CURRENT 2030 TARGETS AND ACTIONS DO NOT PUT THE WORLD ON TRACK TO LIMIT WARMING TO 1.5°C

February 28, 2022

Climate Action Tracker

THE GLOBAL STOCKTAKE SHOULD

The Global Stocktake should support the development of 1.5°C aligned 2035 NDCs and policies, and complement the work of the subsidiary bodies' joint work programme to strengthen the 2030 NDC targets this year.

Specifically, the Global Stocktake should:

- Facilitate the development of 1.5°C aligned mitigation targets for 2035 and beyond by governments;
    - Here, increased climate finance from developed countries is critical
- Assess the level of short-term emissions cuts needed to ensure net zero targets remain achievable
- Explore ways to improve policy implementation including through:
    - Phasing out all coal power and fossil fuel subsidies, not just unabated coal and 'inefficient' subsidies
    - Acknowledging that increased natural gas usage globally is not compatible with the 1.5°C limit and that it is not a transition fuel
    - Accelerating the transition to renewable energy
    - Identifying emission reduction potential in hard-to -abate sectors
- Address the rising emissions and inadequate targets of international aviation and international shipping.

STATUS OF CLIMATE ACTION

- National climate targets for 2030 are totally inadequate and put the world on track for a 2.4°C temperature increase by the end of the century.
- Policy implementation towards achieving these targets is advancing at a snail's pace and would result in even higher levels of end-of-century warming of 2.7°C.
- The CAT estimates that policies and action currently fall short of targets by 2–6 $GtCO_2e$ in 2030 and are off a 1.5°C pathway by 25–29 $GtCO_2e$.
- There has been insufficient momentum from leaders and governments to increase their 2030 climate targets.
- NDC improvements submitted in 2020/2021 have reduced the emissions gap in 2030 by only 15-17%.
- Sectoral pledges announced at COP26 in Glasgow on methane, the coal exit, electric vehicles and deforestation may only close this gap by an additional 9% - or 2.2 $GtCO_2e$, though determining what sectoral action is already covered by NDC targets is challenging.
- At most, NDC improvements and the Glasgow sectoral initiatives, will close the emissions gap in 2030 by 24–25%, a far cry from what is needed.
- The level of climate finance provided by developed countries is inadequate and must be scaled up substantially. South Africa's finance package for the retirement of coal plants, the deployment of renewable energy, and managing a just transition could become a 'blueprint' for other recipient and donor countries.
- Globally, around 90% of emissions are now covered by net zero targets. No single country that we analyse has sufficient short-term policies in place to put itself on track to its net zero target, and the quality of many of these targets is questionable.
- While agreement on the Article 6 rulebook offers clarity in some areas, it is short on details in other all-important areas, leaving open a number of loopholes that risk undermining, rather than increasing global ambition to tackle climate change.

CURRENT 2030 TARGETS AND ACTIONS DO NOT PUT THE WORLD ON TRACK TO LIMIT WARMING TO 1.5°C

The Climate Action Tracker (CAT) is a joint initiative of two research organisations, Climate Analytics and the NewClimate Institute, and has been tracking climate action since 2009. We track progress towards the globally agreed goal of pursuing efforts to limit warming to 1.5°C. We welcome the opportunity to submit our views as part of the call for inputs to the first global stocktake.

END-OF-CENTURY WARMING UNDER CURRENT TARGETS AND ACTION

Our latest assessment (November 2021) shows that the world is not on track to achieve the Paris Agreement's 1.5°C limit. If current 2030 NDC targets (without long-term pledges) are fully implemented, they will put the world on track for a 2.4°C temperature increase by the end of the century. If one considers all NDCs and submitted or binding long-term targets, end of century warming will be 2.1°C. The difference between these two estimates illustrates the growing credibility gap that exists between 2030 targets and net zero commitments.

If all the announced net zero commitments or targets under discussion are implemented, end of century warming could be limited to 1.8°C, with peak warming of 1.9°C. But this is only if these targets are fully implemented, and it is a big if. Our 1.8°C warming estimate is a median estimate and warming of 2.4°C or more cannot be ruled out. Moreover, while heading in the right direction, limiting warming to 1.8°C is not Paris compatible and relies on incredibly steep cuts after 2030 as 2030 emissions are too high. Not a single country that we analyse has sufficient short-term policies in place to put itself on track to its net zero target. Based on current policies, we estimate end-of-century warming to be 2.7°C.

2030 EMISSIONS GAP REMAINS DESPITE NDC IMPROVEMENTS AND SECTORAL INITIATIVES

Despite NDC improvements submitted over the last few years, a substantial gap between where emissions are heading in 2030 and where they need to be to keep 1.5°C alive remains. Contrary to the Paris Agreement's requirement that each NDC update is a progression beyond the last, several governments have only resubmitted the same target as in 2015 (Australia, Indonesia, Russia, Singapore, Switzerland, Thailand, Viet Nam), or submitted an even less ambitious target (Brazil, Mexico). Some have not made new submissions at all (Turkey and Kazakhstan), and Iran has yet to ratify the Paris Agreement.

Sectoral initiatives announced in Glasgow support important actions, but these must go beyond existing national targets to be impactful. Sectoral initiatives help implement action, but with current signatories only narrow the emissions gap to a limited extent. We would recommend that governments update their NDCs if participation in the initiative is not covered already by their target. If these initiatives gather more signatures, they could further reduce the gap by several $GtCO_2e$.

At most, NDC improvements and the Glasgow sectoral initiatives, will close the emissions gap in 2030 by 24–25%, a far cry from what is needed. All governments need to reconsider their targets.

DEVELOPED COUNTRIES MUST INCREASE LEVELS OF CLIMATE FINANCE

Developed country governments need to urgently strengthen their support for mitigation overseas. In many countries, current policies and targets show high potential for further mitigation. To halve global emissions in the next decade, we will need to shift the curve in *all* countries. Doing so in a fair and equitable manner will require increased financial support from developed countries. None of the developed countries the CAT tracks have put forward sufficient climate finance. Announcements of new climate finance made before and during COP26 are welcome but not yet enough to boost the CAT's mitigation finance ratings we released in September 2021, which give a stronger weight to finance actually delivered.

South Africa's announced agreement with several donors (France, Germany, UK, USA, EU) is for a USD 8.5bn package of grants and concessional finance over three to five years to accelerate the retirement of coal plants and the deployment of renewable energy. The agreement builds on a country-led, donor-supported process by the South African government, putting a distinct focus on a Just Transition, including the retraining and support of coal workers. This process could become a 'blueprint' for other recipient and donor countries to provide climate finance.

The commitment by many governments to no longer finance fossil fuels abroad is a major break-through and needs to be implemented swiftly and thoroughly. Governments now also need to take the next step and commit to ending fossil fuel funding and subsidies at home.

COMPLETE PHASEOUT OF COAL IS NEEDED

A phase out, not down, of all coal, not just unabated coal is needed to meet the Paris Agreement's 1.5℃ warming limit. Specifically, all

coal must be phased out of the power sector by 2030 in the OECD, and globally by 2040. But in spite of political momentum and clear benefits beyond climate change mitigation, there is still a huge amount of coal in the pipeline. While some of these governments have committed in Glasgow to phasing out coal, we need to see that reflected on the ground at home.

NATURAL GAS IS NOT A TRANSITION FUEL

The increasing use of natural gas is not Paris Agreement compatible, yet we are seeing the gas industry push and promote their product, supported by governments across the world. In the six years since the Paris Agreement, CO_2 emissions from gas grew by 9%, whereas emissions from coal and oil are down. Gas for electricity generation, as with coal, needs to peak in this decade, and largely be phased out globally in the coming decades, and for other applications soon after, if the world is to reach net zero CO_2 by 2050.

ARTICLE 6 MECHANISMS SHOULD ONLY BE USED TO TARGET HIGH HANGING FRUIT

Glasgow saw governments reach agreement on the rulebook for the Article 6 ambition raising mechanisms. Whilst the text offers clarity in some areas, it is sparse in the all-important details, leaving open a number of loopholes that risk undermining, rather than increasing global ambition to tackle climate change.

The compromise agreement allows carryover of up to 0.3 $GtCO_2e$ of Kyoto era units and enables all Clean Development Mechanism projects to continue crediting, which could generate a further 2.8 GtCO2e worth of credits.

Most, and possibly all, of the combined three billion possible credits from projects accredited under the Kyoto regime are likely to represent emission reductions that will happen anyway and should not be used towards NDC targets. Perhaps more critically, the carryover of legacy, low-cost credits and activities sets a very poor precedent for the development of new projects, whose ambition level must be far higher than the low hanging fruit projects targeted through Kyoto-era flexibility mechanisms, to avoid disincentivising ambition.

Governments who have put their own houses in order—through commitment to sufficiently ambitious NDCs and the fulfilment of their fair share of international climate finance targets—could potentially support further ambition raising by using Article 6 mechanisms to go beyond this, targeting only high hanging fruit projects that are truly inaccessible to the host countries.

For governments whose NDCs and climate finance contributions are not 1.5°C Paris Agreement compatible (and today none are), the use of Article 6 mechanisms is likely to offer an escape hatch from urgently ramping up domestic decarbonisation. In addition, the prospect to be able to sell allowances that go beyond the NDC is an incentive for low ambition.

Unambitious use of the option to trade mitigation outcomes could widen the emissions gap. Current arrangements made by Switzerland appear to fall into this category.

THE GLOBAL STOCKTAKE NEEDS TO ACCELERATE ACTION

In 2015, ahead of the Paris Agreement, the CAT estimated current policies would lead to warming of 3.6°C, and the submitted targets (NDCs) would lead to 2.7˚C. By 2021, the warming from current policies had come down to 2.7°C. If governments were to achieve all their submitted NDC pledges and long-term targets, temperature increase could be limited to 2.1°C. Adding all the net zero targets announced and discussed, this would even lead to 1.8°C. These improvements in temperature estimates show that the Paris Agreement ratcheting-up mechanism is working, but it is just not fast enough.

At COP26, governments recognised that current efforts to close the emissions gap to 2030 had been inadequate. They agreed to revisit and strengthen their 2030 targets this year as well as establish a work programme to scale up mitigation action. Governments must deliver on these commitments to keep 1.5°C alive.

The Global Stocktake should complement and support these efforts to strengthen targets in 2022.

Specifically, the Global Stocktake should:

- Facilitate the development of 1.5°C aligned mitigation targets for 2035 and beyond by governments;
    - Here, increased climate finance from developed countries is critical.
- Assess the level of short-term emissions cuts needed to ensure net zero targets remain achievable;
- Explore ways to improve policy implementation including through:
    - Phasing out all coal power and fossil fuel subsidies, not just unabated coal and 'inefficient' subsidies;
    - Acknowledging that increased natural gas usage globally is not compatible with the 1.5°C limit and that it is not a transition fuel;

    - Accelerating the transition to renewable energy;
    - Identifying emission reduction potential in hard-to -abate sectors;
- Address the rising emissions and inadequate targets of international aviation and international shipping.

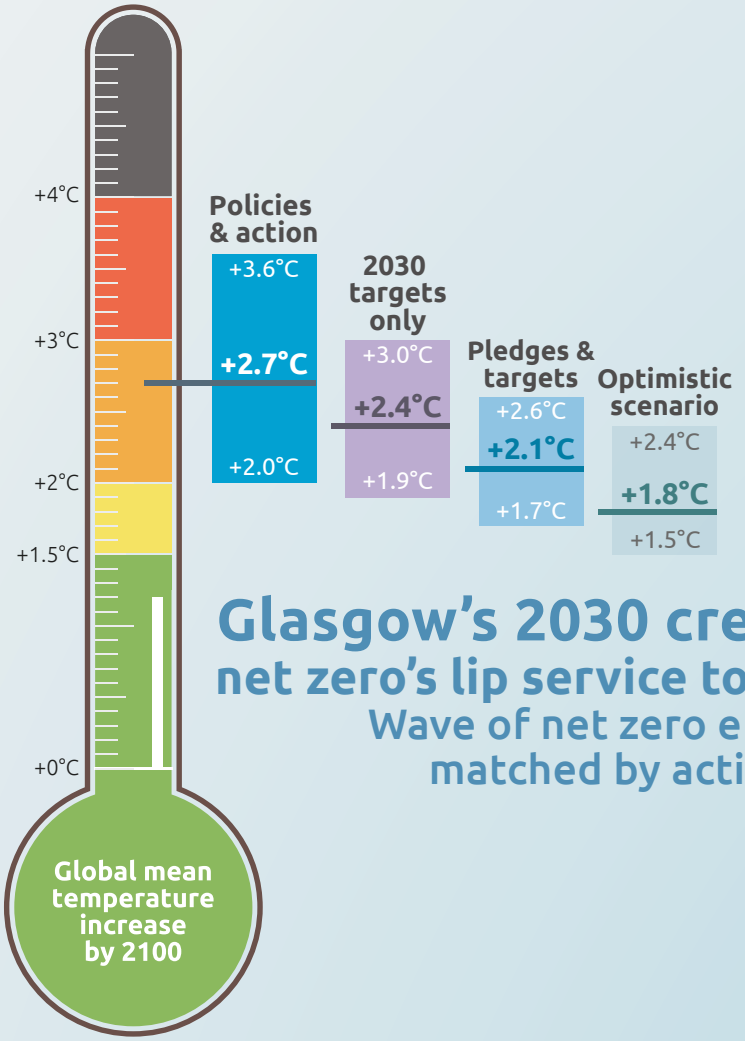
While the warming outlook has improved since Paris, the bottom line is that, if governments are serious about the Paris Agreement's temperature limit and their own net zero goals, they need to translate those long-term goals into net zero aligned ambitious 2030 targets and implement the necessary policies today. Developed countries will also need to significantly increase the climate finance available to support the transition. We need to see a profound effort from *all* governments across *all* sectors, in this decade, to decarbonise the world to be in line with 1.5°C.

