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Preliminary assessment of pledges made by Annex I Parties and voluntary actions and policy goals announced by a number of non-Annex I Parties

Internal Note by the Secretariat

This note provides an assessment of the pledges made by Annex I Parties, and voluntary actions and policy goals announced by a number of non-Annex I Parties in the lead-up to the Conference of the Parties to the UNFCCC held in Copenhagen. It is based on the most recent emission scenarios presented in the IEA 2009 World Energy Outlook and information from Parties on pledges, voluntary actions and policy goals. The assessment is conducted by comparing the reference scenario, the impact from the pledges, voluntary actions and policy goals, and the 450 ppm scenario. The paper shows a gap of 10.5 Gt to the required level of 44Gt needed to achieve stabilization of the concentration of emissions in the atmosphere that is consistent with the goal of staying below 2°C. This gap could be partly covered by the emission savings that could result from minimum pledges and maximum pledges. Unless the remaining gap of around 1.9 to 4.2 Gt is closed and Parties commit themselves to strong action prior and after 2020, global emissions will remain on an unsustainable pathway that could lead to concentrations equal or above 550 ppm with the related temperature raise around 3°C.

I. Background

A number of **Annex I Parties made pledges** for greenhouse gas (GHG) emission reductions and a number of **non-Annex I Parties announced voluntary actions** and related policy goals to address emissions in the lead-up to the Conference in Copenhagen. A summary of these pledges is included in a annex to this paper.

Pledges made by Annex I Parties are in the form of emission reduction compared to the level of base or reference year and basically set the cap on emissions from these Parties. These pledges are, therefore, relatively easy to assess in terms of the aggregated emission reductions that they may deliver compared to the base year emission levels. Reductions that these pledges could deliver below the projected levels of baseline emissions in 2020 are less certain because of the uncertainties related to baseline emission levels. In addition, a number of uncertainties remained associated with these pledges in terms of scale of the use of mechanisms and credits generated from activities in the land use land-use change and forestry (LULUCF) sector. Therefore, the assessment of the aggregated effect from the pledges of Annex I Parties should be considered taking into account all these uncertainties.

The announced **voluntary actions and policy goals by non-Annex I Parties**, referred to herewith as voluntary actions, are primarily in the form of intensity targets or in the form of commitments to action to implement specific policies. They are usually formulated as reduction below the baseline level of emissions projections (BAU), which are prepared by relevant national institutions using different sets of assumptions and models, and variety of approaches and models. Therefore, voluntary actions by non-Annex I Parties are more difficult to assess compared to pledges from Annex I Parties. Even when such assessments are available for individual countries from the available literature, they are not strictly comparable from a methodological point of view.

Notwithstanding the methodological difficulties associated with the integration of all pledges by Annex I Parties and voluntary actions by non-Annex I Parties in a single analytical framework that would allow to assess their overall impact, the objective of the paper is to provide **preliminary assessment of the aggregated effect from the pledges and voluntary actions on the level of emissions in 2020, how far emissions from the most frequently referred 450 ppm stabilization scenario and from the peaking of global emissions in the next 10 to 15 years**. The paper aime to address all these issues in a transparent and methodologically robust way.

II. Approach

The methodologically robust way to assess pledges is to consider them in a single and integrated methodological framework using a consistent set of assumptions, e.g. through a run of any of the global equilibrium models. Then the results could be compared with the IPCC scenarios from the IPCC Fourth Assessment Report (AR4) or any internationally recognized most recent scenarios.

According to the **IPCC 450 ppm** scenarios, Annex I Parties are expected to reduce their emissions by **25-40%** in 2020 compared to 1990 emission levels and developing countries are expected to reduce their emissions significantly below the baseline (this is clarified in the available literature to mean **15-30%** reduction below the baseline).

However, due to the economic crisis the level and trajectory of future emission pathways presented in the IPCC AR4 may not necessarily provide for the most robust basis for this assessment. In addition, such approach might be difficult to implement given that the secretariat does not maintain its own models.

