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International Climate Change Policy: Where do we Stand?

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Abstract

The article begins with a definition of what is meant by *climate change*, from the perspective of an Organisation for Economic Co-operation and Development (OECD) publication. The second section identifies the major legal instruments of international climate change policy adopted before 2012, followed by an analysis of the post-2012 international legal framework in the third section. The next three sections investigate what policy instruments and methods individual countries use to tackle global warming. Two industrialised societies are looked at in detail, namely the European Union, which is a Kyoto Protocol Annex I party, and the United States, the second-largest emitter of greenhouse gases (GHGs), but not a party to the Kyoto Protocol. The investigation then directs its attention to a member of the BASIC group (Brazil, South Africa, India and China) of newly industrialised countries, namely China, as a Kyoto Non-Annex I party and the highest current emitter of GHGs. In the last section, the discussion turns to the developing world, with a special focus on least-developed countries.

A. Introduction

Very few scientists today doubt that climate change is taking place and that human activities are contributing to this trend.[1] But what is actually meant by the term *climate change*? The 2006 *Adaptation to Climate Change: Key*

1 According to a web-based poll undertaken by the Institute for the Study of Earth, Oceans and Space of the University of New Hampshire in 2009, 82% of earth scientists and 97% of climate scientists are of the opinion that global warming is real and that human activities are a major contributing factor to the warming.

Terms paper by the Organisation for Economic Co-operation and Development identifies four definitions of it:[2]

> Climate Change [refers] –
>
> - … to any change in climate over time, whether due to natural variability or as a result of human activity. (IPCC TAR, 2001 a)
> - … to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural processes or external forcing, or to persistent anthropogenic changes in the composition of the atmosphere or in land-use. (IPCC TAR, 2001 b)
> - [to a] change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is[,] in addition to natural climate variability[,] observed over comparable time periods. (UNFCCC, Article 1)
> - [t]he climate of a place or region [changing] if over an extended period (typically decades or longer) there is a statistically significant change in measurements of either the mean state or variability of the climate for that place or region. (Changes in climate may be due to natural processes or to persistent anthropogenic changes in atmosphere or in land use. Note that the definition of climate change used in the United Nations Framework Convention on Climate Change is more restricted, as it includes only those changes which are attributable directly or indirectly to human activity). (UN/ISDR, 2004)

B. Major Legal Documents of International Climate Change Policy Adopted Before 2012

From its inception, international climate change policy and legislation was firmly rooted in the United Nations (UN) system. During the mid- to late 1980s, for the first time ever, research was able to demonstrate that man-made global warming was indeed happening. Against this background, the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) set up an Intergovernmental Panel on Climate Change (IPCC) in 1988 to gather the scientific evidence for (or against) human-induced global warming.

The IPCC's first Assessment Report, which appeared in 1990, presented scientific evidence that global warming was a reality, triggering worldwide concern:

2 OECD (2006:12).

The Report identified as main factors affecting climate (i) atmospheric gases, so-called greenhouse gases, some of which occur naturally (e.g. water vapour, ozone, carbon dioxide (CO_2) methane (CH_4), nitrous oxide (N_2O) and some of which are man-made (e.g. chlorofluorocarbons, CFC) as well as (ii) aerosols which are tiny particles within the atmosphere.[3]
The Report presented evidence that, for a thousand years prior to the industrial revolution, the concentration of GHG was relatively constant and that however since the beginning of the industrialisation in the 18th century the concentration of several GHG, in particular CO_2, methane, N_2O and CFCs, have been increasing markedly primarily due to man's activities.[4]
As a result of the enhanced greenhouse effect, the Earth's surface and atmosphere are warming up. The IPCC Report warned that in a Business-as-Usual scenario (i.e. few or no steps are taken to limit GHG emissions) future human-made emissions will result in a likely increase in global mean temperature of about 1°C above the present value (about 2°C above that in the pre-industrial period) by 2025 and 3°C above today's (about 4°C above pre-industrial) before the end of the 21st century.[5]

I. United Nations Framework Convention on Climate Change, 1992

Based on the findings of the 1990 IPCC Assessment Report, the UN Framework Convention on Climate Change (UNFCCC) was signed during the Rio Earth Summit in June 1992, and entered into force on 21 March 1994. The major accomplishment of the UNFCCC was that it recognised, for the first time, that there was indeed a man-made problem of climate change at a moment when there was still considerable doubt regarding the causes of global warming, its extent and impact.[6]

The ultimate objective of the UNFCCC is to stabilise greenhouse gas (GHG) concentrations "at a level that would prevent dangerous anthropogenic interference with the climate".[7] The stabilisation level is not quantified in the UNFCCC. The latest climate analysis has identified a stabilisation range of 450 to 500 parts per million (ppm) of carbon dioxide in the atmosphere. According to the UNFCCC, this level should be reached within a time frame which allows ecosystems to adapt naturally to global warming,

3 IPCC (1990:13–14).
4 (ibid.:15–16).
5 (ibid.:22).
6 Bothe (2003:240).
7 UNFCCC (2012a:1).

while making sure that food production is not at risk and that development occurs in a sustainable manner.

The UNFCCC is a framework document which introduces two main policy approaches which are intrinsically linked in order to address global warming, namely mitigation and adaptation. While *mitigation* tackles the very cause of climate change, *adaptation* deals with the unavoidable effects of global warming. The less mitigation takes place, the more adaptation is required, and vice versa:

- *Climate mitigation* refers to any action taken to eliminate or decrease the long-term impact of global warming on human life or property.[8] According to the UNFCCC Glossary, mitigation is understood as "human intervention to decrease the sources of GHG or enhance their reabsorption".[9]
- *Climate adaptation* involves initiatives or measures to reduce the vulnerability of individuals, groups and natural systems to the negative effects of climate change.[10] According to the UNFCCC Glossary, the term involves the adaption of natural or human systems in response to climatic stimuli or their impact, which moderates damages or exploits beneficial opportunities.[11]

Any country can become a party to the UNFCCC,[12] thus making it a global instrument. Within this framework of global participation, however, states parties' obligations vary substantially between developed and developing countries. The UNFCCC notes that –

- the largest share of accumulated GHG emissions has originated in developed countries, as opposed to developing countries, and
- per capita GHG emissions in developed countries are much higher than in developing countries.

As a consequence, the UNFCCC introduces the principle of "common but differentiated responsibilities and respective capabilities" or *CBDR principle* for its member states.[13] The CBDR principle is based on the general

8 UNFCCC (2009a).
9 UNFCCC (2012b).
10 UNFCCC (2009c).
11 UNFCCC (2012b).
12 Article 22.1, UNFCCC.
13 Article 3.1, UNFCCC.

principles of equity of international law and includes two elements: while all states together have a common responsibility for the protection of the environment, there are nonetheless differences between the states in terms of their historical contribution to global warming and their ability to fight it, which is why states need to bear different responsibilities.[14] In view of this, the UNFCCC foresees asymmetrical obligations and places the heaviest burden on the wealthier industrialised states.[15] At the same time, the UNFCCC recognises that developing nations, especially least-developed countries (LDCs) and small island developing states (SIDSs) are more vulnerable to climate change, in part because of their greater exposure to climate trends and in part because of their low adaptation skills.[16]

In line with the CBDR principle, the UNFCCC divides states parties as follows:

- *Annex I parties* include the 41 industrialised countries, covering members of the Organisation for Economic Co-operation and Development (OECD) in 1990 and the former Soviet Bloc (economies in transition, or EITs),[17] and
- *Non-Annex I parties*, which are mostly developing countries.

However, it is important to understand that the CBDR principle is not deemed absolute under the UNFCCC and that the UNFCCC provides, to a certain degree, for a transition from the Non-Annex I group to the Annex I group.

Based on the CBDR principle, the UNFCCC imposes voluntary mitigation targets for Annex I parties, according to which they were supposed to reduce their GHG emissions to 1990 levels by the year 2000. As economic development is vital for the world's poorest countries, the UNFCCC accepts that GHG emissions originating in those countries would grow in the near future, as a result of which Non-Annex I parties were not subject to mitigation targets. The UNFCC aims at helping the developing countries limit emissions in ways that will not restrict their development.

14 CISDL (2002:1–2).
15 Boisson de Chazourne (2008:2).
16 Preamble, UNFCCC.
17 There is a sub-category of so-called Annex II parties, which consist of the OECD members of Annex I but not the EITs. Only these Annex II states parties are obliged to make funding available for Non-Annex I parties.

The UNFCCC obliges OECD members (the Annex II states parties) to support developing countries in the elaboration of national adaptation plans.[18] Moreover, industrialised members agreed to share adaptive know-how and technology to offer urgently needed capacity-building for Non-Annex 1 states parties.[19]

The UNFCCC's institutions and procedures are drawn from the UN system, with a Conference of the Parties (COP) being the highest decision-making organ.[20] Decisions are adopted by way of negotiation within the COP, which convenes once a year to review the UNFCCC's implementation.[21] Procedures are governed by the rules included in the UNFCCC itself, as well as the Draft Rules on Procedure – even though the latter have never been formally adopted. This is why most of the decisions of the COP can only be taken by consensus.[22]

II. The Kyoto Protocol, 1997

The publication of the Second IPCC Assessment Report in 1995[23] showed that the measures taken up to that point under the UNFCCC to fight global warming were insufficient. As a consequence, on 11 December 1997, the UNFCCC parties signed the Kyoto Protocol to the UNFCCC,[24] which only came into operation on 16 February 2005. At the time, more than 55 countries had ratified Kyoto, accounting for more than 55% of global carbon dioxide emission in 1990. This included all OECD countries, but with the important omission of the United States of America (USA/US): the biggest emitter in 1990, the US signed but has never ratified the Protocol. As at the time of writing, 190 countries and the European Union (EU) have ratified Kyoto, while Canada withdrew in December 2011.

18 Article 4.3, UNFCCC.
19 Boisson de Chazourne (2008:4).
20 Articles 7–10, UNFCCC.
21 UNFCCC (2012c).
22 Depledge & Yamin (2009:438).
23 IPCC (1995).
24 Hereinafter also *Kyoto* or *the Protocol*.