INPUTS FROM THE CLIMATE ACTION TRACKER TO THE GLOBAL STOCKTAKE:

- Climate Action Tracker Warming Projections Global Update, November 2021 (see Annex I)
- Climate Action Tracker Glasgow sectoral initiatives initial assessment, November 2021 (see Annex II)
- Post-Glasgow analysis: *What do governments need to deliver in 2022?*, December 2021
- Climate Action Tracker country analysis
- Climate Action Tracker Paris Agreement Compatible Sectoral Benchmarks & Decarbonisation memos
- Climate Action Tracker Scaling Up Climate Action Series
- Climate Action Tracker Climate Governance Series

ANNEX 1: WARMING PROJECTIONS GLOBAL UPDATE NOVEMBER 2021

Climate Action Tracker



Glasgow's 2030 credibility gap:
net zero's lip service to climate action
Wave of net zero emission goals not matched by action on the ground

Climate Action Tracker

Warming Projections Global Update

November 2021

CLIMATE ANALYTICS

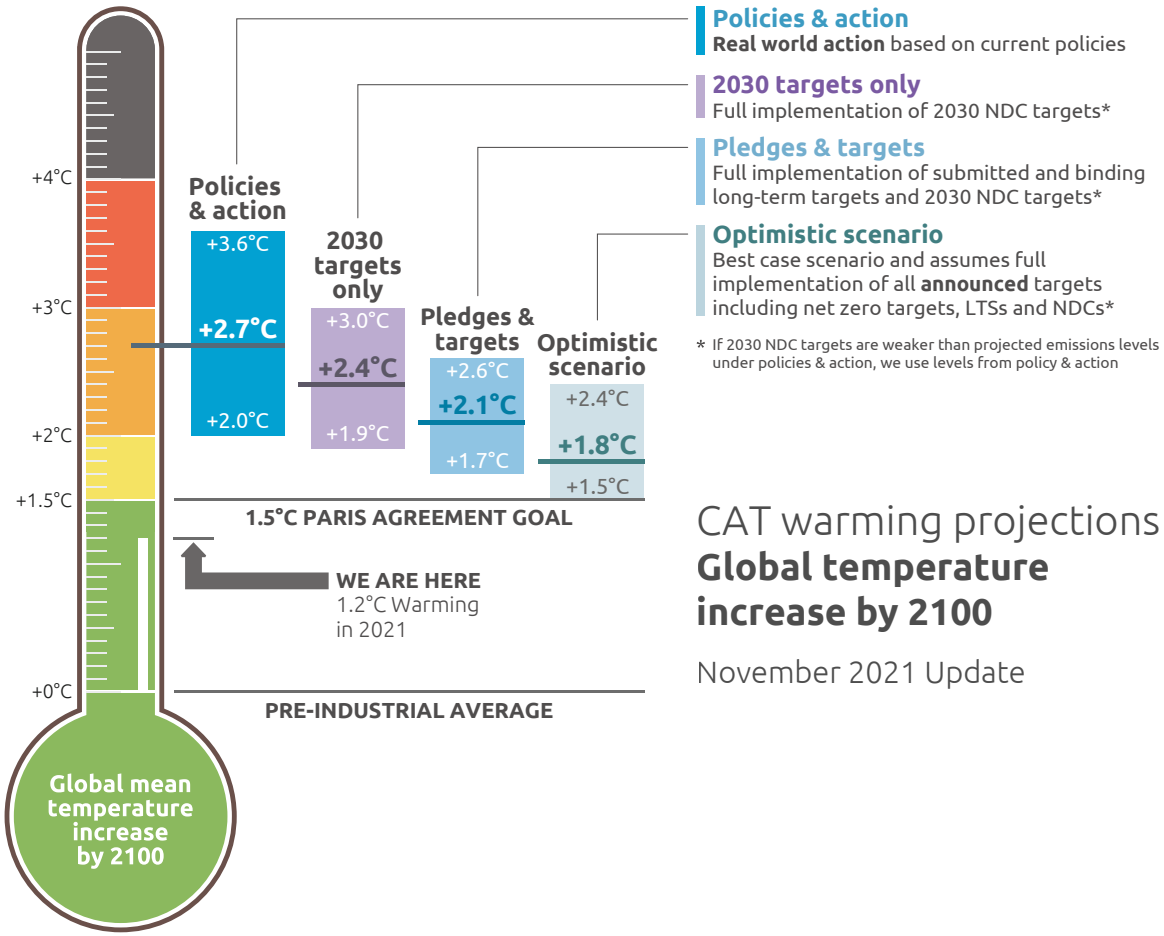
NEW CLIMATE INSTITUTE

Summary

In Paris, all governments solemnly promised to come to COP26, with more ambitious 2030 commitments to close the massive 2030 emissions gap that was already evident in 2015. Three years later the IPCC Special Report on 1.5°C reinforced the scientific imperative, and earlier this year it called a climate "code red." Now, **at the midpoint of Glasgow, it is clear there is a massive credibility, action and commitment gap** that casts a long and dark shadow of doubt over the net zero goals put forward by more than 140 countries, covering 90% of global emissions.

Policy implementation on the ground is advancing at a snail's pace. Under current policies, we estimate end-of-century warming to be 2.7°C. While this temperature estimate has fallen since our September 2020 assessment, major new policy developments are not the driving factor. We need to see a profound effort in in all sectors, in this decade, to decarbonise the world to be in line with 1.5°C.

Targets for 2030 remain totally inadequate: the current 2030 targets[1] (without long-term pledges) put us on track for a 2.4°C temperature increase by the end of the century.[2] Since the April 2021 Biden Leaders' Summit, our standard "pledges and targets" scenario temperature estimate of all NDCs and submitted or binding long-term targets has dropped by 0.3°C to 2.1°C, but this improvement is due primarily to the inclusion of the US and China's net zero targets, now that both countries have submitted their long-term strategies to the UNFCCC.



1 For weak targets, we take a country's estimated 2030 level under current policies, if that level is lower than the target.

2 Normally, the CAT bases its temperature estimates on all binding targets, including both 2030 and longer-term net zero targets; however, as more and more countries adopt their net zero targets in domestic law or submit long-term strategies to the UNFCCC, we felt the need to include this new temperature estimate to highlight the growing credibility gap between targets in 2030 and net zero targets for 2050 or later.

There has been insufficient momentum from leaders and governments to increase 2030 climate targets ahead of, and at, Glasgow: NDC improvements submitted over the last year have reduced the emissions gap in 2030 by only 15-17%. The biggest absolute contributions to this narrowing come from China, EU and the US, though other countries with lower emissions levels have also improved their NDCs.

Contrary to the Paris Agreement's requirement that each NDC update is a progression beyond the last, several governments have only resubmitted the same target as 2015 (Australia, Indonesia, Russia, Singapore, Switzerland, Thailand, Viet Nam), or submitted an even less ambitious target (Brazil, Mexico). Some have not made new submissions at all (Turkey and Kazakhstan), and Iran has yet to ratify the Paris Agreement. **Even with all new Glasgow pledges for 2030, we will emit roughly twice as much in 2030 as required for 1.5°. Therefore, *all* governments need to reconsider their targets.**

Globally, around 90% of emissions are now covered by net zero targets. While these targets are an important signal, and some have accelerated governments' climate action, the quality of most remains questionable. If all the announced net zero commitments or targets under discussion are implemented, this would bring our temperature estimate for this "optimistic scenario" down to 1.8°C by 2100, with peak warming of 1.9°C. But this is only **IF** these targets are fully implemented, and it's a big IF. Our analysis, covering 40 countries, shows only 6% of global emissions are covered by targets with an "acceptable" net zero rating for target comprehensiveness.

No single country that we analyse has sufficient short-term policies in place to put itself on track to its net zero target. The net zero CAT assessment also includes announcements made by governments which are not backed up by any national legislation, nor plans. Some lack critical information to allow for a full evaluation of the target's likely impact, including whether net-zero is defined as CO_2 only or covers all greenhouse gases. It also needs to be emphasised that **our 'optimistic' assessment of end-of-century median warming of about 1.8°C is not Paris Agreement compatible and that *warming of 2.4°C or more cannot be ruled out.***

2030 actions and targets are more often than not inconsistent with net zero goals, so that the gap between current policies and net zero goals is now 0.9°C. This, we consider, is the credibility gap that Glasgow needs to address.

The key drivers for this appalling outlook are coal and gas.

Coal

To meet the Paris Agreement's 1.5˚C warming limit, **coal must be phased out of the power sector by 2030 in the OECD, and globally by 2040**. But in spite of political momentum and clear benefits beyond climate change mitigation, there is still a huge amount of coal in the pipeline, for example in **China, India, Indonesia** and **Viet Nam**, and too many countries, including **Japan, South Korea, Australia**, still have plans centered around coal as a major contributor to electricity generation in 2030. Some also continue funding coal projects abroad. While some of these governments have committed in Glasgow to phasing out coal, we need to see that reflected on the ground at home.

Natural gas

The increasing use of natural gas is not Paris Agreement compatible, yet we are seeing the gas industry push and promote their product, supported by governments across the world. In the six years since the Paris Agreement, CO_2 emissions from gas grew by 9%, whereas emissions from coal and oil are down. Gas for electricity generation, as with coal, needs to peak in this decade, and largely be phased out globally in the coming decades, and for other applications

soon after, if the world is to reach net zero CO_2 by 2050. In Southeast Asia, heavily coal-dependent countries are now considering a switch from coal to gas (e.g. Viet Nam), rather than directly to renewables, large infrastructure for natural gas is also under development in Europe (Nord Stream 2 for imports from Russia), Canada (expansions of pipelines for export), Australia and the USA (LNG exports), and multiple African countries are promoting the increased production and use of natural gas.

Methane and forestry

Global methane and forestry initiatives announced in Glasgow support important actions, but these must go beyond existing national targets to be impactful: the Global Methane Pledge – of reducing methane emissions by 30% in 2030 – has the maximum potential to reduce the 2030 emissions gap by 14%, and warming by -0.12°C by 2100. But much of this potential is already included in existing climate pledges. The US is a prime example: the methane reduction target is already partially included in its long-term strategy, which we have already included the effect of in our 'Pledges and Targets' temperature estimate. Similarly, the Global Forestry Finance pledge can result in additional climate mitigation only if this finance is additional to the current promised funding and does not cut funding for other mitigation measures. Since the USD 100bn goal has not yet been met, the additionality of this new initiative is questionable, at best.

Glasgow must address the credibility gap

While the warming outlook has improved since Paris, the bottom line is that despite all the net zero promises, inadequate real-world action unable to deliver the kind of climate action that is aligned to the 1.5˚C temperature limit: in 2015, ahead of the Paris Agreement, the CAT estimated current policies would lead to warming of 3.6°C, and the submitted targets (NDCs) would lead to 2.7°C. Six years later, the warming from current policies has now come down to 2.7°C. If governments were to achieve their 2030 NDC targets and binding long-term targets (LTS), temperature increase could be limited to 2.1°C.

If governments are serious about the Paris Agreement's temperature limit and their own net-zero goals, they need to translate those long-term goals into net-zero aligned ambitious 2030 targets and implement the necessary policies today. Developed countries will also significantly increase the climate finance available to support the transition. Until this happens, there is no cause for celebration.

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1 2030 targets are totally inadequate and put achieving 1.5°C at risk

The IPCC has set clear benchmarks. To keep the possibility of 1.5°C alive, we need to cut emissions by 45% below 2010 levels by 2030, in other words, halve emissions from present levels by then.

Updated NDC targets fall short, far short, of meeting this benchmark. The 2020/2021 round of NDC updates has only reduced the emissions gap in 2030 by 15-17%. Even after the new update round, global emissions in 2030 resulting from implementation of NDCs will still be twice as high as what's needed for a 1.5°C consistent pathway.

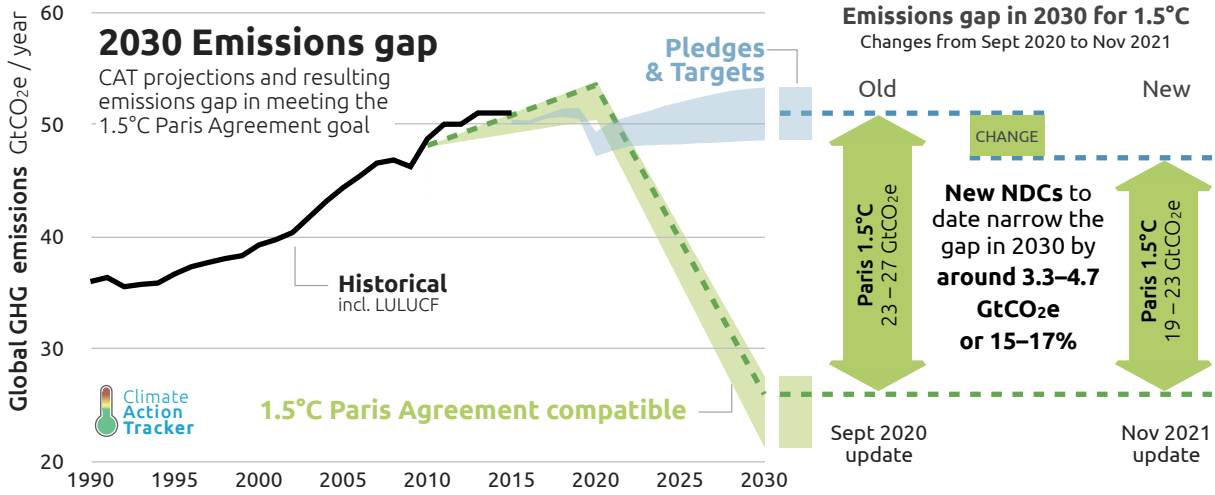


Figure 1 2030 emissions gap between NDC targets and levels consistent with 1.5°C.

If just these targets[3] are considered, end-of-century warming would be 2.4°C, almost a full degree above the Paris limit, at a time when every 0.1°C matters. Normally, the CAT bases its temperature estimates on all binding targets, including both 2030 and longer-term net zero targets; however, as more and more countries adopt their net zero targets in domestic law or submit long-term strategies to the UNFCCC, we felt the need to include this new temperature estimate to highlight the growing credibility gap between targets in 2030 and net zero targets for 2050 or later (see Figure 2).

This credibility gap grows larger when we turn our attention to policy implementation. Under current policies, end-of-century warming will be 2.7°C.[4] While this temperature estimate has fallen since our last assessment, major new policy developments are not the driving factor. It is also still well above our "2030 targets only" temperature estimate, indicating that, collectively, countries are not on track to achieve the targets they have put forward.

3 For weak targets, we take a country's estimated 2030 level under current policies, if that level is lower than the target.

4 We have updated the data for most of the countries we track since our last assessment in September 2020. See Annex I for details.

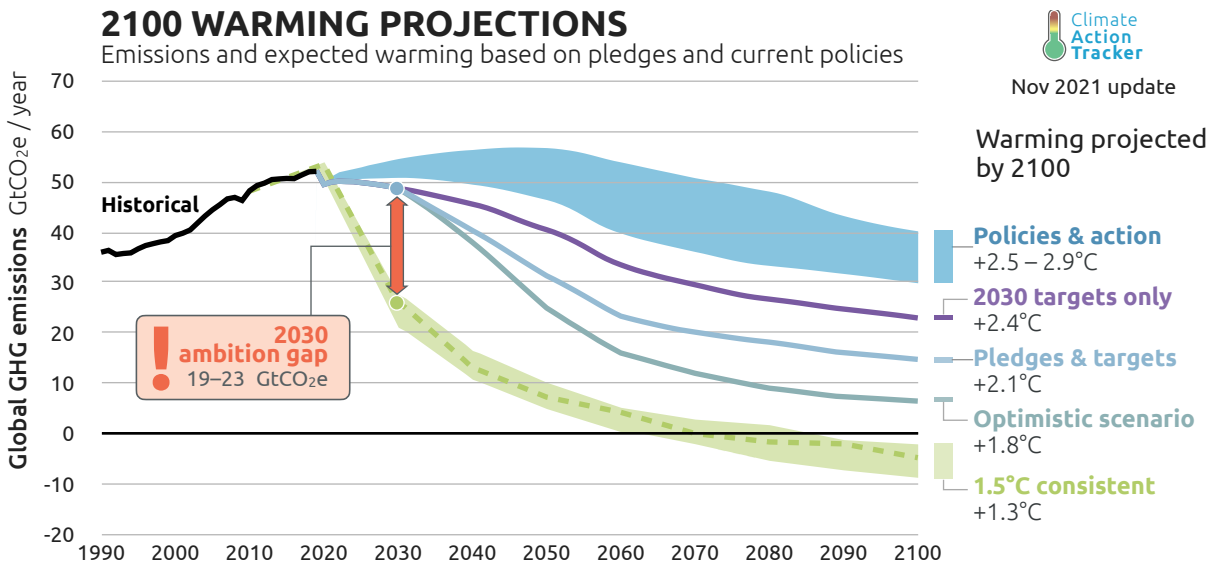


Figure 2 Global greenhouse gas emission pathways for CAT estimates of policies and action, 2030 targets only, 2030 and binding long-term targets and an optimistic pathway based on net zero targets of over 140 countries in comparison to a 1.5°C consistent pathway.

When all NDCs and binding[5] long-term pledges are considered (our "pledges and targets" scenario), end-of-century warming would be limited to 2.1°C. While this estimate is 0.3°C lower than our May 2021 assessment, the drop is primarily due to the official submissions of the long-term plans of US and China.

Expanding our scope to include all net zero targets that have been announced or are currently under discussion, including the most recent announcement from **India**, warming would peak at 1.9°C before falling to 1.8°C by the end of the century. While an estimate that comes under the 2°C level is an important milestone, it must be stressed that this is based on only a 50 / 50 chance that warming will indeed be limited to 1.8°C by 2100 and 1.9°C at its peak. While the level of warming in 2100, in probabilistic terms, is "likely" to be below 2.0°C, the same is not true of the peak level of warming in this century. But again, we reiterate that according to our analysis, only 6% of global emissions are covered by, in our analysis, an "acceptable" net zero target.

In recent weeks, many different organisations have published estimates of the impact of targets on temperature estimates. While at first glance, the headline figures may appear different, a closer examination of the underlying methods reveals that these are closely aligned and offer the same general message: 2030 targets are totally inadequate and put achieving 1.5°C at risk (see Annex 4 for further details).

5 We consider targets to be binding if they have been adopted in domestic legislation or submitted, with sufficient clarity, in long-term strategies to the UNFCCC. We exclude older submissions if we deem that the country has abandoned its target. See Annex I for details.

