CANCUN CLIMATE TALKS -
KEEPING OPTIONS OPEN TO CLOSE THE GAP

Climate Action Tracker briefing paper, 10 January 2011

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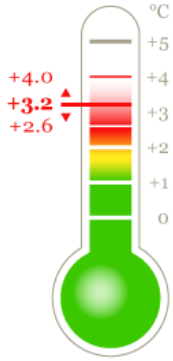
SUMMARY

Current emission-reduction pledges, after the close of the Cancun climate conference, fall short of what is needed to get the world on track for limiting global warming to 2 and 1.5°C above pre-industrial levels. Both of these warming limits are mentioned in the Cancun Agreements. While progress was made on several issues, such as finance and adaptation, emission reduction pledges by individual countries did not change and no global target was set. To keep warming limited to the 2 and 1.5°C targets, global emissions need to drop to 44-40 billion tonnes CO_2 equivalent per year by 2020. After adding up reduction proposals of individual countries and taking into account accounting provisions, expected global emissions leave a gap of 10-14 billion tonnes by 2020 to what is required. In Cancun, countries discussed a wide range of options that influence the size of the gap. If countries implemented the most stringent reductions they have proposed, with the most stringent accounting, the remaining gap would shrink to 8-12 billion tonnes, according to the Climate Action Tracker, a website that provides an independent assessment of individual counties' emission reduction proposals and their global aggregate. The Climate Action Tracker[1] reflects the latest status of the progress being made at international climate negotiations. The team that performed the analyses followed peer-reviewed scientific methods (see publications in Nature and other journals)[2] and significantly contributed to the UNEP Emissions Gap Report[3].

Changes in Cancun



At the climate talks in Cancun in December 2010, constructive, but inconclusive, negotiations evolved around accounting provisions in the existing and proposed international climate policy framework. Although progress was made on a number of issues that could contribute to closing the gap, none of the decisions were concrete enough to lead to quantifiable changes. The most important issues:

- The options for accounting for forests and land use change have been considered, but not agreed upon. They could

[1] www.climateactiontracker.org

[2] e.g. http://www.nature.com/nature/journal/v464/n7292/full/4641126a.html and http://iopscience.iop.org/1748-9326/5/3/034013/fulltext

[3] www.unep.org/publications/ebooks/emissionsgapreport

increase the 2020 emission limits of developed countries by up to approximately 2% relative to 1990, or about 0.5 billion tonnes.

- The current negotiating text includes options that would allow countries to use allowances originally meant for the period until 2012 beyond that date. Used and traded after 2012, these 'surplus' allowances could raise the emission limits of developed countries to an extent that, as a whole, developed countries would not need to implement any further climate policies additional to current practice at least up to 2020. Effectively, these surplus allowances would allow equalizing emissions to business-as-usual levels, effectively adding about 3-9% to the emission limit relative to 1990, or about 0.6-1.6 billion tonnes. The surplus would not be exhausted until 2025-2030. In the 2008-2012 period, countries like Russia, the Ukraine, Belarus and also several EU member states will have emissions below their emission target. This will be the result of emission reduction policies, the effects of the current recession and the fact that 2008-2012 allowance allocations were already noted to be too high during the negotiations for the Kyoto Protocol ("Hot air"). These countries could also use their surplus allowances after 2012, either for domestic use, or to trade with other countries. This would increase the emission limits of the buying countries, not balanced by additional emission reductions of the selling countries.
- Japan's reduction target of 25% below 1990 in 2020 is still ambitious, but will most likely be met to a large extent by supporting reductions elsewhere ('offsets'). Such reductions would most likely be accounted on the side of developing countries as well, which would lead to double counting and effectively to smaller reductions than previously included in the calculations. These additional emissions could amount to 0.1 billion tonnes for Japan.
- In the USA, there is little prospect of federal greenhouse gas legislation, which had included a long-term target for 2050. It is unclear now whether such target will be implemented. Double counting of US offsets could add to the gap roughly 0.5 billion tonnes in 2020.

Adding up the pledges

By 2020, global emissions without any further mitigation are projected to be over 56 billion tonnes. To have a likely chance of limiting warming to 2°C or 1.5°C, 2020 emissions would need to be in the range of 44-40 billion tonnes CO_2eq/yr[4]. Hence, the total reduction needed is around 12-16 billion tonnes by 2020.

