were made when external reviewers suggested national studies published in 2023 or earlier, the emission projections of which are relevant for this assessment.

[10] Some countries also set an emissions budget for a multi-year period; an assessment of these targets may lead to different conclusions.

Selection of IAM scenarios

In this year's assessment, besides the annually updated studies (Climate Action Tracker, 2025; Keramidas et al., 2025; Nascimento et al., 2024), we considered two studies published by the consortium of integrated assessment models (IAMs) (Richters et al., 2024; Schmidt Tagomori et al., 2023b). We selected scenarios based on several criteria.

First, we included only one projection per scenario per model to avoid overrepresentation of projections from any single model. Second, we selected the projection from the most recently-published study for each model. For example, the projections of PBL's IMAGE model are taken from Nascimento et al. (2024) and not from Schmidt Tagomori et al. (2023) because the former is the most recent. For the Network for Greening the Financial System (NGFS) study (Richters et al., 2024), we only considered the REMIND model projections without integrated physical damages, along with the GCAM and MESSAGE models. Third, we excluded projections that are not consistent with the observed emission trends since 2015 (e.g. China's emissions already declining after 2020).

On land-use emissions

The assumptions on LULUCF emissions in 2030 based on NGHGIs are updated and are presented in Table B.5. For many countries we assume constant emissions between 2020 and 2030 for both NDC and current policies scenarios; this is a conservative estimation, as Nascimento et al. (2024), for example, projects reduced net emissions and enhanced net sinks for most countries. For three countries — Argentina, Brazil, and Indonesia — land-use emissions are considerably large compared to their energy and industry emissions.

We also enhanced the alignment of land-use emission estimates from modelling studies with the definition of the LULUCF sector under national GHG inventories. For studies with land-use emissions that are not based on NGHGIs, we harmonised their land-use emission projections (in particular, "AFOLU CO_2 emissions" in case of integrated assessment models) to the historical LULUCF emissions as estimated by the EU Observatory on Deforestation and Forest Degradation, based on the 2024 NGHGIs (2023 NGHGI for Russian Federation) (JRC, 2025). For most countries, the emission projections were harmonised to 2023 emissions; for Brazil and Indonesia, the harmonisation was done on the average of 2014-2023 emissions. For the harmonisation method of LULUCF CO_2 emissions, we harmonised model emissions with the inventory emissions in a country from 2023 emissions (except for Brazil and Indonesia) onwards and converged the absolute difference (for LULUCF CO_2) between the two in 2015 linearly to 0 by 2100.

Table B.4 Official and independent sources for emissions data in 2030 under the NDC and current policies scenarios for the assessment of G20 members.

G20 Member	Updated or new NDC and other announced 2030 target: official data sources (cut-off date: 1 July, 2025)[1]	Current policies scenario and NDC scenario: Independent sources ((a) global models and (b) national models)
Argentina	UNFCCC (2023)	(a) 1. Climate Action Tracker (2025) (incl. LULUCF, as reported in Nascimento et al. (2024), 2. Joint Research Centre (Keramidas et al., 2025), 3. Meinshausen et al. (2023) (NDC only), 4. Network for Greening the Financial System (NGFS): GCAM (Richters et al., 2024)
Australia	Australian Government (2024)	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024)
Brazil	UNFCCC	(a) 1. Climate Action Tracker (2025) (incl. LULUCF, as reported in Nascimento et al.(2024)), PBL (den Elzen et al., 2022; Nascimento et al., 2024), Meinshausen et al. (2023) (NDC only), NGFS: GCAM (Richters et al., 2024)
Canada	Environment and Climate Change Canada (2025)	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024), 4. Meinshausen et al. (2023) (NDC only), 5. NGFS: GCAM (Richters et al., 2024)
China	N/A	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024), 4. ENGAGE: WITCH (Schmidt Tagomori et al., 2023a, 2023b), 5. Meinshausen et al. (2023) (NDC only), 6. NGFS: GCAM, MESSAGE and REMIND (Richters et al., 2024)
European Union	EEA (2024) [4]	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024), 4. Meinshausen et al. (2023) (NDC only)
India	N/A	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024), 4. ENGAGE: WITCH (Schmidt Tagomori et al., 2023a, 2023b), 5. Meinshausen

