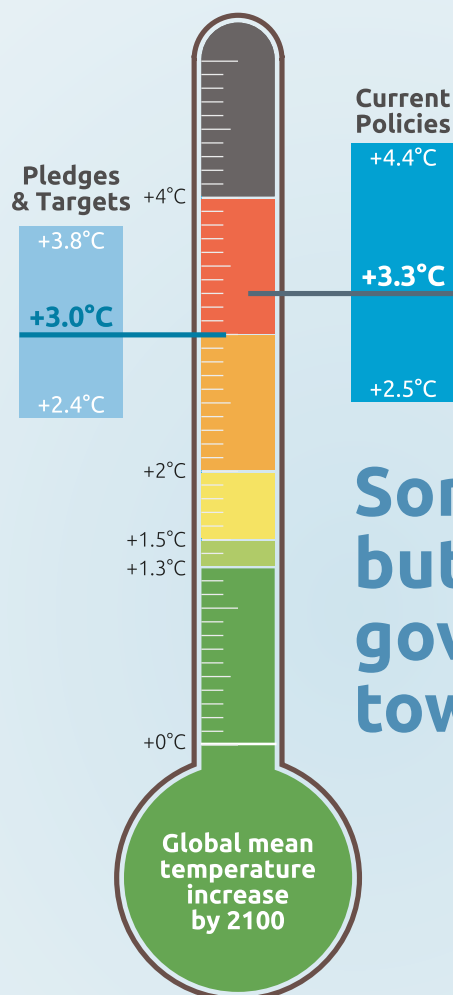




Some progress since Paris,
but not enough, as
governments amble
towards 3°C of warming

Climate Action Tracker

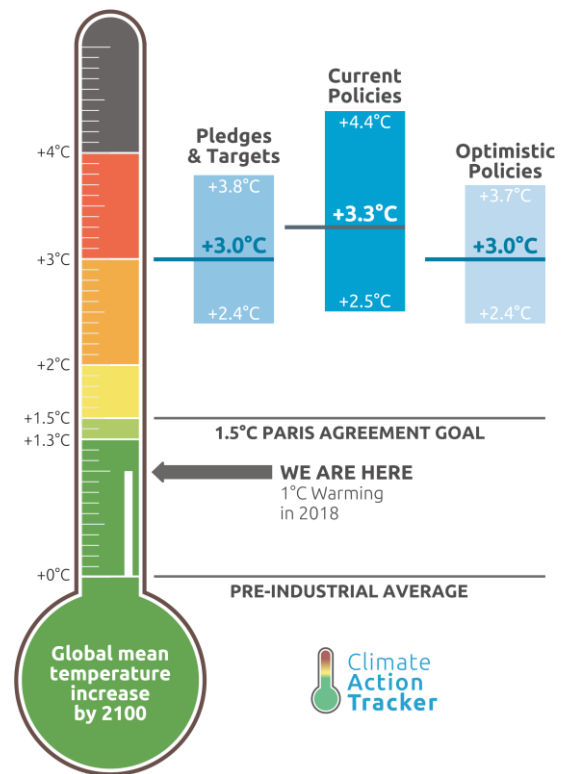
WARMING PROJECTIONS GLOBAL UPDATE

December 2018

Summary

The Climate Action Tracker (CAT) estimate of the total warming of the aggregate effect of Paris Agreement commitments and of real-world policy shows little change. If all governments achieved their Paris Agreement commitments the world will likely warm 3.0°C—twice the 1.5°C limit they agreed in Paris.

- Underneath the lack of progress at the global level, however, the CAT has detected real movement in a number of countries which, if extended, could bend the global emissions curve downward.
- No government ¹ has yet increased its Paris Agreement commitment, so there has been almost no change to the Climate Action Tracker's country ratings. Under the Paris Agreement enabling decisions all countries are to update their commitments—or Nationally Determined Contributions (NDCs)—by 2020.
- Little to no progress has been detected globally on climate action either, with the total global effect of currently implemented policies in countries expected to lead to warming of 3.3°C by 2100, which is still above the Paris Agreement commitment level.
- If governments, however, were to implement the planned or additional policies they have in the pipeline, warming could be reduced by 0.3°C to 3.0°C by 2100, with global emissions in 2030 projected to be a little below those under full implementation of the Paris commitments.



The CAT's projected warming from Paris Agreement commitments and real-world action of 3.0°C and 3.3°C, respectively, and lack of progress in advancing action stands in stark contrast to both the clear warning from the IPCC in its Special Report on 1.5°C of the consequence of exceeding 1.5°C warming and the strong finding that limiting warming to this level is feasible and has substantial economic and sustainable development benefits.

- **To find out whether there has been any progress on the ground, the CAT has looked at the most recent policy movements made by governments since Paris in 2015.**
 - The majority of countries we track have not yet fully aligned their policies to actually achieve their commitments under the Paris Agreement.
 - However, we do detect real movement, with Argentina, Canada, Chile, Costa Rica, Ethiopia, the EU, India and Morocco taking significant steps in the right direction.
 - There has also been some movement in most of the other countries.
 - If extended and scaled, these combined efforts could begin to bend the global emissions curve.
 - Countries with no progress or movements in the wrong direction in emission reduction terms include Australia, Brazil, Indonesia, Russia and the UAE.
 - In the USA the Trump Administration continues its efforts to unwind policy, however emissions are slowing as coal continues to exit the power market, driven by the declining costs of renewables and storage.

¹ of the 32 countries the Climate Action Tracker follows.

- **Progress on climate action has been mixed in 2018:**
 - While some countries, such as **Norway** and **Costa Rica** are forging ahead with decarbonisation of transport and renewable energy deployment, others risk losing their climate leadership positions, such as **China**, where coal use rose again for a second year running, and **Brazil** which appears to have turned away from its forest protection policies even before its recent change of government.
 - Several countries published, adopted or reinforced energy or electricity sector roadmaps which gives reason for hope, such as **Chile's** 2050 energy strategy which aims at decarbonising the energy system, **India** adopting its National Electricity Plan and **South Africa's** long-awaited energy resource strategy which foresees a shift away from coal toward renewables and gas.

The changes in CAT's warming estimates in this update are largely due to improvements in methodology and data updates rather than actual government action in any direction.

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Introduction

At the centre of the Paris Agreement are the government commitments to cut emissions—the Nationally Determined Contributions (NDCs). In Paris in 2015, governments had already formally acknowledged that their combined commitments were far from sufficient to meet the Agreement’s long-term temperature goal of holding warming well below 2°C and limiting it to 1.5°C.

The Talanoa Dialogue provides the first opportunity for governments to take stock of how their commitments stack up, and the IPCC Special Report on 1.5°C provides the scientific basis—and call to action—for them to ratchet up their climate ambition and upgrade their NDCs by 2020.

Evaluating progress towards the Paris Agreement’s 1.5°C warming limit

Collectively, current government NDCs are likely to lead to global warming of about 3.0°C above pre-industrial levels by 2100² (range of 2.4–3.8°C due to uncertainty in carbon-cycle and climate modelling).³ The 3.0°C warming estimate in this year’s CAT update is somewhat lower than the 3.2°C in 2017, but the change is purely methodological⁴ rather than due to improvements in government action; see (Gütschow, Jeffery, Schaeffer, & Hare, 2018).

