EMISSIONS – PLEDGES AND ‘PROJECTED ANYWAY’ IN 2020

Paper 5 in a series of papers on Analytic Support for Target-based Negotiations

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11 July 2010

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Acknowledgement
The author wishes to thank, without implicating, Alex Bowen, Antonia Baker, Michel den Elzen, Niklas Höhne and Fabian Wagner for useful comments and assistance.

Publisher
Climate Strategies 2010

For citation and reprints, please contact the publisher Climate Strategies

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Introduction

This paper draws information from Paper 2\(^1\) and Paper 3\(^2\) in the Climate Strategies’ Analytic Support for Target-based Negotiations paper series, and other relevant reference material, with a view to understanding how countries’ pledged targets in 2020 compare with their ‘likely anyway’ emissions. This can provide a beginning sense of the level of effort that these pledges represent.

While this seems a reasonable and simple enough objective, in fact, the exercise remains fraught with uncertainties. Countries pledges are still not able to understood with precision in terms of exactly what are the ‘allowed emissions’ implied by stated targets (or in Kyoto Protocol jargon, the assigned amount from quantified emissions limitation and reduction commitments). Some critical issues here are:

- **LULUCF.** Key here is how emissions and removals from countries’ domestic land use land use change and forestry (LULUCF) sectors might add to allowed emissions in their non-LULUCF sectors (gross emissions or ‘Annex A gases and sources’ in Kyoto Protocol jargon). A key problem is that, thus far, the LULUCF negotiations have not provided a clear picture of what the LULUCF rules for the next period are most likely to be. So even where, for some countries, there may be some sense of what they may expect for a given option for LULUCF rules, or set of options, this all remains quite speculative.\(^3\)

- **Carry-over.** For Annex B Parties, surplus ‘assigned amount’ from the first Kyoto period can be carried over to the next and add to the total of ‘allowed emissions’ calculated from the next period targets. This carry-over includes the additional CERs that enter the system from the CDM. While LULUCF units (RMUs) can not be carried over, it would be expected that countries would retire these first in meeting their current period commitments, thereby freeing up an equivalent quantity of AAUs for carry-over.

Addressing carry-over also raises the issue (and uncertainty) of what will be the duration of the next period, i.e. how many years is this fixed quantity of carry-over spread across. In considering a specific year like 2020, an assumption then needs to be made about whether the carry-over is used uniformly per year. The number of years and uniformity of use are crucial in determining the effect of carry-over on the overall ‘allowed emissions’, i.e. equivalent collective target, in 2020.

- **Likely ‘emissions anyway’ in 2020.** Not only have Annex I Parties not all provided projections for emissions in 2020 in their recent 5\(^{th}\) National Communications to the UNFCCC, but where they have, it is not clear the extent to which, if at all, these projections have taken into account the effect of the global economic recession. Other sources of projection estimates are available from various modelling groups. However, in addition to the inevitable assumptions that are crucial to these estimates, there can be other issues with their data, e.g. the countries included in regional groupings or whether the coverage of emission sources included or excludes international bunker fuel emissions.

This paper attempts to shed some light on this confusing situation, with an objective to provide insights through quantitative analysis.

**Summarising the available data and estimates**

Table 1 below sets out information mostly provided in Paper 2 with respect to pledges. For a number of major Annex I Parties, it shows the estimated allowed emissions for Annex A gases and sources for both high, and (if applicable) low, pledges. It then provides estimates of possible additions to these allowed emissions from domestic LULUCF as might be interpreted from the pledges. It also provides estimates of carry-over from the Kyoto first period for the EU and Russia.

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\(^{3}\) Even if one considers that LULUCF negotiations may be heading towards the use of forward looking reference levels for forest management (e.g. a ‘bar approach’), the quantity of credits likely to be generated is crucially dependent on exactly where this reference level is set.
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### Table 1 Country pledges and equivalent allowed emissions in 2020.

