25 March 2009

ENGLISH ONLY

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

AD HOC WORKING GROUP ON FURTHER COMMITMENTS FOR ANNEX I PARTIES UNDER THE KYOTO PROTOCOL
Seventh session
Bonn, 29 March to 8 April 2009

Item 3 of the provisional agenda
Consideration of the scale of emission reductions to be achieved by Annex I Parties in aggregate

Item 4 of the provisional agenda
Contribution of Annex I Parties, individually or jointly, to the scale of emission reductions to be achieved by Annex I Parties in aggregate

Items 5 (d), 5 (e), 5 (f) and 5 (h) of the provisional agenda
Other issues arising from the implementation of the work programme of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol
The coverage of greenhouse gases, sectors and source categories
Common metrics to calculate the carbon dioxide equivalence of anthropogenic emissions by sources and removals by sinks
Possible approaches targeting sectoral emissions
Other issues

Consideration of the scale of emission reductions to be achieved by Annex I Parties in aggregate, of the contribution of Annex I Parties individually or jointly, consistent with Article 4 of the Kyoto Protocol, to the scale of emission reductions to be achieved by Annex I Parties in aggregate, and of other relevant issues arising from the implementation of the work programme of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol as contained in document FCCC/KP/AWG/2008/8, paragraph 49 (c)

Submissions from Parties

Addendum

1. In addition to the fifteen submissions contained in document FCCC/KP/AWG/2009/MISC.1, two further submissions have been received.

2. In accordance with the procedure for miscellaneous documents, these submissions are attached and reproduced* in the language in which it was received and without formal editing.

* These submissions have been electronically imported in order to make it available on electronic systems, including the World Wide Web. The secretariat has made every effort to ensure the correct reproduction of the text as submitted.

FCCC/KP/AWG/2009/MISC.1/Add.1

GE.09-60492

CONTENTS

PAPER NO. 1: GRENADA ON BEHALF OF THE ALLIANCE OF SMALL ISLAND STATES

Scale of emission reductions to be achieved by Annex I Parties and allocation of corresponding mitigation effort (AWG-KP)

Grenada welcomes the opportunity to present the views of the 43 member States of the Alliance of Small Island States (AOSIS), in response to the request for views of Parties by 15 February on the scale of emission reductions to be achieved by Annex I Parties in aggregate and on options for the allocation of the corresponding mitigation effort and their contribution to the global effort to reach the ultimate objective of the Convention. See FCCC/KP/AWG/2007/5, para. 23(b).

I. Global emission reduction goals and their implications for Annex I efforts

AOSIS has expressed its views on global emission reduction goals within the context of the AWG-LCA.[1] These views are equally pertinent to any examination of the sufficiency of Annex I Party efforts under the Kyoto Protocol for the second commitment period, as under the Convention Annex I Parties are to take the lead in reducing greenhouse gas emissions. AOSIS is of the view that:

1. Stabilization of atmospheric greenhouse gas concentrations should be ***at well below 350 ppm CO2***.
2. Global average surface temperature increase should be limited to ***well below 1.5º C*** above pre-industrial levels
3. Global greenhouse gas emissions must ***peak by 2015***.
4. Global CO_2 reductions of ***greater than 85%*** are required by 2050.

To achieve this goal:

5. Annex I Parties collectively, whether or not Parties to the Kyoto Protocol, must reduce their emissions by ***more than 40%*** of their 1990 levels by 2020.
6. Annex I Parties collectively, whether or not Parties to the Kyoto Protocol, must reduce their emissions by ***more than 95%*** of their 1990 levels by 2050.

II. Scientific Basis for Annex I Party Emission Reduction Goals

Article 3.3 of the Convention, which guides both the Convention and Protocol, provides that the Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and minimize its impacts. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures.

In the view of AOSIS, in the context of this precautionary approach, the avoidance of further negative impacts on small island developing States must be one of the key benchmarks for assessing the adequacy of any global long-term emission reduction goal and for gauging the necessary scale of emission reductions to be achieved by Annex I Parties in the second commitment period.

In December 2008, the AWG-KP concluded as follows[2]:

---

[1] FCCC/AWGLCA/2008/Misc.5/Add.2 (Part I) (AOSIS input on shared vision).

[2] See FCCC/KP/AWG/2008/8, Report of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol on its resumed sixth session.