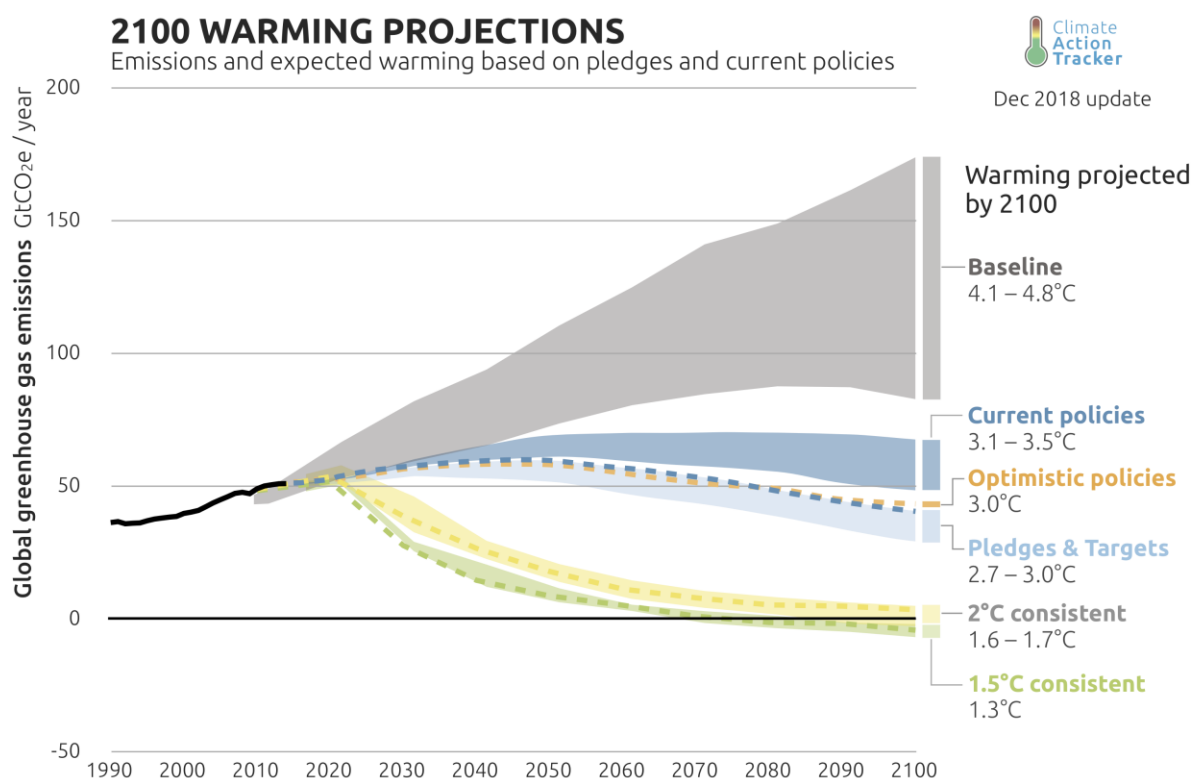


Figure 1 Expected global temperature increase by the end of the century compared to pre-industrial levels implied by global emissions pathways in 6 scenarios: Baseline emissions, emissions compatible with warming of 1.5°C and 2°C, respectively, and the three scenarios resulting from aggregation of our 32 country assessments: Pledges & targets, Current policies and an optimistic scenario. Ranges indicated uncertainty in emissions projections, dotted lines indicate median (50%) levels within these ranges.

² The CAT is a central contributor to the UNEP Emissions Gap Report series, ever since the very first of such reports in 2010. Our 2018 projection of warming by end of century implied by current NDCs is consistent with the estimate in UNEP’s 2018 report of 3.0°C.

³ The “central” (median) estimate of 3.0°C is consistent with a likely (66% or greater chance) of a global average temperature increase below 3.2°C in 2100. This result is similar to our estimate last year, reflecting the fact that little has changed in terms of government commitments and targets in the past 12 months.

⁴ Related to necessary scientific updates, including up-to-date estimates of historical and present-day emissions and the methodology and mitigation scenario library that determines how the “level of effort” over the period to 2030 continues post-2030 and translates into emissions projections and hence warming to end of century

Last year was the first time the warming under CAT's "current policy projections" dropped (from 3.6°C to 3.4°C) due to actual positive developments (China, India). This year presents a stagnation: Currently implemented policies translate into a temperature increase of 3.3°C⁵—almost 2°C above the Paris Agreement's 1.5°C warming limit.⁶ Again, the slight decrease is due to methodological changes⁴.

Despite an overall stagnation (balancing out of positive and negative developments), there have been a multitude of changes in different countries:

- Due to its increased coal use in 2017 and 2018, we have revised the emissions for China upwards in our most optimistic policy scenario, still taking into account national renewable energy targets. Increased policy effort will be needed to turn China's coal consumption around and align it with a 1.5°C-compatible pathway.
- India adopted its National Electricity Plan (NEP), which we now include in our current policy scenario for the first time.
- US emissions projections for 2030 decreased compared to last year's projections, driven mainly by an increasing share of renewables and natural gas in the power sector. However, we expect US emissions to rise again in future given the on-going roll back of federal climate policy.

We also ran an "optimistic" scenario that factors in additional, as well as planned but not yet implemented policies and a continuation of recent developments. These include, for example, the European Union's renewable energy and energy efficiency targets adopted in June 2018, the Turkish National Energy Efficiency Action Plan, Saudi Arabia's 200 GW solar plant, Ukraine's 2050 Low Emissions Development Strategy, Argentina's renewable energy targets, South Africa's Draft Integrated Resource Plan, and the additional measures in Canada's Pan-Canadian Framework on Clean Growth and Climate Change.

Under the optimistic assumption that governments will continue to meet these expectations, the median warming estimate is 3.0°C⁷, which is equal to the globally aggregated effect of NDCs. However, this hides the large diversity of countries meeting or not meeting their NDCs that we explore in the next section.

Unpacking global progress by looking at country-level policies

As with to our warming results, there has been a lack of progress in the last 12 months in 1) the NDC ambition of the countries we rate and 2) their likelihood of achieving their NDC commitments. In the CAT framework of assessing country climate action, shown in Figure 2, this means we record a lack of progress on these two indicators over the last year. For more information see the next section.

This raises the question: what has actually happened since Paris? Are governments doing anything to move us in the right direction? To answer this question, we need to look carefully at policy developments in each country since they negotiated the Paris Agreement in 2015.

⁵ Likely below 3.6°C. Low and high end of policy projections resulting in median warming of 3.1°C and 3.5°C, respectively) in 2100. The modestly lower temperature increase projection (3.3°C) compared to last year (3.4°C) is due to the same technical and scientific updates as mentioned above for the Pledges & Targets pathway.

⁶ If fully implemented and policies of similar strength are implemented after 2030.

⁷ Likely below 3.2°C

CAT framework for evaluating progress on climate action

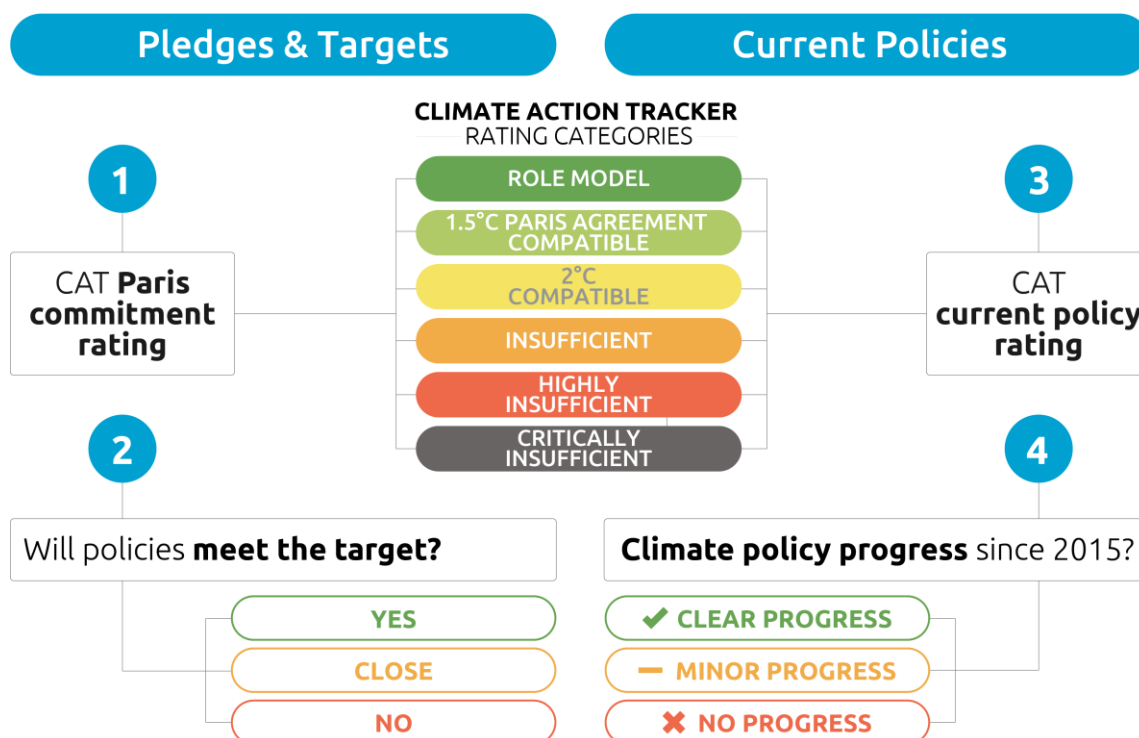


Figure 2 CAT framework for assessing country progress along four indicators: 1) the CAT rating of the country's commitment under the Paris Agreement, 2) whether current policies will meet that target, 3) which CAT rating the expected 2030 emissions levels would receive under current policy developments and, 4) a new indicator measuring policy progress since the Paris Agreement.

