

Trust and Transparency in Climate Action

Revealing Developed Countries' Emission Trajectories

Max van Deursen and Sumit Prasad

Issue Brief | October 2023





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The [Council on Energy, Environment and Water \(CEEW\)](#) is one of Asia’s leading not-for-profit policy research institutions and among the world’s top climate think tanks. The Council uses data, integrated analysis, and strategic outreach to explain — and change — the use, reuse, and misuse of resources. The Council addresses pressing global challenges through an integrated and internationally focused approach. It prides itself on the independence of its high-quality research, develops partnerships with public and private institutions, and engages with the wider public. [CEEW is a strategic/ knowledge partner to 11 ministries for India’s G20 presidency.](#)

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There is an urgent need to scale up mitigation ambition and implementation across the globe in this critical decade.

Executive summary

What remains of the global carbon budget – a benchmark to keeping global warming below 1.5°C – is estimated to be about 500 GtCO₂.¹ This amount will be depleted by the end of the decade at the current rate of global emissions (IPCC, 2021). Given this limited carbon space, deep emission reductions are imperative in this critical decade (2020–2030). However, **are developed countries, who are responsible for over 75 per cent of historical emissions² (Busch, 2015), taking deep emission reductions at an adequate pace?**

The mitigation efforts of developed countries have direct implications for the limited carbon budget available to developing countries, which need sufficient carbon space to address their economic and social development challenges and eradicate poverty. But surprisingly, there is little clarity on how developed countries are performing in relation to their commitments and the remaining carbon budget. In this issue brief, we aim to bridge this gap by analysing the emission trajectories of developed countries, covering historic and projected emissions in the six decades spanning 1990–2050. For this assessment, we used datasets officially disclosed by developed countries in their reports as submitted under United Nations Framework Convention on Climate Change (UNFCCC) transparency arrangements.

2 developed countries

are on track to achieve their NDC commitments for 2030

5 developed countries

are linearly on track to reach net zero by 2050

40-50% of the remaining global carbon budget

for the 1.5°C target would be consumed by developed countries even if they achieve net zero by 2050

Key findings

We observed that, in the period 1990–2020, developed countries cumulatively emitted about 555 GtCO₂e and reduced emissions³ by 20 per cent. While this is in line with the overall goal (18 per cent) of the Doha Amendment, it is important to note that a substantial part of this reduction can be ascribed to the COVID-19 lockdown in 2020 as well as emission reduction in the mid-1990s, when former Soviet countries made the transition to becoming market economies.

In terms of nationally determined contribution (NDC) targets for 2030, only two developed countries, namely Norway and Belarus, are on track to achieve their commitments. Developed countries are projected to collectively emit around 3.7 GtCO₂e more in 2030 than the reduction goals they expressed in their NDCs. This represents a 38 per cent emission overshoot, and the **United States, Russia, and the EU are responsible for 83 per cent of this overshoot.** Further, collectively, NDCs of developed countries also fall short of the global average reduction levels – 43 per cent of the 2019 levels – needed to keep the 1.5°C target alive. The NDC targets represent a 36 per cent reduction of the 2019 levels while their projected 2030 emissions amount to only 11 per cent.

Source: Authors' analysis

¹ 500GtCO₂ is the remaining carbon budget from the beginning of 2020 and has a 50 per cent likelihood of limiting the global warming temperature to 1.5°C

² Between 1850–2011; CO₂ emissions without Land Use, Land-use Change and Forestry (LULUCF)

³ GHG emissions without LULUCF

The projections also reveal that developed countries rely on drastically ramping up emission reductions *after* 2030 to meet net-zero by 2050 rather than doing so before 2030. **To achieve net zero by 2050 from the projected 2030 emission levels, these countries need average year-on-year reductions of 669 MtCO₂e.** This is more than four times the average year-on-year reductions in the period 1990-2020.

This delayed acceleration has implications for the carbon budget consumed by developed countries. We estimate that even if developed countries achieve net zero by 2050, they would collectively emit over 40 to 50 per cent of the remaining global carbon budget for the 1.5°C target, even though they are home to less than a fifth of the world's population.

Recommendations

The climate journey of the developed countries has failed to produce deep emission cuts; this is not projected to change by 2030 and jeopardises any chances of achieving the 1.5°C target. We present five recommendations to course-correct:

- Developed countries must **bridge the projected 3.7 GtCO₂e implementation gap by 2025** so that they can explore opportunities to enhance NDCs in this critical decade.
- Developed countries must do more than the global emission reduction average required to keep the 1.5°C target alive. For this, **developed countries need to enhance their 2030 NDCs beyond 43 per cent reduction from their 2019 levels.**
- Deep emission reductions are needed from developed countries in this critical decade instead of betting on the future. **Developed countries need to chart out year-on-year emission reduction trajectories towards their net-zero targets.**
- Developed countries should formulate **ambitious carbon budgets** to achieve their targets.
- To build trust, **developed countries need to be reliable and stay committed to the Paris Agreement.** They must not repeat the failures of the pre-2020 climate regime, such as non-participation, grey accounting procedures, and unfulfilled pledges.

1. Introduction

Climate change has already led to a 1.1°C rise in temperature (IPCC, 2021). This has resulted in changes in weather patterns and climate extremes in every region across the globe (IPCC, 2021). The loss and damage related to climate change has already cost the V20, a group of vulnerable countries, 20 per cent of their GDP in the last two decades (V20, 2022). Loss and damage could cost developing countries USD 290–580 billion by 2030 and USD 1.3–1.7 trillion by 2050 (Markandya & González-Eguino, 2019). Future climate-induced economic damages per capita are estimated to be higher for developing countries than for developed countries (IPCC, 2022a). With every increment of warming, this number is expected to increase exponentially (IPCC, 2022a).

To avert the worst impacts of climate change and limit global warming to 1.5°C, global greenhouse gas emissions (GHGs) need to be reduced by 43 per cent of their 2019 levels and global carbon dioxide emissions need to reach net zero⁴ by 2050 (IPCC, 2022b). However, the climate targets under the Paris Agreement are insufficient to limit global warming to under 1.5°C (UNFCCC 2022; IPCC, 2022b). In an attempt to turn the tide, the 2021 Glasgow Climate Pact stressed “the urgency of enhancing ambition and action [...] in this critical decade” and further established a “work programme to urgently scale up mitigation ambition and implementation in this critical decade” (UNFCCC, 2021). These calls for acceleration notwithstanding, progress in ramping up ambition has been limited (UNEP, 2022; UNFCCC, 2022).