G20 Member	Updated or new NDC and other announced 2030 target: official data sources (cut-off date: 1 July, 2025)[1]	Current policies scenario and NDC scenario: Independent sources ((a) global models and (b) national models)
		et al. (2023) (NDC only), 6. NGFS: GCAM (Richters et al., 2024)
Indonesia	UNFCCC	(a) 1. Climate Action Tracker (2025) (incl. LULUCF, as reported in Nascimento et al. (2024)), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024)
Japan	UNFCCC	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024), 4. Meinshausen et al. (2023) (NDC only), 5. NGFS: GCAM (Richters et al., 2024)
Mexico	UNFCCC	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. Meinshausen et al. (2023)(NDC only), 4. NGFS: GCAM (Richters et al., 2024)
Republic of Korea	UNFCCC	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024), 4. Meinshausen et al. (2023) (NDC only) [6], 5. NGFS: GCAM (Richters et al., 2024)
Russian Federation	UNFCCC	(a) 1. Climate Action Tracker (2025) (incl. LULUCF, as reported in Nascimento et al.(2024)), 2. Joint Research Centre (Keramidas et al., 2025)(CP only), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024), 4. Meinshausen et al. (2023) (NDC only), 5. NGFS: GCAM (Richters et al., 2024)(CP only)
Saudi Arabia	N/A	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. Meinshausen et al. (2023) (NDC only) (b) 4. KAPSARC (Kamboj et al., 2024)
South Africa	UNFCCC	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al.,

G20 Member	Updated or new NDC and other announced 2030 target: official data sources (cut-off date: 1 July, 2025)[1]	Current policies scenario and NDC scenario: Independent sources ((a) global models and (b) national models)
		2022; Nascimento et al., 2024), 4. Meinshausen et al. (2023) (NDC only), 5. NGFS: GCAM (Richters et al., 2024)
Türkiye	UNFCCC	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024), 4. Meinshausen et al. (2023) (NDC only)
United Kingdom	UNFCCC	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. Meinshausen et al. (2023) (NDC only)
United States of America	UNFCCC	(a) 1. Climate Action Tracker (2025), 2. Joint Research Centre (Keramidas et al., 2025), 3. PBL (den Elzen et al., 2022; Nascimento et al., 2024), 4. Meinshausen et al. (2023) (NDC only), 5. NGFS: REMIND (Richters et al., 2024) (b) 6. Four scenarios from Bistline et al. (2023)[2]

[1] References provided only when the NDC emission levels are available in absolute terms.

[2] Models with full sector and gas coverage were considered (EPS-EI, GCAM-CGS, NEMS-RHG, RIO-REPEAT). These model projections are treated as individual studies for consistency with the 2022 assessment, in which earlier projections were represented as Rhodium Group (Larsen et al., 2022), REPEAT (Jenkins et al., 2022), Energy Innovation (2017).

Table B.5 Harmonization of GHG emission projections related to land-use emissions

G20 Member	NDC scenario		Current policies scenario	
	Harmonisation to LULUCF in case of only excl. LULUCF data	**Notes**	**Harmonisation to LULUCF in case of only excl. LULUCF data (only relevant for Climate Action Tracker)**	**Notes**
Argentina	Historical LULUCF (latest data year)	No official LULUCF-specific target available	Other	LULUCF as significant net emission source. LULUCF projections by IIASA (harmonised to NGHGI data) for Climate Action Tracker, as reported in Nascimento et al. (2024).
Australia	Historical LULUCF (latest data year)	No official LULUCF-specific target available, small LULUCF emissions, little difference between NDC and current policies LULUCF emissions projections for 2030 (den Elzen et al., 2022)	Historical LULUCF	LULUCF as net sink (based on the NGHGI), assumed no considerable change up to 2030.
Brazil	Other	No official LULUCF-specific target available	Other	LULUCF as significant net emission source. LULUCF projections by IIASA (harmonised to NGHGI data) for Climate Action Tracker, as reported in Nascimento et al. .
Canada	Historical LULUCF	No official LULUCF-specific target	Historical LULUCF	Large sink (based on the NGHGI), no