To understand whether there has been any real progress on the ground, we look at (recent) policy developments in individual countries and assess them using two additional indicators:

3) What would we rate the emissions level achieved under current policy?

and

4) Have any countries significantly progressed their policies in the right direction since Paris?

The first question we answered in our COP23 briefing, and we have updated our assessment for this year in Table 1. To answer the second question, we have taken a closer look at the changes in our current and planned policy projections since governments submitted their Intended Nationally Determined Contributions (INDCs) in the run-up to Paris in 2015.

We have developed a “current policy progress” assessment approach, described in more detail in Annex B. With this approach we assess whether countries have made significant progress *due to actual policy development*. Aside from policy developments there are several other elements influencing our current policy projections, such as methodological updates, changes in GDP projections or market developments. With this approach we have tried to tease out the real policy developments from these methodological and other changes to answer the question:

Can we detect a real-world policy shift that decreases the expected emissions for 2030?

Assessment of recent policy progress

For each of the 30 countries⁸ covered by the CAT we estimated the expected emissions reductions for 2030, compared to the same value three years ago by

- Looking at the difference in 2030 emissions from our assessments in 2018 versus our 2015 assessment
- Estimating which part of this decrease was due to real policy developments
- Adding on to this the expected additional emissions reductions in 2030 from planned (but not yet implemented) policies, moderated by our assessment of how likely it is that these policies will come to fruition

This resulted, for each country, in an estimate of the **total likely reduction in projected 2030 emissions** since the Paris Agreement in 2015. Based on the size of this reduction (relative to the 2015 value) we categorised the country with a 'Clear progress' indicator or a 'Minor progress' indicator. All other countries were given a 'No progress' indicator because emissions projections had either not changed, or changed only due to methodological changes, or policies had actually increased emissions projections.⁹

The results paint a more nuanced picture of country progress, compared to only looking at targets and absolute progress to date:

- Countries which have seen a significant emissions reduction due to policy changes at national level include *Argentina, Canada, Chile, Costa Rica, Ethiopia, the EU¹⁰ and India*. These countries represent around 20% of global emissions. We did not cover Morocco in 2015, but gave Morocco a 'Clear progress' indicator, due to the impressive progress in recent years. It is heartening to see Argentina take significant policy steps, which should allow it to strengthen its NDC for 2020, currently rated "Critically insufficient".
- Countries with no improvement in emissions outlook or a worsening policy situation due to policy changes include *Australia, Brazil, Indonesia, Russia, the UAE and the US*. These countries cover around a quarter of global emissions.
- Most other countries have at last seen some progress in the right direction although it is too early to tell whether this will be sustained.

The full approach is described in detail in Annex B.

⁸ The Climate Action Tracker currently tracks 32 countries. Two countries missing from this list are The Gambia and Bhutan as we do not have a current policy emissions projection for these.

Also note that for Morocco we did not have a 2015 current policy projection, but we have rated Morocco based on recent policy progress on the ground.

⁹ Our emissions projections only cover emissions excluding LULUCF. For countries where LULUCF emissions dominate the total GHG effect, we have also taken policy developments in the country into account and adapted the indicator accordingly.

¹⁰ The Climate Action Tracker treats the European Union as one 'country', meaning our ratings reflect European law rather than the individual local implementations of it.

Table 1 CAT current policy rating and progress indicator for policy movements since 2015

Climate Action Tracker December 2018 update		CAT current policy rating	Climate policy progress since 2015?
BEST IN CLASS			
 Ethiopia	1.5°C PARIS AGREEMENT COMPATIBLE	✓ CLEAR PROGRESS	
 Morocco	1.5°C PARIS AGREEMENT COMPATIBLE	✓ CLEAR PROGRESS*	
 Nepal	1.5°C PARIS AGREEMENT COMPATIBLE	✗ NO PROGRESS	
 India	2°C COMPATIBLE	✓ CLEAR PROGRESS	
MOVING, BUT A LONG WAY TO GO			
 Philippines	2°C COMPATIBLE	— MINOR PROGRESS	
 Costa Rica	INSUFFICIENT	✓ CLEAR PROGRESS	
 Switzerland	INSUFFICIENT	— MINOR PROGRESS	
 Canada	HIGHLY INSUFFICIENT	✓ CLEAR PROGRESS	
 Chile	HIGHLY INSUFFICIENT	✓ CLEAR PROGRESS	
 EU	HIGHLY INSUFFICIENT	✓ CLEAR PROGRESS	
 Argentina	CRITICALLY INSUFFICIENT	✓ CLEAR PROGRESS	
SIGNIFICANT ACTION NEEDED NOW			
 Brazil	INSUFFICIENT	✗ NO PROGRESS	
 Peru	INSUFFICIENT	✗ NO PROGRESS	
 China	HIGHLY INSUFFICIENT	— MINOR PROGRESS	
 Japan	HIGHLY INSUFFICIENT	— MINOR PROGRESS	
 Kazakhstan	HIGHLY INSUFFICIENT	— MINOR PROGRESS	
 Mexico	HIGHLY INSUFFICIENT	— MINOR PROGRESS	
 New Zealand	HIGHLY INSUFFICIENT	— MINOR PROGRESS	
 Norway	HIGHLY INSUFFICIENT	— MINOR PROGRESS	
 Singapore	HIGHLY INSUFFICIENT	— MINOR PROGRESS	
 South Africa	HIGHLY INSUFFICIENT	— MINOR PROGRESS	
DELAYING GLOBAL PROGRESS			
 Australia	HIGHLY INSUFFICIENT	✗ NO PROGRESS	
 Indonesia	HIGHLY INSUFFICIENT	✗ NO PROGRESS	
 Russian Federation	HIGHLY INSUFFICIENT	✗ NO PROGRESS	
 USA	HIGHLY INSUFFICIENT	✗ NO PROGRESS	
 Saudi Arabia	CRITICALLY INSUFFICIENT	— MINOR PROGRESS	
 South Korea	CRITICALLY INSUFFICIENT	— MINOR PROGRESS	
 Turkey	CRITICALLY INSUFFICIENT	— MINOR PROGRESS	
 Ukraine	CRITICALLY INSUFFICIENT	— MINOR PROGRESS	
 UAE	CRITICALLY INSUFFICIENT	✗ NO PROGRESS	

* The Climate Action Tracker did not track Morocco yet in 2015, the indicator here is based on recent policy developments.



China's projected 2030 energy related CO₂ emissions have stayed about the same¹¹ since 2015, with an upward shift in the last year. Around 2015, we observed a strong trend change in our projections: earlier projections assumed continuous growth of CO₂ emissions. However, energy-related CO₂ emissions between 2013 and 2016 were stable and even declined slightly, leading to a revision of our CO₂ emissions projections. 2017 emissions data show that this stabilisation is shaky; energy related CO₂ emissions increased, and are expected to do so again in 2018, due to a rise in coal consumption. As a result, our projections for 2030 increased compared to estimates made in the past few years.