A **pragmatic way** to obtain an assessment of the aggregated effect from the pledges and voluntary actions is to use as a basis the most recent scenarios and results available from widely recognized global models and institutions. The recently published scenarios by the International Energy Agency (IEA) **2009 World Energy Outlook (WEO)** represent perhaps the most prominent example in this context. This is why the 2009 WEO scenarios were chosen for this assessment.

III. Emission pathways and peaking of global emissions

The goal of keeping the increase in global average temperature above pre-industrial levels **below 2°C** is most frequently referred to in the political debate during the COP in Copenhagen.

Since the increase in the temperature depends on the cumulative emissions and their concentration in the atmosphere, there are different pathways that may lead to the same level of concentration of emissions in the atmosphere that are consistent with the goal of staying below **2°C**. From the range of IPCC scenarios presented in AR4, category I and the lower end of category II scenarios are consistent with the goal of staying below **2°C** (IPCC AR4 WGIII, SPM5) with a probability to achieve this goal estimated at around 50%. The emission profiles for these scenarios require **global emissions to peak at around 2015-2020** and to **decline thereafter as a result from continued and even stronger action to around 50% by 2050**.

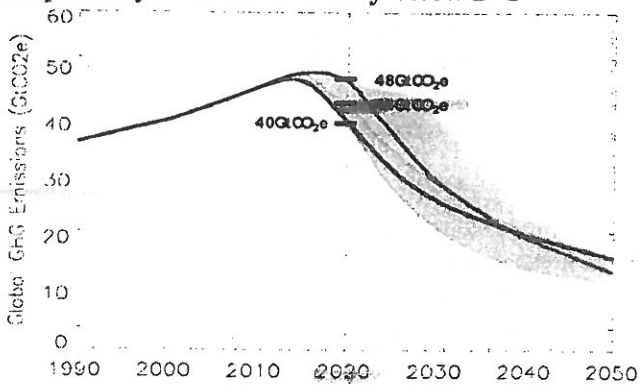
The **same result** could be achieved through global **emissions peaking earlier** than between 2015-2020. However, this would require very strong action in the next 10 years that might be very difficult to be agreed. Alternatively, **emissions could peak later** than between 2015-2020, but then much more dramatic action could be required after the peak of emissions that

could be extremely expensive and politically unfeasible because of the possible lock-in effect of economy with reliance on inefficient and carbon intensive technologies.

One of the key question relating to pathways is **the level at which the global emissions must peak to be able to stay within the 2°C goal**. There is a very good convergence among a number of studies that were published recently on that **44Gt being the level at which global emissions must peak** between 2015 and 2020.

Conversely, the range of **BAU level of emissions in 2020** in these studies is relatively large, between **50 and 57Gt in 2020**. Such wide range reflects different methods being used, different assumptions in terms of the key drivers for emission growth and, importantly, different ways of inclusion of the effects from mitigation policies already implemented in the BAU scenarios.

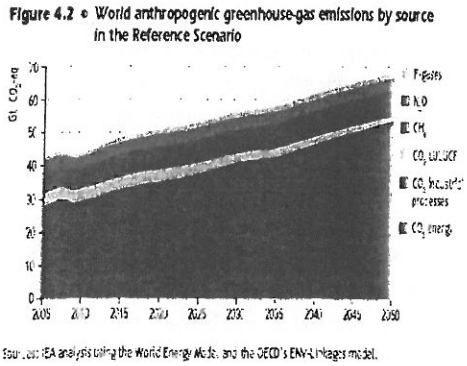
Figure 1. Emission pathways that allow to stay below 2°C