2 NDCs updates are not in line with the Paris Agreement

The majority of countries have submitted NDC updates, but emission cuts in 2030 remain woefully inadequate.

With the announced update from India, more than three-quarters of countries, representing near global emissions coverage (over 95%) and close to 90% of the population, have announced or submitted updates. Turkey is the only G20 country to not have submitted an update, having only ratified the Paris Agreement in October 2021.

While the number of NDC updates is high, the quality of the submissions varies greatly, with a great majority not raising ambition enough, and, in several cases, not raising ambition at all.

IMPROVEMENTS

Since our last update in May, some countries have submitted stronger targets, with a few going beyond their initial announcements.

- **SOUTH AFRICA** heeded the call of its Presidential Climate Commission and submitted a stronger NDC target in September 2021 than it had originally proposed earlier in the year. The bottom end of this range is knocking on the door of 1.5°C compatibility.
- **MOROCCO** strengthened its NDC targets in June 2021, its unconditional target is 1.5°C compatible, while its conditional target, for which it will need support to meet, is within striking distance of the 1.5°C limit.
- **UKRAINE** also submitted a stronger target, adopting the bottom end of the range it originally announced in December 2020. It still has some way to go to be 1.5°C compatible, but if the Ukraine fully implements all the policies it has planned, it could exceed its updated target.
- **ARGENTINA** submitted the slightly stronger it announced at Biden's Leaders' Summit in April 2021. With this strengthening, Argentina's domestic target is now compatible with a 2°C world, but it is still far off from 1.5°C compatible or doing its fair share.
- **NEW ZEALAND'S** new target appears to be continuing with its long history of creative accounting tricks that obscure its effective reductions, and it is still far from doing its fair share.
- **CANADA** and **JAPAN** have officially submitted the targets they announced at Biden's Leaders' Summit: while both domestic targets are getting closer, they still fall short of 1.5°C compatibility.
- **CHINA** officially submitted the stronger targets it had announced last year. While an improvement, these targets are still within the expected emissions level in 2030 under current policies, meaning that China can achieve these targets without further measures. China has yet to commit to a peaking year for carbon dioxide emissions before 2030, nor set absolute emission reduction targets, which leads to uncertainty around its emissions trajectory to 2030. It is also far off a 1.5°C compatible pathway
- **SOUTH KOREA** announced a stronger NDC target during the Glasgow World Leaders Summit. This announced domestic target has halved the distance to becoming 2°C compatible, but it is still far off from 1.5°C compatible or doing its fair share.

UNCERTAIN

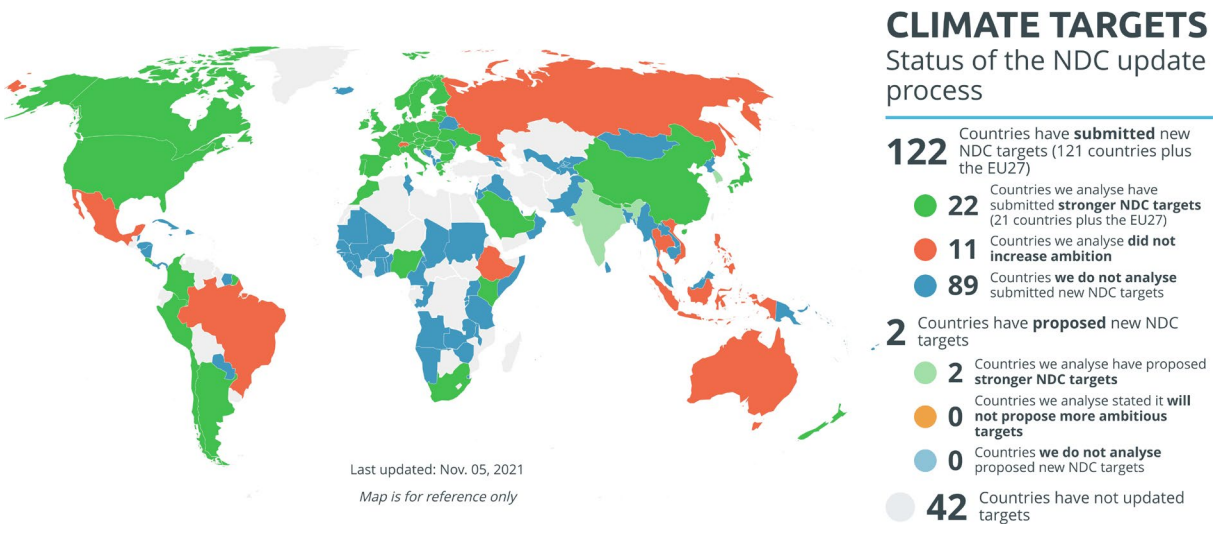
For others, it has been harder to assess whether the targets are stronger, given the lack of details.

- **INDIA** announced updated NDC targets during the World Leaders Summit, but provided few details. Its new intensity target is unlikely to have any real-world effect, as it falls above India's likely 2030 emission level under current policies, while its 500GW non-fossil target will, at most, have a small impact on real-world emissions. Prime Minister Modi promised net zero by 2070, but did not mention any plans to phase out coal, despite having one of the highest coal capacities and pipelines in the world. Recent CAT analysis shows the early retirement of the existing capacity and a reduction of its pipeline could enable India to meet its fair share and save a quarter of a million premature deaths.
- **SAUDI ARABIA** has submitted an updated NDC with a seemingly stronger target, although it is difficult to assess this, as it has not communicated the baseline emissions upon which the reduction is based. The updated NDC retains its 'escape clause': the emissions reduction pledge is contingent on continued and significant oil and gas exports, without which Saudi Arabia reserves itself the right to revisit its target.

UNCHANGED

Unfortunately, it is quite clear that the laggards are still lagging.

- **AUSTRALIA** resubmitted its 2030 target unchanged. It claimed that this will be exceeded by up to 9%. The Paris Agreement requires countries to increase their ambition with each update: claiming that you will overachieve your target without actually committing to a stronger target does not cut it. Based on our assessment of current policies, the government may meet the lower bound of its 2030 target, but not overachieve it. Australia's new 2050 net zero target is also questionable (more on that in the net zero section below).
- **BRAZIL** continues to obfuscate with creative accounting tricks. While the headline reduction target has increased from 43% to 50%, changes in the baseline mean that this target is still less ambitious than the first NDC on an absolute basis. As of 4 November 2021, Brazil had also not submitted this update to the UNFCCC. **MEXICO** did a similar thing with its update last year.
- **INDONESIA** submitted an updated NDC in July 2021 but did not strengthen its 2030 target. It now joins the "submitted the same or a weaker target" club, along with **RUSSIA, SINGAPORE, SWITZERLAND, THAILAND** and **VIET NAM**, contrary to the Paris Agreement's requirement that each NDC must result in lower emissions than its predecessor.
- **TURKEY** finally ratified the Paris Agreement on 11 October 2021 at which time it officially submitted its 2015 INDC to the UNFCCC. This target is very weak and Turkey has been on track to overachieve it for some time. It needs to submit a much stronger updated target.
- **IRAN** has still not ratified the Paris Agreement, nor updated its 2030 target.
- **KAZAKHSTAN** has still not submitted an update target.



COUNTRIES WE ANALYSE

SUBMITTED A STRONGER NDC TARGET		PROPOSED A STRONGER NDC TARGET		DID NOT INCREASE AMBITION*		WILL NOT PROPOSE A MORE AMBITIOUS TARGET
ARGENTINA	NEW ZEALAND	INDIA	SOUTH KOREA	AUSTRALIA	RUSSIAN FEDERATION	
BHUTAN	NIGERIA			BRAZIL	SINGAPORE	
CANADA	NORWAY			ETHIOPIA	SWITZERLAND	
CHILE	PERU			INDONESIA	THAILAND	
CHINA	SAUDI ARABIA			MEXICO	VIET NAM	
COLOMBIA	SOUTH AFRICA			PHILIPPINES		
COSTA RICA	UAE					
EU	UKRAINE					
JAPAN	UNITED KINGDOM					
KENYA	USA					
MOROCCO						
NEPAL						

Figure 3 Status of NDC updates as of 5 November 2021. See our Climate Target Update Tracker page for further details.

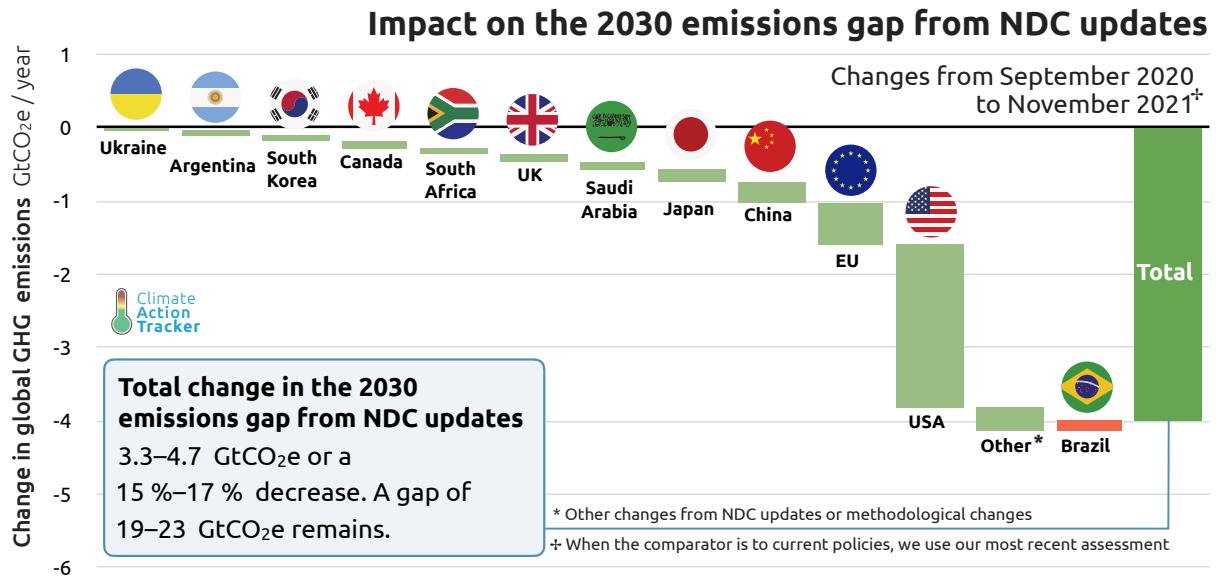


Figure 4 Impact of NDC updates since September 2020 on the reduction in the 2030 emissions gap.

Figure 4 shows the changes in contribution to the emissions gap since last September, while this has improved since our May 2021 update.[6] At the end of the day, the gap remains substantial.

6 While we are not able to track all countries, we have improved our methods in relation to emissions estimates for non-CAT countries. Part of the change is due to NDC updates and part is due to methodological improvements: we used the quantified NDC for over 100 countries based on the mitiQ tool provide by the Potsdam Institute for Climate Impact Research and updated the baseline of the remaining countries based on the newest PRIMAP baselines. These changes are also reflected in the waterfall graph.

3 Implementation gap is growing – and doing better is not enough

While our estimate of temperature warming based on real world action has fallen, the pace is still not fast enough to achieve the Paris Agreement temperature goal and countries are risking a lock-in in coal and gas infrastructure.

Coal

Kicking the coal habit should be on the top of everyone's policy agenda. Globally, we need to phase out coal-fired power generation by 2040, and by 2030 in developed countries, to keep the Paris temperature limit within reach. The COP26 presidency supports those targets through the Powering Past Coal Alliance, and has set accelerating the transition from coal to clean power as a key objective for COP26. Before and during Glasgow, multiple countries have strengthened or announced coal phase-out targets and other initiatives, including the first of its kind partnership to support the transition in a developing country away from coal, the Just Energy Transition Partnership of UK, EU, Germany, France and South Africa.

Phasing out coal has a number of benefits beyond climate protection. CAT analysis shows that faster coal plant retirements and reducing the new plant pipeline could avoid hundreds of thousands of premature deaths in the next decade in India and Indonesia alone. If India were to eliminate its coal pipeline and retire plants 18 years or older, it would reduce emissions enough to be making its fair share contribution to climate change. Electricity generation with existing coal-fired power plants is very often more expensive than building new renewable energy, calling into question the economic sensibility of new coal plants.

Despite the political momentum and clear benefits beyond climate change mitigation, there is still a huge amount of coal in the pipeline, for example in China and India. And too many countries still plan for coal to be a major contributor to electricity generation in 2030 (e.g. Japan 19%, South Korea 30%), although they have revised their energy sector planning. Some countries also continue to fund coal projects — public money spent on infrastructure at risk of becoming a stranded asset. China tops the list of countries financing coal projects internationally (but has announced it will stop doing so), followed by Japan, Czech Republic, Russia, and South Korea.

Natural gas

The increasing use of natural gas is not Paris Agreement compatible, yet we are seeing this pushed and promoted by the gas industry and supported by governments across the world. While, for example, Chile's progress to reduce coal-fired power generation is remarkable, it is not enough for 1.5°C. Chile's plans for retrofitting include the option of switching to natural gas. Gas reduces the emissions intensity compared to coal, but risks locking in higher emissions levels than required for 1.5°C, and increases dependency on energy imports. Gas for electricity generation, similarly to coal, needs to largely be phased out globally in the coming decades.

We are seeing similar developments in Southeast Asia, where heavily coal-dependent countries are now considering a switch from coal to gas, next to expanding renewables. Large infrastructure for natural gas is also under development in Europe (Nord Stream 2 for imports from Russia), Canada (expansions of pipelines for export), and USA (LNG exports), and multiple African countries are promoting the increased production and use of natural gas (e.g. Nigeria).

The recent gas price hikes in Europe illustrate the vulnerability of gas dependence. The answer to such a crisis is building up renewable energy and improving energy efficiency, actions that contribute to a sustainable pathway in the long term and are, to a large extent, independent of geopolitical developments - not the further expansion of gas infrastructure to improve the supply.

The CAT had already warned in 2017 about relying on gas in the transition towards 1.5°C pathways. Since then, research has become even clearer on the required decrease of the role of gas and the associated risks of investing in gas infrastructure, including the limitations of repurposing gas infrastructure for green gases later on.

If governments are serious about the Paris Agreement's temperature limit and their own net

zero goals, they need to realise what those long-term goals require in terms of short-term action, to guarantee the least disruptive pathway possible. Increasing ambition for 2030 follows naturally from such considerations.

Climate finance

To accelerate implementation globally, and ensure that all countries benefit from the transition to 1.5°C, **developed countries need to massively increase international climate finance**. Sufficient climate finance is critical to ensure that developing countries are able to meet their targets. None of the developed countries the CAT tracks have put forward sufficient climate finance (Figure 5). Recent analysis shows that the USD 100bn goal will only be met in 2023. While the goal is projected to be met around 2023, the anticipated level of USD 113-117bn in 2025 is still far below what would represent a fair contribution, but also what is needed. The Just Energy Transition Partnership for South Africa is a promising development, while details on the terms and quality of the financing are still outstanding.

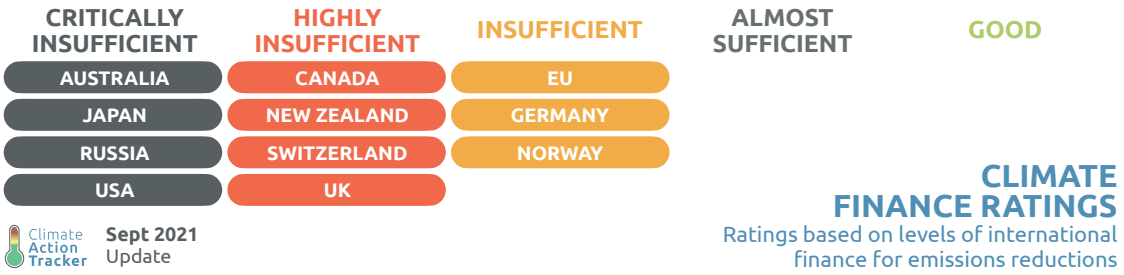


Figure 5 CAT climate finance ratings of developed countries.

Eliminating the provision of finance for fossil fuel developments internationally goes hand-in-hand with increasing climate finance, and stopping fossil fuel subsidies. The world already has sufficient oil and gas supply and no new field development is needed if we are serious about reaching net zero globally. Financing, or otherwise supporting such projects, in developing countries puts them at great risk for stranded assets, undermining efforts for sustainable development.