The lowest ambition proposals by developed and developing countries would decrease emissions by almost 3 billion tonnes, to around 53 billion tonnes in 2020. This leaves an emissions gap of 9-13 billion tonnes in 2020, even after including the effects of the global economic crisis that lowers emissions and *not* including the use of emission allowances carried over from the 2008-2012 period. These proposals would still lead to a warming of 3.2°C above pre-industrial levels by 2100 and a CO_2 concentration of

[4] This range is based on model experiments as in Meinshausen et al (2009), Nature **458**, 1158-1162. The recently published UNEP Emissions Gap report identified a range of 39-44 GtCO2eq/yr, based on a larger set of models and scenarios (www.unep.org/publications/ebooks/emissionsgapreport).

about 650 ppmv by that time. This level is far above the temperature limits 2°C and 1.5°C, both mentioned in the Cancun Agreements.

The high ambition end of the commitments and pledges reduces emissions by a further 1.3 billion tonnes, which would bring projected emissions down to about 52 billion tonnes in 2020, again without adding the surplus allowances carried over from the 2008-2012 period.

Even with the most ambitious pledges and without carried-over surpluses, this leaves a gap of between 8 and 12 billion tonnes by 2020, which can be closed by the options mentioned in the next section.

However, as mentioned before, surplus emission allowances from the 2008-2012 period have the potential to completely eradicate the 2020 reduction pledges of developed countries as a whole. The gap identified above does not include these. Allowing these surpluses to be fully carried over and traded would further widen the global gap by up to 2 billion tonnes in 2020, to 10-14 billion tonnes for both the high and low ends of the proposed reduction ranges. This case implies that all reductions relative to the reference level will be achieved in developing countries.

A way forward

The negotiation text coming out from Cancun, that will be the basis for further negotiations, includes options ranging from allowing all carryover to a complete elimination of carry over. An effort to close the gap is inconsistent with a significant carryover of surplus allowances from previous periods.

In addition to limiting carryover, the Tracker team identified several options for closing the emissions gap. Taken together, these options would achieve more than enough to close the gap:

- Eliminate new surplus emissions 'built into' 2020 reduction pledges, options for this are included in the negotiating text → around 1 billion tonnes in 2020;
- Remove crediting for forestry and other land-use management activities that increase allowed developed country emissions → 0.5 billion tonnes;
- Reduce international aviation and maritime (shipping) CO_2 emissions, by up to half of the projected levels in 2020 → 1 billion tonnes;
- Increase the ambition level of developed countries as a group
    - Reduce to 30% below 1990 in 2020 (from the current maximum of 17% without forestry credits) → 2.5 billion tonnes;
    - Increasing this to 40-45% below 1990 level in 2020 gives a further reduction → 2-3 billion tonnes;
- Ensure reductions of emissions in developing countries as a group:
    - Implementing their national climate plans if they go beyond their current pledge: 2.3 billion tonnes;
    - Reduce to 15%-30% below their stated reference emissions in 2020 → 1.2 billion tonnes – 6.2 billion tonnes, providing the appropriate support;
- Halt deforestation by 2020 → 2 billion tonnes.

In addition, global long-term emission reductions of at least 50% below 1990 by 2050 will be required. Together, closing the gap for 2020 emissions and adequate 2050 reductions are the minimum required to maintain a more than even chance that global warming remains limited to 2°C by 2100. This would also leave the possibility to change track after 2020 towards a pathway limiting warming to 1.5°C in the longer term. The Cancun Agreements did not include a goal on global emissions in 2050, but included a process to consider it in the future.

The Cancun climate conference did not yet close the emissions gap, but it paved the way and kept the options open to do so in the future.

1. Introduction

Ten years from now, global annual emissions will need to be below 44-40 billion tonnes of CO_2 equivalent per year (i.e. below current levels of 48 billion tonnes, 2009) to have more than an even chance of limiting warming to 2°C, or ultimately to below 1.5°C by 2100, as put forward by one hundred developing countries, including the Small Island States and Least Developed Countries, which are particularly vulnerable.

Over the past two years, the Climate Action Tracker (www.climateactiontracker.org) has analysed reduction proposals that countries put forward in the international arena, as well as the complicated emission accounting rules discussed there. It provides an independent assessment of individual counties' emission reduction proposals and their aggregation. It is of highest scientific standards (see publications in Nature and other journals)[5] and significantly contributes to the international debate.[6] The collaborating partners – Ecofys, Climate Analytics and the Potsdam Institute for Climate Impact Research (PIK) – found that to-date, proposals still fall short of what is needed to achieve the goals above: a significant gap remains.