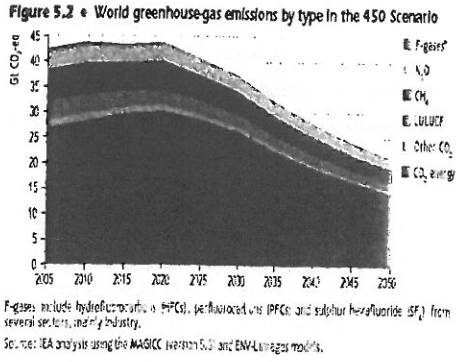
IV. Results from the assessment

Two scenarios, the reference scenario and 450 ppm scenario, for the global emissions from the 2009WEO were used as a basis for the assessment (Figure 2). Emissions included in these scenarios were then presented for Annex I Parties, non-Annex I Parties and bunker fuels, to set the basis for assessing the pledges by Annex I Parties and voluntary actions announced by some non-Annex I Parties.

Figure 2. Reference scenario and 450 ppm scenario form the 2009 World Energy Outlook



Source: IEA analysis using the World Energy Model and the OECD's ENV-Linkages model.



F-gases include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) from several sectors, mainly industry.

Source: IEA analysis using the MAGICC (version 5.3) and ENV-Linkages models.

According to the 2009WEO, global emissions in 2020 are projected to be around **51Gt for the reference scenario**. According to the **450 ppm scenario**, global emissions peak around 2015 at the **level of 43.7 Gt** and remain broadly stable at that level before starting to decline in 2020.

The level of emissions in the reference scenario of 51 Gt is among the lowest compared to the other studies available. There are two reasons for this. The first is that the 2009WEO scenarios **reflect fully the effect from the economic crisis** on energy consumption and associated emission levels. The second is that the **reference scenarios already includes the effects from some of the pledges and voluntary action, in cases where the relevant legislation and policies are put in place**. This includes, among others, a large part of the EU 20% reduction target, Norway 30% reduction target, Australia's 5% reduction target and China's current policies, notably the 20% energy efficiency improvement target. The effect of these pledges and voluntary actions is estimated at **3.2Gt**, and total emissions are estimated at **54.2 Gt** for 2020 for BAU scenario that does not include such affects.

Given that total emissions in 2020 are projected to be **43,7Gt** for the 450 ppm scenario, this leaves a gap of **10.5Gt** between the BAU emission levels and the 450 ppm scenario.

According to the estimates, **minimum pledges could deliver 6.3Gt emission savings** (2.1Gt for Annex I Parties, 3.7Gt for non-Annex I Parties and 1.5Gt from LULUCF, mainly from reduced deforestation from Brazil and Indonesia), while the **maximum pledges could deliver 8.6Gt emission savings** (3.4Gt for Annex I Parties, 3.6Gt for non-Annex I Parties and 1.6Gt from LULUCF, mainly from reduced deforestation from Brazil and Indonesia).

As noted in this section, 3.2Gt of emission savings resulting from pledges and voluntary actions that are backed by existing policies and legislation are already included **in the reference scenario. This leaves a gap of 7.3Gt between the reference scenario and 450ppm scenario.** According to the estimates, **minimum pledges and voluntary action could deliver 3.1Gt additional emission savings** (0.6Gt for Annex I Parties, 1.0Gt for non-Annex I Parties and 1.5Gt from LULUCF, mainly from reduced deforestation from Brazil and Indonesia), while the **maximum pledges and voluntary action could deliver 5.4Gt emission savings** (1.8Gt for Annex I Parties, 2.0Gt for non-Annex I Parties and 1.6Gt from LULUCF, mainly from reduced deforestation from Brazil and Indonesia).

The estimates for pledges for Annex I Parties and voluntary action for non-Annex I Parties are contained in an annex to this paper. For **China** this estimate includes 0.8Gt reductions from energy-related emissions in addition to the reductions of 1.7 Gt already included in the IEA reference scenario (if 45% reduction in carbon intensity is considered) and an additional removal from reforestation of 40 million ha. For **India**, the estimate from the voluntary action to reduce carbon intensity of output does not result in reductions that are additional to the IEA reference scenario, except for the 0.2Gt resulting from reforestation measures and other actions that are in addition to those included in the reference scenario. **Brazil** has a detailed plan for emission reductions that covers up to 0.3Gt from the energy and non-energy sectors. Estimates for voluntary actions from the other non-Annex I Parties, including the Republic of Korea, South Africa, Indonesia and Mexico are estimated at around 0.7Gt. Additional REDD actions could deliver about 0.6Gg from Brazil and 0.7 from Indonesia, and enhanced aforestation and reforestation could deliver another 0.3Mt savings in China and Mexico.