In brief, the Protocol operationalises the UNFCCC:[25]

- It shares the objectives, instruments and the institutions of the UNFCCC. Even more importantly, Kyoto replicates the CBDR doctrine formulated in the UNFCCC. However, as opposed to the UNFCCC, Kyoto excludes a transition from the Non-Annex I category to the Annex I category, hence introducing a so-called firewall between these two groups of countries.
- The major distinction between the UNFCCC and Kyoto is that, for the first time ever, a UN instrument imposes legally binding mitigation targets as opposed to the non-binding goals under the UNFCCC. In line with the CBDR principle, only Annex I parties take on binding mitigation objectives, while the Non-Annex I parties are expected to carry out voluntary mitigation actions.

1. Mitigation

Kyoto introduces binding quantified emission reduction targets for the industrialised countries. Under the Protocol, 41 industrialised countries – including EITs and the EU – are obliged to reduce their GHG emissions by 5.2% compared with 1990 levels over the first commitment period from 2008 to 2012.[26] The individual national targets include, from the 1990 base year, an 8% decrease for the EU,[27] 6% each for Canada and Japan, no decrease for Russia, and an 8% increase for Australia.[28]

The Kyoto Protocol allows for more flexibility as to how to meet binding GHG emission reduction targets by designing three innovative instruments. Under the Clean Development Mechanism (CDM), countries with Kyoto targets may implement an emission reduction project in developing countries, based on which they obtain certified emission reduction (CER) units, which count towards fulfilling their Kyoto obligations.[29] A CDM project is obliged to confer measurable and verifiable emission reductions that are

25 UNFCCC (2012d).
26 Article 3.1, Kyoto Protocol.
27 This value includes reduction targets of 21% for Germany, 12.5% for the United Kingdom, and 0% for France, while Spain may increase its emissions by 15%.
28 Cf. http://unfccc.int/kyoto_protocol/items/3145.php, last accessed 8 October 2012.
29 Article 12, Kyoto Protocol.

additional to what would otherwise have occurred without the CDM.[30] Join implementation is a mechanism similar to the CDM, but the emission reduction project has to be implemented in industrialised countries.[31] CDM and joint implementation are the first global investment tools of their kind, stimulating foreign investment and knowledge transfer in the host country, while offering industrialised countries flexible and cost-effective ways of meeting a part of their Kyoto obligations.[32] Emissions trading is based on the idea that the mitigation targets under Kyoto are formulated as levels of permitted GHG emissions over the 2008–2012 commitment period. As laid down in Article 17 of Kyoto, emissions trading permits countries with CER units to spare to trade such units with other countries that have exceeded their CER allowance.[33]

Under Kyoto, states parties are obliged to monitor their GHG emissions and to keep a national register of trades carried out under Kyoto.[34] The UNFCCC Secretariat keeps an independent transaction log to verify that operations are consistent with the Kyoto Protocol. Furthermore, a compliance mechanism has been established to verify the implementation of the Protocol by its members.

2. Adaptation

Under the adaptation objective, the Kyoto Protocol, like the UNFCCC, is designed to support developing countries, especially LDCs and SIDSs, in adapting to the inevitable impacts of climate change and in facilitating the development of know-how and technologies that could help increase resilience to climate change impacts.[35] A range of funds have been created through the UNFCCC which are managed by the Global Environment Facility (see the discussion under Section D below).

30 Hepburn (2009:412).
31 Article 6, Kyoto Protocol.
32 UNFCCC (2012g).
33 UNFCCC (2012f.).
34 UNFCCC (2012e).
35 The IPCC defines *resilience* as the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.

C. The Post-2012 International Legal Framework – Which Way Forward?

I. Assessment of the Kyoto Protocol

When evaluating Kyoto toward the end of its first commitment period in 2012, we have to recall the logic behind the agreement. Kyoto was always deemed an initial step towards a low-carbon future,[36] introducing humble reduction targets of 5% for industrialised countries over a short period of five years only, until 2012. After 2012, Kyoto was to be followed by a chain of other agreements to impose ever wider and deeper reductions for Annex I parties. Developing countries were expected to follow suit in time, so that at last, all countries would have binding GHG emission reduction goals.

However, the results of Kyoto are mixed, to say the least. Economists agree that the Protocol imposes relatively high costs and generates negligible benefits, while failing to provide a real solution.[37] Additionally, most climate researchers warn that the Protocol has failed to decrease GHG emissions to the extent necessary.[38]

Progress towards the mitigation targets under Kyoto has also not been satisfying. According to the Netherlands Environmental Assessment Agency (NEAA), industrialised countries will, as a group, probably meet the GHG emission reduction goals imposed under Kyoto.[39] When extrapolating the trend of the years 2000–2007 to the period 2008–2012, NEAA forecasts an average emission reduction of almost 16% for this group of countries in the first Kyoto commitment period.[40] However, the NEAA also indicates that the expected decrease of 16% is mainly attributable to large GHG emission reductions of about 40% in Germany and the EITs after the fall of the Berlin Wall.[41] The World Bank reports that there are significant differences in performance across individual countries.[42] If one looks at the individual state level, the compliance gap for many of them is quite noteworthy.[43]

36 UNFCCC (2012e).
37 Olmstead & Stavins (2006:1).
38 Helm (2009b:16).
39 NEAA (2012).
40 (ibid.).
41 (ibid.).
42 World Bank (2008:6).
43 Barrett (2009:62).

Various factors have contributed to this underachievement. Some are linked to the Kyoto Protocol itself, others go beyond the scope of Kyoto, as follows:

- An important deficiency of the Kyoto regime itself is the lack of broad participation, i.e. the number of countries willing to take real action via obligatory mitigation objectives has always been quite small.[44] The world's largest GHG emitter at the time, the US, has never ratified Kyoto. Canada, an Annex 1 state party, left Kyoto in December 2011. Moreover, the largest increase in GHG emissions today originates from six newly industrialised countries (NICs), i.e. including the BASIC group made up of Brazil, China, India and South Africa, as well as Indonesia and Mexico. These six countries ratified Kyoto as Non-Annex I parties. As a consequence, nowadays, Kyoto addresses only 30% of GHG emissions in the world.[45]
- Another great – if not the greatest – weakness of Kyoto is its inflexible partition of countries into two groups in line with the CBDR dogma, building the so-called firewall between Annex I and Non-Annex I members, which has reinforced the existing ideological North–South divide.[46] Kyoto has no graduation process by which to verify whether some of the NICs such as the BASIC group are ready to join the Annex 1 group.[47] This split between richer and poorer nations under Kyoto is clearly outdated and inaccurate, with 50 Non-Annex I countries now having a larger per capita income than some of the Annex I countries.[48] But, more importantly, the partition means that today's biggest GHG emitter, China, remains unconstrained in its emissions output, implying that half of all worldwide emissions will in the near future be generated in a country without binding mitigation targets.[49]
- Some observers indicate that the very methodology of Kyoto is flawed in that it takes a geographical approach to GHG emission responsibilities, i.e. the so-called production basis methodology, as opposed to the consumption methodology.[50] Emissions are attributed to states on the basis

44 (ibid.:61).
45 Gao (2007:7).
46 Gosh & Woods (2009:454).
47 Depledge & Yamin (2009:443).
48 Olmstead & Stavins (2010:2).
49 (ibid.).
50 Helm (2009b:20).

of territory.[51] All emissions produced within a state account for its emissions total. Hence, Kyoto places the burden of GHG emission reduction on those states which produce emission-intensive goods, rather than those which import and finally consume such goods. The weakness of this methodology is that industrialised countries, which are subject to binding emission reduction targets, can relocate carbon-dioxide-intensive production abroad to developing countries (with no such goals) in order to meet their Kyoto targets.[52]

- Another important shortcoming of Kyoto relates to the lack of compliance incentives and enforcement mechanisms to deter non-participation and non-compliance.[53] The UNFCCC, like Kyoto, includes rules for monitoring compliance, in particular for the GHG emission reduction targets of Annex I countries. But monitoring is still inadequate, both in terms of linking it to effective implementation and including issues of importance for developing countries.[54]

In defence of Kyoto, however, it must be said that the problem of global warming does not easily lend itself to a binding international agreement. To name but a few issues, the allocation of responsibility for the existing level of GHGs is complex; the measurement of emissions is at best weak; GHG emissions per capita are low in those nations most rapidly increasing their overall emissions; and the impact of global warming varies between countries.[55] Additionally, the complexity of global warming is increasing all the time and is having a severe impact on international negotiations,[56] which is why each negotiation round becomes more demanding.

51 Pan et al. (2009:145).

52 A country such as the United Kingdom (UK) could produce low-GHG-intensive goods, i.e. services instead of manufacture, and import high-GHG-intensive goods such as aluminium and steel from abroad. By transferring energy-intensive production to China, India or other developing countries, the UK could meet its Kyoto obligations without making any noticeable difference to climate change.

53 Barrett (2009:63); Aldy & Stavins (2009:8).

54 Gosh & Woods (2009:463).

55 Helm (2009b:19).

56 Depledge & Yamin (2009:446).

II. COP12, Montreal, Canada, 2005

Recognising that Kyoto on its own was insufficient to fight global warming, the COP in Montreal adopted a set of decisions which laid the foundation for an innovative dual-track climate negotiation process:[57]

The first track, the so-called Kyoto track, is about negotiating obligatory emission reduction targets for Annex I parties for a second commitment period (CP2) beyond 2012. This negotiation path is only open for Annex I parties. The negotiation track is supervised by the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG–KP).

The second track, the so-called UNFCCC track, involves the negotiation of emission reduction goals for industrialised countries that have not ratified Kyoto, first and foremost the US. This track also covers negotiations for nationally appropriate mitigation actions (NAMAs) to be undertaken by developing countries. This track is open to all UNFCCC states parties. The negotiation path is overseen by the Ad Hoc Working Group for Long-term Cooperative Action under the UNFCCC (AWG–LCA), which was set up at COP13 in Bali in 2007.

This two-track negotiation and decision-making process aims at broadening the participation and improving the effectiveness of the international climate regime.