18. The AWG-KP recalled that its work should be guided by a shared vision of the challenge set by the ultimate objective of the Convention based on the principles and other relevant provisions of the Convention and its Kyoto Protocol. It noted the usefulness of the ranges referred to in the contribution of Working Group III to the Fourth Assessment Report (AR4) of the IPCC and that this report indicates that global emissions need to peak in the next 10-15 years and be reduced to very low levels, well below half of levels in 2000 by the middle of the twenty-first century in order to stabilize their concentrations in the atmosphere at the lowest levels assessed by the IPCC to date in its scenarios. Hence the urgency to address climate change. At the first part of its fourth session, the AWG-KP recognized that the contribution of Working Group III to the AR4 indicates that ***achieving the lowest levels assessed by the IPCC to date and its corresponding potential damage limitation*** would require Annex I Parties as a group to reduce emission in a range of ***25-40 percent below 1990 levels by 2020***, through means that may be available to these Parties to reach their emission reduction targets. The IPCC ranges do not take into account ***lifestyle changes*** which have the potential of increasing the reduction range. The ranges would be significantly higher for Annex I Parties if they were the result of an analysis which assumes that emission reductions were to be undertaken exclusively by Annex I Parties. The AWG-KP also recognized that achievement of these reduction objectives by Annex I Parties would make an important contribution to overall global efforts required to meet the ultimate objective of the Convention as set out in its Article 2.

19. The AWG-KP noted the concerns raised by small island developing States and some developing country Parties with regard to the lack of analysis of stabilization scenarios below 450 ppmv of CO2 equivalent. In line with the iterative approach to the work programme, ***the information referred to in paragraph 18 above will be reviewed in the light of information received by the AWG-KP, including from possible further scientific work on stabilization scenarios***. [footnotes omitted]

The 'lowest levels assessed by the IPCC to date', referenced in the AWG-KP report, associate a stabilization concentration range of 445-490 ppm CO2-eq (350-400 ppm CO_2) with a 2.0 to 2.4º C increase above pre-industrial levels, and estimate that to achieve such a stabilization concentration would require a -85% to -50% reduction in global CO_2 emissions by 2050, and a reduction in Annex I emissions of -25% to -40% by 2020 and -80% to -95% by 2050.[3]

AOSIS has repeatedly emphasized that a 2ºC increase in global average surface temperature would be devastating to SIDS and jeopardize the sovereign existence of many small island State Parties to the Convention and Protocol. For this reason, as AOSIS has repeatedly stated, such a level of ambition is inadequate under the Convention's multi-lateral process. This concern is noted in paragraph 19 quoted above,[4] and must be addressed in the establishment of Annex I Party targets for the second commitment period.

In the view of AOSIS, Annex I Party commitments in the Kyoto Protocol's second commitment period must be consistent with stabilisation of greenhouse gas emissions ***at well below 350 ppmv CO2*** and with a limitation of global average surface temperature increases to ***well below 1.5º C***. (See Hansen et al., 2008). There are emissions pathways described in recent available studies that that show support for this level of stabilisation concentration and this temperature increase limitation.[5]

---

[3] See Contribution of Working Group III to the IPCC AR4, Technical Summary, pages 39 and 90.

[4] It is also reflected in FCCC/KP/AWG/2007/4, para. 19 (Report of the AWG-KP on the first part of its fourth session) where the AWG noted the possibility for further work on lower stabilisation scenarios. The AWG-KP recognized the outcomes of the contribution of IPCC WG II on Impacts, Vulnerability and Adaptation and that 'the lower the stabilisation level achieved, the lower the consequent damages'.

[5] See Rao et al. (2008), IMAGE and MESSAGE Scenarios Limiting GHG Concentrations to Low Levels, 2008; Potsdam Institut for Climate Impact Research (2008), Report of the First Assessment of Low Stabilisation Scenarios,; Van Vuuren et al. (2007), Stabilising Green House Gas Concentrations at Low Levels, an Assessment of Reduction Strategies and Costs; Hansen et al. (2008).

In keeping with the ***iterative approach*** to the AWG-KP's work programme referenced in paragraph 19 cited above, AOSIS believes the AWG-KP must now receive and take on board the results of ***more recent scientific information and analysis*** that has been produced since the IPCC AR4 on:

- the acceleration of climate change and its adverse impacts;
- stabilisation pathways that are consistent with the precautionary approach;
- consequent damages to vulnerable countries and ecosystems implied by mitigation efforts at given stabilisation levels and the timeframes for such damage.

Recent scientific studies support AOSIS's view that stabilisation pathways leading to stabilisation of GHG concentrations at levels lower than those analysed by the IPCC to date are required of the global community to avoid catastrophic climate change impacts on SIDS and to prevent the triggering of critical climate thresholds that cannot be reversed.

Hence a greater than 40% reduction in emissions relative to 1990 levels by 2020 and a greater than 95% reduction in emissions relative to 1990 levels by 2050 is required of Annex I Parties.