This leaves a **gap of around 1.9Gt to the 44Gt emission level in 2020 that should be covered to ensure the transition to 450 ppm emissions pathway for maximum pledges and** voluntary actions. This is less than the assessment by the 2009WEO of 3.7Gt gap between the reference and 450 ppm scenario that could now be assessed at **2.8Gt** taking into account the recent pledge by China for 40 to 45% carbon intensity improvement (this pledge could bring 0.8Gt emission reduction on top of the reductions already delivered by the measures that are put in place and included in the reference scenario). The difference between the 1.9Gt and 2.8Gt could be explained mainly by including in the current assessment of additional emission reductions that could come mainly from the REDD, which are not included in the IEA analysis.

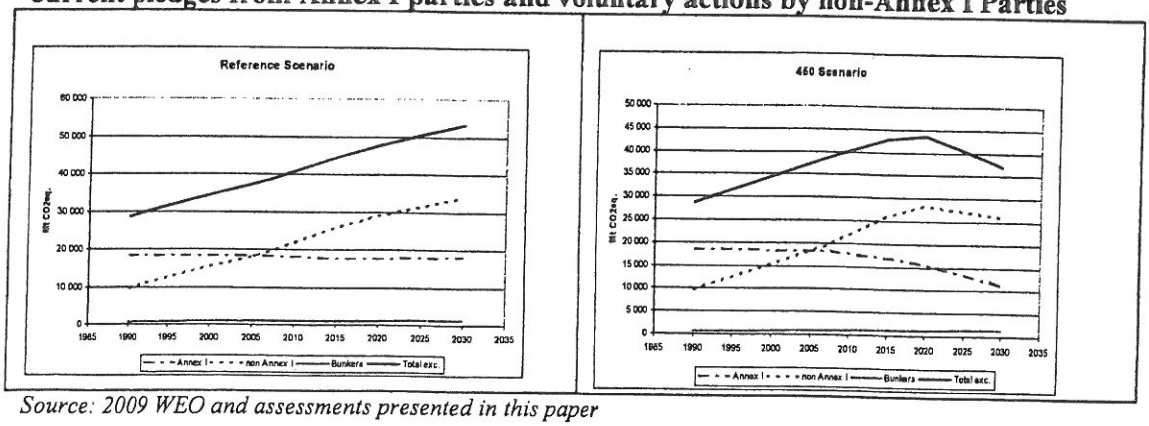
The gap increases to 4.2Gt in the case if Parties do not move to the upper range of their pledges and voluntary actions. It may increase even further if a robust assessment of the portion of the reductions that could be achieved in the non-Annex I Parties through CDM is taken into account and possible double counting of emission reductions in Annex I and non-Annex I Parties is avoided. In addition, emission reductions from voluntary actions announced by developing countries and presented in the annex to this paper tend to overestimate the effects from these actions mostly because optimistic baseline scenarios. Finally, the decision how carry-over units from the first commitment period for compliance for the second commitment period is not taken yet. If all possible carry-over units would be used for compliance for the second commitment period this could increase the gap by at least 1Gt depending on the duration of the second commitment period that is yet to be agreed.