III. COP13, Nusa Dua, Bali, Indonesia, 2007

In 2007 the IPCC's Fourth Assessment Report substantially increased the pressure on the international community to urgently address global warming:

> The IPCC Report indicates that the warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level.[58]
> The Report confirms the findings of earlier Assessment Report that atmospheric concentrations of CO_2, methane (CH_4) and nitrous oxide (N_2O) have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of

57 UNFCCC (2005).
58 IPCC (2007:2).

years.[59] The Report notes that most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations.[60]
The Report projects an increase of global average temperature of about (i) 0.2°C per decade for the next two decades for all four GHG emissions scenarios and (ii) 1.8°C to 4°C by the year 2100 depending on the GHG emissions scenario.[61]

1. Outcome

COP13 in Bali in 2007 decided to uphold the dual negotiations path under both the UNFCCC and Kyoto, with the expectation that the two tracks should be unified in Copenhagen in 2009.

The COP adopted the Bali Road Map, which is an overarching term to include all the decisions made in Bali, identifying the challenges under the two negotiation streams.[62] The main objective of the Road Map was to achieve a legally binding, inclusive climate agreement in Denmark 2009, which was to replace Kyoto after 2012 and would ideally include all major GHG emitters.

The Bali Road Map includes the Bali Action Plan (BAP) which lays down the mandate of the AWG–LCA to supervise the UNFCCC negotiation track.[63] The BAP is built on five pillars, i.e. a shared long-term vision and enhanced action on mitigation, adaptation, technology and funding, which has determined the agenda of any COP to come. Some of the BAP's highlights are as follows:

- The BAP calls for a "shared vision of long-term action" on global warming recognises the need for an overall long-term mitigation objective beyond 2012.[64]

59 (ibid.:5).
60 (ibid.).
61 (ibid.:7-8).
62 CCES (2007c:2).
63 UNFCCC (2012i).
64 Initial proposals for the BAP supported by the EU foresaw that developed countries would have to reduce GHG emissions by 25–40% below 1990 levels by 2020. Due to strong opposition from the US, but also Canada and Japan, the final decision only asks for "deep cuts in global emission". See also TWN (2007).

- As to the mitigation pillar, the BAP urges that national mitigation commitments/actions by all states have to be "measureable, reportable and verifiable" (MRV).[65] For the first time, developing countries pronounced their willingness to consider taking national appropriate mitigation action, hence softening the rigid CBDR viewpoint they had held before.[66]
- Vis-à-vis the adaptation pillar, the BAP recognises the need for enhanced international cooperation to support urgent implementation of adaptation measures, taking into account the immediate needs of vulnerable developing countries.[67]

Furthermore, the COP13 decided to operationalise the Adaptation Fund under Kyoto in support of LDCs and SIDSs.[68] The states parties established a 16-member Adaptation Fund Board to manage the fund on behalf of the COP with the Global Environment Fund operating as secretariat. For the first time, the COP managed to put deforestation on the international climate agenda, which accounts for 20% of all GHG emissions. The states parties agreed to study the issue, especially on how to measure GHG emissions from deforestation with a view to launch a UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) initiative.

2. Assessment

When the COP13 in Bali was evaluated, its outcomes were considered a leap forward in many respects. The BAP was notable in being the first international climate decision after Kyoto which the US joined, despite vigorous earlier opposition. This gave hope that the US could be re-engaged in the post-2012 climate negotiations.

Yet, many vital issues remained open in Bali:[69]

- The AWG–LCA of the UNFCCC track did not succeed in determining what kind of procedure – i.e. formal negotiations, informal dialogues, or

65 BAP, clause 1.(b)(i) and (ii.).
66 UN-NGLS (2008:2).
67 BAP, clause 1.(c)(i.).
68 CCES (2007c:6).
69 UN-NGLS (2008:3).

both – would be adopted in the working group. The objectives to be achieved under the BAP are not quantified, especially with respect to –
  - the long-term mitigation objective under the UNFCCC, and
  - the funding by industrial countries of the adaptation and mitigation efforts by developing countries.
- Even more significantly, COP13 was unable to reach an understanding on a question which has dominated the international climate negotiations since then, i.e. the terms of a post-Kyoto climate agreement after the expiry of the first commitment period in 2012.

IV. COP15, Copenhagen, Denmark, 2009

The COP15 in Denmark in 2009 was meant to finalise two years of intense negotiations which had been launched with the 2007 Bali Road Map and, more importantly, consolidate the two negotiation tracks under the UNFCCC and Kyoto.

1. Expectations

Expectations before the start of the COP15 were running high. It was hoped that the Copenhagen meeting could streamline the two negotiation tracks and produce a new, legally binding global climate agreement to replace the Kyoto Protocol after 2012: one that would involve all the major GHG emitters – or at least a strong commitment by all states parties to work toward this goal.[70]

Furthermore, under the UNFCCC track, COP15 was expected to recognise the imperative of limiting global warming to 2°C.[71] The meeting was also meant to decide on new instruments to generate sustainable funds to bolster mitigation and adaptation efforts by developing countries.[72] In terms of mitigation, it was hoped that the industrialised states parties could agree to a quantified long-term mitigation objective such as a 50% reduction by 2050 ('50 by 50') goal formulated by the G8.[73] The largest developing states,

70 Stavins & Stowe (2010:2).
71 UNFCCC (2009a:2).
72 WRI (2002:4).
73 The world's eight wealthiest countries; Stavins & Stowe (2010:2).

such as Brazil, China, India and Mexico, were to take on a wider range of quantifiable, policy-based mitigation commitments, e.g. sectoral GHG emission reduction targets and intensity goals.[74] The agreement was also intended to establish the terms for reporting on and verifying states parties' mitigation actions.

2. *Outcome*

With the negotiations on the verge of breaking down and after an all-night final session, all the COP15 managed to deliver was the informal Copenhagen Accord,[75] a three-page document with two empty annexes addressing the following:

- Under the UNFCCC negotiation track, the Accord recognises the scientific view as outlined in the IPCC's Fourth Assessment Report that global warming has to be limited to 2°C in order to prevent the most damaging impacts.[76] Copenhagen introduced a new instrument in the form of "national pledges", which every UNFCCC member had to submit by the end of January 2010.[77] The Accord is labelled a *portfolio of national commitments*, under which each state commits and enrols to observe its domestic GHG mitigation targets, whether those are in the form of laws, regulations or multi-year action plans.[78] The Accord also highlights the need for scaled-up and predictable funding to developing countries. It called for US$30 billion over a three-year period from 2010 to 2012, to be split equally between mitigation and adaption, and identified a "goal" of US$100 billion per year as from 2020.[79]
- Copenhagen endorsed the maintenance of the two negotiating tracks by prolonging the Kyoto as well as the AWG–LCA. While some states parties had hoped these negotiating forums could be used to operationalise the new Accord, no formal link between the working groups and the Accord was established.

74 CCES (2009b:2).
75 Hereinafter *Copenhagen* or *Accord*.
76 Egenhofer & Giorgiev (2009:3).
77 (ibid.).
78 Stavins & Stowe (2010:2).
79 Egenhofer & Giorgiev (2009:2).

3. Assessment

The gathering in Copenhagen drew a level of political attention well beyond expectations in that an unprecedented number of heads of state and government – almost 120 – decided to meet to provide the final input for a new global climate regime. Did this strategy pay off?

Initially, most observers showed profound frustration, because for them the three-page Copenhagen Accord represented all that was wrong with international climate negotiations:[80]

- It was felt that the COP had covered no ground whatsoever towards a binding post-2012 climate agreement, as neither of the two working groups, i.e. the AWG–KP and AWG–LCA, had been able to reach a formal decision. Instead, the Copenhagen Accord is a non-binding informal decision, which was not even supported by all UNFCCC members. Due to opposition by a handful of states at the 11th hour, the COP only "took note" of the decision.[81]
- The Accord does not impose a long-term binding mitigation goal on all industrialised countries; nor does it foresee mitigation commitments for the NICs. Instead, the Accord introduces an "open enrolment" framework under which states can register their voluntary domestic mitigation pledges.[82] From the onset, experts have been wary about the quality of the voluntary mitigation pledges. Indeed, today, experts are unanimously of the view that the pledges do not suffice to keep global warming at 2°C below pre-industrial level; instead, the pledges would reflect a target of approximately 3°C.[83] Highlighting the gap between the pledged and the necessary GHG emission reductions (the so-called ambition gap), experts since have called for increased reduction targets. Moreover, most of the pledges that are deemed insufficient are listed with conditions.[84]
- What is more, like no other COP before it, Copenhagen revealed the dividing lines on the terms of a post-2012 climate agreement. These were as follows:

80 Falkner et al. (2010:252).
81 Anderson (2009:2).
82 Cao (2010:3).
83 UBA (2010:5).
84 Diringer (2010a:1).

- While the developing world insists that the CBDR principle be continued as formulated in Kyoto, i.e. excluding mitigation targets – be they voluntary or otherwise – for developing countries,[85] industrial countries argue that the CBDR principle needs to be revised, given that emissions levels are increasing quickly in some developing countries.[86]
- Annex I parties are unwilling to go any further without noteworthy commitments from the US and the large developing countries.[87] They want Kyoto replaced by a new binding agreement, ideally covering all large GHG emitters, including the US and China. For its part, the US indicated that any new climate agreement should be very different from the obligatory top-down Kyoto model and called for a voluntary bottom-up model instead, including all large GHG emitters.[88] On the other hand, the Group of 77/China insist on the extension of Kyoto in its present form, together with a separate agreement under the AWG–LCA.[89]

However, observers soon realised that, with the Copenhagen Accord, a total breakdown of the climate negotiations had been prevented.[90] By the end of 2010, the Accord had become the first-ever vehicle to include explicit, albeit not unconditional, mitigation pledges from all the world's major economies, including China, India and other large developing states.[91] Experts now believe that the Accord is a compromise of what was realistically possible, given the political impasse.[92] Other observers go as far as implying that Denmark could have seen the emergence of a new climate architecture – moving away from the top-down model of Kyoto with its internationally agreed obligatory emission limits and designated instruments, towards a bottom-up model relying on voluntary national pledges and using flexible instruments.[93]

85 Sterk et al. (2011a:4).
86 (ibid.).
87 Sterk et al. (2011b:5).
88 (ibid.:6).
89 Sterk et al. (2012:5).
90 Falkner et al. (2011:252).
91 (ibid.:253).
92 (ibid.).
93 Egenhofer & Giorgiev (2009:3).

