

## **COPENHAGEN CLIMATE DEAL – HOW TO CLOSE THE GAP?**

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### **SUMMARY**

Globally business as usual emissions for 2020 of 57 GtCO<sub>2</sub>e are projected. To have a good chance at limiting warming to 2°C or 1.5°C, 2020 emissions would need to be below 44 and 40 GtCO<sub>2</sub>e respectively. Hence the Copenhagen Climate Deal needs reductions of around 13-17 GtCO<sub>2</sub>e by 2020.

The lowest ambition commitments by developed countries and pledges from developing countries on the table as of 15 December reduce emissions by about 2.3 GtCO<sub>2</sub>e in 2020. This would lead to warming of 3.5°C above pre-industrial by 2100 and a CO<sub>2</sub> concentration of almost 700 ppmv.

The high ambition end of the commitment and pledges reduces emissions a further 3.1 GtCO<sub>2</sub>e (or 5.4 GtCO<sub>2</sub>e in total), which would bring projected emissions down to about 52 GtCO<sub>2</sub>e in 2020. In addition some developing countries, notably China and India, have national plans which go further than the international commitment or pledges they have put forward. An optimistic interpretation of their climate plans, adds a further 3.6 Gt CO<sub>2</sub>e reductions, bringing the total emissions in 2020 down to about 48 GtCO<sub>2</sub>e.

Warming would be reduced by about 0.3°C to roughly 3.2°C by 2100, and CO<sub>2</sub> concentration to about 650 ppmv in 2100.

Hence even with the highest ambition outcome, matched with the national policies of key developing countries, there is a gap of 4-8 GtCO<sub>2</sub>e between what is on the table and Copenhagen and what is needed. Several options exist to reduce global emissions further to reach the required 44 or 40 GtCO<sub>2</sub>e:

- Developed countries as a group reduce to 30% below 1990 in 2020 (from the current maximum of 19% without forestry credits) → 2 billion tonnes;
  - Increasing this to 40-45% below 1990 level in 2020 gives a further reduction → 2-3 billion tonnes.
- Developing countries as a group reduce to 30% below their stated business as usual emissions in 2020 → 4.5 billion tonnes.
  - This would be in the range consistent with IPCC and would require financial and technical support from developed countries.
- Deforestation is halted 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.
- Reducing international aviation and marine (shipping) CO<sub>2</sub> emissions, to half of the projected levels in 2020 → 1 billion tonnes.
- Removal of crediting for forestry and other land-use management activities would reduce allowed developed country emissions → 1 billion tonnes/year

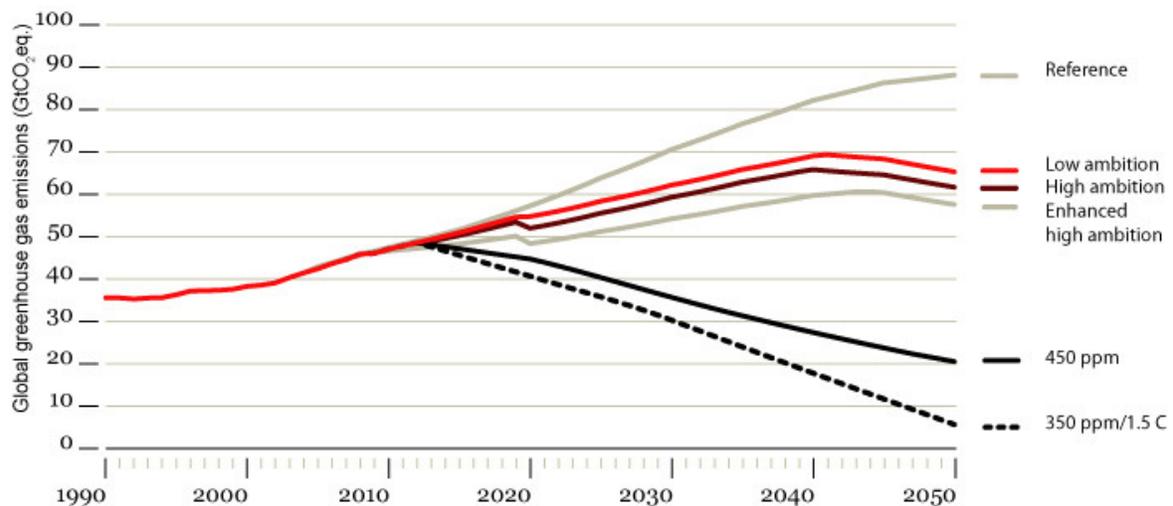
## 1. Introduction

Ten years from now global annual emissions will need to be below 40-44 billion tonnes (i.e. below current levels of 46 billion tonnes per year, 2008) to have more than an even chance of limiting warming to 2°C – as called for by the major emitters – 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 as essential for their survival.