Policy Developments	
+	13 th Five Year Plan + 58% cap on coal in primary energy supply in 2020 + Cap on energy demand in 2020 + Non-fossil electricity generation capacity targets
+	Targets and tax credits for new energy (including electric) vehicles
+	Emissions standards for heavy duty vehicles
+	National emissions trading system set to start in 2019
-	Sudden cuts to solar subsidies in 2018
-	Lift of ban on new coal-fired power plants in 2018
-	Insufficient policies to reduce non-CO ₂ emissions, which account for about 25% of GHG emissions in 2030 in our current policy scenario



Since 2015, the European Union has adopted several policies that decrease projected emissions levels, especially the introduction of the Market Stability Reserve and the energy efficiency directive. The newly adopted directives on energy efficiency and renewable energy—if effectively implemented by the member states (MS)—will have a significant impact on the EU's emissions. Combined, these developments will have a significant impact, resulting in the "Clear progress" indicator.

¹¹ When comparing our 2015 and 2018 assessment, there is a sizeable increase in total greenhouse gas emissions. Most of this increase is the result of using AR4 global warming potentials in 2018 vs SAR in 2015 and changes to the historical dataset. When comparing energy-related CO₂ emissions only, and adjusting for changes to historical data, we find that our most optimistic policy scenario has stayed about the same, and our most pessimistic policy scenario has risen by around 5%.

Policy Developments

- ⊕ EU ETS reform increased price of allowances from €5 in 2017 to ~€20 end of 2018
- ⊕ Renewable energy directive (RED II) and updated energy efficiency directive will reduce emissions by 47.5–49.7% in 2030 compared to 1990 (c.f. 40% NDC target)
- ⊕ The Governance Regulation obliges MS to regularly submit decarbonisation plans
- ⊕ Discussion on increasing standards for passenger cars and vans for 2025 and 2030 as well as introducing standards for heavy vehicles
- ⊕ Revised Energy Performance of Buildings Directive (EPBD) obliges MS to present long-term strategy with the aim of “highly energy efficient and decarbonised building stock by 2050”
- ⊖ European funds still used to develop fossil fuel infrastructure, especially natural gas pipelines
- ⊖ EU law still allows subsidies of carbon intensive power plants via capacity markets



The National Electricity Plan, adopted in 2018, represents an important step towards decarbonising India's energy supply. It is a bit less ambitious than the draft plan, but under current policies, India's NDC targets will be overachieved. If India were to strengthen policies, e.g. by halting coal power expansion or increasing its renewable targets, its current policy emissions level could be rated “1.5°C Paris Agreement compatible”.

Policy Developments

- ⊕ National Electricity Plan exceeding 40% non-fossil capacity target in 2030
- ⊕ The National Solar Mission scaled up in 2015 (100 GW solar, 60 GW wind, 10 GW biomass, 5 GW small-scale hydro)
- ⊕ Auctions observed a 50% decrease in the cost of solar power in the past two years
- ⊖ Unclear aims regarding electric vehicles, resulting in a sporadic uptake of EV technology across states
- ⊖ Increased capacity of coal-fired power projected in National Electricity Plan



Since 2015, Costa Rica has adopted policies in the energy, transport, agriculture, waste and forestry sectors, which have led to lower emission projection levels. The most prominent and recent policy refers to the electrification of its road transport sector—Costa Rica's largest emitting sector. We have estimated that Costa

Rica's emissions could peak before 2030 or continue to increase but at a lower rate depending on electric vehicle penetration resulting from its new law. Policies on the energy sector include a continuation of the support on renewable energy sources—which already account for a high share of its energy matrix.

Policy Developments	
+	New law on incentives and promotion of transport electrification could significantly slow emissions depending on private EV uptake.
+	Carbon Neutrality Programme 2.0: expansion of certification categories with the aim to attract more businesses and encourage other actors such as municipalities to participate.
+	The VII National Energy Plan 2015–2030 supports the continuation of renewable energy development, energy efficiency and low-carbon emissions transport
+	REDD+ National Strategy—and its implementation plan—designed to increase Costa Rica's forestry sector sink



Projected emissions levels for the USA in 2030 have decreased overall since our 2015 estimate, mostly due to increasingly competitive renewables prices, an influx of cheap natural gas, and methodological changes.

The previous administration under President Obama made significant policy progress, for example through the Clean Power Plan, which was reflected in our emissions projections in 2016. However, since President Trump took office in early 2017, his administration has taken systematic steps to roll back most US federal level climate policies. If the US fully implements proposed actions, greenhouse gas emissions projections for the year 2030 could increase by up to 400 MtCO_{2e} over what was projected when President Trump entered office.

Some states continue to implement ambitious climate policy, but this has not yet had a large enough effect on emissions projections to receive a positive current policy rating overall. Recent analysis suggests that recorded and quantified non-state and subnational targets, if fully implemented, could come within striking distance of the US Paris Agreement commitment, resulting in emissions that are 17–24% below 2005 levels in 2025 (incl. LULUCF) (America's Commitment, 2018; Data Driven Yale, NewClimate Institute, & PBL, 2018). These targets are not included in the CAT current policy scenario.

Policy Developments

Previous Administration (*with current status*)

- ⊕ Clean Power Plan, which set emissions targets from the power sector for states individually (proposal for replacement in place)
- ⊕ CAFE standards for emissions from cars (frozen)
- ⊕ Significant New Alternatives Programme aimed to reduce HFC emissions (not to be enforced)
- ⊕ Emissions standards for oil and natural gas sector (proposal to weaken)

Current Administration

- ⊖ Proposed replacement for the Clean Power Plan that is unlikely to have much impact on emissions
- ⊖ Proposed to freeze CAFE light duty vehicle standards at 2021 levels instead of strengthening them as implemented under the Obama Administration
- ⊖ Will not enforce HFC regulations under the Significant New Alternatives Programme
- ⊖ Proposed to weaken emissions standards for the oil and natural gas sector

Additional country summaries are given in Annex C.

Most NDC commitments are still insufficient, as is their likely achievement

The CAT rates government climate action compared to the efforts needed to reach the Paris Agreement's 1.5°C long-term temperature increase limit. We evaluate (1) the ambition level of the NDC targets (see more detail in Annex A) and (2) whether countries are likely to meet their NDC targets with the currently implemented policies. The results are shown in Table 2.

The vast majority of the countries assessed have not committed to an emissions target compatible with their fair share of the 1.5°C long-term Paris Agreement goal.

Three countries have set critically insufficient targets, which they can reach without implementing new policies. For example, Russia's targeted emissions level in 2030 lies significantly above current policy projections and is 18–26% above total GHG emissions excl. LULUCF in 2010. These countries could be amongst the first to update their NDC.

In addition, 17 governments have implemented policies that will not even result in achievement of their (critically or highly) insufficient targets. For instance, South Korea's NDC is rated "Highly insufficient," and its current policies exceed the target by as much as 25%. These countries urgently need to implement additional policies, as well as revise their NDC.

On the other hand, four governments have implemented 2°C or 1.5°C compatible targets, but do not (yet) back them up with sufficient policy action to meet them. By setting such targets, these countries have taken an ambitious step forward, and they now need to quickly implement new policies to achieve their goals.

Remarkable is India: under its currently implemented policies, it will over-achieve its NDC target, which we rate 2°C compatible. Although the NDC is already among the best rated, it is ripe for improvement.

Table 2 CAT pledge rating by country and indication of how close countries are to reaching their NDCs with current policies

Pledges & Targets		
Climate Action Tracker December 2018 update	CAT Paris commitment rating	Will policies meet the target?
The Gambia	1.5°C PARIS AGREEMENT COMPATIBLE	YES
Morocco	1.5°C PARIS AGREEMENT COMPATIBLE	CLOSE
Ethiopia	2°C COMPATIBLE	YES
India	2°C COMPATIBLE	YES
Bhutan	2°C COMPATIBLE	CLOSE
Costa Rica	2°C COMPATIBLE	NO
Philippines	2°C COMPATIBLE	NO
Switzerland	INSUFFICIENT	YES
EU	INSUFFICIENT	CLOSE
Peru	INSUFFICIENT	CLOSE
Australia	INSUFFICIENT	NO
Brazil	INSUFFICIENT	NO
Mexico	INSUFFICIENT	NO
New Zealand	INSUFFICIENT	NO
Norway	INSUFFICIENT	NO
China	HIGHLY INSUFFICIENT	YES
Indonesia	HIGHLY INSUFFICIENT	YES
Singapore	HIGHLY INSUFFICIENT	YES
Japan	HIGHLY INSUFFICIENT	CLOSE
UAE	HIGHLY INSUFFICIENT	CLOSE
Argentina	HIGHLY INSUFFICIENT	NO
Canada	HIGHLY INSUFFICIENT	NO
Chile	HIGHLY INSUFFICIENT	NO
Kazakhstan	HIGHLY INSUFFICIENT	NO
South Africa	HIGHLY INSUFFICIENT	NO
South Korea	HIGHLY INSUFFICIENT	NO
Russian Federation	CRITICALLY INSUFFICIENT	YES
Turkey	CRITICALLY INSUFFICIENT	YES
Ukraine	CRITICALLY INSUFFICIENT	YES
Saudi Arabia	CRITICALLY INSUFFICIENT	CLOSE
USA	CRITICALLY INSUFFICIENT*	NOT APPLICABLE
Nepal	NOT RATED	

* The CAT rating for the US is "Critically insufficient", based on the Trump Administration's intent to withdraw from the Paris Agreement.

