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## **Global Warming's Unfinished Debate: The Post-Kyoto (2008-2012) Era**

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*The Copenhagen Climate Summit in 2009 was aimed at building on an international agreement through a new environmental accord for the post-Kyoto period (2008-2012), including new targets for greenhouse gas emissions. Although various options have been suggested since then, no definite agreement has yet been achieved. The recent United Nations Climate Change Conference in Durban, South Africa further negotiated the implementation of the Convention vis-a-vis the Kyoto Protocol, the Bali Action Plan, and the Cancun Agreements. The main outcome included the decision to adopt a universal legal agreement on climate change as soon as possible and no later than 2015. This commentary looks at the strengths and problems faced with the Protocol and what will constitute a fair differentiation of commitments among countries to address the issue more effectively post-Kyoto.*

## The Issue

Records indicate that the trend in global mean surface temperatures is upwards, with figures showing a near level situation from 1880 to about 1910, a rise to 1945, a slight decline to 1975, followed by a rise which continues to now (Figure 1). Data from the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA) also show an average surface temperature increase of about 1°F since the mid-1970s, with the current warming rate at about 0.29°F per decade. The eight warmest years since 1880 have all occurred since 2001. Further, the Intergovernmental Panel on Climate Change (IPCC) has concluded that most of the observed warming especially since the mid-20<sup>th</sup> century is most likely caused by human activities (Solomon et al., 2007).

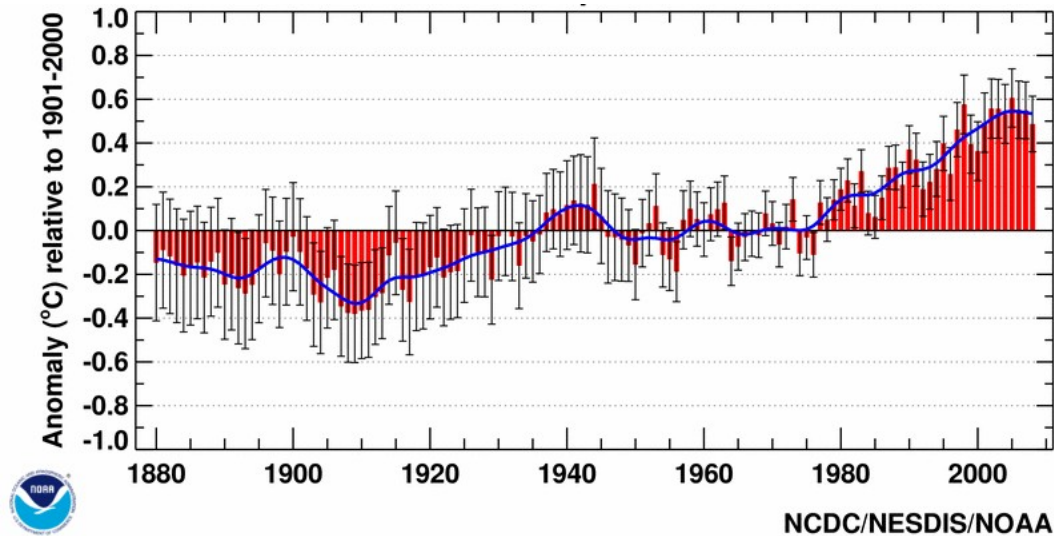


Figure 1. Annual average global surface temperature anomalies recorded from land stations and ships from 1880 to 2008. Source: United States Environmental Protection Agency, 2012 (available at <http://www.epa.gov/climatechange/science/recenttc.html>)

## Addressing Global Climate Change

Aiming to achieve some stabilisation in levels of greenhouse gases (GHGs) in the atmosphere, the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992. The convention is complemented by the 1997 Kyoto Protocol to achieve its objectives through legally binding limits for industrialised countries on emissions of carbon dioxide and other GHGs. The protocol requires industrialised countries to reduce their GHG emissions by five percent by 2012, based on emission levels recorded in 1990.

The Kyoto Protocol is an important milestone in international climate policy, which has contributed to expanding and improving the convention's mechanisms over the years. Among the major accomplishments include the establishment of a negotiation framework built on international participation, strengthening commitments to become legally binding, encouraging the involvement of private sectors into the treaty compliance, mandating the development of procedures and mechanisms to address implementation and compliance to the convention's objectives, making allowance for flexibility with respect to Parties' national implementation of commitments, and allowing the use of emission-trading and other market-based mechanisms to facilitate emission reductions at possibly lower costs.