4. Beyond Copenhagen

Undoubtedly, the weak outcome in Denmark raised important questions about the future of the international climate negotiations.

The first question was how to incorporate Copenhagen, which is an informal political decision reached outside the UNFCCC process, into the UN legal framework.[94] After Copenhagen, three possible scenarios were discussed:

- Using Copenhagen as an alternative negotiation path – a route favoured by the US
- Ignoring Copenhagen and moving on with the UNFCCC/Kyoto tracks only, and
- Integrating successful elements of Copenhagen into the UNFCCC/Kyoto tracks, which was the EU view.[95] For most observers, this third option appeared to be the most realistic for COP18 in Cancun, Mexico, in 2010.

An even more important question concerned the form of a post-2012 climate treaty and how best to reach it. In view of the weak COP outcome in Copenhagen, quite a few observers argued that the EU's "global climate deal" strategy[96] was obsolete, and that a new approach to formulating a climate treaty was necessary.[97]

Indeed, Denmark had exposed major hurdles on the way to a new legally binding global climate agreement:[98]

- Of the major GHG emitters that account for two thirds of carbon dioxide emissions (China, the EU, India, Russia and the US), only the EU unequivocally supports the idea of a new global legally binding treaty
- The EU was, however, unable to exercise leadership at Copenhagen, and
- Instead, the negotiations were overshadowed by the political impasse between the US and China: Washington made its ratification of a new

94 Diringer (2010b:2).
95 (ibid.).
96 A *global climate deal strategy* entails deriving a package deal with legally binding quantified targets on all the key issues – mitigation, adaptation and funding – and is universal in its application; see Falkner et al. (2010:256). This strategy was first used when the 1985 Vienna Convention on Ozone Layer Protection was negotiated, and it dominated international climate-related policy until Kyoto.
97 Falkner et al. (2010:256).
98 Bodansky et al. (2010:3).

binding treaty contingent on obligatory GHG emission reduction goals for key developing countries, such as those of the BASIC group.

On the other hand, China remained opposed to any kind of binding objectives unless the US took the initiative in limiting its GHG emissions.[99] Experts have, before and after Copenhagen, investigated various other options for a post-2012 climate treaty. There is unfortunately only room to discuss two pertinent aspects here:[100]

- ***Top-down v Bottom-up:*** The EU and developing countries, particularly LDCs and SIDSs, insist that a top-down model à la Kyoto, with internationally agreed obligatory emission reduction goals, is the only way to meet the long-term 2°C objective under the UNFCCC. In contrast, the US and others are of the view that a bottom-up approach with domestic voluntary pledges is likely to be more effective, as countries will submit only what they can actually realise. A growing number of observers postulate that what is really needed is something in-between: an international legal instrument that is flexible enough to guarantee wide participation, and binding enough so that states parties can be reasonably confident that others will fulfil their obligations.[101] Although dispensing with the idea of a legally binding climate deal, this option maintains the need for a strong international climate framework by embedding national pledges in a wider international regime.[102]
- ***All-inclusive treaty v Fragmented agreements:*** Instead of waiting for a comprehensive post-2012 climate deal, which includes all pillars of the Bali Road Map, many observers today suggest a fragmentation of the climate negotiations.[103] They want to disaggregate the key issues into components that can be developed in a more flexible way through parallel agreements using various sets of instruments, institutions and methods which are only integrated and linked over time.[104] They favour negotiating –

99 Barriaux (2010).
100 For an overview, see Kuik et al. (2008).
101 Diringer (2010b:1).
102 Falkner et al. (2010:259).
103 Falkner (2011:258); Bodansky & Day O'Connor (2011:10).
104 Bodansky et al. (2010:10).

- issue-specific agreements
- agreements which target specific industries or specific policies, or
- agreements involving only a few like-minded countries.[105]

Specifically, considering the logjam between the US and China, there is a growing number of experts who recommend that a 'coalition of the willing' including the EU, Japan and Russia and progressive developing countries such as Indonesia, Korea and Mexico should continue with Kyoto beyond 2012.[106]

The last major question that needed to be looked at after Denmark involved the obvious weaknesses of the UN negotiation framework. Observers agreed that there was an urgent need for more effective decision-making rules, which simultaneously guaranteed participation and inclusiveness.[107] After Copenhagen, various options were discussed. Under the first main option, negotiations would continue under the UN umbrella, but the decision-making procedure would be overhauled by –

- introducing majority rule, or
- keeping voting rules as they were, but using more exclusive negotiation groups.[108]

Other experts looked beyond the UN as a negotiation platform and suggested using other forums.[109] Alternatives included specialist institutions, i.e. the International Maritime Organization, the International Civil Aviation Organization or other broader international institutions, like the G8, the G20,[110] or the Major Economies Forum on Energy and Climate.[111]

105 Kuik et al. (2008:327).
106 Falkner et al. (2010:259).
107 UBA (2010:28).
108 Falkner et al. (2010:258).
109 Bodansky & Day O'Connor (2011:3–10).
110 Group of 20 major economies.
111 Bodansky et al. (2010:19).

V. COP16, Cancun, Mexico, 2010

1. Expectations

In light of the ongoing discussion about the right approach forward, and with the gridlock between the US and China unresolved, negotiators began organising the next COP in Mexico. Expectations were low. In particular, the US had nothing to bring to the table, given that any new climate deal would not reach a quorum in the US Senate. For this reason, as opposed to a year earlier, COP16 was not thought capable of producing a new legally binding climate deal but merely a set of informal decisions to move forward on key elements of climate-related policy.[112] It was expected that states parties would at least declare their intention to work towards a new binding climate deal, while leaving on the table all options regarding a specific legal framework, including new obligations under Kyoto.

Observers hoped that the COP in Mexico would consolidate the various discussions and negotiation streams which existed: the two formal negotiation streams, supervised by the Kyoto and AWG–LCA, and the more informal Copenhagen Accord.[113] The key issue to resolve in this regard was how to integrate the non-binding Copenhagen Accord into the wider UNFCCC framework. Under the UNFCCC track, COP16 was expected to at least decide on the basic parameters of new or improved mechanisms in those areas where negotiations had reached a certain level, e.g. the REDD+ initiative by UN-REDD and others in respect of deforestation, or initiatives regarding finance or technology.[114]

2. Outcome

The Cancun Agreements did extremely well to integrate the key elements of the Copenhagen Accord into the UNFCCC. For example, –

- Cancun includes, for the first time in an official UN document, the objective to limit the temperature increase below 2°C. Unlike the year be-

112 CCES (2010b:1).
113 Stavins (2010a:3).
114 (ibid.).

fore, in Cancun the states parties formally agreed to the goal instead of only taking note of it.

- by incorporating the mitigation targets and actions pledged under Copenhagen into the UNFCCC, the new agreements set GHG emission reduction goals for some 80 countries.[115] As a consequence, for the first time, all the large GHG emitters – including Brazil, China, the EU, India and the US – have signed up under the UNFCCC for targets and actions to reduce GHG emissions by 2020.[116]
- under the UNFCCC track, the COP inaugurated the Cancun Adaptation Framework in order to improve adaptation efforts and instituted an Adaptation Committee to provide technical support to LDCs on adaptation-related matters.[117] While the emphasis of Kyoto was on mitigation, Cancun put adaptation firmly on the table in line with the IPCC's Fourth Assessment Report. The funding goals set in the Copenhagen Accord were reiterated.[118] A Green Climate Fund was established and designated as an operating entity of the financial mechanisms of the UNFCCC, and will be operated under the guidance of the COP with the World Bank as its interim trustee.[119]
- on the Kyoto track, while the decision about extending Kyoto beyond 2012 was once again referred to the next COP, progress was made on other issues,[120] such as the agreement to use 1990 as a base year and to continue emissions trading and other market-based instruments inaugurated by Kyoto.

3. Assessment

Despite very gloomy predictions ahead of the Cancun COP, the participants achieved unprecedented consensus on a range of issues going forward.

Observers suggest that much of the progress reached could be linked to a somewhat changed negotiation approach. Importantly, Cancun knocked a

115 Stavins (2010b:1).
116 CCES (2010c:1).
117 (ibid.:3).
118 Copenhagen foresaw the joint commitment by developed countries to provide US $30 billion in start-up finance for developing countries in 2010–2012, and their willingness to try to mobilise US$100 billion a year as from 2020.
119 UNFCCC (2012i).
120 CCES (2010c:6).

hole in the firewall between Annex I and Non-Annex I parties – a key step in overcoming the rich–poor gulf which has hobbled climate negotiations for many years.[121] The Cancun Agreements formulate two principles on which all countries are –[122]

- obliged to recognise their historic GHG emissions, i.e. the industrialised world, and
- liable for their future GHG emissions, i.e. the industrialised and the larger developing countries.

Moreover, the states parties seem to have recognised, at least implicitly, that moving forward in incremental steps is going to be more effective than holding out for an all-inclusive global climate deal.[123] Similarly, after the hostile recriminations between the US and China which deadlocked the COP in Copenhagen, these countries adopted a more productive tone in Mexico, with India as a key broker.[124]

VI. COP17, Durban, South Africa, 2011

1. Expectations

Despite the progress achieved in Mexico, it was still far from clear where the negotiations would be headed after Cancun.[125] Indeed, as outlined before, COP16 was once more unable to solve the major question of what to do with the Kyoto Protocol beyond 2012, once the first commitment period ran out. The issue of extending Kyoto for Annex 1 countries had been discussed during COP13 in Bali in 2007, but it has been put off ever since. However, with little more than a year to go before the end of Kyoto, observers pointed out that the question could not be delayed further, given that the necessary ratification would itself take at least a year.[126] This made Durban the last genuine opportunity to extend Kyoto into a second commitment period (CP2) and thereby prevent a so-called commitment gap.