Although the developed countries have left an oversized carbon footprint, climate change will hit developing countries hardest. During the period 1850–2019, North America, Europe, Australia, Japan, and New Zealand – which collectively represent less than 15 per cent of the world's population – were responsible for 55 per cent of historical emissions. By comparison, Africa, home to 17 per cent of the global population, is responsible for less than 3 per cent of historic emissions (Dhakal et al. 2022). Per capita emissions are also strikingly unequal across regions. For example, the average person in Africa and South Asia emits 1.2 and 1.6 tonnes of carbon dioxide every year respectively; meanwhile, per-capita emissions stand at 16 tonnes for North America and 6.5 tonnes for Europe (IPCC, 2022b).

This disparity was even higher in 1992, when the United Nations Framework Convention on Climate Change (UNFCCC) was adopted. Consequently, the 1992 Climate Convention adopted the core principle that developed countries should take the lead in reducing emissions.⁵

Their leadership was seen as particularly important, as the convention anticipated that developing countries would increase energy consumption and greenhouse gas emissions in the process of poverty reduction, development, and industrialisation.

The mitigation performance of developed countries has direct consequences for the carbon budget available to developing countries. **At the beginning of 2020, the carbon budget available to limit warming to 1.5°C was estimated to be 500 GtCO₂⁶ – an amount that will be depleted by the end of the decade at the current rate of global emissions** (IPCC, 2021). Despite this very low carbon budget, there is surprisingly little clarity on what share developed countries will use, partly because point-year reductions and net-zero targets say little about emission trajectories.

Transparency arrangements under the UNFCCC mandate the disclosure of important information on developed countries' emission trajectories. However, this requirement does not necessarily translate into accountability (Gupta & van Asselt, 2019). Moreover, related reports are so voluminous and detailed that their findings seldom receive due attention in mainstream media and policy processes.

The purpose of this issue brief is to assess the mitigation performance of developed countries.⁷ We cover historic and projected emissions for the six decades spanning 1990–2050. This assessment is of key importance to developing countries. The greenhouse gas emission trajectories of developed countries have direct consequences for the global carbon budget, and by implication, the carbon space available to developing countries.

To assess the emission trajectories of developed countries, we use countries' self-reported information on historic greenhouse gas emissions and projections, as disclosed in UNFCCC transparency arrangements. The projections are most likely estimates of developed countries future emissions for 2030, which these developed countries are mandated to report on a biennial basis. All data is publicly available on the UNFCCC website. A supplementary Excel spreadsheet, which covers the data points and tables we discuss in this brief, is also available on our website.

In Section 2, we cover developed countries' emission trajectories from 1990–2020. By looking retrospectively at emissions in this period, we aim to shed light on the extent to which developed countries have managed to reduce emissions. Section 3 scrutinises emission trajectories in the current critical decade and highlights the progress of developed countries towards their 2030 targets. Section 4 assesses the implications of the projected emissions reaching net zero by 2050. Section 5 concludes with our recommendations based on our findings.

2. Pre-2020: The road so far

The implementation of pre-2020 commitments was of utmost importance to achieve the overall objectives of the UNFCCC. Under the Kyoto Protocol and its Doha Amendment, developed countries were obligated to lead global efforts to reduce greenhouse gas emissions; they had legally binding targets. Collectively, developed countries were to reduce emissions against their 1990 levels by 5 per cent in 2008–2012 and by 18 per cent during 2013–2020.

In pre-2020 period, developed countries were obligated to lead global efforts to reduce greenhouse gas emissions.

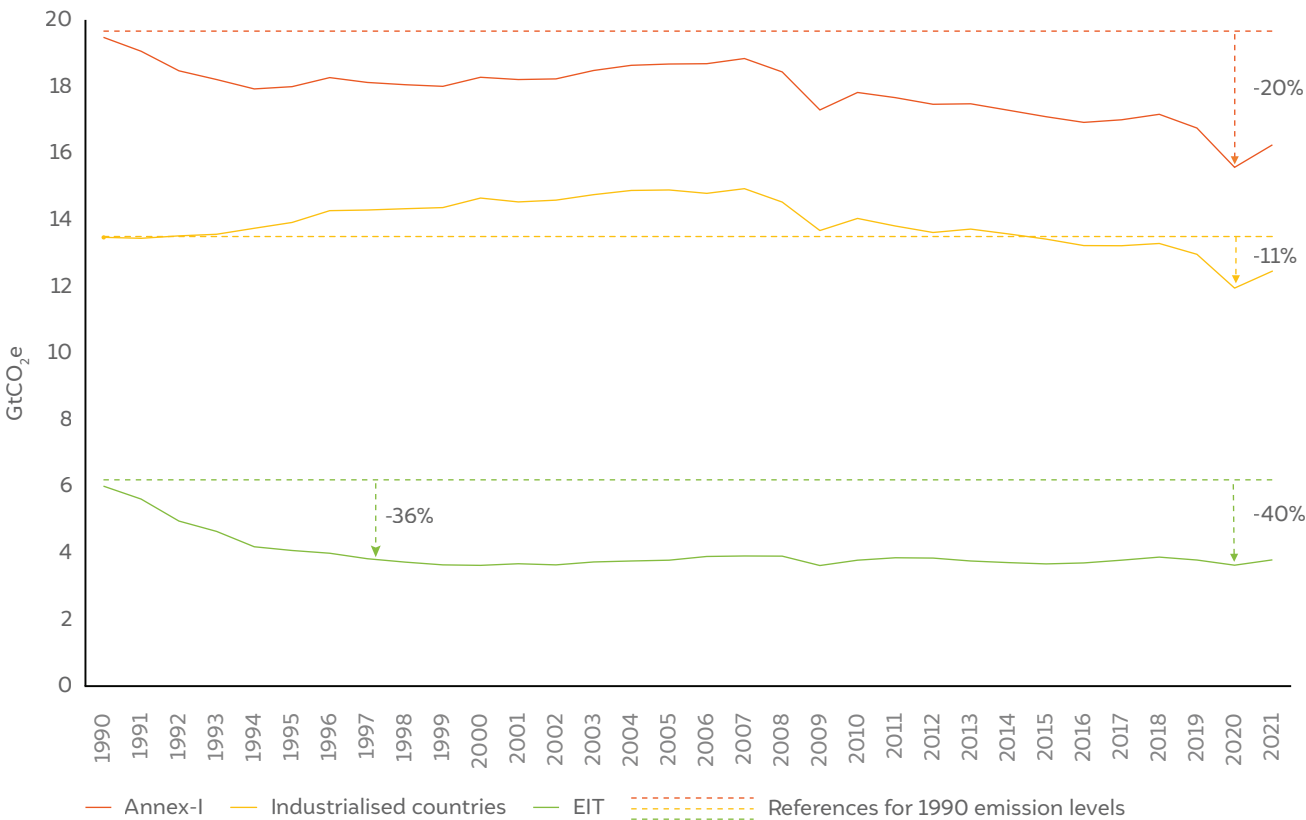
4 Net zero means that any remaining sources of emissions are counterbalanced by emission removals – for example, by expanding forest cover.