III. Recent Scientific Studies Indicate that More Ambitious and Urgent Action is Necessary

The IPCC's Fourth Assessment Report reviewed and analysed scientific studies published up until the end of 2006, and in a few cases to early 2007. Scientific research and information accumulating since that time indicates that climate change is accelerating beyond the projections outlined in earlier studies. Many impacts have been underestimated, the timeframe for these impacts has been overestimated, and carbon cycle feedbacks have not been well-understood and are likely to have been underestimated in many cases.

From recent scientific studies it is apparent that far more ambitious and urgent mitigation efforts are needed than those set out in the lowest stabilisation range referenced in the AWG-KP's Report on its 2008 session. The lower bound of that range (at best a 2-2.4ºC limitation in global average surface temperatures above preindustrial levels and stabilisation range of 445-490 ppm) is not in keeping with the precautionary approach. A number of studies have found that even securing a limit to 2º C is not likely unless a stabilisation concentration well below 400 ppm is achieved.[6] And again, even a limit to 2º C would devastate many small island developing countries.

Risk of rapid, large and inexorable sea level rise. Sea level rise due to global warming is one of the biggest long term threats to SIDS and other low-lying areas and coastal states. The most predictable component of sea level rise is the thermal expansion of the ocean caused by warming of the ocean depths. This process is inexorable and will continue for many centuries after GHG concentrations have stabilized, raising sea level by 0.2-0.6m per ºC of global average warming (IPCC 2007). Thus global warming of 2ºC would commit to a sea level rise of 0.4-1.2m due to thermal expansion alone, regardless of loss of the ice sheets and glaciers, which only add to this figure.

On top of this, there is the risk of substantial and possibly rapid loss of ice from Greenland and Antarctica. Loss of the Greenland ice sheet would raise sea level by 2-7 metres over centuries to millennia and a global warming of 1.9-4.6ºC above preindustrial levels could trigger this loss. The IPCC has said that rapid sea level rise from the decay of this ice sheet "cannot be excluded" (IPCC 2007). Sea level data from the last interglacial period, 125,000 years ago, when warming over Greenland was around that expected for the mid 21st century, indicates that average rates of sea level rise in that period were

[6] See Meinshausen, M. (2006) (stabilisation at 450 ppm CO2-eq. carries a 26 to 78% risk of exceeding 2ºC); Baer P. and Mastrandea M. (2006) (stabilisation at 450 ppm CO2 (454-480 CO2-eq.) carries a 46 to 85% risk of exceeding 2ºC).

rapid, around 1.6 metres/century (Rohling, Grant et al. 2008). The melting of ice that caused this increase may not all have come from Greenland and there could have been a source from the West Antarctica. The consequence of such a rate of rise of sea level would be nothing short of catastrophic for small island developing States.

Sea level is rising faster than the IPCC projected. Since 1990, observed sea level has been rising one and a half times faster than the rise forecasted in the IPCC's Third Assessment Report (Rahmstorf et al., 2007). In 2001, the IPCC projected a sea level rise of 0.18-0.59 meters (18 to 59 cm) by 2100. Recent projections have concluded that by 2100 a sea level rise of 50-140 cm over 1990 levels is most likely (Rahmstorf 2007) and that 80 cm is plausible and even 200 cm theoretically possible (Pfeffer et al., 2008). The IPCC projected a best-estimate rise of sea level rise of less than 2 mm/year. Satellite data show a linear trend of 3.3 ± 0.4 mm/year from 1993-2006 (Rahmstorf et al). The largest contribution to the rapid rise is from ocean thermal expansion and the melting from glaciers as a result of warming. But while the contribution to sea level rise from ice sheet melt has been small, observations indicate that this contribution is rapidly increasing from both Greenland and Antarctica (Rahmstorf et al. 2007).

West Antarctic ice sheet loss is accelerating. The West Antarctic ice sheet has long been identified by the scientific community as a potential source of rapid sea level rise due to global warming, as it is thought to be potentially unstable (Mercer 1978). Citing several lines of evidence, IPCC Working Group II of the AR4 found that for warming over 2.5ºC there is an increasing likelihood of partial or complete loss of the West Antarctic ice sheet, raising sea level 1.5-5 meters over several centuries to millennia (Schneider, Semenov et al. 2007). The observed, accelerating loss of ice from the West Antarctic ice sheet supports the concern that there is significant risk of a disintegration of this ice sheet (Rignot, Bamber et al. 2008; Rignot and Steffen 2008).