This paper provides an overview of the reduction proposals that countries put forward until 15 December 2009 as collected for the Climate Action Tracker by Ecofys, Climate Analytics and the Potsdam Institute for Climate Impact Research (PIK). It also includes illustrative options for reductions, which go beyond the most optimistic interpretation of the proposals.

## 2. Reference level

With present policies, Climate Action Tracker projects annual total GHG emissions from all sources to be around 57 billion tonnes CO<sub>2</sub>-equivalent in 2020 (business as usual, reference).



**Figure 1. Global emissions under the reference scenario, proposals as of 15 December 2009, and necessary levels for 450 and 350 ppm**

### 3. Reduction proposals

#### *Developed countries*

Developed country emission reduction targets as a whole are estimated to amount to 11-19% below 1990 levels of GHG gases (excluding forestry and land use change emissions) by 2020. This corresponds to 0.8 to 2.2 GtCO<sub>2</sub>e below the reference scenario. However, the proposed forestry credits for these countries would degrade this total figure by about 5 percentage points (1 GtCO<sub>2</sub>e). This results in effective reductions in GHG emissions of about 6-14% below 1990 levels by 2020. The low end of the possible reduction range (6%) is based on unconditional targets for most countries. The high end (14%) is linked to proposals by most countries assuming a strong and inclusive agreement in Copenhagen. Around 25-40% reductions by industrialized countries by 2020 from 1990 GHG emissions levels are described as necessary by the Intergovernmental Panel on Climate Change (IPCC).

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 a business-as-usual emission pathway until after 2020 (longer after 2020 for the lowest end of the Copenhagen reduction proposals), while still complying with the currently announced reduction targets. This implies that overall emissions of the developed countries could be only 3% below 1990 levels in 2020. 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 (shortly after 2020), Annex I countries' emissions consequently revert from their business-as-usual projection to the allowed emission reduction pathway, including the assumed forest credits. If the amount of surplus AAUs from the first and/or subsequent commitment periods is limited as part of a new agreement on mitigating global warming, we will include this in an update of our analysis.

However, we have not included these surplus AAUs in the reduction levels that may be reached and are discussed in this paper, opting instead for a direct estimate of current proposals. Including these emissions would increase the gap by more than 2 GtCO<sub>2</sub>e.

### ***Developing countries***

Developing countries propose to reduce emissions 0.8 GtCO<sub>2</sub>e below the reference scenario in 2020 plus an additional 0.7 GtCO<sub>2</sub>e in 2020 by reducing deforestation as unilateral action. A further 1.7 GtCO<sub>2</sub>e reduction is conditional on external financing and includes a further reduction of deforestation to 40-50% below 1990 levels.

### ***Global total***

The low ambition end of the proposals, which are on the table less than five days before the deadline for agreement, deliver a total reduction of only about 2 billion tonnes. The most ambitious proposals, which are nearly all conditional on a strong Copenhagen agreement, with financial support for developing countries, would reduce up to a further 7 billion tonnes.

The pledges of all countries so far will not halt emissions growth before 2040, let alone by 2015 as indicated by the IPCC. They are far from halving emissions by 2050, as has been called for by the G8. Instead global emissions are likely to double from 1990 levels by 2040, based on present pledges.

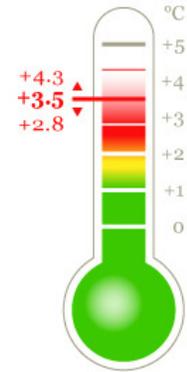
With no concrete pledges on the table for international aviation and marine CO<sub>2</sub> emissions these sectors are projected to double in terms of emissions from 1990 levels to 2020, reaching about 1.8 billion tonnes per year, and to nearly quadruple by 2050, at 3 billion tonnes per year.

The best proposals are only half way to what the science indicates are the emission limits in 2020 that are needed for a good chance of limiting warming to 2°C or 1.5°C. The best proposals result in a maximum reduction of about 9 billion tonnes, whereas at least 13-17 billion tonnes of reductions are needed.

With the confirmed proposals (low ambition), the world is headed for a global warming of 3.5°C by 2100 (2.8 to 4.3°C). Carbon dioxide concentrations are projected to be

over 650 ppm in 2100, far above the 350 ppm limit called for by many countries. Total GHG concentrations would be close to 800 ppm CO<sub>2</sub> equivalent by 2100.

The least ambitious options on the table would result in global emissions 20% above present levels by 2020 and even with the best options on the table GHG emissions would still be rising above present levels by 2020. On the high ambition end of the range of international commitments, warming would be reduced by about 0.2°C to roughly 3.3°C by 2100, and CO<sub>2</sub> concentration to about 670 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 3.2°C and the CO<sub>2</sub> concentration to below 650 ppmv.