5 For example, this is enshrined in Article 3.1 of the 1992 United Nations Framework Convention on Climate Change, and later in Article 4.4 of the 2015 Paris Agreement on Climate Change.

6 Based on the "Summary for Policymakers", in the IPCC Sixth Assessment Report (Table SPM.2), we observed that 500GtCO₂ is the remaining carbon budget from the beginning of 2020 and has a 50 per cent likelihood of limiting the global warming temperature to 1.5°C.

7 In the context of this brief, we understand developed countries as Annex I Parties under the UNFCCC.

Figure 1 Greenhouse gas emissions of developed countries (1990–2021)



Source: Authors’ analysis

Note: The emission trajectories show in this graph are without emissions from Land Use, Land-Use Change and Forestry (LULUCF).

Annex I Parties under the Convention represent developed countries. Annex I Parties are grouped in industrialised countries and economies in transition (EIT).⁸

By 2020, developed countries had collectively reduced emissions by 20 per cent compared to their 1990 levels.⁹ While this indicates that developed countries are in line with the overall goal of the Doha Amendment, it is difficult to relate this achievement with planned emission reduction measures. As Figure 1 shows, the majority of the emission reductions in developed countries during the pre-2020 period was driven by economies in transition (EIT). These **economies witnessed a significant emission reduction – a reduction of 36 per cent by 1997 compared to 1990 – well before the start of the Kyoto Protocol/Doha Amendment.**

This reduction was due to their transition from centrally planned to market-based economies and not because of planned emission reduction measures (CEEW, 2021). Secondly, there was a significant drop in emission levels in 2020 as a result of the global economic slowdown because of the COVID-19 pandemic.

The pre-2020 climate regime also witnessed several challenges as a result of the non-participation of many major developed economies in the climate agreement, inflated base year emissions, and accounting loopholes (CEEW, 2021).

8 Industrialised countries are members of the OECD (Organisation for Economic Co-operation and Development) in 1992, while EIT countries include Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Romania, Russian Federation, Slovakia, Slovenia, and Ukraine.

9 We consider GHG emissions without LULUCF in our analysis of the pre-2020 period.

Table 1 Uneven progress in emission reduction among developed countries (1990–2020)

Party	Cumulative contribution* (1990–2020)	% change in 2020 emission* against 1990 levels*
United States of America	39%	–7%
EU	24%	–32%
Russian Federation	12%	–35%
Japan	7%	–10%
Canada	4%	12%
United Kingdom of Great Britain and Northern Ireland	4%	–49%
Australia	3%	24%
Ukraine	3%	–66%
Türkiye	2%	139%
Kazakhstan	2%	–14%
Belarus	1%	–38%
New Zealand	0.4%	19%
Norway	0.3%	–3%
Switzerland	0.3%	–20%
Iceland	<0.1%	23%
Liechtenstein	<0.1%	–21%
Monaco	<0.1%	–32%
Total Annex I (developed) countries	555.6 GtCO ₂ e	–20%
Industrialised countries	78%	–11%
EIT countries	22%	–40%

Source: Authors’ analysis

* We considered emissions without LULUCF for this analysis

Green indicates that the party is in line with the overall goal of the Doha Amendment

Table 1 highlights the Parties’ 2020 emission changes against their 1990 levels as well as their contribution to the cumulative emissions by developed countries during the period 1990–2020. We then benchmark (in green) these reductions with the overall emission reduction goal of the Doha Amendment but do not assess the actual compliance of the Parties against their individual targets.¹⁰

Based on this analysis, we observed that, **during the three decades of the pre-2020 regime, developed countries collectively emitted about 555.6 GtCO₂e.** Four Parties – the United States of America, the European Union, the Russian Federation, and Japan – account for more than 80 per cent of this cumulative emissions of

developed countries in 1990–2020. While the EU and the Russian Federation have achieved reductions beyond the Doha Amendment’s overall goal of 18 per cent reduction, the United States of America (the highest contributor) and Japan are not close to this goal.

We also observed that significant reductions on the part of the United Kingdom, Ukraine, Belarus, and Switzerland have exceeded the overall goal. But for several other Parties, namely, **Canada, Australia, Türkiye, New Zealand, and Iceland, we observed an increase in emissions instead of a reduction – despite the global lockdown resulting from COVID-19 in 2020 – from their 1990 levels.**

10 It is important to highlight that the responsibility of achieving the overall goal of the Doha Amendment is distributed among the Parties in the form of individual emission reduction targets that may be lower/higher than or equal to the 18 per cent reduction goal. On this basis, carbon allowances are assigned to Parties for the period of their commitment (2013–2020) and then analysed against their actual emissions by UNFCCC review teams to assess compliance.

3. Pre-2030: Ambitious climate action in this critical decade?

The Paris Agreement urges developed countries to commit to economy-wide emission reduction targets. In line with this, these countries communicated new or updated NDCs to be achieved by 2030. It is crucial to scrutinise their progress towards 2030 targets, as the current decade is pivotal in limiting global warming to 1.5°C.

To keep the 1.5°C target alive, by 2030, global emissions should be reduced to 43 per cent from their 2019 levels. Are developed countries' NDC targets aligned with this global average? Figure 2 shows that the NDC targets as

well as the projected emissions of developed countries are well below the required global average reductions needed by 2030.

We must also ask: which developed countries are on track to meet their NDCs? A UNFCCC synthesis report compiles the self-submitted emission projections of developed countries. It narrates a crucial message: none of the developed countries are projected to meet their 2030 climate targets (UNFCCC, 2023).

The UNFCCC's synthesis report draws on information submitted in developed countries' fourth Biennial Reports. Table 2, which is based on their latest submissions, provides an updated estimate, drawing on the fifth Biennial Reports.¹¹ It compares developed countries' NDC targets with their self-reported projected emissions.

Figure 2 Developed countries' 2030 targets and projected emissions do not meet the global average of reductions needed to keep the 1.5°C target alive



Source: IPCC 2022b, Authors' analysis

11 For Croatia, Denmark, Luxembourg, and Ukraine, we considered the fourth Biennial Report, as their fifth Reports were not available as on 10 August 2023.