A gap between the emissions levels targeted by the commitment compared to the levels under current policies does not necessarily imply that the NDC target will not be achieved; countries will be able to meet a shortfall by purchasing emission reductions internationally.

Emissions gap in 2025 and 2030 progress towards peaking emissions by 2020

In addition to the temperature increase outcomes of policies and commitments and targets, the CAT also assesses the expected absolute emissions in two milestone years—2025, and 2030—and compares these with benchmark emissions pathways that are in line with the temperature increase goal of the Paris Agreement. With the release of the IPCC Special Report on 1.5 °C the CAT updated its benchmark emissions pathways (for more detail see Annex D).

The main effect of this update is that 1.5°C-compatible levels for 2030 are lower by about 3 GtCO₂e/yr. This is related to the fact that 2030 and post-2030 emissions need to compensate for higher emissions between 2010 and 2020 than the previously used benchmark pathways. These earlier pathways were intended to guide CAT updates on how the world could benefit from early strong global action, which has however not materialised. Now the 2010s decade of delayed climate action needs to be compensated by steeper reductions from 2020 to 2030 and beyond, which can therefore be seen as an expression of lost time in global mitigation.

The IPCC Special Report on 1.5°C shows that steep reductions are urgent, but feasible, and will still deliver the many benefits associated with 1.5°C-compatible pathways in terms of avoided climate-change impacts, as well as cleaner air, increased employment in the renewable energy sector, access to modern energy, etc.

The benchmark emissions¹² and the policy projections are shown in Figure 3.

The Climate Action Tracker now projects global emissions under current policies in 2030 to be around 57–60 GtCO₂e, which is 1 GtCO₂e higher than last year’s projection, with higher projections for China and lower ones for India. An optimistic case assuming implementation of either additional, or planned (but not yet implemented), policies is substantially lower—at 56 GtCO₂e, our “optimistic scenario”.

The latter result is encouraging as it falls just below this year’s estimate of the emissions level of 57 GtCO₂e resulting from government pledges and targets. If, in addition, governments were to fully implement their *conditional* NDCs, 2030 levels would be yet lower at 54 GtCO₂e.

As explained above, we now account for global emissions over the period 2010–2020 that were too high, resulting in lower 2030 benchmark levels than used until 2017. As a result, the 2030 emissions gap between NDCs and the Paris Agreement compatible emission benchmarks has grown from 22–26 GtCO₂e in last year’s estimate, to 26–29 GtCO₂e.

For comparison, the IPCC’s Special Report on 1.5°C estimated 2030 emissions levels at 52–58 GtCO₂e for NDCs, which compared to that Report’s 25–30 GtCO₂e 1.5°C-compatible 2030 benchmark suggests an emissions gap of about 28 GtCO₂e between the means of both these ranges.

While some of the largest emitters, including China, the EU and India, have either reduced or slowed the growth of their emissions, we do not yet see the much-needed peaking of global GHG emissions.

¹² Our emissions numbers use AR4 GWPs. Note that IPCC SR1.5 SPM numbers use SAR GWPs and are therefore a bit different. The difference between SAR and AR4 GWPs leads to a difference in both benchmark and policy and pledge levels (typically 1–2 GtCO₂e), so that the effect on the size of the emissions gap will be limited.

2030 EMISSIONS GAPS

CAT projections and resulting emissions gaps in meeting the 1.5°C Paris Agreement goal vs 2°C Cancún goal



Dec 2018 update

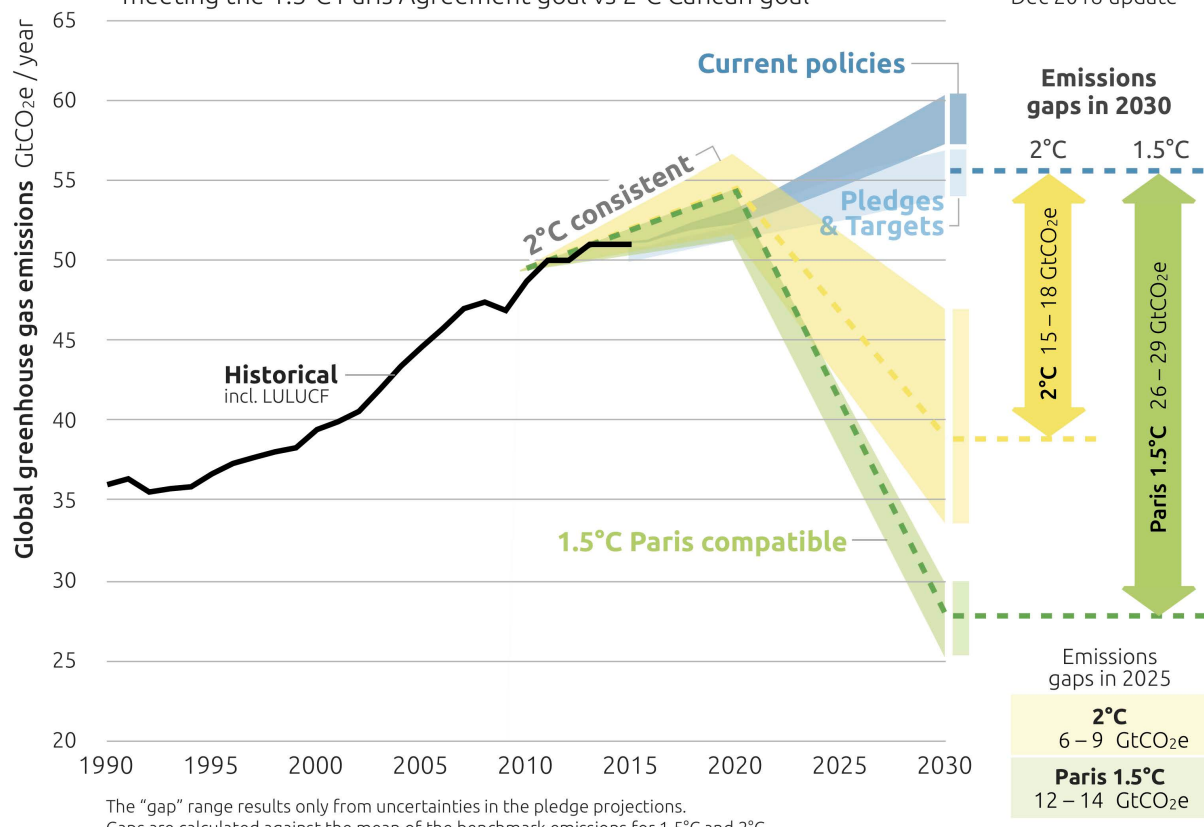


Figure 3 Global emissions pathways resulting from aggregation of our 32 country assessments and the resulting emissions gap in 2030 when compared with 2°C consistent and 1.5°C consistent pathways, now based on the IPCC SR15 2018.

The way forward

While action in some countries is picking up speed, looking at the big picture there is too little movement, with the world still heading towards warming far exceeding the Paris Agreement’s 1.5°C limit. The CAT urges countries to bring their national commitments in line with this global temperature goal when upgrading their Paris Agreement commitments as soon as possible, and latest by 2020.