The Protocol however has its limitations - the major one being stipulated cuts in GHG emissions imposed only on developed countries - and the United States not being a party to it. As levels of GHGs in the atmosphere (especially carbon dioxide) and subsequent impacts continue to rise, discussions towards addressing the issue more effectively have been stepped up. Among the more significant forums include the Bali Conference 2007, Conference of the Parties (COP) 15 meeting in Copenhagen in 2009, and more recently, the COP16 meeting in Cancun, Mexico in 2010 and the COP17 meeting in Durban, South Africa in 2011. These meetings have mainly centred their discussions on commitments from developed countries, possible ways to attain greater participation from developing countries, as well as on gaining greater support from non-signatory governments especially the United States.

The Copenhagen Climate Summit in 2009 for instance was supposed to build on international agreements through a new environmental accord for the post-Kyoto period (2008-2012), including new targets for GHG emissions. Although various options have been suggested since then, no definite agreement has been achieved. The recent COP17 in Durban decided to ‘keep talking’ by extending the 1997 Protocol which expires at the end of 2012 for five years; whilst aiming at negotiating a new protocol, legal instrument or an agreed outcome with legal force by 2015. To ensure successful adoption and implementation, the experience with the Kyoto Protocol would be invaluable to hammer out gaps before any new agreement is detailed out.

### Major Limitations in the Kyoto Protocol

The main objective of the UNFCCC of stabilising levels of greenhouse gases (GHGs) in the atmosphere is far from achieved. For instance, the NOAA recorded a value of 385 parts per million (ppm) of carbon dioxide in 2007 as compared to the pre-industrial levels of 280 ppm in 1850. Annual increases of about two ppm or more have been common since year 2000, compared to 1.5 ppm per year in the 1980s and less than one ppm per year during the 1960s (NOAA, 2008). More recent publication by NOAA (Figure 2) indicated that the growth rate of carbon dioxide has increased over the period from 1979-2010, averaging about 1.43 ppm per year before 1995 compared to 1.94 ppm per year thereafter (NOAA, 2011). It is reported that fossil fuel emissions is the main cause for the accelerated increase in carbon dioxide concentrations.

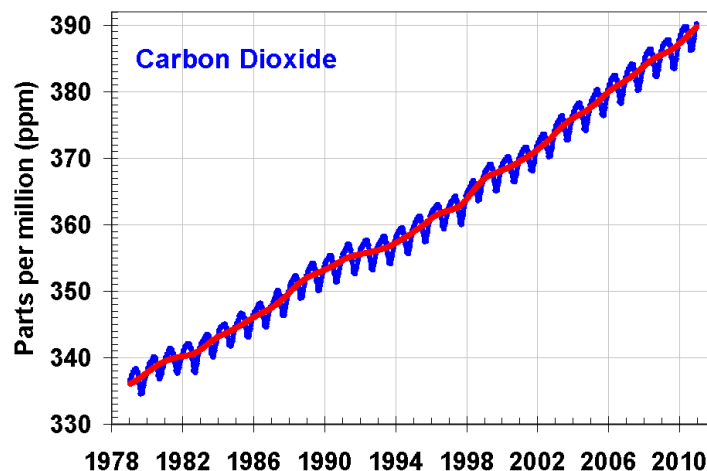


Figure 2. Global average abundance of carbon dioxide from the NOAA global air sampling network plotted from 1979 to 2010. Source: National Oceanic and Atmospheric Administration, 2011 (available at <http://www.esrl.noaa.gov/gmd/aggi/>)

Although seen as an acceptable first step, the Protocol has not been sufficient to address the overall challenge of tackling climate change. For instance, because Protocol targets apply only to the short-term period from 2008-2012 and applied only to developed countries, the agreement would presumably generate modest short-term benefits (Barrett & Stavins, 2003), while failing to provide a real solution to the problem. At the current rates of economic development, it is envisaged that annual GHG emissions by developing countries (especially China and India) would match, if not surpass the annual emissions of the Annex I countries; which would in fact constitute the bulk of the problem of future emissions control (Vuuren et al., 2003). The whole issue is further complicated by the concerns of developing countries that stringent commitments would cap their progress, while developed countries fear the possibility of weakening their industries and economies as fulfilling the Protocol's obligations would place them at a disadvantage *vis-a-vis* competition from the developing nations.