Table 2 Most developed countries are projected to miss their 2030 NDC targets

Party	Base year	NDC base year emissions* (MtCO ₂ e)	Projected 2030 emissions* (MtCO ₂ e with LULUCF)	2030 NDC target (emission reduction compared to base year)	Projected 2030 reduction
United States of America	2005	6,696.3	5236.10	50%	22%
EU	1990	4,645.3	2584.80	55%	44%
Russian Federation	1990	3,089.2	1596.30	70%	48%
Japan	2013	1,407.6	774.00	46%	45%
Türkiye	2030**	1,175.0	928.99	41%	21%
Ukraine	1990	911.4	485.26	65%	47%
United Kingdom of Great Britain and Northern Ireland	1990	817.5	360.33	68%	56%
Canada	2005	732.2	511.70	40%	30%
Australia	2005	608.6	368.47	43%	39%
Kazakhstan	1990	380.2	326.07	15%	14%
Belarus	1990	115.9	72.75	35%	37%
New Zealand	2005	81.8	55.53	50%	32%
Switzerland	1990	55.3	37.30	50%	33%
Norway	1990	50.7	22.03	55%	57%
Iceland	1990	13.3	12.68	55%	5%
Liechtenstein	1990	0.2	0.14	40%	38%
Monaco	1990	0.1	0.06	55%	41%

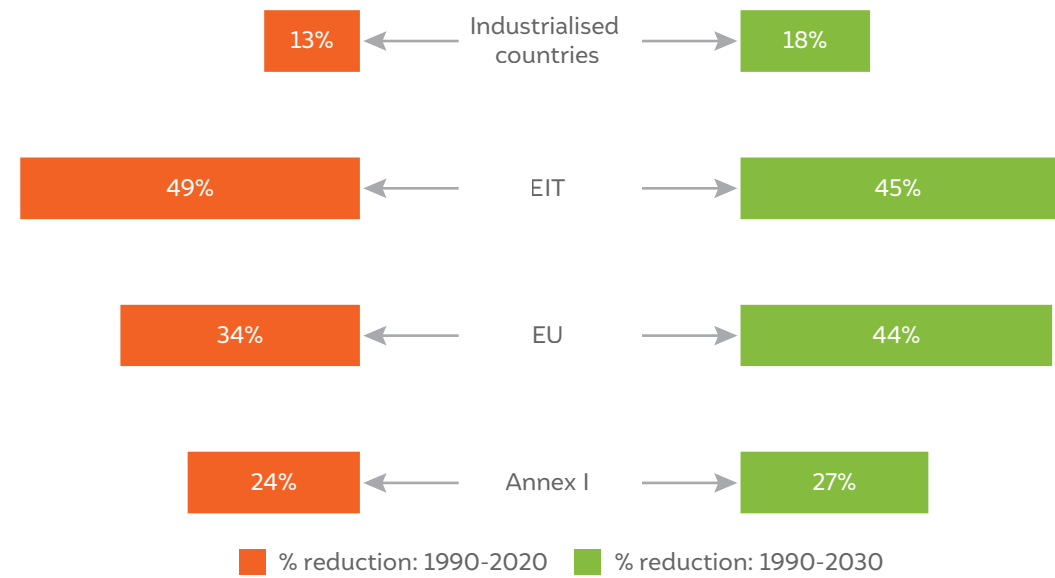
Source: Authors' analysis

Note: The green-highlighted projected reductions for 2030 signify that the country is on track to achieve its 2030 NDC target, while the red-highlighted reductions indicate that the country is projected to fall short of its NDC target.
*The base year emissions are as communicated by the Parties. Some include LULUCF while others do not, as self-determined and communicated by the respective party. More information on the base year is provided in the supplementary Excel file that is available on our website.
**Türkiye has a target relative to estimated business-as-usual emissions in 2030.
We use the latest available projections in the Biennial Reports, but some Parties highlighted (in their Biennial Reports) that their estimates do not cover the most recent policies. The projected emission for the EU is calculated by adding the projections of individual EU countries.

Table 2 shows that **only two developed countries, namely Belarus and Norway, are on track to meet their 2030 NDC targets. But they account for less than one per cent of the total set of developed countries' projected emissions in 2030.** Two other developed countries – Japan and Kazakhstan – are projected to miss their 2030 NDC targets by only one percentage point.

Further, developed countries are projected to collectively emit around 3.7 GtCO₂e more in 2030 than they pledged in their NDCs – more than the annual emissions of the EU at present – representing a collective 38 per cent emission overshoot. The United States, Russia, and the EU are responsible for 83 per cent of this overshoot.

Figure 3 Emission reductions (with LULUCF) by developed countries before and after the critical decade (2020-30)



Source: Authors' analysis

By 2020, the developed countries (Annex I) had achieved emission reductions of 24 per cent (when including LULUCF) from their 1990 levels.¹² Figure 3 shows that considering current projections, this number will not be drastically different by 2030. In fact, given that progress is minimal, by 2030, emissions are set to reduce by 27 per cent from their 1990 levels. In other words, according to the projections, the 'critical decade' (i.e., 2020–2030) will not see deep emission cuts by developed countries as a group. This has implications for the feasibility of achieving net zero by 2050, to which we turn next.

4. Net-zero by 2050: Achievable?

Net zero has evolved to become one of the most prominent concepts in defining climate ambition. As of 4 October 2023, 151 countries – which contribute to 88 per cent of global emissions – pledged or proposed a net-zero target (Net Zero Tracker, 2023). By pledging to reach net

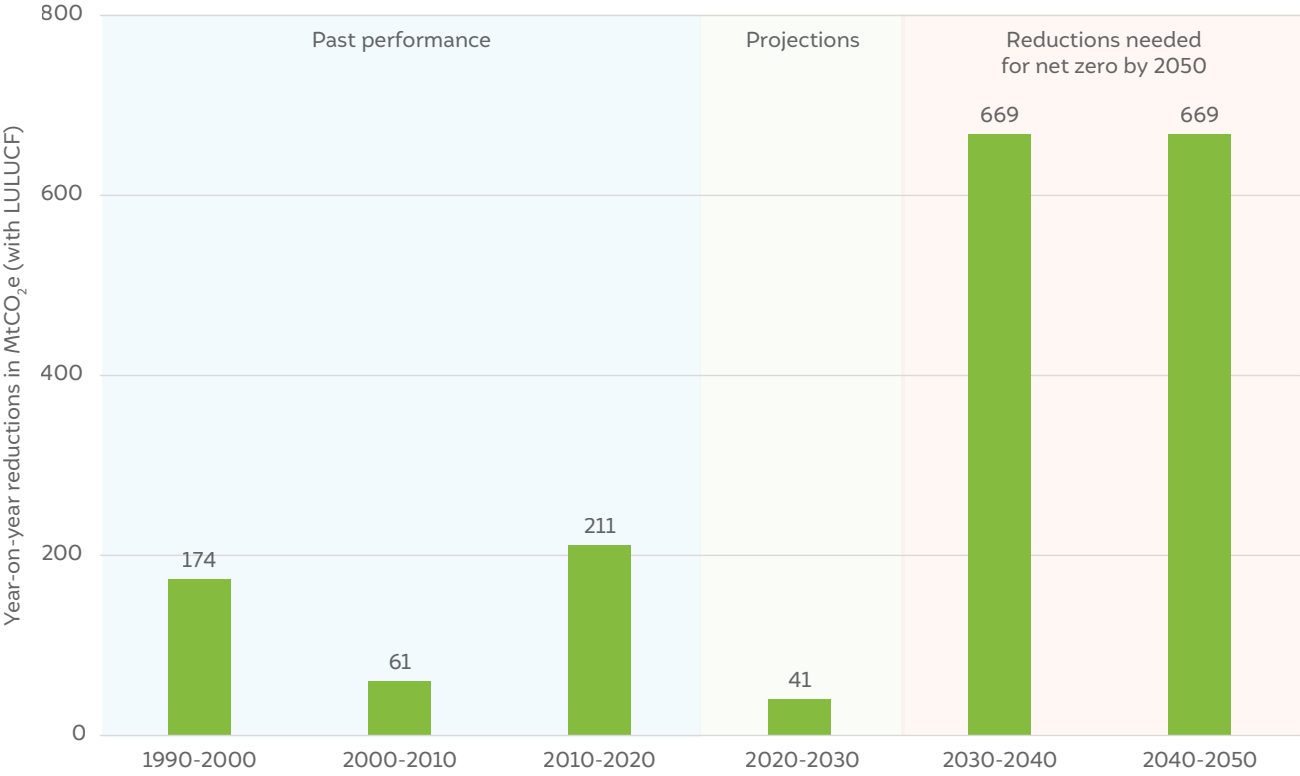
zero in 2050, several developed countries have claimed to be in line with the collective objective of limiting global warming to 1.5°C. Most notably, the US and the EU have used their 2050 net-zero targets to claim that their ambitions are fully in line with the 1.5°C target (European Commission 2022; White House 2021). But are developed countries on track to meet these aspirational targets? And does the achievement of net zero by 2050 always translate into being in line with the 1.5°C target?