G20 Member	NDC scenario		Current policies scenario	
	Harmonisation to LULUCF in case of only excl. LULUCF data	**Notes**	**Harmonisation to LULUCF in case of only excl. LULUCF data (only relevant for Climate Action Tracker)**	**Notes**
	(latest data year)	available. Large sink (based on the NGHGI), no considerable changes in emission trends expected up to 2030		considerable changes in emission trends expected up to 2030
China	Historical LULUCF (latest data year)	No official LULUCF-specific target available. Large sink (based on the NGHGI), assumed no considerable change up to 2030.	Historical LULUCF	LULUCF as net sink (based on the NGHGI), assumed no considerable change up to 2030.
European Union	Historical LULUCF (latest data year)	No official LULUCF-specific target available. Large sink (based on the NGHGI), assumed no considerable change up to 2030.	Historical LULUCF	LULUCF as net sink (based on the NGHGI), assumed no considerable change up to 2030.
India	Historical LULUCF (latest data year)	No official LULUCF-specific target available	Historical LULUCF	LULUCF as net sink (based on the NGHGI), assumed no considerable change up to 2030.
Indonesia	NDC LULUCF	Official LULUCF-specific target available	Other	LULUCF as significant net emission source. LULUCF projections by IIASA (harmonised to

G20 Member	NDC scenario		Current policies scenario	
	Harmonisation to LULUCF in case of only excl. LULUCF data	**Notes**	**Harmonisation to LULUCF in case of only excl. LULUCF data (only relevant for Climate Action Tracker)**	**Notes**
				NGHGI data) for Climate Action Tracker, as reported in Nascimento et al. (2024).
Japan	NDC LULUCF	Official LULUCF-specific target available	NDC LULUCF	LULUCF as net sink (based on the NGHGI). Little difference between NDC and current policies LULUCF emissions projections for 2030 (den Elzen et al., 2022).
Mexico	NDC LULUCF	Taking absolute numbers as indicated in the previous NDC, assume they stay the same for conditional target and for the subsequent NDC.	Historical LULUCF	LULUCF as net sink (based on the NGHGI), assumed no considerable change up to 2030.
Russian Federation	Historical LULUCF (latest data year)	No official LULUCF-specific target available. Large sink (based on the NGHGI), assumed no considerable change up to 2030.	Other	Large sink (based on the NGHGI) that is increasing. LULUCF projections by IIASA (harmonised to NGHGI data) for Climate Action Tracker, as reported in

G20 Member	NDC scenario		Current policies scenario	
	Harmonisation to LULUCF in case of only excl. LULUCF data	**Notes**	**Harmonisation to LULUCF in case of only excl. LULUCF data (only relevant for Climate Action Tracker)**	**Notes**
				Nascimento et al. (2024).
Saudi Arabia	Historical LULUCF (latest data year)	No official LULUCF-specific target available.	Historical LULUCF	Negligible LULUCF emissions.
South Africa	Historical LULUCF (latest data year)	No official LULUCF-specific target available.	Historical LULUCF	LULUCF as net sink (based on the NGHGI), assumed no considerable change up to 2030.
Republic of Korea	Historical LULUCF (latest data year)	No official LULUCF-specific target available. Small LULUCF emissions.	Historical LULUCF	LULUCF as net sink (based on the NGHGI), assumed no considerable change up to 2030.
Türkiye	NDC LULUCF	Official LULUCF-specific target available.	Historical LULUCF	LULUCF as net sink (based on the NGHGI), assumed no considerable change up to 2030.
United Kingdom	Historical LULUCF (latest data year)	No official LULUCF-specific target available.	Historical LULUCF	Small LULUCF emissions (based on the NGHGI), assumed no considerable change up to 2030.

G20 Member	NDC scenario		Current policies scenario	
	Harmonisation to LULUCF in case of only excl. LULUCF data	**Notes**	**Harmonisation to LULUCF in case of only excl. LULUCF data (only relevant for Climate Action Tracker)**	**Notes**
United States of America	Historical LULUCF (latest data year)	No official LULUCF-specific target available. Large sink (based on the NGHGI), assumed no considerable change up to 2030.	Historical LULUCF	Large sink (based on the NGHGI), assumed no considerable change up to 2030.