In Cancun, December 2010, negotiations continued to move worldwide efforts closer to achieving the agreed goals of keeping warming below 2°C and 1.5°C. This paper provides information on the current status, i.e. just after the Cancun Agreements. It also includes illustrative options for reductions, which go beyond the most optimistic interpretation of the proposals and, taken all together, are more than sufficient to close the gap.

2. Reference level

With existing policies, and not including proposals for reductions by 2020, Climate Action Tracker projects annual total GHG emissions from all sources growing to around 56 billion tonnes in 2020 (reference scenario emissions without any further mitigation), see Figure 1. These projections include the estimated effects of the current economic recessions that have an impact on emissions in many countries. The recession implies a downward adjustment of expected emission levels in 2020.

[5] http://www.nature.com/nature/journal/v464/n7292/full/4641126a.html and http://iopscience.iop.org/1748-9326/5/3/034013

[6] Climate Action Tracker results and individual authors contributed significantly to "The Emissions Gap Report" by UNEP, www.unep.org/publications/ebooks/emissionsgapreport

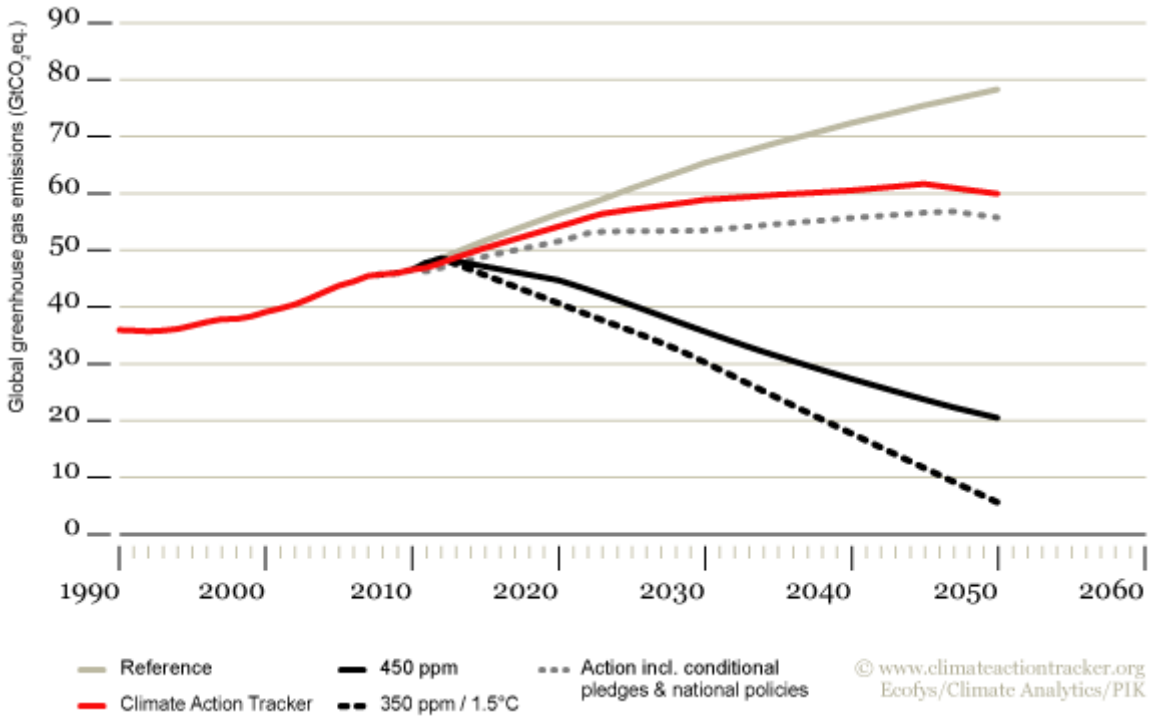
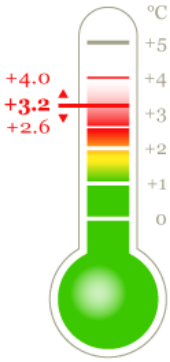


Figure 1. Global emissions under the reference scenario, under reduction proposals and necessary levels for 450 and 350 ppm

3. Changes in Cancun

At the climate talks in Cancun in December 2010, options to further close the reduction gap were discussed. Although progress was made on a number of issues that could contribute to closing the gap, none of the decisions were concrete enough to lead to quantifiable changes. The most important issues:



- The options for accounting for forests and land use change have been considered, but not agreed upon. They could increase the 2020 emission limits of developed countries by up to approximately 2% relative to 1990, or about 0.5 billion tonnes.
- The current negotiating text includes options that would allow countries to use allowances originally meant for the period until 2012 beyond that date. Used and traded after 2012, these 'surplus' allowances could raise the emission limits of developed countries to an extent that, as a whole, developed countries would not need to implement any further climate policies additional to current practice at least up to 2020. Effectively, these surplus allowances would allow equalizing emissions to business-as-usual levels, effectively adding about 3-9% to the emission limit relative to 1990, or about 0.6-1.6 billion tonnes. The surplus would not be exhausted until 2025-2030. In the 2008-2012 period, countries like Russia, the Ukraine, Belarus and also several EU member states will have emissions below their

emission target. This will be the result of emission reduction policies, the effects of the current recession and the fact that 2008-2012 allowance allocations were already noted to be too high during the negotiations for the Kyoto Protocol ("Hot air"). These countries could also use their surplus allowances after 2012, either for domestic use, or to trade with other countries. This would increase the emission limits of the buying countries, not balanced by additional emission reductions of the selling countries.

- Japan's reduction target of 25% below 1990 in 2020 is still ambitious, but will most likely be met to a large extent by supporting reductions elsewhere ('offsets'). Such reductions would most likely be accounted on the side of developing countries as well, which would lead to double counting and effectively to smaller reductions than previously included in the calculations. These additional emissions could amount to 0.1 billion tonnes for Japan.
- In the USA, there is little prospect of federal greenhouse gas legislation, which had included a long-term target for 2050. It is unclear now whether such target will be implemented. Double counting of US offsets could add to the gap roughly 0.5 billion tonnes in 2020.

Elements that did not change in Cancun that would have changed our calculations:

- No country changed its nominal pledge upwards or downwards.
- The Cancun Agreements did not decide on a goal for global emissions in 2050, but it sets out a process to consider it in the future.

3. Reduction proposals

Developed countries

The greenhouse gas reduction targets of developed countries as a whole are estimated at 12-17% below 1990 levels (excluding forestry and land use change emissions) by 2020. This corresponds to 1 to 2 billion tonnes below the reference scenario, see Figure 1. However, the proposed forestry credits for these countries would degrade this total figure by about 2 percentage points (0.5 billion tonnes). This leads to effective reductions in GHG emissions of about 10-15% below 1990 levels by 2020. The low end of the possible reduction range (10%) is based on unconditional targets for most countries. The high end (15%) is linked to proposals by most countries assuming a strong and inclusive agreement that is yet to be agreed upon. The Intergovernmental Panel on Climate Change (IPCC) stated that by 2020, developed countries would need to reduce emissions by 25-40% from 1990 levels.

Currently-projected emissions for the 2008-2012 period by Annex I countries as a whole are less than their aggregate targets (allowed emissions) under the Kyoto Protocol in its first commitment period (2008-2012). Under Kyoto Protocol rules, surplus 'assigned amount units' (AAUs - allowed emissions) from this period may be carried over to subsequent commitment periods and hence be used to increase effective emissions allowances after 2012. The total amount of surplus AAUs is large enough to allow the Annex I countries as a group to follow an emissions pathway without any further mitigation until after 2020 (longer after 2020 for the lowest end of the Copenhagen Accord reduction proposals), while still complying with the currently-

announced reduction targets. This implies that overall emissions of the developed countries could be only 2% below 1990 levels in 2020 and require no additional domestic reduction policies beyond what is currently in place. Given these rules and provisions of the Kyoto Protocol, we assumed in our climate model projections that all surplus AAUs would ultimately be emitted into the atmosphere. Once these are exhausted, Annex I countries' emissions consequently revert from their emissions projections without any further mitigation to the allowed emission reduction pathway, including the assumed forest credits.

The Cancun Agreements do not take a decision on this issue, but provide options to limit the carryover in the future:

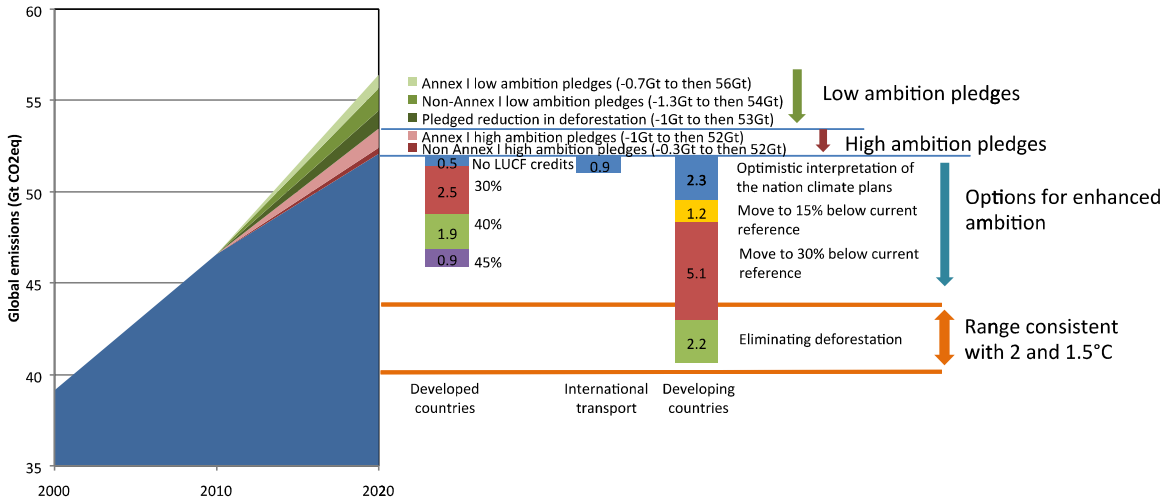
- Cap on carryover of 10% of a Party's 1st commitment period AAUs: deteriorate by about 5% of 1990 emissions
- Cap on carryover of 1% of a Party's 1st commitment period AAUs: almost no deterioration
- Cap on carryover of 0.1% of a Party's 1st commitment period AAUs: virtually no deterioration
- For domestic use only (no trade): deteriorate by 2-3%
- No carryover: no deterioration

We have not included these surplus AAUs in the 2020 reduction levels that may be reached and are discussed in this section and illustrated in Figure 2, opting instead for a direct estimate of current proposals. Including these emissions would increase the global gap by roughly 0.6 to 1.6 billion tonnes in 2020.

Developing countries

Developing countries propose to reduce emissions 1.3 billion tonnes below the reference scenario in 2020 plus an additional 1 billion tonnes in 2020 by reducing deforestation as a unilateral action. A further 0.3 billion tonnes reduction is conditional on external financing.

Figure 2. Summary of proposed and possible further reductions in 2020.



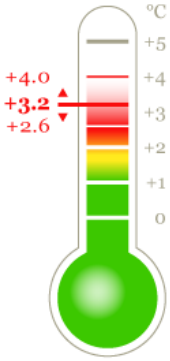
Note that surplus allowances from the 2008-2012 are not included in the effective allowances for developed countries here, because use of these surpluses would imply that no reductions from reference levels are required at all from developed countries in aggregate by 2020.

Global total

The low ambition end of the proposals could deliver a total reduction of about 3 billion tonnes. The most ambitious proposals, which are nearly all conditional on a strong international agreement that, after Cancun, is yet to take shape and requires strong financial support for developing countries, would reduce up to a further 1.3 billion tonnes. This requires, however, that all externally-financed reductions in developing countries are additional to domestic reductions in developed countries. If part of the developing country reductions is financed via 'offsets', these reductions would replace developed countries' domestic reductions and the global total reductions would be lower.

With no concrete pledges on the table for international aviation and maritime transport, CO_2 emissions in these sectors are projected to double in 2020 compared to 1990, reaching about 1.8 billion tonnes, and to nearly quadruple by 2050, at 3 billion tonnes.

The best proposals are only halfway to what the science indicates are the needed emission limits in 2020 to provide a good chance of limiting warming to 2°C or 1.5°C. The best proposals result in a maximum reduction of about 4 billion tonnes, whereas at least 12-16 billion tonnes of reductions are needed.



With the confirmed proposals (low ambition), the world is headed for a warming of 3.2°C by 2100 (2.6 to 4.0°C). Carbon dioxide concentrations are projected to be at about 650 ppm in 2100, far above the 350 ppm limit called for by many countries. Total GHG concentrations would be close to 750 ppm CO_2 equivalent by 2100.

The least ambitious options on the table would result in global emissions of 18% above 2008 levels by 2020 and even with the best options on the table, GHG emissions would still rise above present

levels by 2020. On the high ambition end of the range of international commitments, warming would be reduced by about 0.1°C to roughly 3.1°C by 2100, and CO_2 concentration to about 640 ppmv in 2100. If the estimated effect of national policy plans of China and India is added to these international commitments, global warming by 2100 would reduce by a further 0.1°C to 3.0°C and the CO_2 concentration to around 630 ppmv.