4 Sector and gas initiatives must go beyond existing national targets to be impactful

The Global Methane and Global Forest Finance Pledges made headlines in Glasgow, but their additional impact on the atmosphere is uncertain.

An increasing number of countries have joined the Global Methane Pledge to cut 30% of methane emissions by 2030 and the Global Forestry Finance Pledge.

Global methane emissions are projected to increase in the next decade by 4% under the current NDCs (7-12% under current policies). Any effort to reduce this gas emissions, in both the short and long term, will have a positive effect on the climate and contribute to slowing the global temperature increase.

One rapid assessment has estimated that **the Global Methane Pledge has the maximal potential to reduce the 2030 emissions gap** –the difference between current pledges and where we would need to be for 1.5°C in 2030—**by 3GtCO$_2$e (14% reduction)**. A different study attributed **a maximum warming reduction of -0.12°C** by end of the century. Both studies considered all countries in the world, not only those that have signed the Pledge, and considered all methane reductions as additional to existing activities.

The actual impact of the Global Methane Pledge is likely much lower. The pledge can only have a larger contribution to climate change mitigation if it is additional to the actions already committed by governments to meet NDCs and long-term strategies. However, this might not be the case for most countries. A prominent example is the US, which has already partially included the 30% methane reduction pledge by 2030 in its recently-submitted long-term strategy. The CAT temperature projections, discussed earlier in this briefing, do not consider additional emissions reductions from the Global Methane Pledge. We will only include them in future assessments, if they are shown to be additional to existing national climate pledges.

The same is likely the case for the Global Forest Finance Pledge, which was signed by most G20 countries, to provide finance to halt deforestation, promote forests restoration, and improve forest management. While stopping deforestation is important, governments should not solely rely on the forestry sector to capture emissions, but instead seek to decarbonise all sectors by implementing concrete measures. Currently, CO_2 emissions from land-use, land-use change and forestry make up roughly 5% (1 GtCO$_2$e) of the emission gap in 2030.

The Global Forest Finance Pledge will result in additional climate mitigation only if this finance is additional to the current levels of funding promised and does not cut other mitigation measures. Since the 100bn goal has not yet been met, the additionality of this initiative is questionable.

5 Net zero targets – inching closer to 1.5°C – but credibility is questionable

While NDCs, and their present level of implementation, lead to warming well above 2°C, the picture appears brighter when one considers all recently announced net zero targets, but their credibility is questionable.

Around 90% of global emissions now fall under net zero targets (Figure 6). **India** is the most recent major emitter to announce a net zero goal. Together with **China**, the **EU**, and **USA**, these four countries represent more than half of global greenhouse gas emissions. Even countries with a poor track record in fighting climate change, such as **Australia**, **Russia**, **Saudi Arabia**, **Turkey** and the **United Arab Emirates**, have felt obliged to also commit to net zero emissions. As of 2 November 2021, over 140 countries had announced or are considering net zero targets, covering 90% of global emissions (Figure 6), compared to the 130 countries, covering about 70% emissions, in May 2021.

Our 'optimistic scenario' now shows that if all governments were to fully implement their net zero targets, global temperature increase can be as low as 1.8°C, a 0.2°C improvement on our May 2021 estimate. While going below the 2°C level is an important milestone, it must be stressed that this estimate is based on only a 50 / 50 chance that warming will, indeed, be limited to 1.8°C. In probabilistic terms, warming is likely below 2.0°C. And, while words are good, one must judge governments by their actions.

Governments need to improve their net zero target design. In total, according to the CAT's "good practice" net zero analysis, the design of net zero targets covering a total of 73% of global emissions remains insufficient (Figure 7). Only four of the 40 countries covered by the CAT, responsible for 6% of global GHG emissions, have defined their net zero targets in an 'acceptable' way in terms of scope, architecture, and transparency. Another four countries, responsible for 17% of global emissions, fall into the 'average' category.

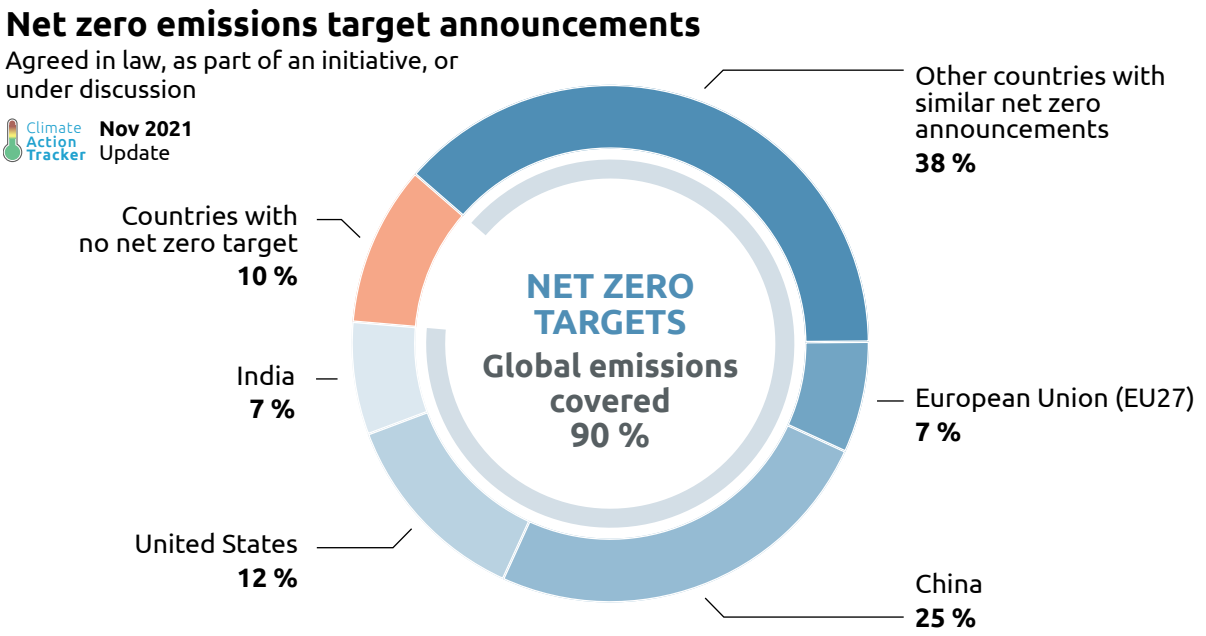


Figure 6 Share of GHG emissions covered by countries that have adopted or announced net zero emission targets (agreed in law, as part of an initiative, or under discussion). Compilation based on ECIU (2021) as of 2 November 2021 complemented by CAT analysis. Emissions data for 2017 taken from EDGAR emissions database (EDGAR, 2019).

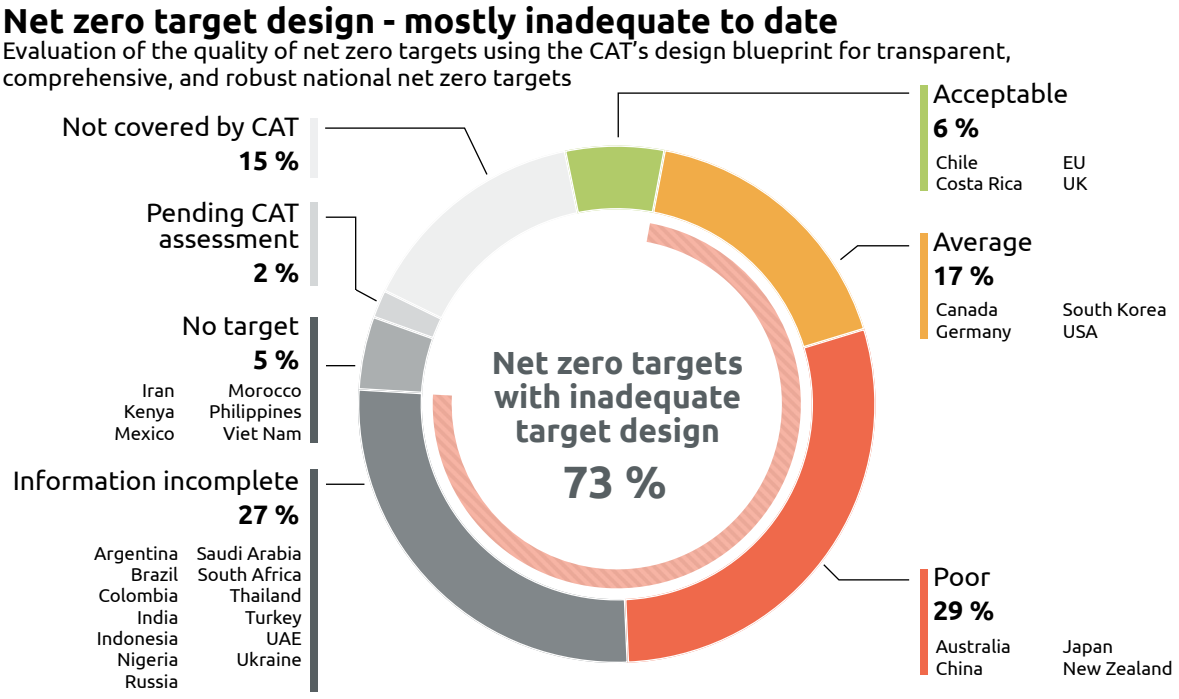


Figure 7 Share of global GHG emissions by Climate Action Tracker's headline evaluation for announced net zero targets as of November 2021. Emissions data for 2017 taken from EDGAR emissions database (EDGAR, 2019).

Australia, **Russia**, **Saudi Arabia**, **Turkey**, and the **United Arab Emirates** have put forward net zero targets that lack critical details on scope, target architecture, and transparency (Table 1). These announcements will only be credible if they are followed by robust legislations and detailed plans on how to achieve net zero, as well as stronger 2030 targets to put the countries on track to meet them. At their worst, these governments and others intend to use these vague and aspirational targets in the distant future to distract from inadequate short-term action.

Table 1: Overview of Climate Action Tracker's net zero target evaluations for Australia, Russia, Saudi Arabia, Turkey, and United Arab Emirates as of 2 November 2021

Rating the comprehensiveness of national net zero target design		Net zero target design elements									
		1	2	3	4	5	6	7	8	9	10
		Target year	Emissions coverage	International aviation and shipping	Reductions or removals outside of own border	Legal status	Separate reduction & removal targets	Review process	Carbon dioxide removal	Comprehensive planning	Clarity on fairness of target
Country	**Rating**										
Australia	POOR	2050	✓	✗	✗	–	✗	–	✗	✗	✗
Turkey	INFORMATION INCOMPLETE	2053	✓	?	?	–	?	?	?	?	?
UAE	INFORMATION INCOMPLETE	2050	✗	?	?	–	?	?	?	?	?
Russia	INFORMATION INCOMPLETE	2060	✗	?	?	–	?	?	?	?	?
Saudi Arabia	INFORMATION INCOMPLETE	2060	✗	?	?	–	?	?	?	?	?

The **Indian** 2070 net zero target announcement caused a big stir during the World Leaders Summit in Glasgow. As with other recent net zero announcements, critical details on scope, target architecture, and transparency are lacking. While Prime Minister Modi referred to 'net zero' in his announcement at COP26, it is not clear whether that covers CO_2 or all GHGs.

Other countries are moving forward with elaborating on their net zero targets. Canada, Japan, South Korea and **Germany** legislated their net zero target in recent months, bringing the number of G20 countries with such target enshrined in law to seven.

Although Japan improved various aspects of its net zero targets in recent months, we still evaluate the target as 'poor', as it lacks clarity on key elements. Canada, Germany, and South Korea all have net zero targets that we evaluate as 'average' - these countries are on the right track, but still have substantial room for improvement. The **USA's** net zero target moved up from 'target information incomplete' to the 'average' category. The country submitted its LTS, with information on some key elements, in November 2021. China's target went from 'target information incomplete' to the 'poor' category, as its LTS lacks detail on most elements. Whereas we previously assumed China's target covered all GHGs, the LTS indicates it only covers CO_2 emissions. Finally, our evaluation of the **United Kingdom's** target moved from 'average' to 'acceptable' after the UK government published a detailed plan to achieve net zero. Only four countries covered by the CAT have net zero targets that fall into this category (see Table 2).

Table 2: Overview of Climate Action Tracker's net zero target evaluations for G20 member countries (excluding non-CAT countries France and Italy) and selected others as of November 2021.

CAT Net zero evaluation of comprehensiveness of target design		
Country	**Previous assessment** Status as of Sept 2021	**New assessment** Status as of Nov 2021
Chile		ACCEPTABLE
Costa Rica		ACCEPTABLE
EU		ACCEPTABLE
UK	AVERAGE	ACCEPTABLE
Canada		AVERAGE
Germany	AVERAGE	AVERAGE
South Korea	POOR	AVERAGE
USA	INFORMATION INCOMPLETE	AVERAGE
Australia		POOR
China	INFORMATION INCOMPLETE	POOR
Japan	POOR	POOR
New Zealand		POOR
Argentina		INFORMATION INCOMPLETE
Brazil		INFORMATION INCOMPLETE
Colombia		INFORMATION INCOMPLETE
South Africa		INFORMATION INCOMPLETE
Ukraine		INFORMATION INCOMPLETE
India		INFORMATION INCOMPLETE
Indonesia		INFORMATION INCOMPLETE
Russia		INFORMATION INCOMPLETE
Saudi Arabia		INFORMATION INCOMPLETE
Turkey		INFORMATION INCOMPLETE
UAE		INFORMATION INCOMPLETE
Iran		NO TARGET
Mexico[7]		NO TARGET

A complete overview of our in-depth assessment can be found in Annex 2. These evaluations aim to provide a nuanced assessment of national net zero targets to understand their scope, architecture, and transparency. Without such scrutiny, there is a risk that poorly backed up net zero claims could render these targets meaningless.

7 We do not consider Mexico to have a net zero target, but do include the country in the Optimistic scenario as ECIU lists their net zero target as under discussion (see Annex 1 and 3 for details).

6 Warming outlook has improved since Paris

In 2015, ahead of the Paris Agreement, the CAT estimated current policies would lead to warming of 3.6°C, and the submitted targets (NDCs) would lead to 2.7˚C. Six years later, the warming from current policies has now come down to 2.7°C. If governments were to achieve all their submitted NDC pledges and long-term targets, temperature increase could be limited to 2.1°C. Adding all the net zero targets announced and discussed, this would even lead to 1.8°C. **The Paris Agreement ratchet-ing-up mechanism is working, but not fast enough.**

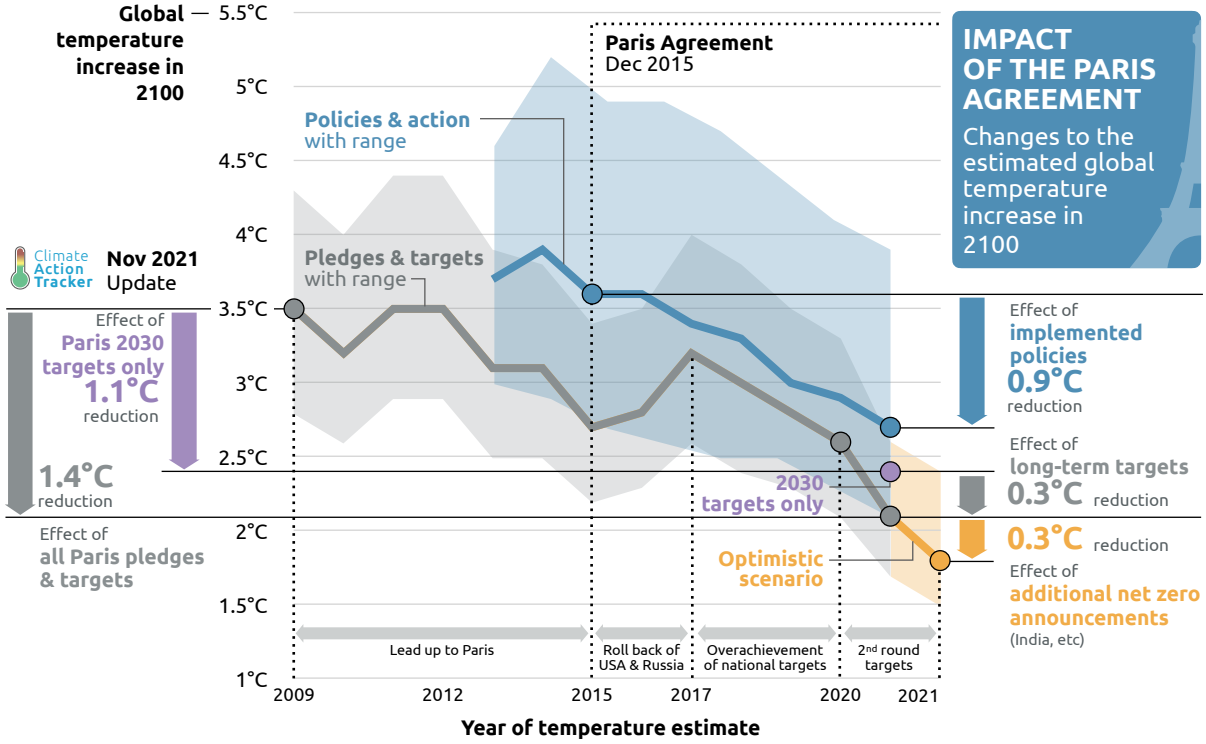


Figure 9 Impact of the Paris Agreement on the estimated global temperature increase in 2100. Figure shows the estimates of the Climate Action Tracker from 2009-2021 for "pledges and targets" and "current policies".[8] In this update, we have also added a temperature estimate for 2030 targets only.