121 Stavins (2011a:1).
122 Stavins (2010b:3).
123 (ibid.:2).
124 CCES (2010c:1).
125 (ibid.:2).
126 Stavins (2011b:3).

In the run-up to the COP17, experts discussed various possible negotiation options for Durban, ranging from a worst-case scenario to a very ambitious one:

- At worst, states parties would be unable to agree on prolonging Kyoto beyond 2012, not even informally. Many experts thought this was the most likely option going into the negotiations in light of the unresolved gridlock, described earlier. Even those Kyoto states parties that had supported its formal extension were no longer inclined to do so without reciprocal commitments by other nations.[127] For example, the EU, which was generally willing to sign up to CP2 of Kyoto, would only do so if negotiations for a new binding climate deal including China and the US were to be launched.[128] Then again, the US would only agree to negotiate such a new deal if it included GHG emission reduction goals of the "same legal force" for all of the major emitters – including China and India – although these obligations could be differentiated.[129] China, on the other hand, seemingly kept on opposing any binding targets, no matter how differentiated they were.
- In the very ambitious scenario, industrialised countries would agree in Durban to a formal extension of Kyoto. For the reasons explained above, most observers viewed this option as highly improbable. Moreover, with Canada, Japan and Russia's declaration to oppose a CP2 of Kyoto – a position which these countries declared just before Durban – a prolonged Kyoto would cover even less GHG emission reduction than the original Kyoto.[130]
- Viewed by most observers as the best-case scenario, states parties would reach an informal agreement launching a CP2 of Kyoto in which GHG emission reduction goals would be political rather than legally binding obligations.[131] Due to the political nature of the new targets, their endorsement would not require a formal amendment of Kyoto, but only a simple decision.

127 Bodansky (2011:5).
128 Stavins (2011b:3).
129 Bodansky (2011:2).
130 (ibid.).
131 (ibid.).

On top of the issue of an extension of Kyoto beyond 2012, it was hoped that COP17 in Durban COP would advance the UNFCCC negotiation stream and include –

- the review of the long-term objective of keeping global warming at 2°C, and
- the elaboration of incremental steps to implement Cancun – involving the overall level of the mitigation pledges, improved MRV, REDD+, adaptation issues, technology and finance.

2. Outcome

In spite of the doom and gloom at COP17's opening, the states parties adopted the Durban Agreements on a range of issues that may lead to a historic breakthrough in international climate negotiations. What was sure was that COP17 kept the discussion of global climate efforts from breaking down and instead moved it in the right direction.[132]

Thirty hours after the scheduled end of the Durban COP, on the Kyoto track, the states parties agreed to a prolongation of Kyoto beginning in 2013. However, the details of the new reduction targets including the length of the new commitment period would be established at COP18. The BASIC group (and other NICs) remained Non-Annex I parties without binding targets.[133] States parties to CP2 of Kyoto would have to submit their quantified reduction targets by May 2012. However, Canada, Japan and Russia indicated that they would not participate in CP2 of Kyoto.[134]

The extension of Kyoto beyond 2012 was combined with the launch of new road map for the negotiation of a post-2020 climate agreement by way of "a protocol, another legal instrument or an outcome with legal force".[135] Negotiations are supervised by a newly formed Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP), and are to finish no later than 2015.[136] The new climate deal is to come into effect only from

132 Diringer (2011b:1).
133 Boyle (2011:4).
134 (ibid.).
135 CCES (2011:1).
136 Sterk et al. (2011b:8).

2020 onwards. Negotiations within the AWG–LCA stream were to continue for at least another year, until the COP in Doha.[137]

On the UNFCCC track, the COP took various significant steps to further the implementation of the Cancun Agreements:

- A major outcome was the operationalisation of the Green Climate Fund to serve as a key vehicle for climate funding.[138] For years, funding has been an issue of ongoing conflict between developing countries and their more industrialised counterparts. Though the UNFCCC includes funding mechanisms, it has a very weak role, and sums pledged to the three financing tools – the Least Developed Countries Fund, the Special Climate Change Fund, and the Adaptation Fund – are notoriously low.[139] However, while states parties were able to decide on the institutional structure of the Green Climate Fund, the decision does not indicate where the money for the Fund will actually come from beyond 2012.[140]
- Importantly, in order to further improve monitoring under the UNFCCC, Durban's COP17 introduced –[141]
  - a voluntary international assessment and review mechanism for developed countries, and
  - a non-binding international consultation instrument for developing countries.
- Finally, states parties agreed on various other operational actions including, for example, –[142]
  - the upcoming inauguration of the new technology instrument in 2012, and
  - funding and technical aspects of the REDD+ initiative.

3. Assessment

Observers believe that Durban kept the international climate negotiations intact and moving in the right direction, thus increasing the likelihood of

137 Boyle (2011:1).
138 (ibid.:7).
139 Sterk et al. (2011b:23).
140 (ibid.:25).
141 CCES (2011:3).
142 Boyle (2009:10–12).

meaningful long-term climate action.[143] South Africa reopened the door to legally binding GHG reduction targets for all major emitters – a door which seemed to have been closed after Denmark.[144] For China, India and the US to even consider an inclusive and robust legal agreement beyond 2012 was certainly an important move.[145] Durban was a step forward in more than one respect:

- The key importance of the innovative ADP was not so much that a further negotiation stream had been launched: it would have been sufficient to prolong the UNFCCC track beyond 2012. It was more that, for the first time, Durban offered states parties the option of a more symmetrical future climate agreement.[146] Thus, while the UNFCCC track is obliged to adhere to the CBDR principle, the ADP does not necessarily have to do so.[147] This is because the mandate to launch the Durban track does not include a reference to the CBDR principle of the UNFCCC or Kyoto, in spite of the insistence by Non-Annex I parties to do so.[148]
- That Kyoto will live to see yet another day has been hailed as a major realpolitik victory for progressive countries, including the EU.[149] Despite tough opposition, the EU managed to form a "green coalition" with the most vulnerable nations, LCDs and two of the BASICs (Brazil and South Africa) in order to obtain a road map for a new universal climate treaty.[150] In doing so, the EU's interventions were vital in avoiding another Copenhagen outcome, which, at times, was a very real possibility in Durban.[151] According to observers, had there been no agreement on a road map, the EU would not have agreed to commit to a CP2 of Kyoto; this, in turn, would have led to developing countries blocking any headway to be made along the AWG–LCA stream, with potentially devastating consequences for the overall international climate negotiations.[152]

143 Diringer (2011b:1); Stavins (2011c:1).
144 Climatico (2011:1).
145 Boyle (2011:1).
146 Diringer (2011:1).
147 Stavins (2011c:2).
148 Rajamani (2011:1).
149 Sterk et al. (2011b:4).
150 (ibid.:31).
151 (ibid.).
152 (ibid.).

- What is also significant is the fact that old alliances were crumbling. In the past, developing countries used to negotiate as one G77 bloc, but were often hijacked by the larger developing countries. In Durban, for example, the LDCs and SIDSs formed a coalition with the EU.[153] Similarly, the BASIC group fractured in Durban: first South Africa and then, later, Brazil insisted on a road map for a new universal treaty, while China indicated its willingness to ponder adopting binding goals after 2020.[154]

Yet again, observers raised various concerns. For one, great ambiguity remains over the legal nature of the post-2020 climate deal, particularly the binding force of the targets. The agreement to launch the ADP, the new negotiation platform, undertakes "to develop a protocol, another legal instrument or an agreed outcome with legal force under the UNFCCC."

However, apart from the question of what is meant by an "agreed outcome with legal force" – which is a novel term in international law – even a legally binding agreement need not contain legally binding commitments.[155] The Durban forum may well have provided for a legally binding agreement by referring to an "agreed outcome with legal force", but nowhere does it state that this new agreement is to include legally binding mitigation targets. It can be expected that the US and others will continue to fight tooth and nail against having quantified binding goals in a 2020 agreement.[156] Observers also warned that the new emission reduction targets under a CP2 of Kyoto would be much weaker than the ones under the first commitment period (CP1) of Kyoto because, for many countries, they would consist of voluntary national pledges which are not linked to an overall emission reduction objective.[157] The large developing countries are still without binding targets, Russia and Japan will not participate in CP2 of Kyoto, and Canada withdrew from Kyoto for good just after COP17 in Durban in 2011.

153 (ibid.:33).
154 (ibid.).
155 Bodansky (2012:1).
156 Sterk et al. (2011b:33).
157 Boyle (2011:2).

VII. COP18, Doha, Qatar, 2012

1. Expectations

In terms of public and media interest, Doha was expected to be a lower-key meeting than its predecessors in Cancun, Mexico, in 2010, and in Durban, South Africa, in 2011.[158] After three years of rather 'big moment' COPs, i.e. in Copenhagen, Denmark, in 2010, and those in Mexico and South Africa, the COP in Doha, Qatar, in 2012 was more about giving operational momentum to the agreements reached in Durban.[159] The progress required in Doha was deemed quite modest, so it was important that expectations were not too high in order to avoid it being labelled "another failure".[160] Although no new initiatives or processes were expected to be launched, much remained at stake. COP18 in Doha came at a particularly important time, namely the end of CP1 of the Kyoto Protocol on 31 December 2012. Hence, Doha would be vital in ensuring a seamless continuation of the Protocol as of 1 January 2013 and, thus, the maintenance of the only international legally binding instrument that existed in respect of tackling global warming.[161] Securing final agreement for the immediate launch of a CP2 of the Kyoto Protocol from 1 January 2013 would be a defining feature of the meeting.[162] Critical issues included the following:

- *CP2 timeframe of five or eight years:* Parties were divided as to whether CP2 should end in 2017 or 2020.[163]
- *The level of ambition:* Despite clear scientific evidence for the kind of reductions required from developed countries, i.e. a 25–40% cut in 1990 emissions by 2020, the level of ambition for a CP2 remained uncertain. Before COP18, the only numbers on the table were those pledged in the aftermath of the Copenhagen summit.[164]
- *Market-based instruments:* Developing countries argued that industrialised countries which were not part of a CP2 of Kyoto should not be

158 The Climate Group (2012a:1).
159 WRI (2012a).
160 House of Commons (2012:6).
161 IISD (2012:3).
162 The Climate Group (2012a:1).
163 FIELD (2012:7).
164 The Climate Group (2012a:4).

entitled to use the CDM or other market-based tools instituted in the CP1 of Kyoto,[165] and

- *Hot air targets:* Many countries – both developed and developing – requested avoiding the granting of hot air targets under a CP2 by limiting the number of surplus emissions units that could be carried over from a CP1 to a possible CP2.[166]

Furthermore, COP18 was expected to conclude the work on the UNFCCC track inaugurated in Bali in 2007 and supervised by the AWG–LCA since then.[167] The three key issues under negotiation in Doha, therefore, included mitigation (for both developed and developing countries), funding, and MRV – although, in the run-up to Doha, states parties were sharply divided over what issues needed finalisation at the COP18.[168] As regards funding, the vital question was whether developed countries would make new commitments for the 2013–2020 period to bridge the gap between the 'start finance' period, which was to end in 2012, and the US$100 billion commitment made in Copenhagen, which begins in 2020.[169] The task in Doha was either to formally conclude work on each of these areas or move them to the two UNFCCC subsidiary bodies or to the ADP itself.