Drawing on official self-reported projections of emissions in 2030, in this section we analyse whether the developed countries are on track to meet net zero by 2050.

The projected average year-on-year emission¹³ reduction for developed countries in the critical decade 2020–2030 is about 41 MtCO₂e per year, which is less than the average for the previous three decades in 1990–2020 (see Figure 4).

The 'critical decade' (2020–2030) will not see deep emission cuts by developed countries.

Figure 4 Net-zero goals rely on drastic emission reductions post-2030



Source: Authors' analysis

Note: This figure shows year-on-year emission reductions in MtCO₂e (including emissions from LULUCF) averaged over a decade for a) past performance in the three decades since the adoption of the UNFCCC (based on greenhouse gas inventory data); b) projected performance in the critical decade (based on self-reported projections); and c) the implications for emission reduction performance needed after 2030 (illustrated by year-on-year reductions if developed countries move linearly to zero by 2050 from 2030 emission levels). In this figure, the low emissions in 2020 due to the COVID-19 pandemic may have inflated the year-on-year reductions in 2010–2020 and deflated it in the decade 2020–2030 decade in a zero-sum manner. However, this does not change the actual emission reductions necessary after 2030 to achieve net zero.

Based on the projections data (and Table 2), developed countries are set to collectively emit 13.4 GtCO₂e in 2030. To move from this level to net zero by 2050 in a linear fashion, **average year-on-year reductions of 669 MtCO₂e are needed from 2030 onwards. This is more than four times the average year-on-year reductions achieved from 1990–2020.** Figure 4 shows that developed countries will need to drastically scale up their efforts after 2030.

Figure 5 shows how individual countries are progressing towards net zero. The blue dots indicate the projected

average year-on-year change in emissions in this critical decade. The green dots show what this implies for the average year-on-year change in emissions needed after 2030 to achieve net zero by 2050. The general trend suggests that given current projections, most countries will have to ramp up climate action after 2030 to meet net-zero by 2050.

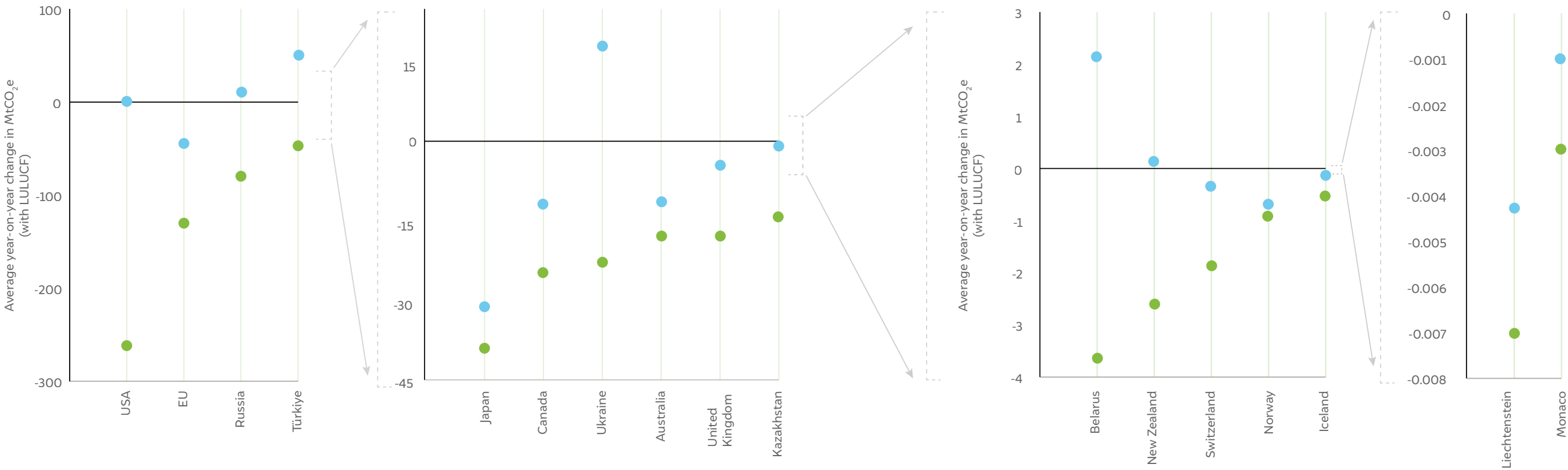
The Czech Republic, Finland, Lithuania, Luxembourg, and Portugal are linearly on track to achieve net zero by 2050.

¹² Note that this may be an overestimation given the low emissions during the COVID-19 pandemic in 2020.