8 The Climate Action Tracker is continuously updating and refining its methodology. As a result, the temperature estimates in this figure cannot solely be attributed to target improvements or real-world action; however, the figure does show the overall progression of our estimates.

7 Country snapshots

ARGENTINA submitted an updated and slightly more ambitious NDC in November 2021 based on the announcement in May 2021. Argentina continues to prioritise oil and gas exploitation in its energy strategy—in "Vaca Muerta", the world's second largest shale gas reserve—jeopardising the achievement of its climate objectives.

AUSTRALIA refused to strengthen its 2030 climate target, while claiming it could exceed it. Its continued strategy supporting fossil fuels (especially gas) over renewable energy is of major concern and makes its new net zero claim not credible. Australia has put forward a net zero target that lacks critical details on its scope, target architecture, and transparency.

BHUTAN submitted a second NDC in June 2021, which reiterated its goal to remain carbon neutral. However, increasing energy and industry emissions could put Bhutan in a difficult position in the long-term and risk breaking its carbon neutrality.

BRAZIL'S new announced 2030 target is only stronger on paper and, at best, only reverts some of the damage caused by the 2020 NDC update. Lack of clarity on the references used makes the target emissions level uncertain.

CANADA has updated its NDC, but needs to focus on implementing the policies to achieve it as it is currently far off-track. It continues to fund fossil fuel pipelines, exceeding the capacity need. Raising transport emissions are also a concern.

CHILE has increased the speed of its coal phase-out and approved a new energy efficiency law that could bring emissions under current policies downward. If all planned policies are implemented Chile could peak emissions two years before planned, in 2023. It has recently submitted a long-term strategy.

CHINA submitted only a mildly more ambitious NDC, which will make net zero CO_2 emissions by 2060 difficult to achieve. China is giving mixed signals about coal. While signals to "phase down" coal consumption are welcome, coal power increased by a net 29.8GW in 2020, 76% of the world's new coal plants.

COLOMBIA adopted a stronger target in its NDC update, but needs stronger action across the board. It must increase renewables and abandon coal, fracking plans – especially as coal mining investors are leaving the country. Deforestation is of great concern as LULUCF are 30% of its emissions.

COSTA RICA updated its NDC in December 2020, slightly increasing the ambition of its 2030 climate target and improving its target architecture. It outlined various sectoral measures and targets, and could improve further by specifying the sectoral breakdown.

ETHIOPIA submitted an NDC update in July 2021 committing to its first unconditional emissions target. It will achieve both targets if current policies are fully implemented.

The EUROPEAN UNION member states' policies are far from sufficient to meet the emissions reduction target of "at least 55%" below 1990. Some of its members are pushing for continued public funding of natural gas infrastructure – all while paying the price for the EU's high reliance on fossil fuel imports amidst the current energy crisis. The EU needs to step up ambition at home, and provide international finance to support decarbonisation abroad.

GERMANY'S updated target for 2030 and coal phase-out by 2038 is inconsistent with 1.5˚ C. It has a large and growing emissions gap in the transport sector. Renewables will not reach its 65% by 2030 target, which is, by itself, too low.

INDIA'S announced NDC will, at most, mildly improve emission reductions beyond current policies. Its 2070 net zero target is welcome, but it is difficult to evaluate due to a lack of clarity over its gas coverage. This target is incompatible with India's huge coal pipeline and this issue needs to be addressed. Its first COVID19 recovery package prioritised fossil fuels, but the second has some stimulus aimed at a green recovery.

INDONESIA'S coal pipeline is huge, while renewables face many regulatory hurdles. In 2020 alone, fossil fuel subsidies were a massive USD 7bn. Forests are still in decline, amid rollbacks of environmental regulation. Indonesia submitted an NDC in July 2021 but did not strengthen its 2030 target. In Glasgow, Indonesia joined the list of countries promising to phase out coal.

IRAN is the only country out of the 40 we assess that has yet to ratify the Paris Agreement. It is expected to overachieve its INDC due to an inflated baseline. This OPEC member's economy is dominated by fossil fuels despite having huge renewables potential.

JAPAN'S new 2030 target level is now close to being 1.5˚C-compatible. Government policies reduce emissions, but not enough to match the 46% emissions reduction target. Reducing coal to 19% share of power mix in 2030 is better, but it needs to be zero.

KAZAKHSTAN has yet to update its 2030 climate target. The failure to increase its mitigation ambition for 2030 does not comply with the Paris Agreement's requirement that each successive NDC should present a progression beyond the current one.

KENYA updated its NDC in December 2020, where it slightly increased its 2030 targets and provided an unconditional target.

MEXICO'S government continues to show a lack of commitment to climate change by refusing to update its climate target, rolling back regulation meant to foster investment in renewable energy, and favouring fossil fuels over renewables.

MOROCCO strengthened its unconditional and conditional 2030 emissions reductions targets in June 2021. It has one of the highest levels of renewable energy capacity in Africa, but it also continues to heavily rely on coal to meet its electricity needs.

NEPAL submitted its second NDC on December 2020, which, for the first time, included part of their energy-related targets as unconditional commitments. The submission also strengthened the conditional target's transparency, included more quantifiable targets and reference to a net zero target.

NEW ZEALAND is exempting methane from its 2050 target, with no policies to address 40% of its emissions (agriculture). Its emissions reduction plan must focus on high emitting sectors, not forests. It plans to meet a full two thirds of its new NDC by buying international credits.

NIGERIA has an ambitious 2030 renewable energy target, which it is not on track to achieve, due to slow implementation. Nigeria should reconsider policies to revive its coal sector and expand its gas market. These policies run the risk of stranded assets and are at odds with the Paris Agreements 1.5°C limit.

NORWAY was the world's ninth largest natural gas and eleventh largest oil producer in 2020—with no end in sight for continued exploration. Its 2020 NDC will cut emissions by at least 50% by 2030 and aims for a 55% emissions reduction below 1990 levels. If Norway were to drop the 50% target and move to the 55% target, consistent with the EU's update goal, its target would become 1.5°C compatible when compared to the minimum it needs to cut emissions within its own borders.

PERU'S updated NDC will result in 2030 emissions that are 6% lower than its predecessor. We estimate that Peru can reach this target with existing policies, and could therefore increase its climate targets. The updated NDC includes a goal to reach carbon neutrality by 2050.

THE PHILIPPINES increased its conditional target from 70% to 75% below BAU; and has proposed an unconditional target in its updated NDC for the first time. The unconditional target is well above emissions projections under current policies, and thus does not strengthen the country's own ambition. To achieve the conditional target, the Philippines would need international support for its planned policies as well as to adopt additional measures.

RUSSIA'S Energy Strategy focuses almost exclusively on promoting fossil fuels: extraction, consumption and exports. Its renewable target is negligible. It also intends to use unmanaged forests in its accounting, violating UN guidelines. This makes the new net zero pledge not credible.

SAUDI ARABIA'S updated 2030 target is contingent on a significant contribution of oil and gas exports to its economy, and it reserves itself the right to update its NDC target should exports decline as a result of other governments implementing the Paris Agreement. Despite numerous announcements and targets since 2013, renewables supply only 0.1% of electricity generation—far from the 50% target by 2030 in the NDC. There are still several uncertainties about the newly announced 2060 net zero target.

SINGAPORE updated its NDC in March 2020. While it improved the form of its target, moving from an emissions intensity target to an absolute cap on emissions and adopting the latest IPCC reporting guidelines, as well as gas coverage, the level at which Singapore will limit emissions remains unchanged.

SOUTH AFRICA'S submitted a stronger 2030 target in September 2021. The uncertainty around the successful implementation of the Integrated Resource Plan (IRP2019) remains high, given state-owned utility giant Eskom's unresolved financial and operational problems and government's poor past performance in managing the energy transition.

SOUTH KOREA is making slow progress in climate change mitigation and energy sector planning. It has cut coal, but is replacing it with gas, still a fossil fuel that must be phased out. The share of fossil fuels in power sector is still at 67%. South Korea's government appears to have backpedalled on its vow to stop funding international coal. At COP26, South Korea proposed a more ambitious NDC to reduce emissions by 40% by 2030 and has progressed on the development of its net-zero target, which is now enshrined in law.

SWITZERLAND rejected its amended CO_2 Act in a June 2021 referendum and did not submit a more ambitious target, a significant setback to progressing its climate action. Putting forward an alternative set of policies and regulations should now be a top priority.

THAILAND is shifting out of coal, but its huge push towards gas is a highly risky investment for the climate & stranded assets. We estimate that Thailand will not reach its weak 2030 target with current policies. In good news: Thailand has shown recent intent to get on track.

THE GAMBIA proposes more action in its second NDC but higher historical and baseline emissions means absolute emissions are higher, may impact CAT rating, full analysis to come.

TURKEY has ratified the Paris Agreement and set a 2053 net zero target, but details on how it will reach this target are lacking. It has not updated its very unambitious 2030 target and still has a large pipeline of planned coal power plants.

The **UNITED ARAB EMIRATES** was the first Gulf country to update its NDC in December 2020, setting the UAE's first economy-wide emissions reduction target for 2030. It has also recently announced a net zero target for 2050. The 2050 National Energy Strategy foresees expansion plans for coal and natural gas, which is inconsistent with global decarbonisation by 2050.

The **UNITED KINGDOM'S** Net Zero Strategy maps out several potential scenarios to achieve its 2050 target, but details on how it will achieve its 2030 and 2035 targets are still lacking.

UKRAINE submitted an updated NDC in July 2021, including a target of 65% reduction below 1990 levels by 2030 – a significant improvement from its previous target of at least 40% reduction below 1990 by 2030, and an announcement of climate neutrality no later than 2060.

The **UNITED STATES OF AMERICA'S** emissions will remain relatively high, reaching 16-18% below 2005 levels in 2030, far short of its 50-52% reduction target, without new policies. On November 5, the US passed one of two major bills before Congress, each with considerable steps forward on climate action. Together, both bills represent a major step forward for the US in bringing its 2030 target within reach. The US also submitted a long-term strategy at the beginning of COP26.

VIET NAM has the world's third largest coal pipeline, after China & India, & massive plans for gas. While it has supported some renewables, it has the potential to become a regional leader for solar energy & offshore wind.

Annex

A1 Scenario definition

What's included in the various temperature scenario?

Table 3: Overview of what is included for each country under the various Climate Action Tracker's temperature projections for 2100 (November 2021 update).

Country	2030 targets only*	Pledges & Targets		Optimistic scenario		Policies & action data from
		2030 NDC target*	Net Zero targets	NZT included?	Method	
Argentina	Updated NDC (Nov. 2021)	Updated NDC (Nov. 2021)	No	Yes	Conservative global estimate	July 2020
Australia	Current policies	Current policies	Yes (max)	Yes (min)	CAT estimate	Nov. 2021
Bhutan	Current policies	Current policies	No	Yes	Conservative global estimate	Nov. 2021
Brazil	Announced NDC (Nov. 2021)	Announced NDC (Nov. 2021)	No	Yes	CAT estimate	Nov. 2021
Canada	Updated NDC (July 2021)	Updated NDC (July 2021)	Yes (max)	Yes (min)	CAT estimate	Sept. 2021
Chile	Updated NDC (April 2020)	Updated NDC (April 2020)	Yes	Yes	CAT estimate	Nov. 2021
China	Updated NDC (Oct. 2021)	Updated NDC (Oct. 2021)	Yes (max)	Yes (min)	CAT estimate	Sept. 2021
Colombia	Updated NDC (Dec. 2020)	Updated NDC (Dec. 2020)	No	Yes	CAT estimate	Sept. 2021
Costa Rica	Updated NDC (Dec. 2020)	Updated NDC (Dec. 2020)	Yes (max)	Yes (min)	CAT estimate	July 2020
Ethiopia	Current policies	Current policies	No	Yes	Conservative global estimate	Sept. 2021
EU27	Updated NDC (Dec. 2020	Updated NDC (Dec. 2020)	Yes (max)	Yes (min)	CAT estimate	Sept. 2021
Germany	Covered in EU27					
India	Current policies	Current policies	No	Yes	CAT estimate	Sept. 2021
Indonesia	Current policies	Current policies	No	Yes	CAT estimate	Nov. 2021
Iran	Current policies	Current policies	No	No	--	Sept. 2021
Japan	NDC (Oct. 2021)	NDC (Oct. 2021)	Yes (max)	Yes (min)	CAT estimate	Sept. 2021
Kazakhstan	First NDC (Dec. 2016)	First NDC (Dec. 2016)	No	Yes	CAT estimate	Nov. 2021
Kenya	Current policies	Current policies	No	No	--	Nov. 2020
Mexico	Updated NDC (Dec. 2020)	Updated NDC (Dec. 2020)	No	Yes	Conservative global estimate	Sept. 2020
Morocco	Updated NDC (June 2021)	Updated NDC (June 2021)	No	No	--	July 2020
Nepal	Current policies	Current policies	No	Yes	Conservative global estimate	Nov. 2020

Country	2030 targets only*	Pledges & Targets		Optimistic scenario		Policies & action data from
		2030 NDC target*	Net Zero targets	NZT included?	Method	
New Zealand	Updated NDC (Nov. 2021)	Updated NDC (Nov. 2021)	Yes (max)	Yes (min)	CAT estimate	Sept. 2021
Nigeria	Updated NDC (July 2021)	Updated NDC (July 2021)	No	Yes	CAT estimate	Sept. 2021
Norway	Updated NDC (Feb. 2020)	Updated NDC (Feb. 2020)	Yes (max)	Yes (min)	CAT estimate	Sept. 2021
Peru	Current policies	Current policies	No	Yes	Conservative global estimate	Nov. 2020
Philippines	Current policies	Current policies	No	No	--	Nov. 2020
Russian Federation	Current policies	Current policies	No	Yes	CAT estimate	Oct. 2021
Saudi Arabia	Current policies	Current policies	No	Yes	CAT estimate	Sept. 2021
Singapore	Current policies	Current policies	Yes	Yes	CAT estimate	July 2020
South Africa	Updated NDC (Sept. 2021)	Updated NDC (Sept. 2021)	Yes	Yes	CAT estimate	Sept. 2021
South Korea	Announced NDC (Nov. 2021)	Announced NDC (Nov. 2021)	Yes	Yes	CAT estimate	Nov. 2021
Switzerland	Updated NDC (Dec. 2020)	Updated NDC (Dec. 2020)	Yes	Yes	CAT estimate	Sept. 2021
Thailand	Updated NDC (Oct. 2020)	Updated NDC (Oct. 2020)	No	Yes	Conservative global estimate	Sept. 2021
The Gambia**	First NDC (Nov. 2016)	First NDC (Nov. 2016)	No	Yes	Conservative global estimate	Nov. 2020
Turkey	Current policies	Current policies	No	Yes	CAT estimate	Oct. 2021
UAE	Updated NDC (Dec. 2020)	Updated NDC (Dec. 2020)	No	Yes	CAT estimate	Nov. 2020
UK	Updated NDC (Dec. 2020)	Updated NDC (Dec. 2020)	Yes	Yes	CAT estimate	Sept. 2021
Ukraine	Updated NDC (July 2021)	Updated NDC (July 2021)	No	Yes	CAT estimate	Nov. 2021
USA	Updated NDC (April 2021)	Updated NDC (April 2021)	Yes (max)	Yes (min)	CAT estimate	Sept. 2021
Viet Nam	Current policies	Current policies	No	No	--	Oct. 2021

* For weak targets, we take a country's estimated 2030 level under current policies, if that level is lower than the target.