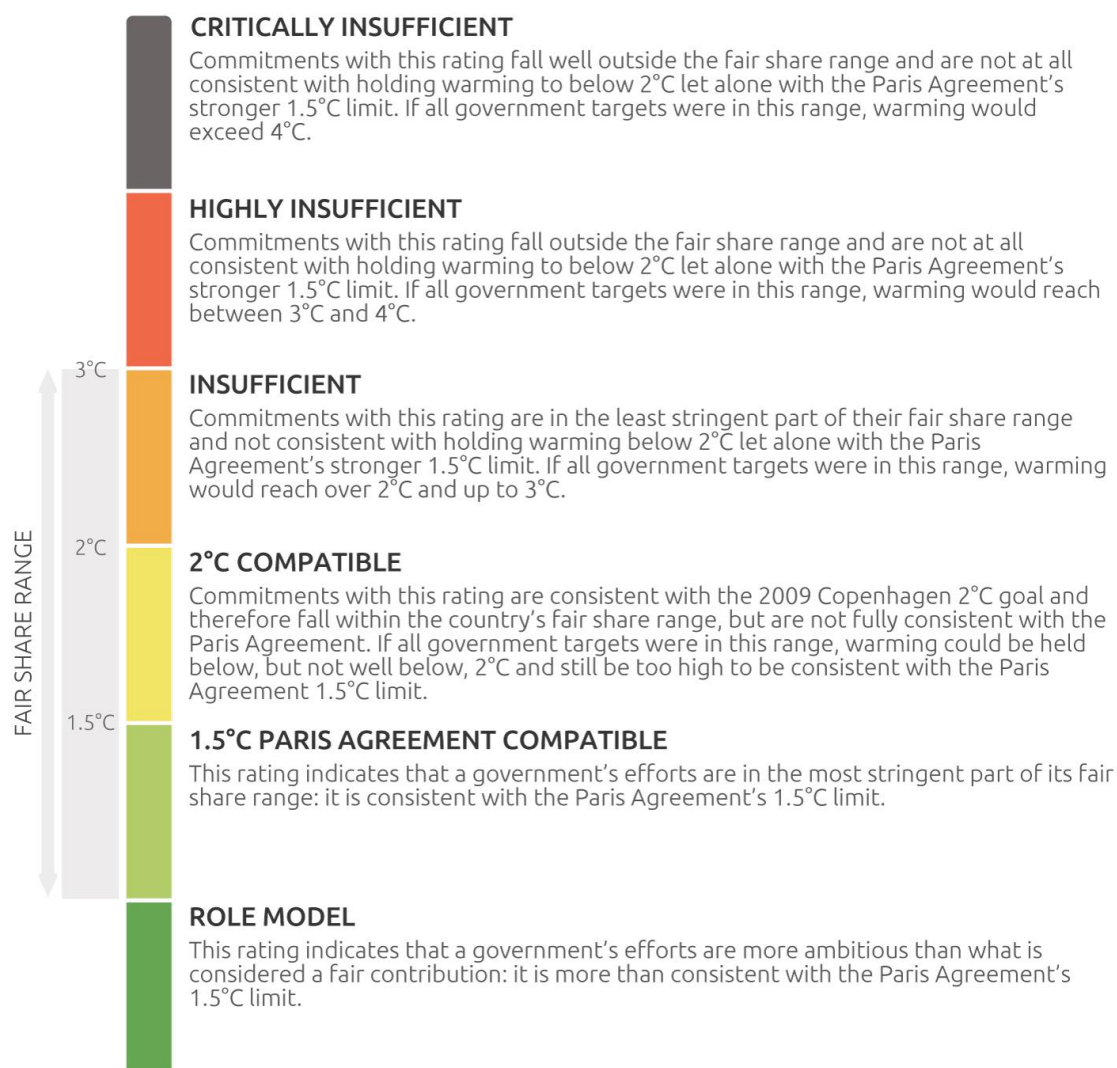
Even more important than upgrading NDCs is increasing the speed of real world climate action to achieve and exceed NDC commitments. Taking action on the [ten most important, short-term steps that key sectors need to take to help the world achieve the Paris Agreement’s 1.5°C limit](#)—assessed by CAT in 2016—becomes more pressing every year. These steps include ramping-up the growth of renewable energy, phasing out coal-fired power plants and fossil-fuelled cars, as well as building zero energy buildings and increasing renovation rates of existing buildings.

The CAT has also looked in detail at recent trends and options for getting to 1.5°C in most emitting sectors in our [decarbonisation series](#), including [passenger](#) and [freight transport](#), [buildings](#), [appliances](#), [agriculture](#), [power](#) and [heavy industry](#).

For individual countries, the CAT is launching detailed studies in our new [scaling-up climate action series](#), which lays out policy options for achieving Paris compatible pathways in selected sectors.

There are numerous solutions on the table. These are currently being picked up by some front-runner countries but can be used by all countries to bring 1.5°C within reach.

Annex A - CAT rating system



Annex B - Approach to assessment of recent policy progress

The CAT directional current policy assessment is based on a quantitative and qualitative analysis of the relative impact of actual policy developments since the submissions of the INDCs in 2015 on projected emissions levels. This assessment consists of the two main elements: 1) the impact of policy implementation since 2015 and 2) the expected impact of policies that are currently still in the planning phase.

Implementation of policies: We look at the absolute change in the projected 2030 emissions levels from our first assessment including the INDC submission of the country (2015 in most cases) to our current assessment. We examine which part of this change is due to actual policy action, as opposed to other changes, such as methodological updates, adjusted GDP projections and market changes. One of five categories is used for this assessment:

- None of the change due to real policy development
- Small change due to policy developments
- Both policy and other impacts, relative impact about equal
- Most of the change due to policy changes
- All change due to real policy development

Planned policies: For countries that have planned policies that potentially will lead to significant emissions reductions in 2030, we assess the likelihood of full implementation of these policies according to the following categories:

- Implementation very unlikely (e.g. immature status and poor track record)
- Implementation uncertain (e.g. immature status but good track record, or advanced status but poor track record)
- Implementation likely (e.g. advanced status and/or good track record)

These two elements combined, result in an assessment of the direction of change due to actual policy developments. The possible outcomes are:

Indicator	Meaning
✓ CLEAR PROGRESS	Clear decrease in projected 2030 emissions level due to actual policy development
— MINOR PROGRESS	Minor decrease in projected 2030 emissions levels due to actual policy development
✗ NO PROGRESS	No decrease at all in projected 2030 emissions levels due to actual policy development

For The Gambia and Bhutan, we could not perform this assessment, because we do not have current policy projections and therefore could not make a comparison. We did not cover Morocco in 2015, but gave Morocco a 'Clear progress' indicator, due to the impressive progress in recent years.

For China we deviated from the general approach because when comparing our 2015 and 2018 assessment, there is an increase in emissions. This increase is the result of using AR4 global warming potentials in 2018 vs SAR in 2015. When applying the same global warming potentials for both years, we find a modest decrease of emissions (not sufficient to meet our threshold for the "Clear progress" category). Therefore, we apply the "Minor progress" category.

Table 3 shows the inputs and outcomes for this assessment of recent policy progress for all CAT countries.