Finally, under the ADP, much needed to be concretised, e.g. starting to define the details regulating the negotiations expected to set up the new "protocol, another legal instrument or a legal outcome under the [UNFCCC]" applicable to all states parties by 2015.[170] As a negotiation track, the objective in Doha was to consolidate the understanding among countries on the negotiation issues for the next three years under both so-called workstreams:[171]

- Under Workstream 1, which focused on the post-2020 treaty, countries were to discuss how the UNFCCC's existing framework would apply to the new 2020 treaty; for example, developing countries were insisting on upholding the CBDR rule and the so-called firewall between Annex I and Non-Annex I parties, and

165 The Climate Institute (2012:16).
166 The Climate Group (2012a:5).
167 ICCG (2012:2).
168 The Climate Group (2012a:2).
169 The Climate Institute (2012:6).
170 ICCG (2012:2).
171 The Climate Group (2012a:9).

- Under Workstream 2, countries were to look at how to improve the level of existing pledges for the 2013–2020 period.

2. *Outcome*

The Doha Climate Gateway successfully managed to end two long-standing negotiation streams, i.e. Kyoto and the UNFCCC track, and to progress to a unified track – the ADP – with the objective of an inclusive legal climate agreement by 2015.

First and foremost, the COP agreed on the revision of the Kyoto Protocol to formally establish the CP2.[172] Having been launched in 2005, the AWG–KP thus terminated its work in Doha. States parties also decided that CP2 would run for eight years, i.e. from 2013 through 2020.[173]

In addition, the extended Kyoto features an ambition trigger, requiring that states parties verify and increase their emission reduction targets by 2014 in line with the IPCC's Fourth Assessment Report.[174] In the face of strong Russian objections, as the main benefactor of hot air targets under KP1, states parties decided to restrict the use of the surplus emission allowance gained under KP1.[175] For Non-CP2 parties such as Canada, Japan, New Zealand and Russia, COP18 agreed to restrict their eligibility to market-based instruments, including the CDM and emissions trading.[176] Furthermore, the states parties agreed to terminate the Convention track under the AWG–LCA. As expected, the COP simply took note of the pledges already listed under Copenhagen, while launching a one-year work programme to verify those pledges. Efforts to improve the accounting rules for the MRV were unsuccessful.

A major outcome of the UNFCCC track was the agreement to look towards establishing some kind of 'loss and damage' mechanism in favour of the most vulnerable countries at COP19 in 2013.[177] On the other hand, industrial countries refused any new funding commitment, and only agreed to maintain through 2015 the average finance levels provided during 2010–

172 Marcu (2012:1).
173 CCES (2012:2).
174 WRI (2012b).
175 CCES (2012:2).
176 WRI (2012b).
177 The Climate Group (2012b:20).

2012 – roughly US$10 billion a year.[178] At least a few European countries, i.e. Denmark, France, Germany, Sweden, and the UK, pledged to somewhat augment their funding post-2012.

Under the ADP track, China, India and other developing countries again tried to introduce the CBDR principle explicitly into the ADP framing, which the US and others had objected to include in the mandate.[179] The COP decided to establish a one-year work programme to think through the application of the UNFCCC principles.[180] The COP also stated that the ADP should consider "elements for a draft text" for the new agreement no later than COP20, "with a view to making available a negotiating text before May 2015".[181] For the rest, the ADP decision was mainly of a procedural nature.

3. Assessment

> This round of international climate change talks was a modest step forward. We always knew they would be very tough after the breakthrough at the same conference in Durban last year.[182]
> The success in agreeing a second Kyoto commitment period, although important politically, is also something of a Pyrrhic victory for its supporters.[183]

Despite the devastation wrought by Hurricane Sandy and President Barack Obama's re-election, the US was once again less than helpful in moving ahead, declining any proposal to increase their emission reduction targets or to commit to new funding.[184] The EU is similarly to blame for a lack of progress on this score, since the traditional frontrunner arrived at Doha with a reduction objective it had basically already met, with no joint funding commitment, and with divergent positions among the EU member states on various issues.[185] With the industrialised world unwilling to increase their targets or to improve on funding, there was no incentive for the likes of China or India to better their voluntary emission reduction goals.[186]

178 WRI (2012b).
179 CCES (2012:3).
180 WRI (2012b).
181 CCES (2012:4).
182 Davey (2012); Sterk et al. (2012a:1).
183 The Climate Group (2012c).
184 Sterk et al. (2012b:39).
185 The Climate Group (2012b:2).
186 Sterk et al. (2012b:38).

- Observers warn that the outcome of COP18 was even more modest than would have been necessary. CP2 will be a far cry from CP1 in terms to emission reductions: under the original Kyoto, all industrialised countries (39 at the time) – representing more than 55% of all global emissions – committed to reducing those emissions. With Canada having withdrawn from the treaty entirely, and Japan and Russia declining to sign up to CP2, this left the EU27, plus Australia (subject to conditions), Belarus, Iceland, Kazakhstan, New Zealand (possibly), Norway, and the Ukraine as members[187] – representing only around 15% of global emissions. Also noteworthy is that, at the time of writing, the 2020 target of the largest party (the EU) had almost already been met.[188] Moreover, the overall emission reduction to be achieved under CP2 will be approximately 18% by 2020 from 1990 levels and, hence, significantly less than the 25–40% range recommended by the IPCC.[189] The net result is that Doha left the world firmly on track to 4°C or more of warming by 2100.[190]
- In terms of the UNFCCC track, mitigation ambitions remained low. As expected, funding proved to be the most difficult issue to resolve in Doha. There was no joint commitment by Annex I parties in terms of mid-term funding from 2013 to 2020. The relevant decision simply "urges", "invites" and "encourages". Annex I parties to increase their funding, but when their "financial circumstance permit".[191]

Yet again, Doha also produced some positive results, as follows:

- Its main objective was to streamline the complex, multi-track negotiating process. The achievement in reducing the overall negotiations down to one unique track from 2013 onwards should not be underestimated:[192] it allows states parties to concentrate on the discussions at hand, and frees up time and resources for states parties to the UNFCCC.[193]
- As for the level-of-ambition discussion, there remains hope. Workstream 2 under the ADP, which was instituted to increase pre-2020 ambitions of the states parties, and the review of the CP2 states parties' targets

187 The Climate Group (2012c).
188 The Climate Group (2012b:2).
189 Sterk et al. (2012b:6).
190 WRI (2012b).
191 The Climate Group (2012b:3).
192 The Climate Group (2012c); CCES (2012:1).
193 Marcu (2012:1).

envisaged between 2013 and 2015, provide the tools for jump-starting mitigation efforts.[194]

- The idea of setting up a kind of 'loss and damage' instrument at COP19 in 2013 is a major achievement for LDCs, particularly for those most vulnerable to the long-term impacts of global warming.[195] Where mitigation and adaptation fail, people may suffer damages to their assets and health due to global warming. Yet, industrialised countries, notably the US, remain extremely wary of such a legal mechanism, fearing that, as traditionally high emitters, they may be held liable for damages of potentially unlimited economic value whose attribution to global warming may still be unclear.[196]

However, following Doha, the Wuppertal Institute for Climate, Environment and Energy pointed out the following:[197]

> The decisions required in 2015 will be momentous: to raise collective global ambition for 2020–30 to meet the 2°C pathway; to agree a new, legally binding framework; to identify the sources of finance that can meet the goal of providing US$100 billion in climate assistance to the poorest countries by 2020; and to agree a new international collaboration on the development, demonstration and deployment of low-carbon technologies.

With just three years to go, there is no time to lose. The next three sections therefore investigate what policy instruments and methods individual countries use to tackle global warming. Two industrialised societies are looked at in detail, namely the EU, which is a CP1 and CP2 Kyoto Annex I party; and the US, the second largest GHG emitter, but not a party to Kyoto. The investigation then directs its attention to a member of the BASIC group of NICs, namely China, as a Non-Annex I party and the highest current emitter of GHGs. Based on Kuik et al.'s synthesis article of 2008,[198] the investigation aims to outline the main climate policy instruments used by these three countries. Kruik et al. examine various policy approaches for a new climate treaty along the lines of what they regard as five key policy dilemmas:[199]

194 The Climate Group (2012b:1).
195 (ibid.:3).
196 Morgan (2012).
197 Sterk et al. (2012b:43).
198 Kuik et al. (2008).
199 (ibid.).

- *The Carrot v The Stick*, i.e. taxes, permits and standards v financial incentives such as subsidies and tax credits
- *The 'Front Door' v The 'Back Door'*, i.e. direct climate policy (the front door) v indirect climate policy as a side benefit of other policies such as those on energy, air quality, technology and security (the back door)
- *Market-based Instrument v Direct Regulation*
- *Multilateral Parties v Small (Unilateral) Parties; and*
- *Mitigation v Adaptation*.

The discussion then turns to the developing world, with a special focus on LDCs.

D. Climate Change and Industrialised Countries

I. The European Union

The EU, representing 27 member states, with a combined output of 4,050 Mt of carbon dioxide in 2010, is the world's third largest GHG emitter after China and the US, accounting for 12.3% of global carbon dioxide emissions, and having shown an increase of 3% from 2009 (and a decrease of 5% from 1990).[200] The EU27's emission intensity of 0.26 kg carbon dioxide per unit of GDP[201] in 2010 is about a third lower than the US's (0.41 kg) and China's (0.77 kg), and has decreased by 37.2% from 1990.[202] Per capita carbon dioxide emissions in the EU27 totalled 7.29 t of carbon dioxide in 2010 (compared with 17.3 t for the US and 5.4 t for China), which signifies a reduction of 17.3% for the EU27 from 1990.[203] The EU has long been at the vanguard of international efforts to address global warming, and has been a state party to the UNFCCC since 1993 and the Kyoto Protocol since 2002. Unlike the US, the EU follows mainly a 'stick' climate policy approach, i.e. a permit and tax system, combined with direct regulations such as fuel efficiency standards. This top-down approach is complemented by financial incentives to stimulate innovation and market-based instruments. The European Climate Change Programme (hereinafter ECCP I) of 2000, replaced in

200 NEAA (2011:11, 14).
201 In 2005 US Dollars, using purchasing power parities.
202 IAE (2011:96, 98). Note that the numbers relate to carbon dioxide emissions from fossil fuel combustion, which account for over 90% of all such emissions.
203 (ibid.:99, 101).