** The Gambia submitted its second NDC in September 2021. We will incorporate its updated NDC in subsequent assessments.

CAT temperature estimates are done using the MAGICC climate model. More information on the model is available here.

A2 Detailed overview of net zero target assessments

Table 4: Overview of Climate Action Tracker's net zero target evaluations for G20 member countries (excluding France and Italy as both not separately analysed by the CAT) and selected other countries per key elements as of November 2021

Rating the comprehensiveness of national net zero target design		Net zero target design elements									
		1	2	3	4	5	6	7	8	9	10
Country	Rating	Target year	Emissions coverage	International aviation and shipping	Reductions or removals outside of own border	Legal status	Separate reduction & removal targets	Review process	Carbon dioxide removal	Comprehensive planning	Clarity on fairness of target
EU	ACCEPTABLE	2050	✓	−	✓	✓	✗	✓	✓	✓	✗
UK	ACCEPTABLE	2050	✓	✓	✗	✓	✗	✓	✓	✓	−
Chile	ACCEPTABLE	2050	✓	✗	✓	−	✓	−	✓	✓	✗
Costa Rica	ACCEPTABLE	2050	✓	✗	✓	−	✓	−	✓	✓	✗
Germany	AVERAGE	2045	✓	✗	✗	✓	✓	✓	✗	−	−
South Korea	AVERAGE	2050	✗	✗	✓	✓	✓	−	✓	−	✗
Canada	AVERAGE	2050	✓	✗	✓	✓	✗	✓	✗	−	✗
USA	AVERAGE	2050	✓	✗	✗	−	✗	−	✓	−	✗
Japan	POOR	2050	✓	✗	✗	✓	✗	✓	✗	−	✗
New Zealand	POOR	2050	✗	✗	✗	✓	✗	✓	✗	−	✗
Australia	POOR	2050	✓	✗	✗	−	✗	−	✗	✗	✗
China	POOR	2060	✗	✗	✗	−	✗	✗	✗	−	−

Rating the comprehensiveness of national net zero target design Country	Rating	Net zero target design elements 1 Target year	2 Emissions coverage	3 International aviation and shipping	4 Reductions or removals outside of own border	5 Legal status	6 Separate reduction & removal targets	7 Review process	8 Carbon dioxide removal	9 Comprehensive planning	10 Clarity on fairness of target
Ukraine	INFORMATION INCOMPLETE	2060	✓	?	?	–	?	?	?	?	?
Turkey	INFORMATION INCOMPLETE	2053	✓	?	?	–	?	?	?	?	?
South Africa	INFORMATION INCOMPLETE	2050	✗	?	?	–	?	?	?	?	?
Argentina	INFORMATION INCOMPLETE	2050	✗	?	?	–	?	?	?	?	?
Russia	INFORMATION INCOMPLETE	2060	✗	?	?	–	?	?	?	?	?
Saudi Arabia	INFORMATION INCOMPLETE	2060	✗	?	?	–	?	?	?	?	?
UAE	INFORMATION INCOMPLETE	2050	✗	?	?	–	?	?	?	?	?
Indonesia	INFORMATION INCOMPLETE	2060	?	?	?	–	?	?	?	?	?
Brazil	INFORMATION INCOMPLETE	2050	?	?	?	–	?	?	?	?	?
Colombia	INFORMATION INCOMPLETE	2050	?	?	?	–	?	?	?	?	?
India	INFORMATION INCOMPLETE	2070	?	?	?	–	?	?	?	?	?
Iran	NO TARGET	-	*Not applicable as no target existing*								
Mexico*	NO TARGET	-	*Not applicable as no target existing*								

* We do not consider Mexico to have a net zero target, but do include the country in the Optimistic scenario as ECIU lists their net zero target as under discussion

A3 Optimistic Temperature Estimate Assumptions

We had to make several assumptions to assess the impact of net zero targets on the global temperature increase by 2100. These relate to (1) the emissions covered by the various targets, (2) land-use, land-use change and forestry (LULUCF) emissions by 2050, (3) the trajectory of non-CO2 emissions and (4) the importance of 2030 targets.

Table 5 provides an overview of all net zero targets assessed for which the Climate Action Tracker has developed estimates. Table 5 lists all net zero targets included in the modelling runs for the CAT's temperature estimate in November 2020.

Table 5: List of net zero targets for which CAT has developed estimates

Country	Type of net zero target	Target year	Assumption on LULUCF	Assumptions on GHG emissions excluding LULUCF
Australia	Net zero GHGs	2050	N/A	We use the estimates for the scenarios excluding offsets contained in the government's long-term strategy, converted these values into AR4 GWP and assumed a linear decline between 2030 and 2050. The top end of the range is used in our standard pledges and targets pathway, the bottom end is used in the Optimistic pathway.
Brazil	Net zero GHGs	2050	We used an estimate from the Fórum Brasileiro de Mudança do Clima, a government advisory body, for 2050 LULUCF emissions.	We assumed a linear decline in total GHGs between 2030 and 2050 to balance LULUCF emissions in 2050.
Canada	Net zero GHGs	2050	The government has not provided any detail on how it intends to meet its 2050 target; therefore, we use the same LULUCF as for its NDC.	We assumed a linear decline in total GHGs between 2030 and 2050 to balance LULUCF emissions in 2050. The top end of the range is used in our standard pledges and targets pathway, the bottom end is used in the Optimistic pathway.
Chile	Net zero GHGs	2050	We used national projections for 2050 presented in the updated NDC and Climate Neutrality Plan of 2020 and assumed LULUCF emissions to be -65 $MtCO_2e$.	We used national projections for all GHG emission 2050 presented in the updated NDC and Climate Neutrality Plan of 2020 to balance LULUCF sinks in 2050.
China	Net zero CO_2	2060	We used a ten-year historical average based on GHG inventory data from 2005 to 2014. The average of LULUCF emissions in those years is –783 $MtCO_2e$, which we assumed as a value for 2050 and 2060. This estimate is consistent with the scenarios from Tsinghua University, which show agricultural and forestry sinks of 700-780 $MtCO_2e$ in 2050.	We apply a linear interpolation for economy-wide CO_2 emissions (excl. LULUCF) from 2030 emission levels expected under achievement of the NDC targets, to zero CO_2 emissions in 2060, expected under the carbon neutrality target. We assume that non-CO_2 gases, significant in China, will lag behind but still be phased out indirectly through carbon neutrality efforts. We apply linear interpolation between the 2030 economy-wide non-CO_2 emissions (excl. LULUCF) expected under achievement of NDCs to zero in 2080. For 2030 values, we use the average of the NDC non-fossil fuel and the NDC peaking pledge as the starting point. We assume LULUCF sinks will be in the order of 783 $MtCO_2e$ in mid-century and beyond, and expect it to be used to counterbalance hard-to-abate emissions. The top end of the range is used in our standard pledges and targets pathway, the bottom end is used in the optimistic pathway.

Country	Type of net zero target	Target year	Assumption on LULUCF	Assumptions on GHG emissions excluding LULUCF
Colombia	Net zero GHGs	2050	In the beginning of 2021, Colombia announced their target to reach "carbonon neutralidad" assumed to be net zero GHG emissions by 2050, for which the strategy is still in the works. Projections for LULUCF emissions in 2050 are taken here from the background modelling document used in the updated NDC. In even the most ambitious scenario, Colombia does not create a substantial land-based sink of emissions in 2050. We assume no contribution from LULUCF to the target.	We assume emissions are zero in 2050, with a linear decline from 2030 levels.
Costa Rica	Net zero GHGs	2050	We used national projections for 2050, as provided for in the 2018 Decarbonization Strategy submitted to the UNFCCC.	We used national projections for 2050, as provided for in the 2018 Decarbonization Strategy, to balance LULUCF sinks in 2050. We use the upper limited of the NDC in 2030 as the starting point. The top end of the range is used in our standard pledges and targets pathway, the bottom end is used in the Optimistic pathway.
European Union	Net zero GHGs	2050	*See assumptions for EU's for 2050 excluding LULUCF on the right.*	We used the EU's own projections for 2050 excluding LULUCF, from the 1.5LIFE and 1.5TECH scenarios, adjusted to the EU27. The top end of the range is used in our standard pledges and targets pathway, the bottom end is used in the Optimistic pathway.
India	Net zero GHGs	2070	The government has not provided any detail on how it intends to meet its 2070 target, nor the reliance on the land sector. In its first NDC, India committed to enhancing its sink by an additional 2.5 to 3bn tonnes by 2030. Assuming those figures represent a cumulative 15-year total (2016-2030), India's LULUCF sink would grow to around 500 $MtCO_2$ in 2030 (from a historic level of around 300$MtCO_2e$ in 2016). In the absence of any other estimate, we have used this figure for its sink in 2070.	We assume the target covers all gases and that there is a linear decline in total GHGs between 2030 and 2070 to balance LULUCF emissions in 2070.
Indonesia	Net zero GHGs	2060	The Indonesian government assumes a LULUCF sink of 299 $MtCO_2e$ in the LCCP scenario presented in the LTS submitted to the UNFCCC. We keep this value constant for 2060.	We assumed a linear decline in total GHGs between 2030 and 2060 to balance LULUCF emissions in 2060.
Japan	Net zero GHGs	2050	We extrapolated the 2009-2019 trend to 2030, followed by a constant sink to 2050, and took the average sink for the 2009-2019 period to create a range for LULUCF.	We applied a linear interpolation of all GHG emission between 2030 and 2050 to balance LULUCF sinks in 2050. The top end of the range is used in our standard pledges and targets pathway, the bottom end is used in the Optimistic pathway.

Country	Type of net zero target	Target year	Assumption on LULUCF	Assumptions on GHG emissions excluding LULUCF
Kazakhstan	Net zero GHGs	2060	As the government announced an extensive reforestation plan, we assumed that by 2060 LULUCF emissions will equal the lowest level between 1990 and 2020. We assumed that LULUCF emissions will linearly decrease between 2020 and 2060.	We assumed a linear decline in total GHGs between 2030 and 2060.
New Zealand	Net zero GHG, with the exception of CH_4 from agriculture and waste	2050	We used national projection for 2050, harmonised to historical data.	We calculate the methane reduction target separately and then assume a linear decline in emissions between 2030 and 2050, to balance LULUCF removals in 2050. The top end of the range is used in our standard pledges and targets pathway, the bottom end is used in the Optimistic pathway.
Nigeria	Net zero GHGs	Second half of the century*	We make no assumptions about LULUCF given the limited data available.	We quantified the 2050 target referenced in Nigeria's final NDC update of 50% below currently levels (which we took to be 2018). We did not explicitly calculation a net zero target during the second half of the century, but used our model's pathway extension from the 2050 value. **Note: Nigeria announced a 2060 net zero target during the World Leaders Summit. We will update our analysis for Nigeria to take this development into account in our next assessment.*
Norway	GHGs reduce by 90-95%, compared to 1990. We assumed that LULUCF emissions are included in this target.	2050	We used a projection from NIBIO, which gives a sink in 2050 of 20 $MtCO_2$.	We assume a linear decline in GHG emissions excluding LULUCF between 2030 and 2050, such that total emissions in 2050 including LULUCF are 90-95% below 1990 levels. The top end of the range is used in our standard pledges and targets pathway, the bottom end is used in the Optimistic pathway.
Russian Federation	Net zero CO_2	2060	Russia does not have 2060 LULUCF projections. We have used the most ambitious 2050 sink scenario in its draft long-term strategy.	We assumed that CO_2 emissions will decline at a linear rate between 2030 and 2060 to balance LULUCF removals in 2060. We assume that non-CO_2 emission follow a linear decline to zero by 2070 based on the 2030 value in Russia's 4th Biennial Update Report 'with measures' scenario.
Saudi Arabia	Net zero CO_2	2060	The Saudi government has announced to achieve a sink of 200 MtCO2 from 2030 onwards, which we assume to stay constant towards 2060.	We assumed that CO2 emissions will decline at a linear rate between 2030 and 2060 to balance LULUCF sinks in 2060. We assume that non-CO_2 emissions will decline at a linear rate between 2030 and 2080 in line with the IPCC SR1.5 pathways.
Singapore	Net zero GHGs	Second half of the century	We make no assumptions as LULUCF is negligible.	We use Singapore's 2050 target to peak emissions at 32$MtCO_2e$ in 2050 (converted from AR5 GWP values to AR4). We make no further assumptions about when the net zero target will be met later in the century.
South Africa	Net zero CO_2	2050	We used a ten-year historical average based on national inventory data from 2005-2015 resulting in -16 $MtCO_2e$.	We assumed that CO_2 emissions will decline at a linear rate between 2030 and 2050 to balance LULUCF sinks in 2050. We assume that non-CO_2 emissions will decline at a linear rate between 2030 and 2080 in line with the IPCC SR1.5 pathways.
South Korea	Net zero GHGs	2050	The government of South Korea projects a LULUCF sink of 25$MtCO_2e$ by 2050 in its 2050 Carbon Neutral Scenario report.	We assumed a linear decline in total GHGs between 2030 (announced NDC level) and 2050 to balance LULUCF emissions in 2050.

Country	Type of net zero target	Target year	Assumption on LULUCF	Assumptions on GHG emissions excluding LULUCF
Switzerland	Net zero GHGs	2050	We used the "with existing measures" projection for 2030 from the 4th Biennial Report and assumed the same value for 2050.	We assumed a linear decline in total GHGs between 2030 and 2050 to balance LULUCF emissions in 2050.
Turkey	Net zero GHGs	2053	We used the government projection for 2030 under the "with existing measures" scenario in the 4th Biennial Report as Turkey does not have a 2053 LULUCF projection.	We assumed a linear decline in total GHGs between 2030 and 2053 to balance LULUCF emissions in 2053.
Ukraine	Net zero GHGs	2060	We used the government's LULUCF projection for 2050, as described in the modelling report that informed Ukraine's updated NDC. As the report provides no data point for 2060, we assumed the LULUCF sink remains stable between 2050 and 2060, at -36 $MtCO_2e$.	We assumed that GHG emissions decrease linearly between 2030 and 2060. By 2060, emissions amount to 36 $MtCO_2e$, so Ukraine's net emissions are zero.
United Arab Emirates	Net zero CO_2	2050	We used a ten-year historical average based on national inventory data from 2004-2015 resulting in -11 $MtCO_2e$.	We assumed that CO_2 emissions will decline at a linear rate between 2030 and 2050 to balance LULUCF sinks in 2050. We assume that non-CO_2 emissions will decline at a linear rate between 2030 and 2080 in line with the IPCC SR1.5 pathways.
United Kingdom	Net zero GHGs	2050	We used the 2050 LULUCF projection from the 'balanced net zero pathway' scenario in the UK Centre for Ecology and Hydrology's Updated quantification of the impact of future land use scenarios to 2050 and beyond final report (-19 $MtCO_2e$).	We assumed that GHG emissions decrease linearly between 2030 and 2050 from the emissions level implied by the UK's 2030 target to balance the projected 2050 LULUCF sink.
United States	Net zero GHGs	2050	Our LULUCF assumptions are based on data extracted from the graphs in the US's long-term strategy. We use the LULUCF projection range for our assumptions on the sink by 2050.	We assumed that GHG emissions will decline at a linear rate between 2030 and 2050 to balance LULUCF removals in 2050. The top end of the range is used in our standard pledges and targets pathway, the bottom end is used in the Optimistic pathway

Table 6: List of all net zero targets included in the 'optimistic scenario' modelling runs for the global aggregation based on the ECIU (2021) complemented by CAT analysis as of 2 November 2021.