- B.5 Methods underlying the G20 net-zero benchmarks (section 3.4.3)

To identify national or regional modelled pathways to G20 members' stated net-zero pledges,[11] we surveyed academic and grey literature published between January 2020 and June 2025, as well as countries' most recent climate policy documents submitted to the UNFCCC. More specifically, we relied on EBSCO to search the abstracts of peer-reviewed papers for: 1) the name of each G20 member, 2) "net zero," "climate neutrality," "carbon neutrality," or "GHG neutrality," and 3) "scenario," "pathway," "model," or "trajectory." We supplemented this review by identifying publications directly from the websites of national and regional climate change councils (e.g., the Canadian Climate Institute and the European Scientific Advisory Board on Climate Change) and research institutes (e.g., Federal University of Rio de Janeiro's Climate Center and Tsinghua University), as well as international modelling initiatives (e.g., the Deep Decarbonization Pathways Initiative). Finally, we read G20 members' most recent biennial transparency reports (BTRs) and their long-term low-emissions development strategies (LT-LEDs). We did not systematically search for global studies that yielded national emissions pathways. Finally, because we

[11] When identifying net zero scenarios for each G20 member, we selected those in which all GHGs that are covered by the members' explicitly stated targets reach net zero. In most countries, these targets include all Kyoto-recognized GHGs. However, in cases where countries have communicated net-zero targets that only apply to a subset of Kyoto-recognized GHGs (e.g., South Africa's 2050 net zero target covers CO2 emissions only), we identified scenarios that reach net zero for those gases but may not achieve net zero for all GHG emissions. For G20 members that have yet to clarify which GHG emissions are covered by their net-zero pledge (i.e., China, India, Mexico, Saudi Arabia, and Republic of Korea), we included modelled pathways that reach net-zero CO2 emissions, as well as modelled pathways that reach net-zero GHG emissions. Relatedly, because the GHGs not covered within Indonesia's net-zero pledge (i.e., HFCs and SF6) have historically been negligible, we selected scenarios that reach net-zero GHG emissions for this G20 member.

conducted this literature review primarily in English, we acknowledge that there is a potential bias toward knowledge generated by those in the Global North.

Only a relatively small subset of publications identified during this review (Table 1) presented national (or regional, in the case of the European Union), economy-wide scenarios that reach net zero[12] before or by each G20 member's stated net-zero pledge, and those included within our analysis were primarily modelled by integrated assessment models (IAMs) directly and/or simulated by country-specific or region-specific models.

Table B.6: Publications Included in National or Regional Benchmarking Analysis for G20 Members

G20 Member	Studies and Scenarios
Argentina	• The "high ambition" scenario from Cui et al. 2024.
Australia	• The "A40/G1.5" and "A50/G2" scenarios from Climate Change Authority 2024. • The "CRD" scenario from Brinsmead et al. 2023. • The "1.5°C scenario" from Climateworks Centre 2023. • The "NDC-LTS" and "1.5C" scenarios from EU JRC 2024. • The "net zero" scenario from Davis et al. (2024). • The "A40/G1.5" and "A50/G2" scenarios from Verikios et al. 2024. • The "delayed transition" and "high ambition" scenarios from Cui et al. 2024. • The "high use of renewables" and "alternative fuels" scenarios from the Australia's 2021 LT-LEDS.
Brazil	• The "DDS" scenario from DDP 2024. • The "CMA1" and "CMA2" scenarios from Climate and Development Initiative 2021. • The "1.5C" scenario from EU JRC 2024. • The "delayed transition" and "high ambition" scenarios from Cui et al. 2024.

[12] Some scenarios designed to reach a G20 member's stated net-zero pledge still simulate non-zero GHG emissions in the specified year, and where these GHG emissions are marginal (<10 MtCO2e), we included the scenario in our analysis.