Arctic sea ice loss is outpacing IPCC projections. Recent studies have found that the Arctic Ocean is losing sea ice 30 or more years ahead of IPCC modelled projections (Stroeve et al. 2007). Climate models analysed by the IPCC simulated a loss in September ice cover of roughly 2.5% per decade from 1953 to 2006. Newly available data sets indicate that September ice cover actually declined at a rate of 7.8% per decade over that period (Stroeve et al. 2007). The IPCC AR4 reported a decline in the area covered by summer sea ice of approximately 7.4% per decade from 1979-2005, as measured by satellite. However, the last few years have seen three record lows in summer sea ice cover, increasing this average significantly. A seasonally ice-free Arctic Ocean is now plausible by 2060 (Stroeve et al., 2007).

Greenland Ice Sheet rate of ice loss has accelerated in recent years beyond predictions. Northern polar temperatures are increasing at twice the rate of the global mean. Disintegration of the Greenland Ice Sheet may be triggered inside a global average surface temperature increase of 2 ºC (IPCC 2007). The rate of Greenland Ice Sheet loss accelerated 200 to 300% between assessment periods in the 1990s and 2005 (Chen et al., 2006; Velicogna & Wahr, 2006; Rignot & Kanagaratnam, 2006). The annual contribution of the Greenland Ice Sheet to sea level rise in 2007 appears to have increased by more than three fold compared to the IPCC AR4 estimate of 0.21 mm/yr for the decade 1993-2003 (Rignot and Kanagaratnam 2006; Chen 2006).

Atmospheric CO_2 concentrations are growing at an accelerating pace. Annual mean growth rate of atmospheric CO_2 was 2.2 ppm per year in 2007, and averaged 2.0 ppm for the period 2000-2007. The average annual mean growth rate for the previous 20 years was about 1.5 ppm per year (Global Carbon Project 2008). The atmospheric CO_2 concentration at 383 ppm in 2007 was 37% above the concentration at the start of the industrial revolution. The present concentration is the highest during the last 650,000 years and probably during the last 20 million years (Global Carbon Project 2008).

Ocean acidification. Global average surface seawater pH has been reduced by 0.1 since the industrial revolution, and is now at 8.18. If emissions continue to rise at their current rate, pH is estimated to decrease by a further 0.4 by 2100 (Caldeira and Wickett, 2003), impacting the ability of corals and other ocean organisms to adapt and causing a decline in the effectiveness of ocean sink strength.

Since the IPCC's Fourth Assessment Report was issued, and since the materials underlying the report were collected, many studies have found that climate change is happening more rapidly, and impacting key natural systems more severely and earlier than projected by the IPCC AR4. This information must be made part of the AWG-KP's deliberations on appropriate targets for Annex I Parties in the second commitment period. Under the Convention, the Parties are to protect the climate system for the benefit of present and future generations of humankind and developed country Parties are to take the lead in combating climate change and its adverse impacts.

IV. Vulnerability of SIDS

The implications for SIDS of delayed or insufficiently ambitious mitigation effort by Annex I Parties must be considered in establishing targets for Annex I Parties for the Kyoto Protocol's post-2012 period. SIDS are already suffering from the impacts of climate change and further sea level rise threatens the very sovereign existence of a number of AOSIS member countries.

The avoidance of further negative climate change impacts on small island developing States must be one of the key benchmarks for assessing the appropriateness of any long-term emission reduction goal and the sufficiency of mitigation efforts by Annex I Parties in the post-2012 period.

Annex I Party efforts must be consistent with a long-term goal sufficient to ensure that long-term global average temperature increase is limited to well below 1.5 ºC. Efforts consistent with a 2ºC temperature increase compared to pre-industrial levels, as have been proposed by many Parties, would have devastating consequences on SIDS due to resulting sea level rise, coral bleaching, coastal erosion, changing precipitation patterns, increased incidence and re-emergence of climate-related diseases, and the impacts of increasingly frequent and severe weather events.

Critical physical, environmental, social and economic thresholds exist for many SIDS, as well as for other particularly vulnerable countries and groups; these thresholds must not be breached.

Increasing emissions cause a direct, consequent, increase in damage to SIDS that must be adequately addressed in any post-2012 agreement.

V. Options for the allocation of the corresponding mitigation effort

Annex I Parties as a group must reduce their GHG emissions by more than 40% below 1990 levels by 2020 and more than 90% below 1990 levels by 2050.

These targets require consideration of how this effort should be shared among Annex I Parties to the Kyoto Protocol. AOSIS is of the view that effort among Annex I Parties should be shared according to the principle of common but differentiated responsibilities and respective capabilities, applied through a transparent allocation process, which ensure that Annex 1 emission reduction efforts are effective and achieve real reductions.