<table>
<thead>
<tr>
<th>Country</th>
<th>Pledge(s)</th>
<th>‘Allowed Emissions’</th>
<th>Percent change in 2020 Allowed Emissions</th>
<th>Additional ‘allowed emissions’ from domestic LULUCF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Eqv KP Annex A 2020,Mt CO₂e</td>
<td>cf 1990</td>
<td>cf 2005</td>
</tr>
<tr>
<td>AUSTRALIA:</td>
<td>High -25% cf 2000</td>
<td>371.1</td>
<td>-10.7%</td>
<td>-29.3%</td>
</tr>
<tr>
<td></td>
<td>Low -5% cf 2000</td>
<td>470.1</td>
<td>+13.1%</td>
<td>-10.4%</td>
</tr>
<tr>
<td>CANADA:</td>
<td>-17% cf 2005</td>
<td>606.7</td>
<td>+2.5%</td>
<td>-17%</td>
</tr>
<tr>
<td>EU27:</td>
<td>High -30% cf 1990</td>
<td>3,894.6</td>
<td>-30.0%</td>
<td>-23.7%</td>
</tr>
<tr>
<td></td>
<td>Low -20% cf 1990</td>
<td>4,451.0</td>
<td>-20.0%</td>
<td>-12.9%</td>
</tr>
<tr>
<td></td>
<td>Carryover from CP1 to CP2 estimated at 2,300⁴</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JAPAN:</td>
<td>-25% cf 1990</td>
<td>952.2</td>
<td>-25.0%</td>
<td>-29.9%</td>
</tr>
<tr>
<td>RUSSIA:</td>
<td>High -25% cf 1990</td>
<td>2,489.5</td>
<td>-25.0%</td>
<td>+17.5%</td>
</tr>
<tr>
<td></td>
<td>Low -15% cf 1990</td>
<td>2,821.4</td>
<td>-15.0%</td>
<td>+33.2%</td>
</tr>
<tr>
<td></td>
<td>Carryover from CP1 to CP2 estimated at 5,000 - 7,000 (see CS Paper 2)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

⁴ This carry-over figure is from EC Staff Working Document Part II, May 2010. In the EU’s 30 June 2010 submission to the UNFCCC, this is further elaborated as potentially being 2,489 Mt (including surplus of initial assigned amount plus from use of flexible mechanisms).

⁵ Note also that the EU has said that its 20% target, as set in EU legislation (so not just a ‘pledge’) does not include LULUCF. However, it remains unclear what would happen to a 20% target in the circumstance that a LULUCF rule set is agreed which would generate LULUCF credits for the EU.
<table>
<thead>
<tr>
<th>Country/Pledges</th>
<th>Allowed ‘Annex A’ emissions in 2020, Mt</th>
<th>% change cf 1990</th>
<th>% change cf 2005</th>
<th>Additional allowed emissions from LULUCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNITED STATES:</td>
<td>5,920.6</td>
<td>-3.4%</td>
<td>-17.0</td>
<td>The intent in domestic bills is seemingly that domestic LULUCF would be treated as an offset, subject to stringent offset rules that reductions are real, verifiable and additional. This is quite different to Kyoto LULUCF rules where credits from LULUCF accrue from activities that are not subject to an additionality test. The key point here is that under stringent additionality requirements credits would not be generated for ‘removals anyway’ from managed forests, one of the key concerns in the negotiations of LULUCF rules under the AWG-KP. (However, what potentially is not addressed by additionality rules on LULUCF credits for removals is concerns around harvesting emissions, in the event forest harvesting regimes are changed substantially to provide additional sources of bioenergy.)</td>
</tr>
</tbody>
</table>

A key quantitative finding of Paper 3 *Economic Growth, the Recession and Greenhouse Gas Emissions* is that

”.... Overall, the trajectory of global greenhouse gas emissions is likely to have been lowered – perhaps by 1% and 5% in the longer term, if the path of energy prices has been permanently lowered by global recession by around 7% (the revision in the IEA estimate for crude oil prices in 2030). That back-of-the-envelope estimate incorporates a substantial ‘price rebound’ effect, without which the global trajectory might be some 5-9% lower in the long run. The reduction in the short run is likely to be much more than this, first, because the impact of lower energy prices is likely to take a long time to come through and, second, because an unexpected downturn initially hits harder the more carbon-intensive sectors of the economy.”

With respect to ‘emissions anyway’ in 2020, a general finding of Paper 3 is that projections for 2020 in countries’ 5th National Communications (where available for the countries looked at) were likely to overstate emissions because they had not yet fully taken into account the recession. This has also been signalled by reports of very significant drops in emissions in 2009 – e.g. 11% drop in emissions of covered sources in the EU ETS and 7% drop in US energy CO2 emissions.