#### 4. Further reductions

Provided that all of most ambitious measures that have been put forward until now are agreed and will materialize, the required additional reductions of 4 to 8 billion tonnes could for example be reached by any combination of the following:

- Developed countries as a group agree to increase ambition to 30% reduction below 1990 in 2020 (from the current maximum of 19% without forestry credits) → 2 billion tonnes; Increasing this to 40-45% below 1990 level in 2020 would result in a further reduction → 2-3 billion tonnes.
- Developing countries as a group reduce to 30% below their stated business as usual emissions in 2020 → 4.5 billion tonnes. The resulting emissions level would be sufficient to be in the range consistent with IPCC and would require financial and technical support from developed countries.
- Deforestation is halted 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 recent levels by 2020 (or about the same from estimated 1990 deforestation emissions). This would also need financial and technical support from developed countries.

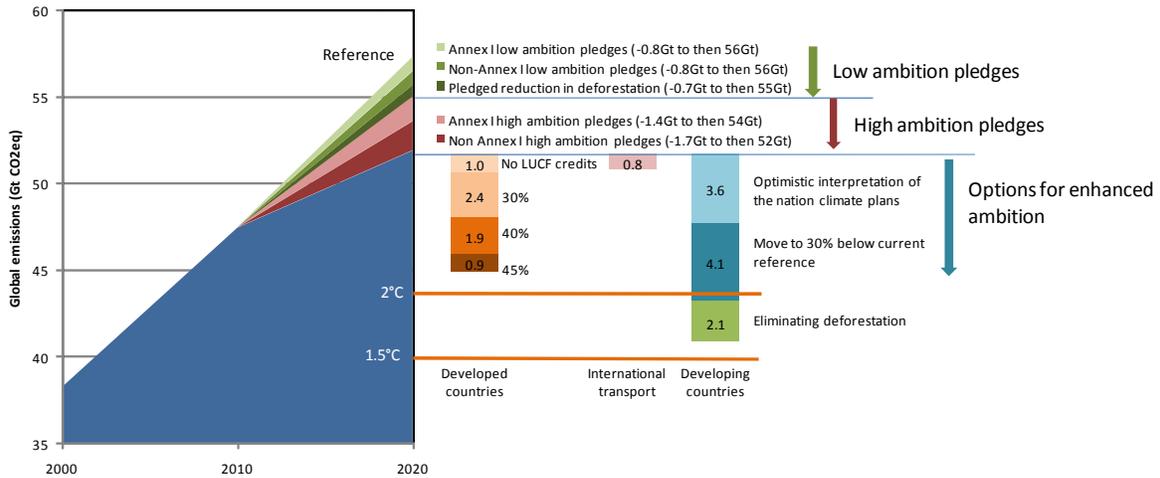
- Reducing international aviation and marine (shipping) CO<sub>2</sub> emissions, which are currently uncontrolled and expected to grow fast, to half of the projected levels in 2020 → 1 billion tonnes.
- Removal of crediting for forestry and other land-use management activities would reduce allowed developed country emissions → 1 billion tonnes/year (these credits add to the emissions allowed by countries).

## 5. Overview of proposed reductions and further options

Figure 2 provides an overview of the proposed and pledges reductions. The low ambition pledges reduce emissions by about 2.3 GtCO<sub>2</sub>e in 2020. Moving to the high end of the pledges reduces further 3.1 GtCO<sub>2</sub>e, resulting in 52 Gt CO<sub>2</sub> in total. Several options exist to reduce global emissions further to reach the required 44 or 40 GtCO<sub>2</sub>e.

Annex I countries could eliminate LULUCF credits and could move the ambition level to reduce 30, 40 or 45% below 1990 in 2020. International transport emissions could be covered by the agreement, here halving projected 2020 emissions. Developing countries' emissions would be 3.6 Gt CO<sub>2</sub>e lower under an optimistic interpretation of their climate plans, going beyond the proposed targets considering national policies in place, especially for China and India. Further, deforestation could be halted by 2020.

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



## 6. Background on the Climate Action Tracker

The “Climate Action Tracker”, [www.climateactiontracker.org](http://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. Maldives and Costa Rica are in the lead, which have proposed to become climate-neutral by around 2020. At the high end of the scale are Norway, Japan and Brazil, as they propose to reduce their emissions significantly. In the “medium” range are developing countries such as India, Indonesia, Mexico and South Korea, which propose to reduce the growth of their emissions by the 2020s. The EU is a special case, in that its unconditional commitment

is rated “inadequate”. However, if the 30% reduction target were to be adopted, the EU would move into the “medium” range and very close to “sufficient”. China has moved down a category, because its recently announced target falls short of the ambition level that we had expected from the implementation of the current national policies. Between the middle and the bottom of the scale are the United States, whose recently proposed actions are “inadequate”, i.e. they do not fall within the range that is needed to keep global warming within lower limits. At the very bottom end of the scale are countries that have yet to propose substantial action beyond “business as usual”. These include Belarus, Russia and Ukraine.

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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