V. Peaking of emissions according to the current pledges and next steps

According to the 2009WEO, to stabilize emissions at 450 ppm, **global emissions should peak between 2015 and 2020 at the latest,** and should be reduced steadily thereafter, which is in line with the relevant scenarios from the IPCC AR4. The global peak of emissions is primarily defined by the profile of emissions of non-Annex I Parties, which in the 450 ppm scenario are expected to peak at around the same time according to the 450 ppm scenario. However, to achieve the peak of global emissions between 2015 and 2020, it is of critical importance for Annex I Parties to commit to strong action, beyond the current maximum pledges to achieve a peak of emissions around 2010 at the latest and to reduce them rapidly thereafter (Figure 3)

Given that there is still **around 1.9Gt gap to the required emission levels in the 450 ppm scenario**, the **peak of emissions could be expected to occur a few years later than in the IEA 450ppm scenarios**. If no further action is taken, this could lead to concentrations equal or above 550 ppm with the related temperature raise around 3°C.

Figure 3. Reference scenario form the 2009WEO and mitigation scenario that includes current pledges from Annex I parties and voluntary actions by non-Annex I Parties



Source: 2009 WEO and assessments presented in this paper

The assessment of pledges ***made by Annex I Parties, and voluntary actions and policy goals announced by a number of non-Annex I Parties*** and the resulting gap to the level of 44Gt is based on the existing information. Further steps are possible and necessary to fill in the remaining gap 1.9 to 4.2Gt. This could be done by increasing the aggregated emission reductions by Annex I Parties to at least 30% below the base-line levels; further stronger voluntary actions by developing countries to reduce their emissions by at least 20% below the BAU and; reducing further emissions from deforestation and international aviation and marine shipping.

VI. Conclusions

The pledges made by a number of **Annex I Parties** for emission reductions below base year levels and **announcements made by a number of non-Annex I Parties for voluntary actions** to address emissions in the lead-up to the COP in Copenhagen could bring significant emission reductions and help to reduce the gap between the current reference emission levels in 2020 and the required level of global emissions of 44 Gt in the same year which is estimated at around 10.5 Gt. Even if Parties agreed to deliver in accordance with the upper range of their pledge, this will still leave a gap of around 1.9 to 4.2 Gt.

Unless the remaining **gap of around 1.9 to 4.2 Gt** is closed and Parties commit themselves to strong action prior and after 2020, global emissions will peak later than 2020 and remain on an unsustainable pathway that could lead to concentrations equal or above 550 ppm with the related temperature raise around 3°C.equal or above 550 ppm. This in turn will reduce significantly the probability to stay within a temperature increase of **2°C.**

Annex

Table 1. Information on pledges for emission reductions made by Annex I Parties

Party	Information on pledges		Status of pledges	Inclusion of LULUCF[c]	Inclusion of mechanisms
	Range of emissions reduction by 2020	Reference year			
Australia	–5 to –15%; or –25%	2000	Officially announced	Yes	Yes
Belarus	–5 to –10%	1990	Under consideration	Yes	The QELROs are conditional on access to mechanisms
Canada	–20%	2006	Officially announced	Preliminary range of –2 to 2% of total 2006 emissions	No significant use of mechanisms
Croatia[a]	+6%	1990	Under consideration	Yes	TBD
European Community (EU-27[b])	–20 to –30%	1990	Adopted by legislation	No for –20%; Preliminary range of –3 to 3% of 1990 emissions for –30%	Preliminary estimates of 4% for –20% and 9% for –30%
Iceland	–15%	1990	Officially announced	Substantial contribution	Limited use of mechanisms
Japan	–25%	1990	Officially announced	Preliminary range os 1.5 to -2.9% of 1990 emissions	TBD
Kazakhstan	–15%	1992	Officially announced	TBD	TBD
Liechtenstein	–20 to –30%	1990	Officially announced	No	10 to 40%
Monaco	–20%	1990	Officially announced	No	Yes
New Zealand	–10 to –20%	1990	Officially announced	Yes	Yes
Norway	–30 to –40%	1990	Officially announced	Around 6% (3 Mt CO_2 eq)	Yes for –30%; Yes for –40%
Russian Federation	–15 to –25%	1990	Officially announced	TBD	TBD
Switzerland	–20 to –30%	1990	Officially announced	Yes, under current accounting rules	Legally binding cap of 50% of the target on mechanisms. Preliminary estimate of around 36% of the 20% target and 42% of the 30% commitment
Ukraine	–20%	1990	Under consideration	TBD	Yes
Unites States	–14 to –17%	2005	Under consideration	Yes	Yes

Abbreviations: LULUCF = land use, land-use change and forestry, QELROs = quantified emission limitation and reduction
objectives, TBD = to be determined.