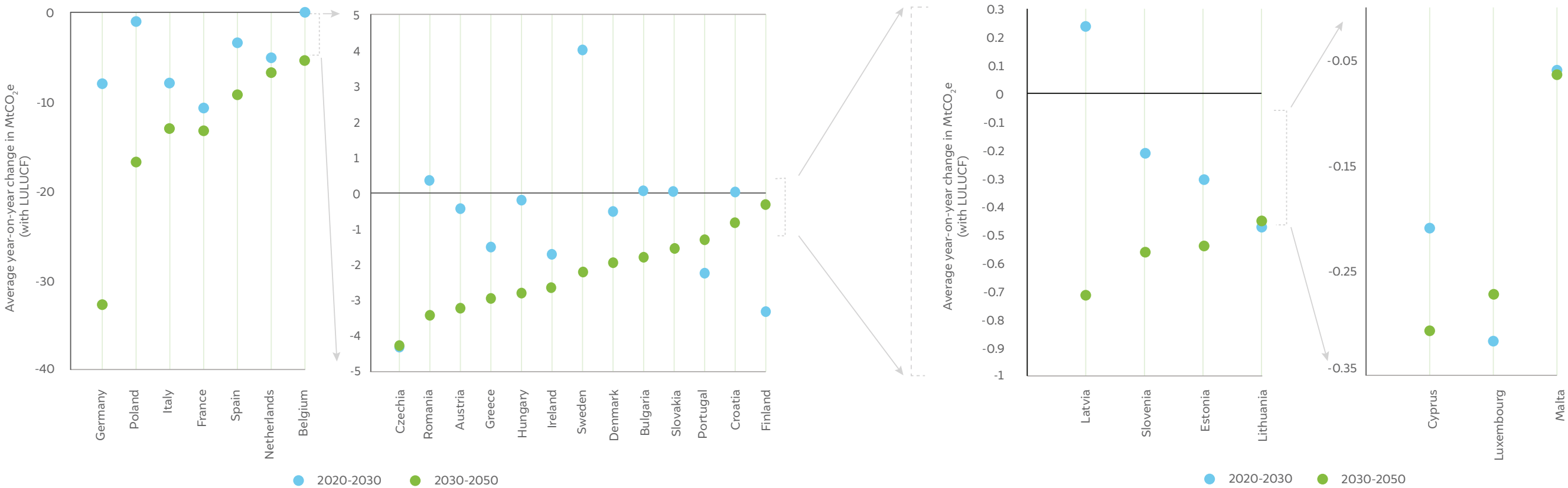
¹³ We consider greenhouse gas emissions with LULUCF for the net-zero analysis.

Figure 5 Developed countries rely on large emission reductions after 2030 to meet net zero by 2050

5.1 Annex I Parties



5.2 EU countries

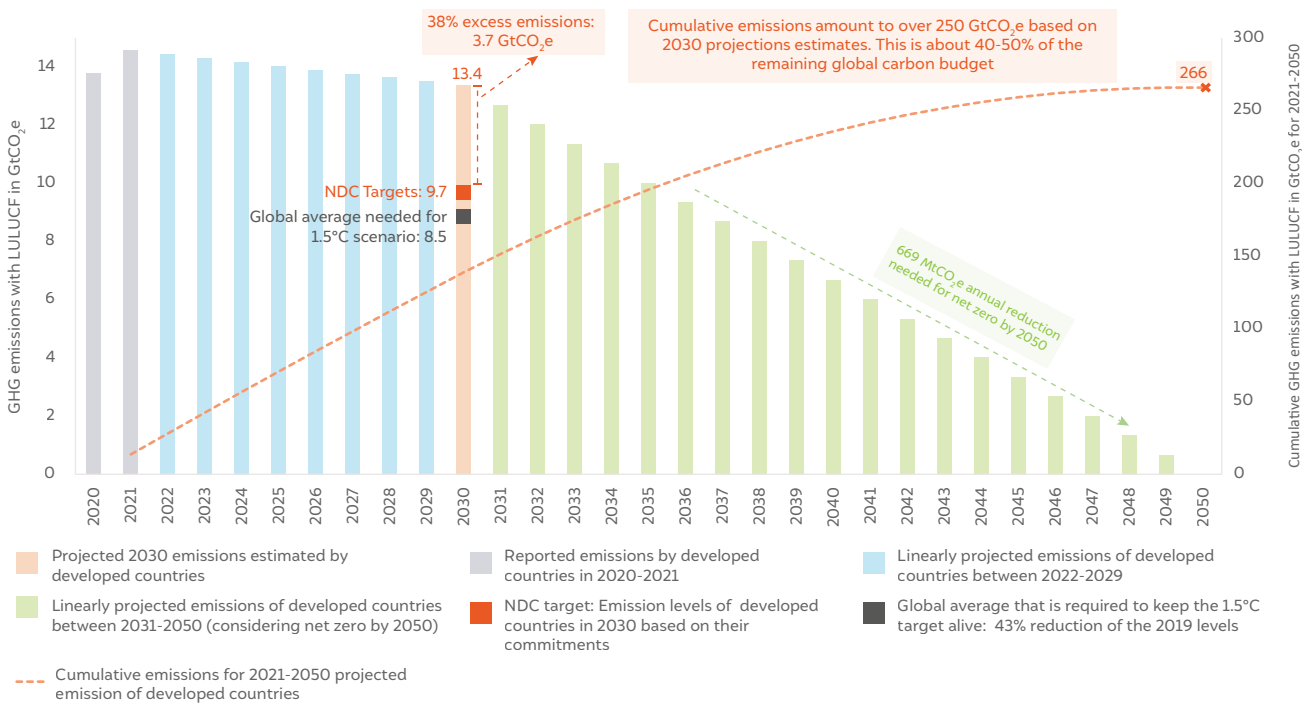


Source: Authors' analysis

Note: This figure shows the projected year-on-year change in emissions for the critical decade (blue dots) and the year-on-year change in emissions that would be required after 2030 to meet net zero by 2050 based on current projections (green dots). When the blue dot is below the green dot, it means that the country is moving at a pace of emission reduction in this critical decade that does not require any further acceleration after 2030 to meet net zero

by 2050 (i.e., the country is on track). If the blue dot is above the green dot, it means the country will have to ramp up reductions after 2030, from the level of the blue dot to that of the green dot (i.e., the country is not on track). The year-on-year change in emissions differ substantially between large and small countries. One can imagine that the United States and a small country like Monaco have very different emission levels. This makes it hard to plot them in one graph. This is why the graphs are split up to allow for different y-axis ranges. The arrows give a visual illustration of this difference in range.

Figure 6 Enhanced climate action by developed countries is imperative in this critical decade



Source: Authors' analysis

Only five developed countries – the Czech Republic, Finland, Lithuania, Luxembourg, and Portugal – are linearly on track to achieve net zero by 2050. This means that if the rate of emission reduction in this critical decade is sustained, the country will reach net zero by 2050. However, these five countries represent less than 2 per cent of the developed countries' emissions in 2020.