Table 3 Inputs for assessment on recent policy progress

Country	CPP change	Other significant impacts	PPP change	Improvement of domestic action compared to Paris
Argentina	4% decrease, Most of the change due to policy changes	Revision of inventory data with new method moves projections down. Using GWPs from IPCC AR4 moves projections up.	13% decrease, Implementation uncertain	✓ CLEAR PROGRESS
Australia	15% decrease in Government 2030 projections from 2015 to 2017 harmonized to historical date. None of the change due to policy.	Using GWPs from IPCC AR4 moves projections up. There are no new policies in place. Despite this the government continues to revise its projections downwards based on changing macroeconomic assumptions. Expansion of LNG export industry likely to increase projections for 2030.		✗ NO PROGRESS
Brazil	8% decrease, None of the change due to real policy development	The 45%RE target quantification added to the assessment in 2016 was removed in early 2018 given the change in government and the limited progress in this sector, moving projections up. Downward revision of GDP projections in recent versions of the World Energy Outlook moves projections down. Quantification of new biofuel intensity targets, included in latest assessment moved projections down. Using GWPs from IPCC AR4 moves projections up.		✗ NO PROGRESS
Canada	12% decrease, None of the change due to real policy development	Using GWPs from IPCC AR4 moves projections down.	17% decrease, Implementation likely	✓ CLEAR PROGRESS
Chile	12% decrease, Both policy and other impacts, relative impact about equal	Downward revision of GDP projections moves projections down. Use of different electricity generation projections moves projections down.	11% decrease, Implementation uncertain	✓ CLEAR PROGRESS
China	12% increase, None of the change due to real policy development	Update of historical data and using GWPs from IPCC AR4 moves projections up.		— MINOR PROGRESS
Costa Rica	13% decrease, All change due to real policy development	[n/a]		✓ CLEAR PROGRESS
Ethiopia	29% decrease, Most of the change due to policy changes	Using GWPs from IPCC AR4 moves projections up.		✓ CLEAR PROGRESS
EU	8% decrease, Most of the change due to policy changes	Using GWPs from IPCC AR4 moves projections up.	19% decrease, Implementation likely	✓ CLEAR PROGRESS
India	16% decrease, Most of the change due to policy changes	Downward revision of cement production projections moves emissions down.		✓ CLEAR PROGRESS
Indonesia	61% increase, None of the change due to real policy development	Use of updated data sources, not reflecting real policy change, moves projections up. Using GWPs from IPCC AR4 moves projections up.	6% decrease, Implementation very unlikely	✗ NO PROGRESS

Japan	8% decrease, Small change due to policy developments	Revised electricity mix projections (higher upper bound projections of renewable and nuclear power shares) and lower final energy use projection moved projections down.		— MINOR PROGRESS
Kazakhstan	15% decrease, Both policy and other impacts, relative impact about equal	Using GWPs from IPCC AR4 moves projections up.		— MINOR PROGRESS
Mexico	4% decrease, Small change due to policy developments	Downward revision of GDP projections moves projections down.		— MINOR PROGRESS
Nepal	7% increase, None of the change due to real policy development	Due to use of different data sources, projections are now a range instead of a single line. Using GWPs from IPCC AR4 moves projections up.		✗ NO PROGRESS
New Zealand	11% decrease, Small change due to policy developments	Changes in assumptions (e.g. GDP) underlying the external scenarios used (official government projections) moves projections down.		— MINOR PROGRESS
Norway	7% decrease, Small change due to policy developments	Using GWPs from IPCC AR4 moves projections up.		— MINOR PROGRESS
Peru	3% increase, None of the change due to real policy development	Emissions projections for 2030 actually decreased slightly but using GWPs from IPCC AR4 moved projections up overall. The positive impact of policies would not have been strong enough to merit a 'Minor progress' indicator, so Peru received a 'No progress' indicator		✗ NO PROGRESS
Philippines	10% decrease, Small change due to policy developments	Use of new data source moves projections down.	7% decrease, Implementation likely	— MINOR PROGRESS
Russian Federation	10% increase, None of the change due to real policy development	Downward revision of GDP projections in recent versions of the World Energy Outlook moves projections down. Revised national inventory for historical emissions moves projections down. Using GWPs from IPCC AR4 moves projections up.		✗ NO PROGRESS
Saudi Arabia	16% decrease, Small change due to policy developments	Revision of inventory data moving the harmonisation year down moves projections down. Using GWPs from IPCC AR4 moves projections up.	23% decrease, Implementation very unlikely	— MINOR PROGRESS
Singapore	22% decrease, Small change due to policy developments	Downward revision of GDP projections in external scenarios used (APEREC) moves projections down.		— MINOR PROGRESS
South Africa	30% decrease, None of the change due to real policy development	Use of different of scenarios (and different assumed underlying GDP growth rates) moves projections down.	3% decrease, Implementation uncertain	— MINOR PROGRESS
South Korea	3% increase, None of the change due to real policy development	Use of new data sources narrowed the range for projected emissions, slightly increasing the average.	8% decrease, Implementation likely	— MINOR PROGRESS

Switzerland	8% increase, Both policy and other impacts, relative impact about equal	Using GWPs from IPCC AR4 moves projections up.	17% decrease, Implementation uncertain	— MINOR PROGRESS
Turkey	17% decrease, Small change due to policy developments	Downward revision of GDP projections moves projections down Using GWPs from IPCC AR4 moves projections up.	7% decrease, Implementation uncertain	— MINOR PROGRESS
UAE	27% decrease, None of the change due to real policy development	Use of different data sources moves projections down. Using GWPs from IPCC AR4 moves projections up.		✗ NO PROGRESS
Ukraine	19% decrease, Small change due to policy developments	Use of different data sources moves projections down. Revision of inventory data moving the harmonisation year down moves projections down.	23% decrease, Implementation very unlikely	— MINOR PROGRESS
USA	6% decrease, None of the change due to real policy development	Revision of inventory data moving the harmonisation year down, moves projections down. Using GWPs from IPCC AR4 moves projections up.	13% decrease, Implementation uncertain	✗ NO PROGRESS

Annex C - Additional country vignettes

This annex lists policy developments since the adoption of the Paris Agreement for additional selected countries which received a 'Clear progress' or 'Minor progress' indicator.

Argentina

✓ **CLEAR PROGRESS**

Argentina's "Clear progress" indicator results from the developments in renewable energy policies. Argentina continues implementation of the renewable energy auctioning scheme RenovAr, that supports the target to generate 20% of electricity through renewable energy (excl. large hydro). It remains highly uncertain if the target will be achieved, and further tendering rounds and improvements to the electricity grid will be required to do so.

Policy Developments	
+	Implementation of RE auctioning scheme RenovAr
+	Carbon tax, first important step but initial level low (10 US\$/tCO ₂) (impact not quantified)
+	New ambitious emissions scenarios from government ministries including pathways where emissions stabilise (counted as additional policy)
+	Biofuel targets (mitigation impact unclear because of possible supply chain emissions)
-	Focus of parts of the government on expanding gas exploration (not accounted for here)

Canada

✓ **CLEAR PROGRESS**

The main change in Canada's climate policies since 2015 is the Pan-Canadian Framework on Clean Growth and Climate Change. It would represent a step in the right direction. However, one of its flagship policies, the Federal Carbon Pricing Initiative, including its backstopping plan to stop provinces 'opting out', is being contested by several provinces.

Policy Developments	
+	Wide-ranging climate policy framework (Pan-Canadian Framework on Clean Growth and Climate Change, 2016)
+	Carbon pricing backstopping plan (2018) imposing a tax of up to C\$50/tCO ₂ e (US\$38/tCO ₂ e) in provinces which have failed to comply
+	Phase out of traditional coal-fired power plants by 2030 announced in 2016
-	Several provinces plan to contest the carbon pricing backstopping plan
-	Ontario cancelled cap-and-trade programme on 11 July 2018; as a result, its Electric and Hydrogen Vehicle Incentive Program was cancelled

Chile

 **CLEAR PROGRESS**

Emission projections in Chile have moved downward since 2015 due to improvements in climate policy as well as due to changes in methodological assumptions (i.e. lower economic growth projections). The alignment of recent policies and planning documents (including sectoral roadmaps) to its 2050 Energy Strategy is a step in the right direction.

Policy Developments

-  January 2018: agreement to cease construction of new coal-fired power plants without CCS
-  2018 “Net billing” law (Law 20.571) reform to promote projects (with up to 300 kW capacity) that produce renewable electricity for self-consumption
-  2017 electromobility strategy publication, setting a target of 40% share of passenger vehicles and 100% electric public transport by 2050
-  2050 Energy Strategy (from 2016), setting targets to generate 60% of electricity from renewable sources (incl. hydro) in 2035 and 70% in 2050
-  Chile has implemented three stages of its “Green tax law” (Law 20.780 from 2015), which taxes production of NO_x in private transport and CO₂ from stationary electricity generation sources with capacities greater than 50 MW

Ethiopia

 **CLEAR PROGRESS**

In 2016, the creation of Ethiopia’s Second Growth and Transformation Plan resulted in a significant reduction in projected 2030 emissions levels. Ethiopia is the country in which we have seen the largest relative decrease in projected emissions for 2030.