4. Further reductions

Provided that all of the most ambitious measures that have been put forward until now are agreed upon and will indeed materialize, and no surpluses from the 2008-2012 are used to loosen emission allowances by 2020, additional reductions of 8 to 12 billion tonnes will be required to close the gap. This can be achieved, for example, by a combination of the following, see Figure 2:

- Eliminate new surplus emissions 'built into' 2020 reduction pledges → around 1 billion tonnes;
    - Russia, Belarus, Ukraine and Moldova have proposed 2020 emission targets that are above their projected reference levels without any further mitigation. Such targets require no domestic reductions and may provide credits to the international markets that increase the emission allowances of other Parties.
- Remove crediting for forestry and other land-use management activities that increase allowed developed country emissions → 0.5 billion tonnes;
- Reduce international aviation and maritime (shipping) CO_2 emissions, to up to half of the projected levels in 2020 → 1 billion tonnes;
- Increase the ambition level of developed countries as a group
    - Reduce to 30% below 1990 in 2020 (from the current maximum of 17% without forestry credits) → 2.5 billion tonnes;
    - Increasing this to 40-45% below 1990 level in 2020 gives a further reduction → 2-3 billion tonnes;
- Ensure reductions of emissions in developing countries as a group, providing the appropriate support:
    - Implementing their national climate plans: 2.3 billion tonnes;
    - Reduce to 15%-30% below their stated reference emissions in 2020 → 1.2 billion tonnes – 6.2 billion tonnes;
- Halt deforestation by 2020 → 2 billion tonnes
    - Brazil and Indonesia together already announced plans to reduce emissions from deforestation, which represents about 40 to 50% of global reductions from estimated 1990 deforestation emissions.
    - This would also need financial and technical support from developed countries.

Figure 2 provides an overview of the proposed and pledged reductions. The high end of the pledges reduces result in 52 billion tonnes in total. Several options exist to reduce global emissions further to reach the required 44 or 40 billion tonnes.

In addition, global long-term emission reductions of at least 50% below 1990 by 2050 will be required. Together, closing the gap for 2020 emissions and adequate 2050 reductions are the minimum required to maintain a more than even chance that global warming remains limited to 2°C by 2100. This would also leave the possibility to change track after 2020 towards a pathway limiting warming to 1.5°C in the longer term. The Cancun Agreements did not include a goal on global emissions in 2050, but included a process to consider it in the future.

The Cancun climate conference did not yet close the emissions gap, but it paved the way and kept the options open to do so in the future.

5. Background on the Climate Action Tracker

The "Climate Action Tracker", www.climateactiontracker.org, is a science-based assessment by Ecofys, Climate Analytics and the Potsdam Institute for Climate Impact Research (PIK) that provides regularly updated information on countries' reduction proposals.

The Climate Action Tracker enables the public to track the emission commitments and actions of countries. The website provides an up-to-date assessment of individual country pledges about greenhouse gas emission reductions. It also plots the consequences for the global climate of commitments and actions made ahead of and during the Copenhagen Climate Summit.

The Climate Action Tracker reveals major differences between the ambition levels of countries when it comes to reducing greenhouse gas emissions. In the lead are the Maldives, which have proposed to become climate-neutral by 2020. At the high end of the scale are Bhutan, which proposes to stay carbon neutral and Costa Rica, which proposes to become carbon neutral by 2021 if international support is provided. They are followed by Brazil, Japan, Norway, Papua New Guinea and South Korea, who are proposing to reduce their emissions significantly. In the 'medium' range are developing countries such as Chile, India, Indonesia, Mexico and South Africa. Many of them propose to reduce the growth of their emissions by the 2020s. The EU is a special case. Its unconditional commitment of 20% reduction is rated 'inadequate'. However, the adoption of the 30% reduction target would move the EU into the 'medium' range and very close to 'sufficient'. China is rated 'inadequate', because it's target falls short of the ambition level that was expected from the implementation of the current national policies. Between the middle and the bottom of the scale is the United States, whose target is 'inadequate'. At the very bottom end of the scale are countries that have yet to propose substantial action beyond 'business as usual'. Among them are Russia and Moldova.

The Climate Action Tracker shows that much greater transparency is needed when it comes to targets and actions proposed by countries. In the case of developed countries, accounting for forests and land-use change significantly degrades the overall stringency of the targets. For developing countries, climate plans often lack calculations of the resulting impact on emissions.

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