Consistent with its views on global emission reduction goals within the context of the AWG-LCA, AOSIS recognises that these targets to be achieved by Annex 1 Parties, will be part of an overall global emissions reduction effort, that will enable global greenhouse gas emissions to peak by 2015 and global CO_2 emission reductions of greater than 85% by 2050.

In the post-2012 period, all Annex I Parties to the Convention must engage in mitigation effort that is comparable. To this end:

- 1990 must be used as a base year against which effort by all Annex I Parties is measured.
- The timeframe established for measuring mitigation effort under the Kyoto Protocol and Convention must be the same for all Annex I Parties.
- Nation-wide emission reduction targets must be established for all Annex I Parties, so that overall effort and progress can be measured.
- Procedures and mechanisms on compliance adopted by the Parties through decision 27/CMP.1 must continue to apply to all Annex I Kyoto Parties in the second commitment period to ensure that there is no reward for failure to meet earlier agreed Kyoto targets.
- Comparable mechanisms for compliance must apply to quantified emission limitation or reduction commitments or objectives taken by any non-Kyoto Annex I Party under the Convention.

The absence of any major-emitting Annex I Party from the Kyoto Protocol must not affect the scale or nature of Annex B Party targets calculated for the second commitment period. It must be assumed that comparable effort from any non-Kyoto Annex I Party will be secured under the Convention through a nation-wide legally-binding quantified emission reduction or limitation commitment, consistent with decision 1/CP.13 paragraph 1(b)(i), sufficient to enable aggregate Annex I Party efforts that are measurable, legally-binding, and consistent with the scale of the climate challenge.

Combined efforts by all Kyoto Parties and non-Kyoto Parties, both Annex I and Non-Annex I, must be consistent with the stabilization of CO_2 concentrations ***as far below 350 ppmv as possible*** and a long-term limitation of global average surface temperature increase to ***as far below 1.5°C*** as possible. This is necessary in view of the ultimate objective of the Convention and the obligation of all Parties to take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects.

VI. Information received by the AWG-KP

In light of the iterative nature of the AWG-KP's work programme, AOSIS the AWG-KP must review and reflect upon recent scientific information on the pace and scale of climate change impacts to support and inform deliberations on Annex I Party targets for the second commitment period to ensure consistency with the objectives of the Convention and Protocol. This includes an evaluation of the implications for vulnerable countries of any consequent damage likely to be associated with any given level of emission reduction effort.

Appendix: Non-Exhaustive List of Studies for Consideration by AWG-KP

Baer P. and Mastrandea M. (2006). High Stakes: Designing emissions pathways to reduce the risk of dangerous climate change. IPPR.

Caldeira K. and Wickett M. E., (2003). Anthropogenic carbon and ocean pH, Nature, 425: 325–325, UCRL-ID-143232.

Chen, J.L., Wilson C.R., Tapley B.D. (2006) Satellite Gravity Measurements Confirm Accelerated Melting of Greenland Ice Sheet. Science: 313. no. 5795: 1958-1960.

Global Carbon Project (2008) Carbon budget and trends 2007, [www.globalcarbonproject.org, 26 September 2008]

Hansen J., Sato M., Kharecha P., Beerling D., Masson-Delmotte V., Pagani M., Raymo M., Royer D., Zachos J., (2008). "Target Atmospheric CO2: Where Should Humanity Aim?" Open Atmos. Sci. J., vol. 2: 217-231.

IPCC (2007). Climate Change 2007: Synthesis Report. An Assessment of the Intergovernmental Panel on Climate Change. Geneva, Intergovernmental Panel on Climate Change.

Meinshausen, M. (2006). "What Does a 2ºC Target Mean for Greenhouse Gas Concentrations?" In: Avoiding Dangerous Climate Change. Schnellnhuber HJ (ed.), Cambridge University Press: 265-280.

Mercer, J. H. (1978). West Antarctic Ice Sheet and CO_2 Greenhouse Effect - Threat of Disaster. Nature 271(5643): 321-325.

Pfeffer W.T., Harper J.T. , O'Neel S. (2008). Kinematic Constraints on Glacier Contributions to 21st Century Sea-Level Rise. Science 321:1340-1343.

Potsdam Institut for Climate Impact Research (2008). Report of the First Assessment of Low Stabilisation Scenarios.

Rahmsdorf S. (2007). A Semi-Empirical Approach to Projecting Future Sea-level Rise. Science 315: 368-370.

Rahmstorf S., Cazenave A., Church J., Hansen J., Keeling R., Parker D., Somerville R. (2007). Recent Climate Observations Compared to Projections. Science 316: 709.