Table 2 below includes data from Table 1 along with projections of emissions (excluding the LULUCF sector) taken from National Communications, and as well independent estimates of the reference emissions in 2020 by the Dutch Environmental Assessment Agency (PBL) with Ecofys6, the IIASA online GAINS emissions calculator, and the European Commission (for the EU27)7. Note that these different sources have their own inherent characteristics in terms of methodologies and assumptions, so these data should not be seen as representing an ‘apples for apples’ comparison. In particular:

- For the EU, measures needed by EU ETS sectors to meet their EU ETS Phase 3 caps are included – whereas it is unlikely that other countries reference emissions for 2020 includes the effect of similar measures, yet to be undertaken.
- It is unclear whether National Communications projections for 2020, where these have been provided, include the effects of the global economic recession. The PBL data estimates state that they do include the effects of the recession. They also do not include future measures in their baselines because the costs of these measures would then be missed in the cost analysis8.

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6 Evaluation of the Copenhagen Accord: Chances and risks for the 2°C climate goal, May 2010
7 From EC Staff Working Document Part II, May 2010. (PBL’s data for the EU is for the Europe region not just EU27.) Note, however that the EC numbers for 2020 include international aviation, so this estimate is higher than for just Annex A gases and sources.
8 Source: Personal communication with M den Elzen at PBL.
The GAINS results use the IEA 2009 estimates for the energy sector (so include the recession with respect to the energy sector, as calculated by IEA), except for the EU where they use the EU’s Climate and Energy Package scenario that reflects already most of the policies leading to -20% relative to 1990.

The right hand in Table 2 columns show the reference emissions for emissions not including LULUCF and as well calculate the % change between the reference and the pledge. Data gaps are because the detail is not provided in the noted sources. Given the uncertainties about additions from LULUCF to allowed emissions, this is not incorporated in the percentage change calculations. Also note that allowed emissions do not include any carry-over from the Kyoto first period.

Table 2 Pledges’ equivalent allowed emissions and estimates for reference emissions in 2020.

<table>
<thead>
<tr>
<th>Country</th>
<th>Allowed ‘Annex A’ emissions in 2020, Mt CO₂e</th>
<th>Additional allowed emissions from domestic LULUCF Mt CO₂e</th>
<th>Estimates of Reference Emissions in 2020, Mt CO₂e, and (% change, pledge cf reference)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>From LUC: 23.8-52.8 From A/R: 7-40</td>
<td>5th NatCom</td>
</tr>
<tr>
<td><strong>Australia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High -25% cf 2000</td>
<td>371.1</td>
<td></td>
<td>628</td>
</tr>
<tr>
<td>Low -5% cf 2000</td>
<td>470.1</td>
<td></td>
<td>628 (-25%)</td>
</tr>
<tr>
<td><strong>Canada</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-17% cf 2005</td>
<td>606.7</td>
<td>unknown</td>
<td>800 (-24%)</td>
</tr>
<tr>
<td><strong>EU27</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High -30% cf 1990</td>
<td>3,894.6</td>
<td>unknown</td>
<td>5229.9</td>
</tr>
<tr>
<td>Low -20% cf 1990</td>
<td>4,451.0</td>
<td></td>
<td>5229.9 (-14.9%)</td>
</tr>
<tr>
<td><strong>Japan</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-25% cf 1990</td>
<td>952.2</td>
<td>~38 ? Depends on CP2 rules</td>
<td>1300</td>
</tr>
<tr>
<td><strong>Russia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High -25% cf 1990</td>
<td>2,489.5</td>
<td>~69 ? Based on projections over ‘bar’</td>
<td>2200 (+13%)</td>
</tr>
<tr>
<td>Low -15% cf 1990</td>
<td>2,821.4</td>
<td></td>
<td>2200 (+28%)</td>
</tr>
<tr>
<td><strong>United States</strong></td>
<td>5,920.6</td>
<td>unknown for offsets subject to additionality test</td>
<td>7416 (-20%)</td>
</tr>
</tbody>
</table>

It can be seen from the above results in Table 2 that estimates of emissions in 2020 can vary quite considerably between the three sources provided.