G20 Member	Studies and Scenarios
Canada	• The "high ambition" scenario from Cui et al. 2024. • The path to 2050" scenario from Energy Policy Simulator 2025. • The minimum and maximum values of 216 net zero scenarios from the Canada Energy Dashboard 2025. These scenarios were simulated by the same model used to develop 62 net zero scenarios presented in Canadian Institute for Climate Choices 2021, but given that the model has since undergone several updates and improvements, we opted to download more recent scenarios directly from the dashboard. • The "NDC-LTS" scenario from EU JRC 2024. • The "high use of engineered CO2 removal technologies," "high use of renewables and alternative fuels", and "high electrification" scenarios from Canada's LT-LEDS (2022).
China	• The "deep decarbonization GHG" scenario from DDP 2024. • The "climate mitigation" and "towards sustainability" scenarios from Lu et al. 2024. • The "carbon neutrality" scenario from Energy Policy Simulator 2025. • The "1.5C target" scenario from Yi and Xu 2023. • The "high enhancement" scenario from Li et al. 2022. • The "1.5C target path" scenario from Tsinghua University 2022. • The "1.5C" scenario from EU JRC 2024. • The "delayed transition" and "high ambition" scenarios from Cui et al. 2024. • The "DCS" and "SPC" scenarios from Wang et al. 2024. • The "LTS" scenario from He et al. 2025. • The "111," "112," "113," "121," "122," "123," "131," and "132" scenarios from Wen et al. 2022.
European Union	• The minimum and maximum values of 33 scenarios from European Scientific Advisory Board on Climate Change 2023. • The "NZE benchmark" and "NZE EU policy standard" scenarios from Boitier et al. 2023. • The "NDC-LTS" and "1.5C" scenarios from EU JRC 2024.

G20 Member	Studies and Scenarios
	• The "delayed transition" and "high ambition" scenarios from Cui et al. 2024. • The "S1," "S2," and "S3" scenarios from European Commission 2024. • The "reference," "flexible demand," and "reliable" scenarios from Chyong 2024. • The "TEMOA-Europe" scenario from Lerede et al. 2024.
India	• The "enhanced NDC scenario" from DDP 2024. • The "NDC-LTS" and "1.5C" scenarios from EU JRC 2024. • The "LTD" scenario from Energy Policy Simulator 2025. • The "managing natural resources" and "net zero" scenarios from Golechha et al. 2025. • The "delayed transition" and "high ambition" scenarios from Cui et al. 2024.
Indonesia	• The "DDS Low" scenario from DDP 2024. • The "NDC-LTS" scenario from EU JRC 2024. • The "NZ2045," "NZ2050," and "NZ2060" scenarios from Low-Carbon Development Initiative 2021. • The "delayed transition" and "high ambition" scenarios from Cui et al. 2024.
Japan	• The "4%MFT" and "4%ITP" scenarios from Hata et al. 2025.
Mexico	• The "DDS High" scenario from DDP 2024. • The "1.5C" scenario from EU JRC 2024. • The "LTS" scenario from Energy Policy Simulator 2025. • The "delayed transition" and "high ambition" scenarios from Cui et al. 2024.
Russian Federation	• The "transformation" scenario from Dmitriev (2022). • The "NDC-LTS" and "1.5C" scenarios from EU JRC 2024. • The "target inertial" scenario from Russia, Federation's LT-LEDS (2022). • The "high ambition" scenario from Cui et al. 2024.
Saudi Arabia	• The "NDC-LTS" scenario from EU JRC 2024. • The "high ambition" scenario from Cui et al. 2024.