Rao S., Riahi K, Cho C., van Vuuren D., Stehfest E., den Elzen M., van Vliet J, Isaac M. (2008) IMAGE and MESSAGE Scenarios Limiting GHG Concentrations to Low Levels.

Raupach M., Marland G., Ciais P., Le Quéré C., Canadell J.G., Klepper G., Field C. (2007). Global and regional drivers of accelerating CO2 emissions. Proceedings of the National Academy of Science USA 104:10288-10293.

Rignot E., Kanagaratnam P. (2006). Changes in the velocity structure of the Greenland Ice Sheet. Science 311: 986-990.

Rignot, E., J. L. Bamber, M. R. van den Broeke, C. Davis, Y. Li, W. J. van de Berg and E. van Meijgaard (2008). Recent Antarctic ice mass loss from radar interferometry and regional climate modelling. Nature Geosci advanced online publication.

Rignot, E. and K. Steffen (2008). Changes in West Antarctic ice stream dynamics observed with ALOS PALSAR data. Geophysical Research Letters 35(L12505 doi:10.1029/2008GL033365.): 1-5.

Rohling, E. J., Grant K., Hemleben C., Siddall M., Hoogakker B. A. A., Bolshaw M. and Kucera M., (2008). "High rates of sea-level rise during the last interglacial period." Nature Geosci 1(1): 38-42.

Schneider S., Semenov S. H., Patwardhan A., Burton I., Magadza C. H. D., Oppenheimer M., Pittock A. B., Rahman A., Smith J. B., Suarez A. (2007). Assessing key vulnerabilities and the risk from climate change. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden and C. E. Hanson, Cambridge University Press, Cambridge, UK**:** 779–810.

Sommerkorn M. (2008). A Closing window of Opportunity – Global Greenhouse Reality 2008. WWF.

Stroeve J., Holland M., Serreze M., Scambos T., (2007), Arctic Sea Ice Decline: Faster than Forecast? Geophysical Research Letters 34: L09501.

Van Vuuren D.P., den Elzen M., Lucas P., Eickhout B., Strengers B.J., van Ruiven B., Wonink S., van Houdt R. (2007) Stabilising Green House Gas Concentrations at Low Levels, an Assessment of Reduction Strategies and Costs.

Velicogna I., Wahr J. (2006). Acceleration of reenland ice mass loss in spring 2004. Nature 443: 329-331.

PAPER NO. 2: TUVALU

Submission by Tuvalu on the scale of emission reductions to be achieved by Annex I Parties and allocation of corresponding mitigation effort (AWG-KP)

Tuvalu wishes to present its view on the scale of emission reductions to be achieved by Annex I Parties in aggregate and on options for the allocation of the corresponding mitigation effort and their contribution to the global effort to reach the ultimate objective of the Convention as requested in paragraph 23(b) of FCCC/KP/AWG/2007/5.

Being one of the most vulnerable countries to the impacts of climate change, Tuvalu believes that there should be a global response to reducing emissions. The aggregate response by Annex I and Non Annex I countries should ensure that atmospheric greenhouse gas concentrations are stabilized well below 350 ppm CO2. This would hopefully mean that global average surface temperature increase should be well below 1.5 deg C above pre-industrial levels and that global greenhouse gas emission must peak by 2015 at the latest.

The proposed ranges are below those identified by Working Group III of the IPCC in the Fourth Assessment Report and noted in paragraph 16 of Report of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol on its resumed fourth session, held in Bali from 3 to 15 December 2007 (FCCC/KP/AWG/2007/5). This is due to the fact that more recent scientific papers have been published since the release of the Fourth Assessment Report highlighting the need for more urgent action to address climate change.

To meet the urgent need to reduce emissions globally, we envisage that Annex I Parties and Non Annex I Parties must contribute collectively to the limits. However, the primary contribution to reducing emission must come from Annex I Parties. In this context we believe that Annex I Parties must reduce their emissions by more than 40% of their 1990 levels by 2020.

With respect to the work of the AWG KP we believe that the primary consideration for the allocation of responsibility for emissions reductions should be based on historical emissions. Based on the Accumulative Emission table (WRI CAIT, 2009) (see Annex) Annex I Parties have contributed approximately 75% of cumulative global emissions of CO_2 . A global breakdown of historical responsibility can be represented as:

Kyoto Annex I Parties	45.75
The United States	29.25
Non Annex I Parties	25%

Any consideration of the scale of emission reductions must be premised on the need to ensure that vulnerable island countries like Tuvalu are ensured a sustainable future.