Policy Developments

-  Growth and Transformation Plan: Aims to increase power generation capacity to 22 GW in 2030, increase electricity coverage to 90% by 2020 and cement Ethiopia’s role as a green hub in Africa
-  Plans to introduce feed-in-tariff scheme to support renewable energy deployment

Philippines

 **MINOR PROGRESS**

The Philippines current policy pathway is still far from reaching its NDC. Policy developments since 2015 do not significantly impact emissions. Implementation of renewable energy targets have been lagging and continuous investment in coal might result in considerable stranded assets in the future. Still, the increase of coal-fired power generation costs through application of a coal tax and definition of sectoral mitigation targets in the Philippines’ tentative NDC are positive developments that should be encouraged and developed further.

Policy Developments

-  Circular to set a floor of 30% for renewables in total installed capacity
-  Process of reviewing the NDC enhanced transparency on sectoral targets even though still misses the business-as-usual pathway used as reference
-  Implementation of tax on coal that increases coal-fired electricity generation costs as part of the wider tax reform
-  Development of coal roadmap reinforces the government’s commitment to coal-fired power generation

Saudi Arabia

— MINOR PROGRESS

In 2016, Saudi Arabia's "Vision 2030" was adopted, including the announced phase out of fossil fuel subsidies. However, in the vision Saudi Arabia also slows down its renewable power target that was announced in 2013 by eight years. In 2018, Saudi Arabia announced a 200 GW solar plant that would far exceed both the new and initial renewable energy targets. However, experts are questioning the feasibility of this solar plant. These developments combined result in a 'Minor progress' indicator of projected 2030 emissions levels since 2015.

Policy Developments

-  Vision 2030 phase out of fossil fuel subsidies has started leading to an expected reduction of 53 Mt in 2030 compared to business as usual
-  Announcement of 200 GW solar plant in 2018(feasibility is questioned by experts)
-  Vision 2030 slowing down of renewable energy target by eight years, including a renewable energy target of 9.5 GW in 2023 instead of 54 GW of renewable power (+ 17 GW nuclear) previously
-  RE Targets for the period post-2023 have not yet been announced

Ukraine

— MINOR PROGRESS

In July 2018, Ukraine published its 2050 Low Emission Development Strategy. This strategy provides emission reduction pathways for the energy and industry sectors based on four scenarios containing different ambition levels of decarbonisation measures and policies. If fully implemented, Ukraine could significantly overachieve its NDC target with emission levels of 20% to 44% below the 2030 target.

Policy Developments

-  Decarbonisation scenarios of Ukraine's industry energy sector including measures such as energy efficiency, increased renewable energy, innovation and market transformation (published in the 2050 Low Emission Development Strategy)
-  2050 Low Emission Development Strategy does not contain specific policies measures to decarbonise energy and industry and therefore the realisation of the decarbonisation scenarios is uncertain

Annex D - Methodological updates since last assessment

Change in Global Warming Potentials

Up until 2017, the CAT assessments expressed all emissions in CO₂e by converting the various contributing greenhouse gases using global warming potential (GWP) factors established in the IPCC's Second Assessment Report (SAR) from 1995.

For this assessment we have converted the non-CO₂ emissions shown in our 32 country assessments as well as all global emission pathways from being expressed in terms of SAR GWPs to being expressed in terms of AR4 (Fourth Assessment Report, published in 2007) GWPs.

This methodological change means that emission levels shown in our results post December 2018 and pre-December 2018 are no longer directly comparable. Total GHG emissions in terms of AR4 GWPs are slightly higher than in SAR GWPs for most countries.

New 1.5°C and 2°C CAT benchmark pathways for global GHG emissions

Prompted by the publication of the IPCC Special Report on 1.5 °C (IPCC SR1.5) (Masson-Delmotte et al., 2018), which contained a large new set of mitigation pathways—in particular for 1.5°C—the CAT has updated its “benchmark” pathways for 1.5°C and 2°C. The IPCC SR1.5 assesses pathways that limit global warming to 1.5°C with no or limited overshoot, which the CAT uses to define “Paris Agreement compatible”—or “1.5°C compatible”—pathways.

Based on sustainability and economic constraints on Carbon Dioxide Removal (CDR), the IPCC SR1.5 identified limits to BECCS (below 5 GtCO₂e/yr globally in 2050) and AFOLU (below 3.6 GtCO₂/yr sequestration globally in 2050). For CAT's “1.5°C compatible” and “2°C compatible” benchmark pathways, the new sets of mitigation pathways have been filtered to exclude those that do not meet these CDR limits.

For consistency with IPCC SR1.5, and to show the most robust results across models, the new CAT benchmark pathways follow the approach to derive median and inter-quartile ranges (50% ranges) extracted from the IPCC SR1.5 database for total global greenhouse gas emissions (for those pathways that meet the CDR criteria above).

The central “1.5°C compatible” benchmark is defined as the median of pathways that limit global warming to 1.5°C, or below, throughout the 21st century with no or limited (<0.1°C) overshoot (for the pathways meet the CDR criteria above). In these pathways global average temperature increases above pre-industrial are limited to below 1.6°C over the 21st century and below 1.5°C by 2100 (typically 1.3°C). “1.5°C compatible” emissions levels in 2030 are consistent with IPCC SR1.5 SPM (25–30 GtCO₂e/year based on SAR GWP) but due to CDR constraints are 1 GtCO₂e/year lower for median and 2 GtCO₂e/year lower for top end of range.

The “2°C” compatible benchmark pathways are drawn from the “lower-2°C” and “high-overshoot 1.5°C” pathways in the new set of IAM pathways assessed in IPCC SR1.5. This includes all pathways in the IPCC SR1.5 scenario database that have global average temperature increase held below 2°C above pre-industrial with at least a likely (>66%) probability over the 21st century, excluding pathways that qualify as “1.5°C compatible” as explained above. As above, these pathways are filtered to exclude those that exceed the BECCS and AFOLU sustainability limits identified in the IPCC SR1.5. The final IPCC SR1.5 pathway category of “higher-2°C” is not included at all, as these pathways hold warming below 2°C throughout the 21st century with a probability less than 66% (50–66%).

Previous CAT pathways were based on immediate-action 2010 scenarios, which start strong global mitigation action in 2010 and show an emissions gap in 2020 compared to Cancun targets and projected actual emissions. The new pathways are based on so-called “delayed-action” 2020 scenarios, which have higher emissions levels in 2020 and do not show a 2020 emissions gap. The higher 2020 levels lead to somewhat higher 2025 levels,

somewhat lower 2030 levels and substantially lower 2050 levels to compensate for the higher emissions in the period 2010–2025, compared to the previous CAT benchmark pathways for both 1.5°C and 2°C.

Glossary

AFOLU Agriculture, Forestry and Other Land Uses

AR4 The fourth Assessment Report of the Intergovernmental Panel on Climate Change

BECCS Bioenergy with Carbon Capture and Storage

CDR Carbon Dioxide Removal

GWP Global Warming Potential

INDC (Intended) Nationally Determined Contribution under the Paris Agreement

IPCC SR1.5 IPCC Special Report on Global Warming of 1.5°C

NDC Nationally Determined Contribution under the Paris Agreement

SAR Second Assessment Report of the Intergovernmental Panel on Climate Change

RE Renewable energy

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The Climate Action Tracker (CAT) is an independent scientific analysis produced by three research organisations tracking climate action since 2009. We track progress towards the globally agreed aim of holding warming well below 2°C, and pursuing efforts to limit warming to 1.5°C.

The Consortium



Climate Analytics is a non-profit climate science and policy institute based in Berlin, Germany with offices in New York, USA, Lomé, Togo and Perth, Australia, which brings together interdisciplinary expertise in the scientific and policy aspects of climate change. Climate Analytics aims to synthesise and advance scientific knowledge in the area of climate, and by linking scientific and policy analysis provide state-of-the-art solutions to global and national climate change policy challenges.

Contact: Dr. h.c. Bill Hare, +49 160 908 62463

climateanalytics.org



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Contact: Prof. Kornelis Blok, +31 6 558 667 36

ecofys.com



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Contact: Prof. Dr. Niklas Höhne, +49 173 715 2279

newclimate.org