All other developed countries are banking on accelerating action after 2030. For example, to achieve net zero by 2050, **the United States would have to reduce emissions by 262 MtCO₂e every year. This is more than the total annual emissions of Spain** (which, in 2020, amounted to 228 MtCO₂e) and more than twice the rate of reduction the US has ever achieved in previous decades (the record is 106 MtCO₂e in the decade ending with the COVID-19 pandemic). The EU, as per the projections we analysed, would need to cut emissions by 129 MtCO₂e every year after 2030 to achieve net zero by 2050. This is almost twice the rate of reduction the

EU has ever achieved in previous decades (the record is 76 MtCO₂e in the decade ending with the COVID-19 pandemic). Yet, **even if developed countries manage to accelerate after 2030 and move linearly to net zero, their cumulative emissions would still put the achievement of the 1.5°C goal at risk.**

Figure 6 shows that under current 2030 projections and linear reduction to net zero after 2030, developed countries are set to reach cumulative emissions of 266 GtCO₂e by 2050. The remaining global carbon budget, starting from 2020, is estimated at 500 GtCO₂ (for a 50 per cent chance to stay below 1.5°C temperature rise). We estimate that developed countries are set to emit 40-50 per cent of the remaining carbon budget, even if they achieve net zero by 2050.¹⁴ With about 80 per cent of the world's population living in developing countries – and this figure is likely to increase slightly by 2050 (UNCTAD, 2022) – our estimates show that developed countries are set to emit more than their fair share in the years to come.

5. Recommendations

The climate journey of developed countries – historical and proposed – does not show deep enough emission reductions to reflect climate leadership. Even though this period (2020–2030) is the critical decade, developed countries are not projected to meet their 2030 NDC targets. Their failure to execute the necessary pre-2030 actions has implications for the limited global carbon budget. This means that the burden to mitigate global warming shifts to developing countries – which is problematic in a context where financial support to developing countries to achieve this transition has not been forthcoming, as promised. We present five key action points to course-correct.

- **The bare minimum: bridge the 3.7 GtCO₂e implementation gap**
Beyond ambition lies the important question of actual implementation. Although the NDCs are self-determined, developed countries are not on track to achieve them; they are projected to emit 3.7 GtCO₂e more in 2030 than they had pledged. It is important to bridge this projected implementation gap by 2025 so that developed countries can explore opportunities to enhance NDCs in this critical decade.
- **The critical decade: go beyond the 43 per cent reduction by 2030 from 2019 levels**

Currently, developed countries' NDCs for 2030 collectively represent a 36 per cent reduction in emissions from their 2019 levels. This is less than the global average that is required to keep the 1.5°C target alive (43 per cent reduction by 2030 from 2019 levels). To fulfil their role as climate leaders, developed countries must do more than meet the global average. This also applies to their net-zero targets. For example, the United Nations secretary-general called upon all developed countries to pledge that they would meet their net-zero targets by 2040 instead of 2050 (UNPress, 2023).

- **Towards net zero: chart out year-on-year emission reduction trajectories**

Net-zero targets must be anchored in deep emission reductions in this critical decade. Based on the current projections for 2030, developed countries would need to reduce annual emissions by 669 MtCO₂e from 2030–2050 to reach net zero by the middle of the century. Such enormous annual reductions have never happened before except during the global financial crisis and the COVID-19 pandemic. Instead of betting on the future, developed countries should outline their year-on-year emission reduction trajectories to meet their net-zero targets in this critical decade.

- **Keeping 1.5 alive: place the carbon budget at the forefront when target-setting**

At the end of the day, achieving the 1.5°C target relies on staying within the remaining carbon budget (500 GtCO₂). Even if developed countries achieve net zero by 2050, they are projected to emit about 40 to 50 per cent of the remaining carbon budget. However, developing countries will be left with limited carbon space even though they are least responsible for climate change. Hence, it is important for developed countries to not just commit to point-year reduction targets (in the form of NDCs or net-zero targets) but also consider setting an ambitious carbon budget to achieve their targets.

- **Building trust: stay committed to the Paris Agreement**

The Paris Agreement cannot afford to witness failures similar to those seen in the pre-2020 climate regime, such as non-participation, grey accounting procedures, and unfulfilled pledges on the part of some developed countries. Developed countries need to show true leadership by staying committed to their targets and the Paris Agreement's long-term goals. They must support developing countries in the global effort to address climate change.

¹⁴ The IPCC estimates on remaining carbon budget covers only CO₂ emissions. Our emission estimate includes CO₂ along with other greenhouse gasses. To compare cumulative GHG emissions with the IPCC's carbon budget, the contribution of CO₂ in developed countries latest GHG emissions and methodological differences between IPCC and UNFCCC GHG accounting (15 per cent reduced carbon budget as indicated in IPCC AR6 WGIII) were considered.

References

Busch, J. 2015. "Climate Change and Development in Three Charts." Center for Global Development, <https://www.cgdev.org/blog/climate-change-and-development-three-charts>; accessed 4 October 2023.

CEEW. 2021. Unpacking Pre-2020 Climate Commitments: Who Delivered, How Much, and How Will the Gaps Be Addressed? New Delhi: Council on Energy, Environment, and Water. <https://www.ceew.in/sites/default/files/ceew-study-on-pre-2020-climate-commitment-gaps-and-country-wise-results.pdf>.

Dhakal, S., J.C. Minx, F.L. Toth, A. Abdel-Aziz, M.J. Figueroa Meza, K. Hubacek, I.G.C. Jonckheere, et al. 2022. "Emissions Trends and Drivers." In *Climate Change 2022: Mitigation of Climate Change*. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, edited by P.R. Shukla, J. Skea, R. Slade, A. Al Khouradajie, R. van Diemen, D. McCollum, M. Pathak, et al., 229–294. Cambridge University Press. DOI: 10.1017/9781009157926.004.

European Commission. 2022. "Speech of Frans Timmermans at the COP27 Closing Plenary." https://ec.europa.eu/commission/presscorner/detail/en/SPEECH_22_7042.

Gupta, A. and Harro van Asselt. 2019. "Transparency in Multilateral Climate Politics: Furthering (or Distracting from) Accountability?" *Regulation and Governance* 13 (1): 18–34.

IPCC. 2022a. "Summary for Policymakers." In *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, edited by H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, et al., 1–33. Cambridge University Press.

—. 2022b. "Summary for Policymakers." In *Climate Change 2022: Mitigation of Climate Change*. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, by IPCC, edited by P.R. Shukla, J. Skea, A. Reisinger, R. Slade, R. Fradera, M. Pathak, A. Al Khouradajie, et al., 1–48. Cambridge University Press. DOI: 10.1017/9781009157926.001.

—. 2021. "Summary for Policymakers." In *Climate Change 2021: The Physical Science Basis*. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, edited by V. P. Masson-Delmotte, A. Zhai, S.L. Pirani, C. Connors, S. Péan, N. Berger, Y. Caud, et al., 1–31. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 3–32, DOI:10.1017/9781009157896.001.