Cumulative Emissions
1850-2005 (CO_2 energy)
1950-2000 (LULUCF CO_2)

Country	**MtCO2**	Rank	**% of World Total**
United States of America	328,263.6	(1)	29.25%
European Union (27)	301,940.0	(2)	26.91%
China	92,950.0	(3)	8.28%
Russian Federation	90,327.2	(4)	8.05%
Germany	79,032.8	(5)	7.04%
United Kingdom	67,776.8	(6)	6.04%
Japan	42,742.0	(7)	3.81%
France	32,031.5	(8)	2.85%
India	26,008.1	(9)	2.32%
Canada	24,561.5	(10)	2.19%
Ukraine	24,015.7	(11)	2.14%
Poland	22,330.3	(12)	1.99%
Italy	18,409.3	(13)	1.64%
South Africa	12,443.8	(14)	1.11%
Australia	12,251.2	(15)	1.09%
Mexico	11,320.4	(16)	1.01%
Belgium	10,702.2	(17)	0.95%
Spain	10,389.3	(18)	0.93%
Czech Republic	10,129.6	(19)	0.90%
Kazakhstan	9,939.4	(20)	0.89%
Korea (South)	9,253.6	(21)	0.82%
Brazil	9,112.3	(22)	0.81%
Netherlands	9,101.2	(23)	0.81%
Iran	7,634.9	(24)	0.68%
Romania	6,772.8	(25)	0.60%
Indonesia	6,257.3	(26)	0.56%
Saudi Arabia	6,104.6	(27)	0.54%
Uzbekistan	5,802.0	(28)	0.52%
Argentina	5,487.7	(29)	0.49%
Turkey	5,253.3	(30)	0.47%
Taiwan*	4,911.4	(31)	0.44%
Venezuela	4,440.6	(32)	0.40%
Austria	4,435.8	(33)	0.40%
Sweden	4,263.6	(34)	0.38%
Hungary	4,174.2	(35)	0.37%
Belarus	4,139.0	(36)	0.37%
Korea (North)	3,892.7	(37)	0.35%
Denmark	3,472.3	(38)	0.31%
Thailand	3,430.3	(39)	0.31%
Egypt	3,170.6	(40)	0.28%
Bulgaria	3,078.2	(41)	0.27%
Slovakia	3,074.2	(42)	0.27%
Greece	2,667.5	(43)	0.24%
Switzerland	2,428.7	(44)	0.22%
Finland	2,398.6	(45)	0.21%
Pakistan	2,363.8	(46)	0.21%
Malaysia	2,311.5	(47)	0.21%
Azerbaijan	2,239.0	(48)	0.20%
Iraq*	2,198.0	(49)	0.20%
Algeria	2,166.4	(50)	0.19%
Nigeria	2,131.0	(51)	0.19%

Serbia & Montenegro	2,113.3	(52)	0.19%
Colombia	2,104.4	(53)	0.19%
Philippines	1,884.0	(54)	0.17%
Norway	1,814.7	(55)	0.16%
United Arab Emirates	1,805.2	(56)	0.16%
Turkmenistan	1,770.3	(57)	0.16%
Portugal	1,770.3	(58)	0.16%
Chile	1,645.6	(59)	0.15%
Ireland	1,613.7	(60)	0.14%
Kuwait	1,544.5	(61)	0.14%
Israel	1,419.5	(62)	0.13%
Vietnam	1,406.4	(63)	0.13%
New Zealand	1,293.6	(64)	0.12%
Cuba	1,198.5	(65)	0.11%
Estonia	1,146.0	(66)	0.10%
Syria	1,121.3	(67)	0.10%
Peru	1,073.1	(68)	0.10%
Lithuania	1,071.3	(69)	0.10%
Libya	1,055.7	(70)	0.09%
Singapore	950.2	(71)	0.08%
Morocco	888.1	(72)	0.08%
Moldova	879.9	(73)	0.08%
Croatia	825.6	(74)	0.07%
Georgia	769.6	(75)	0.07%
Trinidad & Tobago	711.1	(76)	0.06%
Luxembourg	666.2	(77)	0.06%
Bosnia & Herzegovina	654.9	(78)	0.06%
Kyrgyzstan	624.1	(79)	0.06%
Latvia	623.9	(80)	0.06%
Zimbabwe	612.6	(81)	0.05%
Ecuador	586.6	(82)	0.05%
Bangladesh	574.8	(83)	0.05%
Qatar	570.6	(84)	0.05%
Slovenia	562.2	(85)	0.05%
Tunisia	508.8	(86)	0.05%
Armenia	500.6	(87)	0.04%
Bahrain	436.4	(88)	0.04%
Lebanon	416.2	(89)	0.04%
Macedonia, FYR	406.4	(90)	0.04%
Tajikistan	402.2	(91)	0.04%
Dominican Republic	385.5	(92)	0.03%
Oman	375.5	(93)	0.03%
Jordan	352.5	(94)	0.03%
Yemen	328.8	(95)	0.03%
Mongolia	327.7	(96)	0.03%
Jamaica	311.0	(97)	0.03%
Myanmar	302.9	(98)	0.03%
Kenya	291.3	(99)	0.03%
Uruguay	271.0	(100)	0.02%
Angola	263.2	(101)	0.02%
Sri Lanka	259.2	(102)	0.02%
Bolivia	253.8	(103)	0.02%
Albania	219.8	(104)	0.02%
Guatemala	218.8	(105)	0.02%
Sudan	207.7	(106)	0.02%
Zambia	178.9	(107)	0.02%
Cyprus	177.5	(108)	0.02%