The Kyoto Protocol allows for flexibility instruments to boost low carbon growth. The three main flexibility instruments and key features of the Protocol include emission trading, joint implementation, and clean development mechanisms (CDM). Article 12 of the Protocol for instance highlights that CDMs be used through which emission reductions can be earned within a non-Annex I Party and applied towards meeting the Annex I Party's commitments. However, the flexibility feature is still somewhat vague and needs further definition to ensure effective adoption especially in terms of measurement, reporting, and verification. Another issue linked to these features include the allowable trade of 'assigned amounts' of countries (i.e., system of tradable permits to achieve national emission targets). However, opponents of emissions trading systems have often referred to this as a potential loophole; arguing that international trade in permit rights may lead to an effective increase of global emissions when signatory countries whose baseline emissions are below their Kyoto entitlements sell large amounts of their abundant emission rights.

### **Where to from here?**

There is no silver bullet to achieving the desired aims in tackling global warming. The process is a delicate one, with powerful national and vested interests involved; which in itself illustrates why so many years were taken to get this far. The entire regime was designed to meet that objective of stabilising GHG concentrations in the atmosphere. So the resolving question now is 'how do we actually get there?'

The vision for a post-Kyoto era must be largely based on stabilisation of GHGs, sustainable development, as well as mitigation and adaptation strategies that are backed by clear scientific information and financial resources to ensure successful adoption and implementation (Business Roundtable, 1998). Although it can be argued that ethically industrialised countries should take the first steps since they are responsible for the bulk of anthropogenic concentrations of GHGs in the atmosphere, only through broad participation by major industrialised nations and key developing countries can the issue be addressed more effectively.

The Kyoto Protocol has always been focused on the notion that emissions mitigation is a global problem and thus require consensus among as many countries as possible (Oppenheimer & Petsonk, 2005). However often the more parties there are, the lower the chances would be in achieving an agreement as there would be different stakes and agendas involved. Furthermore, there are perhaps fewer than 20 countries worldwide that are responsible for most of the world's GHG emissions with the rest probably only slowing down the emissions mitigation efforts. If existing policies continue, carbon dioxide emissions are forecast to increase by 57 percent between 2005 and 2030 with the United States, China, India, and Russia contributing to two-thirds of this increase (World Energy Outlook, 2007). This nevertheless would require participation from both developed and developing countries, regardless of which category of countries they fall into, that are producing the largest chunks of emissions (e.g., China,

India, the United States, and European Union countries). The COP17 in Durban has nevertheless agreed to adopt a universal agreement on addressing climate change through the best of their ability in pursuit of the common goal by 2015 (United Nations Climate Change Secretariat, 2012).

Due to the complexity of the issue, there have been suggestions to build on the existing framework rather than developing a whole new protocol. For instance, Grubb (2004) argued that the Kyoto Protocol has the essential features required, and therefore small changes may increase its effectiveness. It was suggested that perhaps one of the major amendments required is to strengthen reduction targets for Annex I countries. This however poses a policy conundrum. On the one hand, for purposes of environmental effectiveness and economic efficiency, key developing countries should participate. However, for the purposes of distributional equity and international political pragmatism, they cannot be expected to incur the consequent costs. To address these concerns, Olmstead and Stavins (2006) suggest that a set of growth targets that are set initially at *business-as-usual* levels be adopted for respective developing countries, but become more stringent as those countries become wealthier.

Climate change is a multi-level governance problem and not just a matter for negotiation among nations. Rather than just the top-down universalism embodied in Kyoto, countries should also initiate implementation policies and strategies that suit their particular circumstances at the national level. The benefit of this approach is that it focuses on what individual governments, firms, and households would actually do to reduce their emissions, in contrast to the directive target setting that has characterised international discussions.

Current strategies are somewhat based on slowing GHG emissions over adapting to the impacts imposed by climate change. It is however important that mitigation and adaptation strategies go hand in hand to address the issue more effectively, especially since developing countries have largely refused any abatement commitment mainly because they fear negative effects of emissions limitation on their economic growth and lacking financial resources for its implementation. There is hence a need for developed countries to allocate more investments into research and development (R&D) and capacity building to generate alternative energy sources or clean energy technologies. Without such investments, the technologies upon which a viable emissions reduction strategy would depend on will not be available (Elzen et al., 2005).

For a realistic mitigation strategy to be developed for the post-Kyoto era, a broader participation of major emitters including industrialised nations and key developing countries, strengthening of reduction targets for Annex I countries, greater investments by developed countries in R&D and capacity building, more efforts at the national levels to move away from the present top-down approach, and clearer specification of the market-based instruments would be required to fulfil key functions in addressing the issue. In this regard it will be interesting to follow discussions at the upcoming United Nations Climate Change Conference to be held in Bonn, Germany in May 2012.

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