Comparing the independent results with the 5th National Communication results, it can be seen that GAINS estimates for emission in 2020 are lower (and the lowest of the estimates, except for Russia where the PBL result is lowest); so this would be consistent with the general finding of Paper 3. The PBL result for the US (the only one where a comparison with 5th National Communication results is available) is the highest of the projection estimates; so this US result is not consistent. The European Commission projected emissions in

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*Source: Personal communication with F Wagner in the GAINS team at IIASA.*
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2020 for the EU27, taken from Staff Working Document Part II (the detail behind the recent Communication on options for the EU to move beyond the 20% target), includes an analysis of the effects of the global economic recession, and is similar to the GAINS result for the EU.

Conclusions

General

The analysis above provides a sense that there is a significant issue here – that the level of effort implied by Annex I Party pledges (taking into account LULUCF and likely carry-over) has been significantly reduced by ‘likely anyway’ emissions in 2020, given the global economic recession. However, the available data sources make it difficult to make a robust case, because of both the unavailability and uncertainty of data and, as well, the outstanding issues of understanding exactly what the pledges imply for allowed emissions in 2020 – in particular with respect to how domestic LULUCF and carry-over from the Kyoto first period add to allowed emissions for Annex A gases and sources (the non-LULUCF sectors).

For major non-Annex I Parties looked at in Papers 2 and 3 (China and India), the issue is different. First, these countries’ pledges are made in intensity terms. For absolute emissions in 2020, this means there is already a built-in correction to the effects of the recession with respect to changes in GDP. The question then is whether the recession has had any lasting structural effect on the relationship between GDP and emissions. But this seems unlikely to be a significant factor, given the quick rebound of these two economies. A separate issue raised by other researchers, e.g. Ecofys in its Climate Action Tracker work, is whether the pledged reductions in emissions intensity, in fact, fully encompass the outcomes of all the planned domestic reduction measures – in other words, the effect of existing planned measures is likely to be greater than implied by the pledged intensity target.

Responding to the problems

To address the concerns noted in this paper and in work by other researchers looking more broadly at how pledges connect to the 2°C objective, we provide below a questionnaire that governments could use to set out their pledges to allow more accurate understanding and objective comparison.

Questionnaire: Issues and Questions about Country Pledges

Base year

- What is the official number in MtCO$_2$e for your country’s (or regional group’s) greenhouse gas (ghg) emissions excluding LULUCF and excluding international bunker in the following years:
  - 1990
  - 2005
  - The base year you have chosen for your pledge percentage reductions, if different than one of these two years
- Is this number from your latest official ghg inventory, the independent review when assessing countries’ starting assigned amounts under the Kyoto Protocol, the latest compilation of countries’ ghg inventories by the UNFCCC, or some other source (please specify)?

Pledge percentage(s) in 2020

- In the circumstance where the official pledge (or pledges, where there is more than one) for 2020 made by your country (or regional group) for 2020 includes LULUCF (or some elements of LULUCF), or includes international bunkers, would the pledge percentage(s) change if these are excluded? If so, please specify the changed percentage(s).

Projected emissions in 2020

- What is the official number in MtCO$_2$e for your country’s (or regional group’s) projected ghg emissions in 2020, excluding LULUCF and excluding international bunkers?
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- Does this number reflect a recent estimate that has taken into account the effect in your country (or regional group) of the global economic crisis?
- Is there a specific published source of this number that can be cited?

LULUCF

- For the LULUCF accounting framework that your country (or regional group) prefers for the post-2012 period, what number of ‘credits’ in MtCO$_2$e do you project to be added to your allowed emissions for non-LULUCF emissions in 2020? Credits here can be seen as deriving from net CO$_2$ removals from LULUCF, and as well from reduced emissions from LUC, in the event that KP Article 3.7(2) is expected to apply in the post-2012 period and would apply to your country.
- Connected to the above number, what is the LULUCF accounting framework that your country (or regional group) prefers? And is the above number of credits calculated for full LULUCF, or just some part of LULUCF, e.g. A/R/D under Article 3.3?
- If this preferred LULUCF accounting framework is different than the idea of having a forward looking reference (or bar) number and earning credits for performance that beats this reference number, how would you expect the above number of credits to change if the negotiations on LULUCF result in this reference approach being agreed, and not the LULUCF accounting framework that your country (or regional group) prefers?

Carry-over of emission allowances and international credits from 2008-2012

- Do you expect that your country (or regional group) will carry over allowances (units of assigned amount) and international credits from the 2008-2012 period to the 2013-2020 period? If so, what is your estimate for this carry over in MtCO$_2$e?