G20 Member	Studies and Scenarios
	• The "NZ2060" scenario from Kamboj et al. 2024.
South Africa	• The 'DDS 8GT' and 'DDS 9GT' scenarios from DDP 2024. • The "NZ_2050 nCDR" and "NZ_2050 No_nCDR" scenarios from Afrane et al. 2024 • The "delayed transition" and "high ambition" scenarios from Cui et al. 2024. • The "2050CM" scenario from Kazumasa et al. 2023. • Multiple NZ CO2 scenarios from ESRG 2024.
Republic of Korea	• The "K Map" scenario from the Green Energy Strategy Institute 2022. • The "NDC-LTS" and "1.5C" scenarios from EU JRC 2024. • The "Annual reduction targets for 2023-2030" scenario from the First National Basic Plan on Carbon Neutrality and Green Growth 2023. • The "example decarbonization" scenario from Energy Policy Simulator 2025. • The "A" and "B" scenarios from Republic of Korea Ministry of Environment 2021.
Türkiye	• The "NZ" scenario from McKinsey 2024. • The "1.5C" scenario from EU JRC 2024.
United Kingdom	• The "high ambition" scenario from Cui et al. 2024. • The "balanced pathway" scenario from the United Kingdom Climate Change Committee 2025. • The "patchwork (decentralized)" and "clockwork (centralized") scenarios from Energy Systems Catapult 2021. • The "electric engagement," "holistic transition," and "hydrogen evolution" scenarios from Future Energy Scenarios 2024. • The "NDC-LTS" scenario from EU JRC 2024.
United States of America	• The "high ambition" scenario from Cui et al. 2024. • The "central" scenario from Jones et al. 2024. • The "net zero pathway" scenario from Jenkins et al. 2024. • The "NDC" scenario from Energy Policy Simulator 2025.

G20 Member	Studies and Scenarios
	• The "1.5C" scenario from EU JRC 2024 • Multiple scenarios from the U.S.' LT-LEDS (2021).

Note: We plan to include highlighted studies in this analysis but are currently awaiting responses from authors for fulltime series data and/or confirmation that the scenarios are aligned with each G20 member's stated net zero target.

From each national or regional net-zero scenario, we collected historical and projected GHG emissions data and then normalized these data to PRIMAP and Grassi et al. 2025, using GHG emissions in 2019 where possible to calculate a normalization factor.[13] We formed benchmark ranges for each G20 member by taking the minimum and maximum values from these normalized, G20 member-specific data in 2030 and 2035. For some scenarios, data were only available in five- or ten-year increments, and in these instances, we relied on linear extrapolation to estimate GHG emissions in specific years when authors of each affected scenario confirmed that such extrapolation was appropriate.

- B.6. Global developments in net-zero targets and long-term pledges

Note to reviewers: Historically, this has been part of the main chapter. Because there are very few updates this year, we propose to move it to the annex, as this also allows the chapter to be structured in a more straightforward way.

As at 1 May 2025, 107 parties[1] representing 108 countries and covering approximately 82 per cent of global GHG emissions had adopted net-zero pledges either in law (29 parties), in a policy document such as an NDC or a long-term strategy (61 parties), or in an announcement by a high-level government official (17 parties).[2] Since the Emissions Gap Report 2024, six new parties -including Mexico, the last G20 country to come forward - communicated a new net-zero target. An additional twelve parties covering an additional 2 per cent of global GHG emissions have communicated another (non-net-zero) GHG mitigation target as part of their long-term strategy. A total of 36 per cent of 2022 global GHG emissions are covered by net-zero targets for 2050 or earlier, while 46 per cent of global emissions are covered by net-zero pledges for years later than 2050. Six parties, representing 0.1 per cent of global emissions, report they have already achieved net-zero emissions and have explicitly committed to maintaining this status.

Net-zero targets vary in their scope, with some applying to all GHGs and sectors of the economy and others applying to a subset of sectors and gases. A total of 81 net-zero targets cover all sectors, one net-

[13] Due to data limitations in historical time series data for some G20 members, we normalized GHG emissions data to 2015, 2018, 2020, or 2021, or 2022. We avoided normalizing to 2020 wherever possible.

zero target (the Netherlands') explicitly mentions that it only covers a subset of sectors, and the remainder do not specify sectoral coverage. A total of 59 cover all gases, 15 cover fewer than all gases, and the remainder do not specify. The vast majority of countries with net-zero targets fail to specify whether their targets cover international shipping and aviation, and whether they permit the use of international offsets. Six parties set separate targets for gross emission reductions and carbon removal, explicitly acknowledging the projected role that both reductions and removals will play in delivering their net-zero target.