Brunei*	165.9	(109)	0.01%
Cameroon	164.6	(110)	0.01%
Ghana	162.3	(111)	0.01%
Cote d'Ivoire	159.1	(112)	0.01%
Panama	158.9	(113)	0.01%
Congo, Dem. Republic	156.8	(114)	0.01%
Gabon	136.3	(115)	0.01%
El Salvador	135.8	(116)	0.01%
Bahamas	135.3	(117)	0.01%
Costa Rica	133.2	(118)	0.01%
Honduras	121.6	(119)	0.01%
Senegal	110.4	(120)	0.01%
Nicaragua	102.8	(121)	0.01%
Mozambique	102.3	(122)	0.01%
Tanzania	99.5	(123)	0.01%
Ethiopia	95.7	(124)	0.01%
Iceland	91.8	(125)	0.01%
Paraguay	87.0	(126)	0.01%
Papua New Guinea	84.9	(127)	0.01%
Suriname	83.6	(128)	0.01%
Botswana	78.0	(129)	0.01%
Afghanistan	69.7	(130)	0.01%
Malta	68.9	(131)	0.01%
Guyana	67.3	(132)	0.01%
Congo	64.0	(133)	0.01%
Madagascar	58.4	(134)	0.01%
Mauritius	55.5	(135)	0.00%
Mauritania	54.6	(136)	0.00%
Nepal	48.7	(137)	0.00%
Guinea	46.7	(138)	0.00%
Uganda	46.7	(139)	0.00%
Cambodia	42.1	(140)	0.00%
Haiti	39.1	(141)	0.00%
Liberia	37.1	(142)	0.00%
Barbados	34.8	(143)	0.00%
Fiji	34.0	(144)	0.00%
Benin	31.6	(145)	0.00%
Malawi	31.5	(146)	0.00%
Niger	30.6	(147)	0.00%
Namibia	30.0	(148)	0.00%
Equatorial Guinea	29.4	(149)	0.00%
Togo	27.2	(150)	0.00%
Sierra Leone	25.9	(151)	0.00%
Laos	19.9	(152)	0.00%
Swaziland	19.0	(153)	0.00%
Burkina Faso	18.9	(154)	0.00%
Mali	17.5	(155)	0.00%
Antigua & Barbuda	15.8	(156)	0.00%
Rwanda	14.6	(157)	0.00%
Belize	13.2	(158)	0.00%
Djibouti	11.8	(159)	0.00%
Eritrea	9.7	(160)	0.00%
Central African Republic	8.6	(161)	0.00%
Seychelles	8.0	(162)	0.00%
Maldives	7.3	(163)	0.00%
Saint Lucia	7.1	(164)	0.00%
Gambia	6.9	(165)	0.00%

Guinea-Bissau	6.8	(166)	0.00%
Chad	6.6	(167)	0.00%
Burundi	6.4	(168)	0.00%
Bhutan	5.7	(169)	0.00%
Solomon Islands	5.0	(170)	0.00%
Cape Verde	4.9	(171)	0.00%
Nauru	4.7	(172)	0.00%
Grenada	4.5	(173)	0.00%
Lesotho	4.2	(174)	0.00%
Samoa	4.1	(175)	0.00%
Saint Vincent & Grenadines	3.4	(176)	0.00%
Vanuatu	2.8	(177)	0.00%
Tonga	2.7	(178)	0.00%
Dominica	2.3	(179)	0.00%
Sao Tome & Principe	2.2	(180)	0.00%
Saint Kitts & Nevis	2.2	(181)	0.00%
Comoros	2.1	(182)	0.00%
Palau	1.6	(183)	0.00%
Kiribati	1.1	(184)	0.00%
Cook Islands	1.0	(185)	0.00%
Niue	0.1	(186)	0.00%

* Note: Tuvalu is not included in the WRI CAIT

- - - - -