Country	Status	Year
Afghanistan	Target Under Discussion	2050
Andorra	In Policy Document	2050
Angola	Target Under Discussion	2050
Antigua and Barbuda	Target Under Discussion	2050
Argentina	Target Under Discussion	2050
Armenia	In Policy Document	2050
Australia	In Policy Document	2050
Austria*	In Policy Document	2040
Bahamas (the)	Target Under Discussion	2050
Bahrain	Target Under Discussion	2060
Bangladesh	Target Under Discussion	2050
Barbados	Target Under Discussion	2050

Country	Status	Year
Belgium*	Target Under Discussion	2050
Belize	Target Under Discussion	2050
Benin	Target Under Discussion	2050
Bhutan	Achieved	
Brazil	In Policy Document	2050
Bulgaria*	Target Under Discussion	2050
Burkina Faso	Target Under Discussion	2050
Burundi	Target Under Discussion	2050
Cabo Verde	Target Under Discussion	2050
Cambodia	Target Under Discussion	2050
Canada	In Law	2050
Central African Republic (the)	Target Under Discussion	2050
Chad	Target Under Discussion	2050
Chile	Proposed Legislation	2050
China	In Policy Document	2060
Colombia	Target Under Discussion	2050
Comoros (the)	Target Under Discussion	2050
Congo (the Democratic Republic of the)	Target Under Discussion	2050
Cook Islands (the)	Target Under Discussion	2050
Costa Rica	In Policy Document	2050
Croatia	Target Under Discussion	2050
Cyprus	Target Under Discussion	2050
Czechia	Target Under Discussion	2050
Denmark*	In Law	2050
Djibouti	Target Under Discussion	2050
Dominica	Target Under Discussion	2050
Dominican Republic (the)	Target Under Discussion	2050
Ecuador	Target Under Discussion	2050
Eritrea	Target Under Discussion	2050
Estonia*	Target Under Discussion	2050
Ethiopia	Target Under Discussion	2050
European Union	Proposed Legislation	2050
Fiji	Proposed Legislation	2050
Finland*	In Policy Document	2035
France*	In Law	2050
Gambia (the)	Target Under Discussion	2050
Germany*	In Policy Document	2050
Greece	Target Under Discussion	2050
Grenada	Target Under Discussion	2050
Guinea	Target Under Discussion	2050
Guinea-Bissau	Target Under Discussion	2050
Guyana	Target Under Discussion	2050
Haiti	Target Under Discussion	2050
Hungary*	In Law	2050
Iceland	In Policy Document	2040
India	Target Under Discussion	2070
Indonesia	In Policy Document	2060
Ireland*	In Policy Document	2050
Israel	Target Under Discussion	2050

Country	Status	Year
Italy*	Target Under Discussion	2050
Jamaica	Target Under Discussion	2050
Japan	In Law	2050
Kazakhstan	In Policy Document	2060
Kiribati	Target Under Discussion	2050
Korea (the Republic of)	In Law	2050
Lao People's Democratic Republic (the)	Target Under Discussion	2050
Latvia*	Target Under Discussion	2050
Lebanon	Target Under Discussion	2050
Lesotho	Target Under Discussion	2050
Liberia	Target Under Discussion	2050
Lithuania*	Target Under Discussion	2050
Luxembourg	Target Under Discussion	2050
Madagascar	Target Under Discussion	2050
Malawi	Target Under Discussion	2050
Malaysia	In Policy Document	2050
Maldives	Target Under Discussion	2050
Mali	Target Under Discussion	2050
Malta*	Target Under Discussion	2050
Marshall Islands (the)	In Policy Document	2050
Mauritania	Target Under Discussion	2050
Mauritius	Target Under Discussion	2050
Mexico	Target Under Discussion	2050
Micronesia (Federated States of)	Target Under Discussion	2050
Monaco	Target Under Discussion	2050
Mozambique	Target Under Discussion	2050
Myanmar	Target Under Discussion	2050
Namibia	Target Under Discussion	2050
Nauru	Target Under Discussion	2050
Nepal	In Policy Document	2045
Netherlands (the)	Target Under Discussion	2050
New Zealand	In Law	2050
Nicaragua	Target Under Discussion	2050
Niger (the)	Target Under Discussion	2050
Nigeria**	In Policy Document	second half of century
Niue	Target Under Discussion	2050
Norway	In Policy Document	2050
Panama	In Policy Document	2050
Pakistan	Target Under Discussion	2050
Palau	Target Under Discussion	2050
Papua New Guinea	Target Under Discussion	2050
Peru	Target Under Discussion	2050
Portugal*	In Policy Document	2050
Romania*	Target Under Discussion	2050
Russia	Target Under Discussion	2060
Rwanda	Target Under Discussion	2050
Saint Kitts and Nevis	Target Under Discussion	2050
Saint Lucia	Target Under Discussion	2050

Country	Status	Year
Saint Vincent and the Grenadines	Target Under Discussion	2050
Samoa	Target Under Discussion	2050
Sao Tome and Principe	Target Under Discussion	2050
Saudi Arabia	Target Under Discussion	2060
Senegal	Target Under Discussion	2050
Seychelles	Target Under Discussion	2050
Sierra Leone	Target Under Discussion	2050
Singapore	In Policy Document	2060
Slovakia*	Target Under Discussion	2050
Slovenia*	In Policy Document	2050
Solomon Islands	Target Under Discussion	2050
Somalia	Target Under Discussion	2050
South Africa	In Policy Document	2050
South Sudan	Target Under Discussion	2050
Spain*	Proposed Legislation	2050
Sri Lanka	In Policy Document	2050
Sudan (the)	Target Under Discussion	2050
Suriname	Achieved	
Sweden*	In Law	2045
Switzerland	In Policy Document	2050
Tanzania, United Republic of	Target Under Discussion	2050
Thailand	In Policy Document	2070
Timor-Leste	Target Under Discussion	2050
Togo	Target Under Discussion	2050
Tonga	Target Under Discussion	2050
Trinidad and Tobago	Target Under Discussion	2050
Turkey	Target Under Discussion	2053
Tuvalu	Target Under Discussion	2050
Uganda	Target Under Discussion	2050
Ukraine	In Policy Document	2060
United Arab Emirates	Target Under Discussion	2050
United Kingdom of Great Britain and Northern Ireland (the)	In Law	2050
United States of America (the)	In Policy Document	2050
Uruguay	Target Under Discussion	2030
Vanuatu	Target Under Discussion	2050
Yemen	Target Under Discussion	2050
Zambia	Target Under Discussion	2050

* Note: All Member States of the EU27 are included in the modelling runs through EU27, not individually.

** Nigeria announced a 2060 net zero target during the World Leaders Summit. We will update our analysis for Nigeria to take this development into account in our next assessment.

A4 Differences between Climate Action Tracker, UNFCCC Synthesis Report & UNEP Gap Report

Several studies, including the Climate Action Tracker, UNFCCC Synthesis Report (UNFCCC, 2021) & UNEP Emissions Gap Report (UNEP, 2021), illustrate the state of climate action in terms of end-of-century warming, the gigaton gap in emissions between where we are and a 1.5°C compatible level, or level of emissions reduction achieved. These reports are fully aligned after closer examination of the underlying methodological assumptions, even if at first glance estimates may appear to differ.

The studies are characterised as follows:

- The Climate Action Tracker provides a temperature estimate based on bottom-up, detailed and up-to-date policy and emission information of 39 countries plus the EU27 scaled to the global level.
- The UNEP Emissions Gap Report compares and synthesises eight studies using very different methodologies to derive global GHG emissions and estimate resulting temperature outcomes. CAT is one of the studies used in the UNEP emissions gap report to derive emissions.
- The UNFCCC Synthesis report is an independent analysis that only takes information reported by national governments under the Paris Agreement and compares the result to a global pathway in the literature.

The main messages hold over all three reports:

- The new round of NDCs decreases global greenhouse gas emissions expected for 2030, but narrows the gap to a 1.5°C compatible pathway only to a limited extent.
- Under current policies, temperature increase by 2100 is expected to be slightly below 3°C.
- With full implementation of NDCs, temperature increase by 2100 is expected to be lower than under current policies, i.e. between 2°C and 3°C. It is at the lower end of this range if not only the 2030 targets but also the submitted long-term targets are taken into account.
- With full implementation of all adopted and announced national net zero targets, temperature increase by 2100 could be around 2°C.

Table 7: Comparison of temperature estimates for 2100 (limit reached with 66% probability. CAT usually uses 50% probability)

	66% chance to be below…		
	CAT Nov 2021	UNEP Oct 2021	UNFCCC Oct 2021
Current Policies	2.9°C	2.8°C	N/A
Pledges	2.3°C	2.7°C	2.7°C
Net zero targets	2.0°C	2.2°C	N/A

In this section, we outline the differences in CAT methodology and that used by the UNFCCC Secretariat in its recent NDC Synthesis Report as well as the UNEP Emissions Gap Report.

Estimation of emissions in 2030 based on NDCs

One major difference is how the studies estimate the impact of NDCs on resulting 2030 emissions and an emissions gap in $GtCO_2e$. The Climate Action Tracker and UNEP Emissions Gap Report use more optimistic assumptions (including announcements and taking into account overachievement of NDCs) and therefore derive a slightly lower emissions gap in 2030 than the UNFCCC synthesis report.

Table 8: Methodological differences that affect the estimation of the 2030 emissions gap

	Climate Action Tracker	UNEP Emissions Gap Report	UNFCCC synthesis report
Including official submissions or announcements	Also includes announcements that are not yet submitted to UNFCCC (e.g.Republic of Korea) (Lower emissions)	Summarising studies, some of which some include announcements, others do not (Lower emissions)	Only officially submitted information (Higher emissions)
Overachievements of NDCs	Takes the current policy scenario for countries that overachieve their NDCs with current policies (Lowest emissions)	Takes the average current policy scenario from studies for countries that overachieve their NDCs with current policies (Lower emissions)	Assesses only the NDCs (Higher emissions)
Emissions in 2030 compatible with 1.5°C	26 $GtCO_2e$	25 $GtCO_2e$	29 $GtCO_2e$
Gap between unconditional NDCs and a 1.5°C compatible pathway	19-23 $GtCO_2e$ (November 2021 analysis)	22-28 $GtCO_2e$ (October 2021 analysis)	27 $GtCO_2e$ (October 2021 analysis)

The UNFCCC Synthesis Report released in October 2021 found that emissions under the current NDCs are set to be 16% higher than emissions levels in 2010. But this assumes that countries with very weak NDCs will grow their emissions to grow beyond what a business-as-usual trajectory based on current policies suggests. The Climate Action Tracker's analysis removes this 'hot air' and uses likely 2030 emission levels based on current policies, and finds that by 2030 emissions are set to rise by 1% from 2010 levels. This is still far short of the halving of emissions seen in 1.5°C compatible pathways, but at least suggests that emissions are flatlining, not continuing to rise.

Current policy estimates

The estimation of current policy projections for 2030 differs for the studies:

- The CAT includes the latest developments, which are usually trends that lead to decreasing emissions, including the faster uptake of renewables and the dip due to the COVID-19 pandemic in its estimate for 2030 emissions under current policies and action.
- UNEP compares and synthesises a set of studies. Not all studies used in the UNEP report include these latest developments. The CAT's estimate is the lowest of all the studies considered by UNEP.
- The UNFCCC synthesis report does not include a current policies projection.

This also has an effect on the estimate of pledges and targets, because several large countries are likely to overachieve their pledges (India, Russia), and in such cases the overachieving policies are assumed also in the "pledge" scenario in CAT results (see NDC estimates above).

Long term and net zero targets

Temperature increase by 2100 is significantly influenced by the emissions after 2030 and therefore by the inclusion of long term targets of countries. The methods of CAT and UNEP are compared in more detail in a paper in Nature Climate Change (Höhne et al., 2021).

Table 9: Long-term targets considered when estimating temperature increase

	Climate Action Tracker	UNEP Emissions Gap Report	UNFCCC synthesis report
NDC scenario	Includes 2050 targets submitted to the UNFCCC (lower temperature)	Does not include any 2050 targets (higher temperature)	Does not include any 2050 targets (higher temperature)
Net zero scenario	Includes announced and agreed net zero targets of over 140 countries, including CO_2 and non-CO_2.	Includes net zero targets of selected countries and CO_2 effect only	(Does not include a Net Zero scenario)

Climate system uncertainty

All studies have large uncertainty bands for the uncertainty of the climate system, and how it reacts to increased greenhouse gas concentrations. These bands are wider than the difference between the estimates of the individual studies.

The studies also differ in which value of the full band they report as the default:

- The CAT uses the "best guess" (median) estimate, i.e. temperature level at which there is a 50% chance that it is above and a 50% that it is below that level.
- UNEP uses a "likely below" estimate, i.e. there is a "likely" chance (66%) that the temperature is below this level.
- UNFCCC synthesis report also uses a "likely below" estimate, i.e. there is a "likely" chance (66%) that the temperature is below this level.

Comparison of temperature estimates

All three estimates can be translated in the same metric (see table below). Differences between estimates should be compared at the same probability level.

Table 10: Comparison of temperature estimates for 2100

	50% chance to be below…			66% chance to be below…		
	CAT Nov 2021	UNEP	UNFCCC	CAT Nov 2021	UNEP Oct 2021	UNFCCC Oct 2021
Current Policies	2.7°C	N/A	N/A	2.9°C	2.8°C	N/A
Pledges	2.1°C	N/A	N/A	2.3°C	2.7°C	2.7°C
Net zero targets	1.8°C	N/A	N/A	2.0°C	2.2°C	N/A

References

Höhne, N., Gidden, M. J., den Elzen, M., Hans, F., Fyson, C., Geiges, A., Jeffery, M. L., Gonzales-Zuñiga, S., Mooldijk, S., Hare, W., & Rogelj, J. (2021). Wave of net zero emission targets opens window to meeting the Paris Agreement. Nature Climate Change, 11(10), 820–822. https://doi.org/10.1038/s41558-021-01142-2

UNEP. (2021). UNEP Emissions Gap Report 2021. https://www.unep.org/resources/emissions-gap-report-2021

UNFCCC. (2021). Nationally determined contributions under the Paris Agreement Revised synthesis report by the secretariat, FCCC/PA/CMA/2021/8/Rev.1. In English. https://unfccc.int/sites/default/files/resource/cma2021_08rev01_adv.pdf

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ANNEX 2: GLASGOW SECTORAL INITIATIVES CURRENTLY CLOSE THE 2030 EMISSIONS GAP BY 9%

Climate Action Tracker

COP26 Glasgow

INITIAL ASSESSMENT

Climate Action Tracker

Glasgow sectoral initiatives currently close the 2030 emissions gap by 9%

November 2021

CLIMATE ANALYTICS

NEW CLIMATE INSTITUTE

Summary

The key sectoral pledges announced at COP26 in Glasgow on methane, the coal exit, transport and deforestation would **close the 2030 emissions gap between a 1.5°C path and government targets by around 9% - or 2.2 $GtCO_2e$**. This includes only the signatories of respective initiatives as of 10 November 2021, and only accounts for reductions that are not already planned to achieve the submitted NDCs.

With the Glasgow sectoral initiatives, the **emissions gap in 2030 reduced by a total of 24–25%**; the sectoral initiatives add to the NDC updates, which alone reduced the gap by 15-17% (Climate Action Tracker's latest analysis).

Sectoral initiatives help implement action, but with current signatories only narrow the emissions gap to a limited extent. We would recommend that governments update their NDCs if participation in the initiative is not covered already by their target. If these initiatives gather more signatures, they could further reduce the gap by several $GtCO_2e$.

Even with all new pledges and such sectoral initiatives for 2030, global emissions are still expected to be almost twice as high in 2030 as necessary to for a 1.5°C compatible pathway. Therefore, all governments need to reconsider their targets towards COP27 in 2022 to jointly enhance mitigation ambition.