2005 by the ECCPII, serves as the main EU climate policy document, which is an example for a 'front door' approach.

1. Mitigation Policy

a) Binding Mitigation Targets?

Under Kyoto, the 15 older EU member states (EU-15) took on the obligation of reducing their collective GHG emissions by 8% on average in the first commitment period until 2012, compared with its 1990 base-year emissions.[204] While the EU's Fifth National Communication under the UNFCCC in 2009 projected that the EU-15 would overshoot their Kyoto target by 5.8% in 2010,[205] individual members had varied results in achieving their targets. Though some member states, like France, Greece and the United Kingdom, have reduced domestic GHG emissions beyond their Kyoto targets, others like Austria, Denmark, Italy, Portugal and Spain are lagging in compliance.[206]

Regarding the 2013–2020 follow-up, in March 2007 the EU took the unilateral decision to reduce its GHG emissions by at least 20% by 2020 compared with its 1990 levels. In order to implement this obligation, in June 2009 the EU adopted a Climate and Energy Package,[207] in which it reiterated the overall target of a 20% GHG emission reduction, with an additional commitment to push this up to 30% if a satisfactory international agreement involving all big GHG emitters is reached. Apart from these new mitigation targets, the package obliged EU members to generate 20% of their energy from renewables by 2020. In a communication of May 2010[208] and a Staff Work Document of February 2012,[209] the European Commission (hereinafter *Commission*) investigated various options for moving towards a 30% GHG emission reduction, underlining that the 20% target was well within reach, given a much quicker GHG emission decrease than originally anticipated due to high oil prices as well as the ongoing global financial crisis.

204 EC (2011c).
205 EC (2009a:vi).
206 Barrett (2009:62).
207 EC (2007).
208 EC (2010a).
209 EC (2012a).

Yet, due to opposition from some EU members, the EU was unable to push its emission reduction target to 30% at COP18 in Doha, while observers indicated that the 20% target had already been met.

With regard to the long-term ambition of keeping the global temperature increase to below 2°C, the Climate and Energy Package contains an EU objective of reducing domestic GHG emissions by 80–95% below 1990 levels by 2050, which was reconfirmed by the European Council (hereinafter *Council*) in February 2011. In March 2011, the Commission adopted a *Roadmap for Moving to a Competitive Low Carbon Economy in 2050*[210] outlining scenarios on how to achieve this target.

b) Policy Instruments

In order to achieve the binding mitigation goals, the EU uses various regulatory instruments, central to which is the trade in GHG emission permits, i.e. the EU Emissions Trading System (EU ETS) launched in 2005, which now in its third phase, running till 2020.[211]

The 2005 Directive introduced a mandatory 'cap and trade' regime. According to this regime, a GHG emission limit for the whole ETS is fixed, and for each year a certain quantity (a 'cap') of GHG emission allowances is granted to EU members, who in turn distribute ('trade') these via public sale to the 10,800 installations throughout the bloc participating in the scheme.[212] If an installation emits more than the allowances it has obtained, it has to buy unused allowances from other installations under the ETS.[213] In 2009, a revised ETS directive was adopted[214] to further improve the EU scheme for a third phase running from 2013 to 2020. Moreover, the Commission wants to promote the creation of a robust OECD-wide carbon market by 2015, to be further extended to the larger developing countries by 2020.

210 EC (2011b); hereinafter *Roadmap for 2050*.

211 Directive 2003/87/EC of the European Parliament and the Council of 13 October 2003 Establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community, *Official Journal L 275*, 25 October 2003, 32–46.

212 EC (2009a:84–86).

213 (ibid.).

214 Directive 2009/29/EC of the European Parliament and the Council of 23 April 2009 Amending Directive 2003/87/EC to Improve and Extend the Greenhouse Gas Emission Allowance Trading Scheme of the Community, *Official Journal 140*, 5 June 2009, 63–87.

Up until 2012, the EU ETS only involved carbon dioxide emissions in the power- and heat-generating sector as well as a few other emissions-intensive industries (oil, iron and steel) across the 27 EU members plus Iceland, Liechtenstein and Norway. While overall ETS guidelines are set at EU level, allocation rules and GHG emissions caps are determined at national level. The firms in question obtain allowances to emit a certain tonnage of GHG each year,[215] but the overall emissions level is reduced over time. It is currently some 6.5% below the 2005 level, and by 2020 will be 21% lower. In 2008, 3 billion t of carbon dioxide were traded at a market value of US$92 million.[216]

While the EU ETS is generally acknowledged for its pioneering role, observers outline a number of flaws: at the beginning, it was unclear whether it was indeed more effective than carbon taxes in terms of reducing GHG emissions.[217] In Phase II, the ETS only covered 40% of all EU GHG emissions, notably excluding the transport sector, which was an important omission.[218] Other weaknesses included the lack of harmonised rules on allocation within the EU, the lack of strict enforcement tools, and the missing linkage between the EU ETS and other ETSs in third countries.[219] In the revised EU ETS Directive of 2009, coverage of the ETS was broadened for Phase III in order to include carbon dioxide emissions from the chemical industry and the aviation sector as well as certain other GHGs such as nitrous oxide. Moreover, caps are to be set at EU level and allocation rules harmonised across the EU. In spite of these structural reforms the ETS has been facing its most important challenge to date over the past months: the growing surplus of allowances due the economic crisis risks undermining the orderly functioning of the regime.

As to the other main regulatory instrument usually discussed by observers, namely carbon taxes, notably, quite a few EU members have introduced some form of eco-taxation;[220] however, there is no EU-wide carbon tax as

215 For an overview, see Massai (2007:18).
216 CCES (2009a:3).
217 Helm (2009a:229).
218 Farnsworth (2007:29).
219 Massai (2007:21).
220 Finland and The Netherlands (1990), Norway and Sweden (1991), the UK (1993), Germany (1999), Denmark (2002) and Ireland (2010) have a carbon dioxide tax in place; Austria, Belgium and Slovenia have some kind of carbon elements in their tax regime; in 2010 Spain was investigating the options for introducing carbon taxations; see Wilkinson (2012).

yet. However, proposals for a carbon taxation dispensation have been floated since 1999, prompting the Commission in 2010 to propose the amendment of the Energy Taxation Directive of 2003 which lays down common rules for the taxation of energy products.[221] The proposal aimed to introduce a carbon tax mainly for those sectors not yet included in the ETS.[222] However, the proposal has yet to reach a majority in the Council due to considerable lobbying by industry.

These regulatory instruments are accompanied by incentive-based mechanisms which promote the transition to a low-carbon society. The Energy Review of 2008, which stress that the EU's climate goals for 2020 will necessitate an overhaul of EU energy arrangements, looks at the challenges facing the bloc between 2020 and 2050 and formulates an EU Strategic Energy Plan.[223] This Plan tries to speed up the development of innovative, inexpensive, low-carbon technologies, and is built on a wide-ranging research and development scheme.[224] The initiative is complemented by the European Energy Programme for Recovery, which allocated €1 billion for carbon capture and storage installations and €50 million for offshore wind installations.[225] In 2011, the Commission proposed its *Roadmap for 2050*, which is based on the view that innovative ideas are needed to scale up investments in energy, transport, industry and information technologies and that more focus is necessary to combat energy inefficiency.[226] Together with the Energy Efficiency Plan of 2011 and the White Paper on Transport of 2011, the *Roadmap for 2050* is a key deliverable to achieve the EU's long-term objective of reducing GHG emissions up to 95% by 2050.[227]

2. Funding for Developing Countries

As an Annex I party under the UNFCCC, the EU is obliged to assist developing countries to tackle global warming, both in respect of reducing GHG emissions and in adapting to the unavoidable impacts of climate change.

221 EC (2009a:109).
222 FSB (2010:2).
223 EC (2012b).
224 EC (2010b).
225 EC (2012c).
226 EC (2011a:3).
227 (ibid.:4).

Before COP15 in Denmark in 2009, the Commission adopted a communication *Stepping Up International Climate Finance*: *A European Blueprint* for the Copenhagen deal, recognising that supporting developing countries was vital to reaching an ambitious outcome at COP15. The blueprint identified that, by 2020, developing countries would incur yearly costs of €100 billion to finance their mitigation and adaption activities, and proposed that industrialised nations and larger developing countries grant them funding to the tune of some €22–50 billion a year, with the remaining €50 billion coming from national sources and expanded international carbon dioxide markets.[228]

At COP15 in Denmark in 2009 and COP16 in Mexico in 2010, the EU and other industrialised countries pledged to jointly grant nearly US$30 billion from 2010 to 2012 to kick-start the scheme, and offered to mobilise US $100 billion a year by 2020. Despite budgetary constraints, the EU did, in fact, manage to award €2.34 billion in 2010 as well as in 2011, bringing its contribution to €4.68 billion, or 65% of the overall pledge for 2010–2012, most of which was deployed through existing instruments.[229]

With the assistance of the EU, COP17 in Durban in 2011 launched the Green Climate Fund, the new funding instrument intended to serve as the key long-term financing vehicle. However, states parties were unable to reach consensus on where the money for the Fund would come from, in either the medium (beyond the fast-start resources) or long term.[230] In recent years, three funding mechanisms have been set up by the Commission, i.e. the Global Climate Change Alliance, the Global Energy Efficiency and Renewable Energy Fund, and the Climate Change Windows, pooling more than €1.5 billion in grants from the EU budget and EU members' national budgets. These tools are estimated to leverage around €14 billion in climate finance by 2013.[231]

II. The United States of America

The US, with its output of 5,250 Mt of carbon dioxide in 2010 alone, is the world's second largest GHG emitter after China and ahead of the EU in third

228 EC (2009a:244).
229 EC (2012d).
230 Boyle (2011:2).
231 EC (2012d).

position. The US accounts for 15.9% of global carbon dioxide emissions, showing an increase of 4% from 2009 (and an increase of 5% from 1990).[232]

The US's emissions intensity of 0.41 kg carbon dioxide per unit of GDP is almost half as low as China's (0.77 kg) and about a 40% higher than the EU27's (0.26 kg), and has decreased by 30.6% from its 1990 levels.[233] Per capita emissions in the US totalled 17.3 t of carbon dioxide in 2010, which is more than double the value of the EU27's 7.29 t and more than three times the value of China's 5.4 t; for the US, this signifies a reduction of 11.0% since 1990.[234]

While the US became a state party to the UNFCCC in 1992, it declined to ratify Kyoto in 2003, making it the only major industrialised country – and the world's largest GHG emitter at the time – to do so. Unlike the EU, against the background of voluntary mitigation goals, the US pursues a 'carrot' climate policy approach with various incentive-driven instruments rewarding energy innovation, such as its Climate Change Technology Program, while favouring market solutions. This bottom-up approach is – albeit only recently – complemented by direct regulations, i.e. energy standards and mandates. Unlike the EU, the US lacks an explicit climate policy and strives to attain reduction of GHG emissions by indirect means such as air quality and energy efficiency policies.