[a] An increase of emissions of six per cent by 2020 relative to 1990 levels is equivalent to a decrease of five per cent of emissions relative to Croatia's base year calculated according to decision 7/CP.12.

[b] Total emissions for the European Community include emissions from the inventory submission of the 15 member States that are bound by the provisions of Article 4 of the Kyoto Protocol and emissions from the remaining member States that are also included in Annex I to the Convention.

Note: According to the RDA, total emissions from Annex I Parties would reach 17.4Gt in 2020 for the minimum pledges and 15.8 Gt for the maximum pledges, if LULUCF emissions are excluded. This represents around 2.1 to 3.4Gt, or 11 to 17% deviation from the BAU excluding LULUCF or 10 to 18% deviation from the BAU including LULUCF. This also represents around 9 to 17% emission reduction from 1990 emission levels.

Table 2. Information on mitigation actions and policy goals announced by the non-Annex I Parties

Party	Mitigation action and policy goals for 2020	Reference Year or level	Status	Context	Emission reduction Mt CO2eq.
Brazil	Reduce emissions by 36.1–38.9 % from BAU. Reductions for sectors: energy (6.1 to 7.7%); agriculture (4.9 to 6.1%); deforestation (20.9% Amazonia, 3.9% Cerrado)	2020 (BAU)	Officially announced	Around half of the reductions are conditional to external support, including REDD	840-910 (264–332 Mt and REDD 580 Mt)
Costa Rica	Reduce emissions and increase removals to achieve carbon neutrally by 2021	2021	Officially announced	National Strategy on Climate Change under preparation	18.6 Mt
China	Reduce carbon intensity by 40–45 % relative to 2005	2005	Officially announced	The intensity target is in the context of the current Climate Change Plan (2007-2010) and the Strategy for Renewable Energy (2008-2020)	800-2,700 Mt
India	Reduce emission intensity of output by 20–25 % relative to 2005	2005	Officially announced	The intensity target is in the context of the National Action Plan on Climate Change (2008) and the 11th five year plan	160 Mt
Indonesia	Reduce its emissions by 26% from BAU level unilaterally and by41% with international support	2020 (BAU)	Officially announced	Domestic portion of the target is to be achieved primarily through REDD and measures in the LUCF	800-1,200 Mt
Maldives	The Maldives is committed to become a carbon neutral nation by 2019	2019	Officially announced	The National Adaptation Programme of Action (NAPA) of the Maldives was published in December 2006	NA
Mexico	National Plan on Climate Change with policies by 2012 aimed at reducing emissions by 5% in 2020 below BAU	2020	Officially announced	Overall strategy of reducing emissions by 50% by 2050 is consistent with a 20% emission reduction by 2020	20-180 Mt
Republic of Korea	Reduce emissions by 4% below 2005 level, or 30% from BAU level	2005 and 2020 (BAU)	Officially announced	Unilateral pledge with intention to harness the power of carbon markets	160 Mt
Singapore	Reduce emissions by 16% from BAU level	2020 (BAU)			NA
South Africa	Reduce emissions by around 34% from BAU level in 2020 and by around 42% by 2025	2020 (BAU) and 2025 (BAU)	Officially announced	Current policies are expected to reduce emissions by by about 10% from BAU in 2020. Plans are for emissions to peak between 2020 and 2025, remain broadly stable for a decade and decline in absolute terms thereafter	185 Mt

Abbreviations: NA = not available

Note: According to the FTS, total emissions from the 7 major non-Annex I Parties would reach 18.7Gt in 2020. This will represent around 3Gt, or 14% deviation from the BAU.