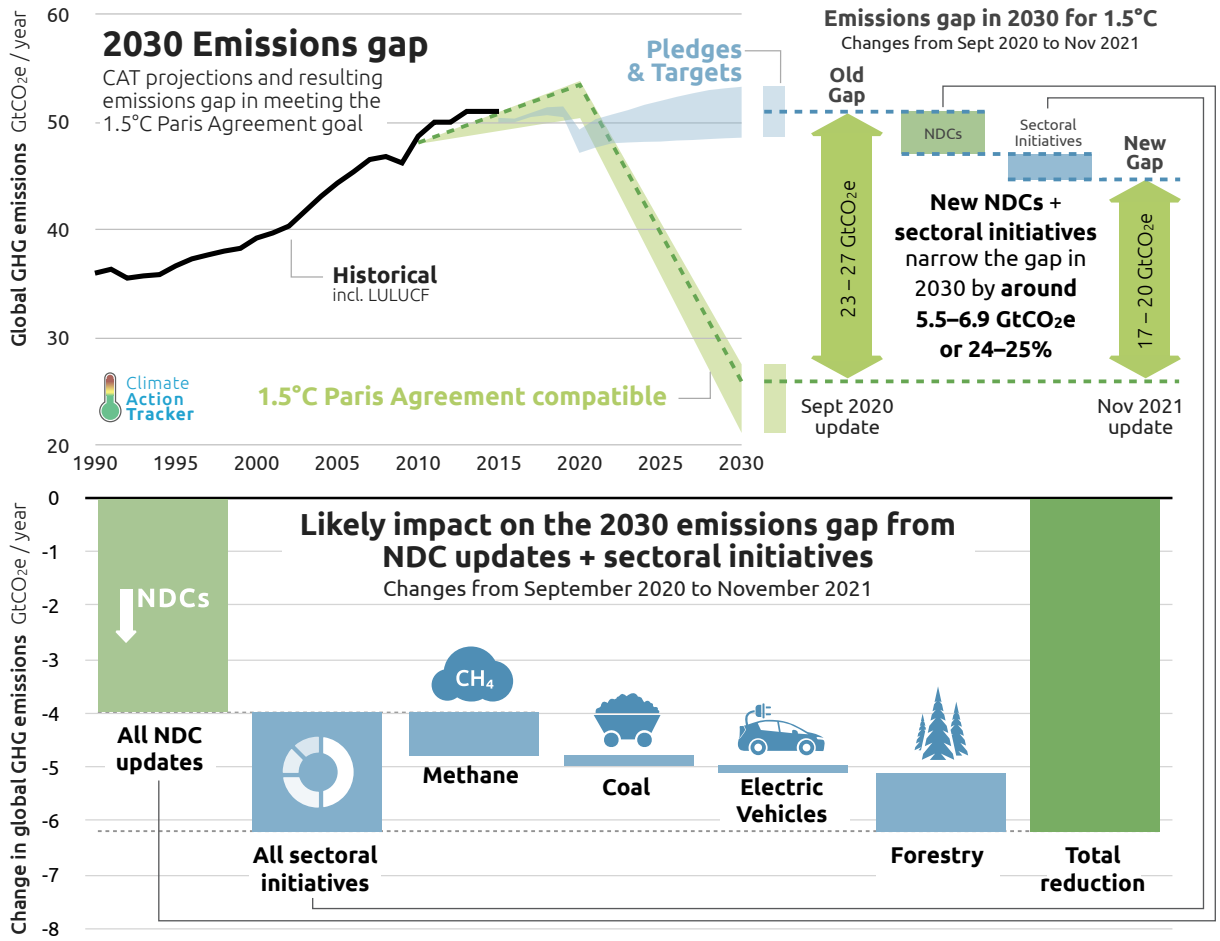

Figure 1 Potential of sectoral initiatives (methane, deforestation, coal exit, electric mobility) announced at COP26 to close the 2030 emissions gap in addition to new Glasgow NDC updates. Note: The likely emission reduction impact of updated NDCs ranges from 3.3 to 4.7 $GtCO_2e$ (15-17% of the 2030 emissions gap), displayed as the average of 4 $GtCO_2e$ above.

Global Methane Pledge (GMP)

CAT estimates

Likely impact: The participant countries of the Global Methane Pledge (GMP) are collectively expected to deliver 0.8 $GtCO_2e$ (range of 0.6–1.1 $GtCO_2e$, "likely impact") of additional emissions reductions in 2030 compared to the CAT 'pledges and targets' scenario.

Potential impact: If all those who did not sign up to this pledge, including large methane emitters like China, India and Russia were to sign up, the additional emission reductions could be as high as 1.4–2.4 $GtCO_2e$ below the 'pledges and targets' scenario projections.

The Global Methane Pledge (GMP)

The GMP is an initiative led by the United States and the European Commission to reduce global anthropogenic methane (CH_4) emissions across all sectors by 30% below 2020 levels by 2030. The GMP was launched during the first week of COP26 and, as of 11 November 2021, 108 countries and the European Commission have signed up to the initiative.

Methodology

Using the PRIMAP-Hist emissions database (which is based on country-reported data where available), we estimated that the GMP participant countries as of 11 November 2021 collectively cover about 45% of global anthropogenic CH_4 emissions in 2019, which were 319 $MtCH_4$ or 8 $GtCO_2e$. CH_4 emissions for 2020, the reference year used by the GMP, was assumed to remain at 2019 levels.

For country-specific emission estimates under the NDCs, the lower bound estimates assumed the growth rates of CH_4 emissions between 2019 and 2030 to be identical to those for all greenhouse gases under the NDC scenario projections; the upper bound estimate assumed that the 2030 emissions would remain at 2019 levels. The resulting CH_4 emissions projections in 2030 for the current GMP participants under NDCs were collectively 8% below the 2019 levels (range of 0–15%). We count the difference of 30% - 8% = 22% as additional to NDCs.

Global Coal to Clean Power Transition Statement

CAT estimates

Likely impact: We calculate the current signatories to the UK Presidency's COP26 Global Coal to Clean Power Transition Statement will collectively deliver 0.2 $GtCO_2e$ additional emissions reductions in 2030 above the CAT 'pledges and targets' scenario ("likely impact"). This remains far from the required 80% reduction of global coal use in electricity generation below 2010 levels.

Potential impact: If the membership of this pact were to include all OECD countries, and those countries with the largest coal pipelines, the impact could grow to around 2 $GtCO_2e$.

Global Coal to Clean Power Transition Statement

The detail of what governments have committed to is important. Clause 2 of the statement says signatories will "transition away from unabated coal generation in either the 2030s for major economies," or 2040s otherwise. Clause 3 states that signatories pledge "to cease issuance of new permits and stop new construction for any planned coal plants which have not already achieved financial closure." Some governments (Morocco) have not signed up to Clause 2, or to Clause 3 (Indonesia, The Philippines and Botswana). The Philippines has 'partially' signed up to Clause 2. After the announcement, Poland indicated it will not phase out coal before 2049.

We calculate that the current signatories to Clause 2 are collectively expected to deliver below 0.1 $GtCO_2e$ ("likely impact") of additional emissions reductions in 2030 compared to the CAT 'pledges and targets' scenario. This assumes all major economies that signed up to the pledge would phase out their existing coal fleet by 2035. A phase-out later in the decade would lead to an even smaller contribution in reducing the emissions gap. This low estimate of additional emission reductions is driven by the fact that phasing out coal long after 2030 only affects emissions in 2030 to a limited extent.

When assuming all major economies in the world would phase out their existing coal fleet by 2035, we arrive at an emissions reduction potential of around 0.8 $GtCO_2e$ ("potential impact"). Our findings emphasise the need for coal-fired power generation to decline rapidly over this decade, with OECD countries phasing out coal completely by 2030, and a global phase-out by 2040. This is a key transformation necessary to keep the 1.5°C warming limit of the Paris Agreement in sight.

Signatories to Clause 3 commit to cancelling their full coal plant pipeline which have not already achieved financial closure. Here, we calculate that signatories, collectively, will deliver around 0.08 $GtCO_2e$ ("likely impact") of additional emissions reductions in 2030 compared to the CAT 'pledges and targets' scenario. Some countries with the some of largest coal capacity pipelines, such as Indonesia, the Philippines, and Botswana have explicitly excluded signing up to this clause.

If every country in the world, including these three countries, were to cancel all their coal power plant development plans, we estimate the overall emissions reduction potential by 2030 to be 1.2 $GtCO_2e$.

Methodology

We assume for clause 2 signatories a phase-out of coal by 2035 for major economies committed to the pledge given its broad definition of transitioning away from unabated coal generation in 2030s for major economies, with a linear reduction of coal capacity from 2022. For other signatories we assume there will be no impact on emissions reductions on their 2030 emissions, because the phase-out is only required to occur in the 2040s. We have not counted the impacts for governments that already include a coal phase-out in their NDCs. We assess likely avoided emissions based on the full closure of the coal pipeline of clause 3 signatories, unless countries have explicitly excluded this clause.

To assess the full potential of emissions reduction from the pledge, we assume a coal phase-out for all OECD countries by 2035 with a linear reduction from 2022 and full cancellation of the coal pipeline worldwide. The current capacity and the coal pipeline capacity are taken from the Global Coal Plant Tracker.

Declaration on Accelerating the Transition to 100% Zero Emission Cars and Vans

CAT estimates

Likely impact: We calculate that the current signatories of the COP26 declaration on accelerating the transition to 100% zero emission cars and vans are collectively expected to deliver below 0.1 $GtCO_2e$ ("likely impact") of additional emissions reductions in 2030 compared to the CAT 'pledges and targets' scenario.

Potential Impact: If all government, including major automobile manufacturing countries such as Germany and the United States, were to sign up to the declaration, the additional emission reductions could be as high as 0.75 $GtCO_2e$ below 'pledges and targets' scenario projections ("potential impact").

Declaration on accelerating the transition to 100% zero emission cars & vans

The declaration on accelerating the transition to zero emission vehicles led by the UK COP26 Presidency aims to reach a 100% share of new cars and vans being zero emissions globally by 2040, and by no later than 2035 in leading markets. These benchmarks are in line with the Climate Action Tracker's Paris Agreement compatible benchmark for passenger transport, to reach at least a 95% market share by 2030 for developed countries, and 100% in almost all countries by 2040.

As of 10 November 2021, a total of 22 countries have signed up to the declaration's clause 2-A, committing to the a phase out by 2035 for leading markets (18 signatories) and 2040 for non-leading markets (4 signatories) respectively. At the time of writing, signatories from major automobile manufacturing countries such as Germany, Japan, the United States, China, or France are missing.

Other clauses in the declaration provide dates for non-state actors (by 2035 for public vehicle fleets), automobile manufacturers (all sales by 2035), business fleet owners (by 2030 for fleet), and investors (all sales by 2035) to switch to zero emission new cars and vans. We have not quantified the impact of these actors.

Methodology

Using the IEA Greenhouse gas emissions from energy database, we estimated that the signatory countries to clause 2-A, as of 10 November 2021, collectively cover about 9% of global road transport emissions in 2019 (including passenger, freight, and public transport), which were roughly 6 $GtCO_2e$.

For country-specific emission estimates under the NDCs in 2030, we assume the average growth rates of road transport emissions between 2019 and 2030 to be identical to those for all greenhouse gases under the NDC scenario projections.

To calculate the "likely impact", we compare these estimates for 2030 to estimates of a linear emissions reduction to a fully decarbonised road transport sector, assuming a lifetime of 15 years for internal combustion engine vehicles. Hence, we assume a car fleet of 100% EVs in 2050 for leading markets and 2055 in non-leading markets.

For our "potential impact" estimate assessing emissions savings by 2030 from reaching 100% global EV sales by 2035, we use a global s-curve stock model of Light Duty Vehicles fleet assuming a carbon intensity of electricity consistent with the IEA Beyond 2 Degrees Scenario (B2DS). We compare the level of emissions obtained to the projected emissions from the Transport Summary from the Energy Technology Perspective Reference Scenario for Light Duty Vehicles in order to estimate overall reduction potential. We do not consider other modes of transport including heavy duty vehicle and non-passenger vehicle road transport.

For comparability, the potential emissions from the IEA B2DS scenario against its reference case would lead to around 1.6 $GtCO_2e$ for Light Duty Vehicles. We further assume that approximately half of these reductions are already embedded in stronger NDCs including, e.g., the EU and US NDCs which explicitly include transport electrification components. For the UK, we already include the 2035 target in our current policy projections as part of the UK's Ten Point Plan.

Glasgow Leaders' Declaration on Forests and Land Use

CAT estimates

Likely impact: We calculate the more than 100 signatories to the Glasgow Leaders' Declaration on Forests and Land Use, could deliver 1.1 $GtCO_2$ ("likely impact") of additional emissions reductions in 2030 compared to the CAT 'pledges and targets' scenario.

Potential impact: We estimate a maximum potential on top of existing commitments and targets to be about a total of around 2-3 $GtCO_2$ if all countries were to sign up, including Indonesia, which later reversed its decision. However, the lack of progress by many signatories in keeping to previous commitments to end deforestation under the New York Declaration on Forests, brings into question how this Glasgow declaration will be converted into concrete action on the ground.

Glasgow Leaders' Declaration on Forests and Land Use

More than 100 global leaders pledged "to halt and reverse forest loss and land degradation by 2030" at the beginning of COP26. We interpret this pledge as halting all deforestation within a signatory's borders by 2030, and therefore look to the latest available data of emissions due to deforestation as reported by individual countries.

Emissions from deforestation and land-related activities are highly uncertain, as are estimates of potential emissions reductions and removals through action in this sector. According to nationally reported data, in 2015 the level of emissions from deforestation was around 4.5 $GtCO_2$, globally. We take this as a likely upper limit to the potential for mitigation through reducing deforestation, noting that deforestation emissions have recently been on an upwards trend.

Some of this potential is already captured by the NDCs. Grassi et al (2017) estimated that LULUCF emissions under the NDCs would be at least 1 $GtCO_2$ lower than under existing policies, but this is not only from deforestation; forest and ecosystem restoration are also included in a number of NDCs. An alternative way to estimate the effect of NDCs is to look at modelled results of emission pathways that are largely in line with current NDCs, which see a downward trend in land-use emissions. While their starting points vary, the best estimate of LULUCF CO_2 reductions arising from these scenarios is 33% resulting from policy action consistent with NDCs. From these estimates of the LULUCF mitigation covered by the NDCs, we assume that reducing deforestation makes up a large component.

Many countries had previously signed up to the 2014 New York Declaration on Forests, committing to halt and reverse global forest loss. Of the 4.5 $GtCO_2$ of deforestation emissions in 2015, around 1.5 $GtCO_2$ are from countries that signed up to both the New York declaration and the recent pledge in Glasgow, suggesting that reducing these emissions would not be additional. Considering only signatories that have not also signed up to the New York declaration, we estimate a maximum of around 2 $GtCO_2$ of deforestation emissions reductions could be additional to what is in the NDCs, or up to around 3 $GtCO_2$ if all other countries were to sign up.

For this level of additional mitigation to be realised, emissions from deforestation in countries with the highest rates of forest loss need to drop to zero by 2030. This would require a dramatic improvement and expansion in forest protection, and unfortunately the experience from previous commitments–including the New York declaration–suggest that this will be a challenge to implement.

Indonesia has already changed course since signing the pledge, and the lack a deforestation target in Brazil's updated NDC suggests that a key signatory has no plan in place to implement the commitment. Until we see the necessarily levels of finance, governance and plans, measures on the ground and systems for monitoring progress, we cannot be confident that these emissions reductions will be achieved.

Methodology

We estimate the potential impact of this pledge by combining our land-use policy projects for countries within the Climate Action Tracker with relevant country-reported data as well as data on forestry removals and gross deforestation emissions from Grassi et al (2021). For countries we assess,

we estimate net land-use emissions under current policies in 2030 or a government projection, if available, to determine the total potential for the pledge for these countries. For countries we do not assess in detail in the Climate Action Tracker, we look at net emissions from Grassi et al. (2021). In both cases, we exclude any country which has previously signed up to deforestation pledges (the NYCDF). In total we arrive at 1.1 $GtCO_2$, of which potential contributions from Brazil comprise about 20%.

To arrive at our maximum potential estimate, we assess the total carbon fluxes from deforestation to date in Grassi et al. (2021) and apply a reduction factor based on LULUCF emissions in current policy scenarios from the relevant scientific literature. We arrive at an estimate of approximately 3 $GtCO_2$, given that scenarios reduce such emissions by about 1/3 in the 2020s.

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