Markandya, A., and M. González-Eguino. 2019. "Integrated Assessment for Identifying Climate Finance Needs for Loss and Damage: A Critical Review." In *Loss and Damage from Climate Change* Climate Risk Management, Policy and Governance, edited by R. Mechler, L. Bouwer, T. Schinko, S. Surminski, and J. Linnerooth-Bayer. Springer. DOI: https://doi.org/10.1007/978-3-319-72026-5_14.

Net Zero Tracker. 2023. "Global Net Zero Coverage." Net Zero Tracker, October 4. <https://zerotracker.net/>.

UNCTAD. 2022. "World Population Growth." United Nations Conference on Trade and Development. <https://unctad.org/data-visualization/now-8-billion-and-counting-where-worlds-population-has-grown-most-and-why>.

UNEP. 2022. Emissions Gap Report 2022: The Closing Window – Climate Crisis Calls for Rapid Transformation of Societies. Nairobi: United Nations Environment Programme. <https://www.unep.org/emissions-gap-report-2022>.

UNFCCC. 2023. "Compilation and Ssynthesis of fourth Bbiennial Rreports of Parties Included in Annex I to the Convention." Geneva: Nations Framework Convention on Climate Change. DOI: FCCC/SBI/2020/INF.10/Add.1/Rev.2."

—. 2022. Nationally Determined Contributions under the Paris Agreement Synthesis Report by the Secretariat. Geneva: United Nations Framework Convention on Climate Change. https://unfccc.int/sites/default/files/resource/cma2022_04.pdf.

—. 2021. "Glasgow Climate Pact, Decision." -/CMA.3, Advance Unedited Version 1–11. United Nations Framework Convention on Climate Change. https://unfccc.int/sites/default/files/resource/cma3_auv_2_cover%252odecision.pdf.

UNPress. 2023. Secretary-General Calls on States to Tackle Climate Change 'Time Bomb' through New Solidarity Pact, Acceleration Agenda, at Launch of Intergovernmental Panel Report SG/SM/21730. 20 March. <https://press.un.org/en/2023/sgsm21730.doc.htm>.

V20. 2022. Climate Vulnerable Economies Loss Report: Economic Losses Attributed to Climate Change in V20 Economies over the Last Two Decades. The Vulnerable Twenty Group. https://www.v-20.org/wp-content/uploads/2022/06/Climate-Vulnerable-Economies-Loss-Report_June-14_compressed-1.pdf.

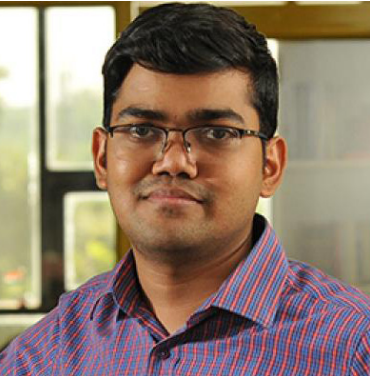
White House. 2021. "Fact Sheet: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies." <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>.

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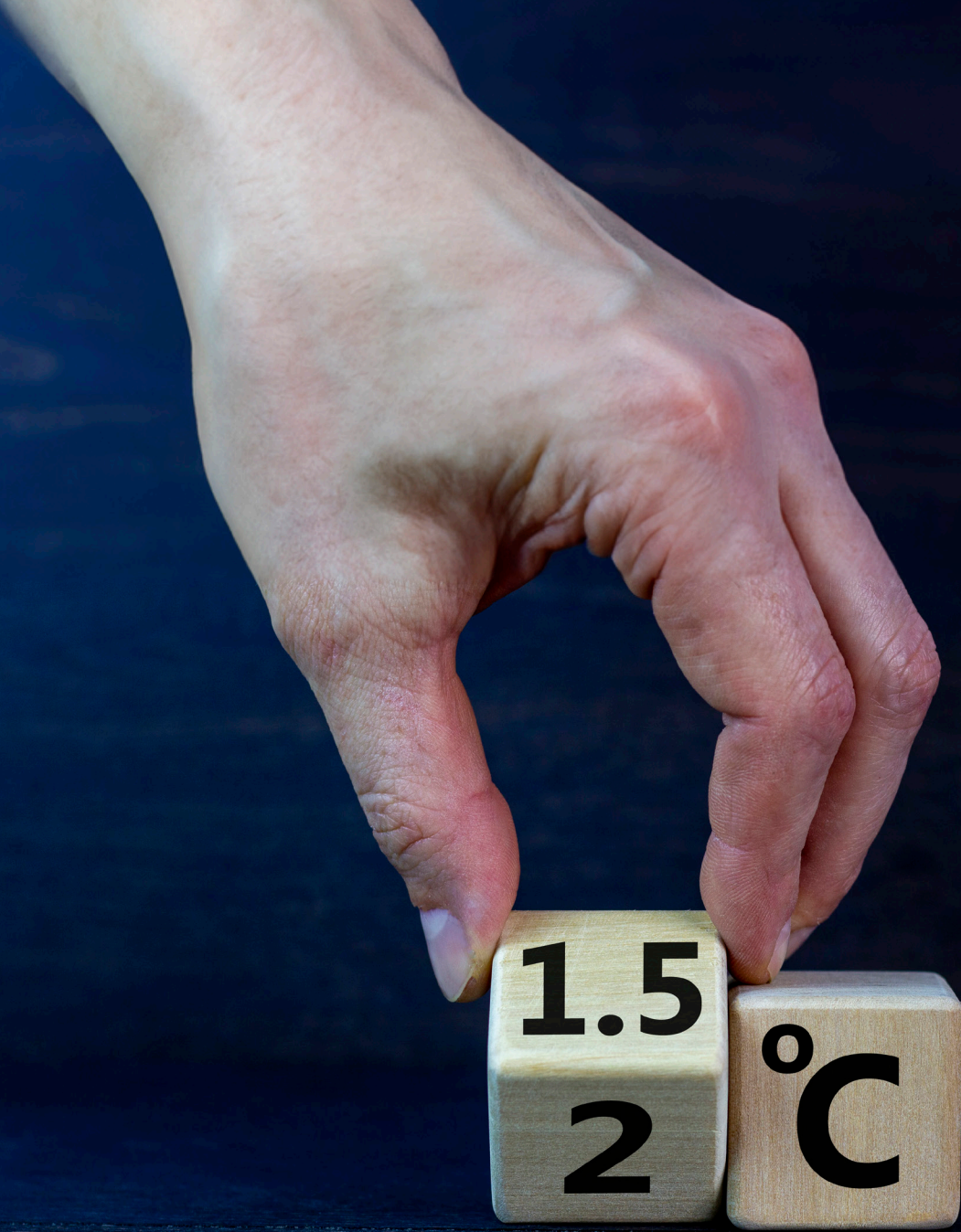
The Climate
is Changing



why aren't we?



To build trust, developed countries need to be reliable and stay committed to the Paris Agreement.



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