- B.7 Methods underlying the G20 net-zero pledges assessment (Box 3.2, section 3.4.3)

The indicators and criteria by which G20 net-zero pledges are assessed are as follows:

- Source: Refers to whether the net-zero target is established in law, in a policy document (including an NDC or a long-term strategy), or via a political announcement or pledge, such as those made at the 2020 Climate Ambition Summit.
- Target year: Refers to the year by which the source indicates net-zero emissions will be achieved.
- Covers all sectors and gases: Receives green checkmark if the source specifies that the target applies to all economic sectors (as opposed to, for example, the energy sector only) as well as all Kyoto greenhouse gases. Receives yellow checkmark if full coverage is met for one of the two indicators (i.e., gases or sectors) tracked in this column, but not both.

Transparent information on carbon removal: Receives green checkmark if the source contains transparent assumptions for both domestic LULUCF and domestic removals and storage; receives yellow checkmark if source contains information on domestic LULUCF, removals and storage, but assumptions are not transparent.

- Published plan: Receives green checkmark if source meets all Climate Action Tracker and Net Zero Tracker criteria for information on anticipated pathway or measures for achieving net-zero target, and a yellow checkmark if source meets some, but not all, criteria.
- Review process: Receives a green checkmark if source establishes a legally binding process to review progress against the target at regular intervals; receives a yellow checkmark if the process is not legally binding, is still being established, or lacks detail or tracking of progress.
- Annual reporting: Receives a green checkmark if source establishes a process to report at least annually on progress towards the target.

All indicators receive an "X" if the criteria for either a green or yellow checkmark are not met, a question mark where not enough information is available, an "inconclusive" if the data sources reach differing conclusions regarding the indicator and a "not evaluated" if none of the data sources track the indicator for the G20 member. The European Union is evaluated according to its long-term strategy, while individual European Union Member States are evaluated according to the laws, policies and plans specific to the

714 respective States. Further detail on the methods underlying each indicator can be found at Climate Action
715 Tracker, Climate Watch and Net Zero Tracker.

716 This table is a meta-analysis compiled from three independent sources. Data for each indicator are
717 compiled and reconciled as follows:

718 *Source and target year:*

719 Data for the source and target year columns are derived from Climate Watch, the Net Zero Tracker, and
720 Climate Action Tracker. In cases of discrepancies between the trackers, we report the source that is most
721 binding and its corresponding target year, with law more binding than policy document and policy
722 document more binding than government announcement. It is important to note here, however, that the
723 durability and credibility of targets communicated in law, policy document, or government announcement
724 may vary depending on the governance structure of particular countries.

725 *Sector and gas coverage:*

726 Data for sectoral coverage are derived from Climate Watch ("coverage of domestic sectors" indicator),
727 while data for gas coverage are derived from Climate Watch ("coverage of GHGs" indicator), the Net Zero
728 Tracker ("greenhouse gases" indicator), and Climate Action Tracker ("emissions coverage" indicator). In
729 cases of discrepancies between the three trackers which provide data for gas coverage, we report
730 consensus if two out of the three trackers agree.

731 *Transparent information on carbon removal:*

732 Data for the transparent information on carbon removal column are derived from the Net Zero Tracker
733 ("plans for carbon removal" indicator) and Climate Action Tracker ("carbon dioxide removal" indicator).
734 In cases of discrepancies between the two trackers, we report the less-ambitious code as a conservative
735 measure if the trackers disagree on whether the code should be yellow or green, though mark the country
736 as "inconclusive" if one tracker codes the indicator as red.

737 *Published implementation plan:*

738 Data for the published plan column are derived from the Net Zero Tracker ("published plan" indicator)
739 and Climate Action Tracker ("comprehensive planning" indicator) and are reconciled according to the
740 scheme described in the figure key (a country receives a green checkmark if source meets all Climate
741 Action Tracker and Net Zero Tracker criteria for information on anticipated pathway or measures for
742 achieving net-zero target, and a yellow checkmark if source meets some, but not all, criteria.)

743 *Review process:*

744 Data for the review process column are derived from the Climate Action Tracker ("review process"
745 indicator).

746 *Annual reporting:*

747 Data for the annual reporting column are derived from the Net Zero Tracker ("annual reporting
748 mechanism" indicator).

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