1. Mitigation Policy

a) Binding Mitigation Targets?

Since the US has never ratified Kyoto, it has, to date, never signed up to binding mitigation targets at international level. Following COP15 in Denmark in 2009, the US signed up to the Copenhagen Accord and took on the voluntary goal of reducing its GHG emissions by 17% below 2005 levels. With regard to the long-term vision of keeping global warming at 2°C, at COP15 the US Government stated that it sought to voluntarily reduce its GHG emissions by 85% by 2050, compared with its 2005 levels.

232 NEAA (2011:11,14).
233 IAE (2011:96, 98).
234 (ibid.:99, 101).

Neither has the US, at federal level, adopted an explicit climate policy ('front door' approach). In order to reach the voluntary goal agreed at COP15, the Obama Administration made an all-inclusive obligatory Climate Bill one of its legislative priorities. The so-called American Clean Energy and Security (ACES) Bill was passed by the House of Representatives in June 2009,[235] but was defeated in the Senate in June 2010.[236] The ACES Bill would have established a nationwide cap-and-trade scheme covering 85% of US GHG emissions, with the long-term goal of achieving an 80% reduction in GHG emissions relative to 2005 levels by 2050.[237] Emissions limits would have been placed on power generation, oil refining, natural gas supply, and other energy-intensive industries, such as iron and steel, cement and paper, covering approximately 85% of US GHG emissions by 2016.[238]

Since the failure of the ACES Bill, the Clean Air Act (CAA) has become vital for developing a federal climate policy ('back door' approach).[239] The CAA formulates the broad authority of the Environmental Protection Agency (EPA) to develop regulations to mitigate harm from air pollution. In 2011, the EPA succeeded in implementing regulations imposing mandatory fuel standards for vehicles, thus introducing, for the first time, obligatory emission reduction targets at national level via the 'back door' of the CAA.[240]

For lack of binding mitigation targets at federal level, individual states have, over the years, introduced obligatory emission objectives. Since November 2009, 23 of the 50 states had adopted a state GHG emission reduction target, although these vary in stringency, timing, and enforceability.[241] As for carbon dioxide trading systems, the most important is the Regional Greenhouse Gas Initiative involving 10 north-east US states, which was launched in 2009 as the first-ever obligatory cap-and-trade programme.[242] Emissions from large power generators in 10 north-east and mid-Atlantic states are capped at 2009 levels, and the cap will be reduced by 2.5% in each of the four years from 2015 through 2018, for a total reduction of 10% below 2009 levels.[243]

235 CCES (2009c).
236 Zusman et al. (2012:3).
237 (ibid.).
238 (ibid.).
239 Burtraw (2011:1).
240 US (2010:44).
241 (ibid.:62).
242 Burtraw (2011:1).
243 US (2010:61).

b) Policy Instruments

The US mitigation policy at federal level is essentially incentive-driven and aims to achieve a reduction of GHG emissions by way of investing in low-carbon technology and renewable energy. The main policy instrument is the American Recovery and Reinvestment Act of 2009, through which the US Government offers subsidies and tax incentives of more than US$90 billion for investment in sustainable energy technologies.[244]

Key aspects include the following:[245]

- Appropriating funding for numerous grant programs and tax incentives for clean energy technologies;
- A 30% tax credit for residential energy investments, as well as mandates for improved energy standards for heating facilities;
- Increasing the investments allocated to new clean renewable energy bonds and qualified energy conservation bonds;
- Investing in critical energy infrastructure by providing loan guarantees for new or upgraded electric power transmission projects, and by providing funding for the Smart Grid and new Smart Grid technologies;
- Asserting an energy efficiency leadership role for the federal government, investing in the "green" conversion of federal facilities, and purchasing vehicles for government use with higher fuel economy, including hybrid and electric vehicles.

Another very important incentive scheme is the Energy Improvement and Extension Act adopted in 2008, which offers a set of incentives for renewable energy production, clean coal and carbon sequestration, as well as energy-efficient transportation.[246]

Recently, this incentive-based policy has been complemented by regulatory instruments which are designed and implemented by EPA, based on the CAA:[247]

- The first involves new vehicle fuel economy standards regulations that took effect in January 2011, affecting all vehicles beginning with the 2012 year model
- The second instrument introduces permits for the construction of and major alterations to new sources of GHG emission. Since January 2011,

244 (ibid.:41).
245 For more information, see (ibid.:40).
246 (ibid.:43).
247 Burtraw (2011:2).

this instrument has applied to about 900 construction projects per year at sites that emit large quantities of GHGs, and
- The third and most important tool concerns performance standards that apply to the operation of new GHG-emitting sources in various categories.

2. *Funding for Developing Countries*

As with the EU, the US is committed to helping developing countries in their mitigation and adaptation efforts. Since 1991, the US Agency for International Development (USAID) has included climate change funding mechanisms in its development funding, spending approximately US$2.6 billion on climate-related development programmes.[248] However, in its evaluation of the Fourth US National Communication in 2009, the UNFCCC noted that US resources, which expressly target developing countries, in particular LCDs and SIDSs were modest.[249] This is mainly due to the US's 'back door' approach according to which climate goals are embedded in a wider development agenda.

Against this background, the Obama Administration passed the Consolidated Appropriations Act of 2010, which nearly tripled climate-related foreign assistance to over US$1 billion in 2010, including a first-ever US contribution of US$50 million to the Least Developed Country Fund and Special Climate Change Fund; a contribution of US$375 million to the World Bank-managed Climate Investment Funds; and substantially increased funding for the USAID climate programmes.[250] At COP16 in Mexico in 2010, the US pledged to contribute US$1 billion between 2010 and 2012 in aid to reduce GHG emissions from deforestation, land degradation, and other activities.[251] Furthermore, in 2004, the US's Millennium Challenge Account (MCA) was launched. To date, agreements with 20 countries totalling nearly US$7.2 billion have been signed under the MCA.[252]

248 US (2010:77).
249 UNFCCC (2009b:30).
250 US (2010:98).
251 (ibid.:99).
252 (ibid.:102).

E. Newly Industrialised Countries: China

China, with its output of 8,950 Mt of carbon dioxide in 2010 alone, is the world's largest GHG emitter, accounting for 27.1% of global carbon dioxide emissions, showing an increase of 10% from 2009 (and of 257% from 1990).[253] Coal constitutes 70% of China's primary energy – more than twice the international average.[254] China's emissions intensity of 0.77 kg carbon dioxide per unit of GDP in 2010 is almost double the US's value of 0.41 kg and almost three times higher than the EU's value of 0.26 kg, but has decreased by 52.4% since 1990.[255] Per capita carbon dioxide emissions in China totalled 5.4 t of carbon dioxide in 2010, which is still below the value of the EU's 7.29 t and less than one third of the US's value of 17.3 t; for China, however, this signifies an increase of 174.3% since 1990.[256] Even more importantly, the NEAA forecasts that, by 2017, China will have overtaken the US as the highest per capita GHG emitter.[257]

China employs mainly a 'stick' climate policy approach through a permit and tax system using various direct regulations, supplemented by some market-based instruments. Like many other developing countries, China tries to achieve its climate goals indirectly, as side effects of a general development policy (the 'back door' approach).[258]

I. Binding Mitigation Targets?

China has participated actively in the international climate negotiations since the beginning and has ratified the UNFCCC as well as the Kyoto Protocol. However, it is important to remember that China, as a Non-Annex 1 (developing) country, did not have to take on quantified binding mitigation targets under Kyoto.[259]

253 NEAA (2011:11, 14).
254 CELP (2012:1).
255 IAE (2011:96, 98). Note that the numbers relate to carbon dioxide emissions from fossil fuel combustion, which accounts for over 90% of all carbon dioxide emissions.
256 NEAA (2011:14).
257 (ibid.:12).
258 Lewis (2007:1).
259 China, an active participant in the CDM, is by far the largest source of CDM credits, accounting for over 40% of those generated to date.

For years, China, together with India, followed a rather inflexible policy at the climate negotiations, rejecting each attempt to commit it to setting (binding) GHG emission reduction goals, emphasising the historical liability of the industrialised nations and its own development needs.[260] While this line was reiterated once more at the G8 Summit in Germany in 2007, where President Hu Jintao argued that climate-related policy was essentially development policy, after the COP13 in Bali in 2007 there were indications that China was willing to take on a more proactive role in climate negotiations.[261]

In November 2009, China stated its intention to reduce the intensity of carbon dioxide emissions per unit of GDP by 40–45% by 2020, compared with 2005 levels.[262] According to China, this is a "domestic voluntary action" which will be included as a compulsory indicator in its medium- and long-term planning for economic development.[263] In January 2010, China followed up on its statement and voluntarily pledged to reduce its GHG emissions intensity by up to 45% by 2020, a target which was reiterated at COP16 in Mexico in December 2010.

In Mexico 2010, China – at least officially – continued to put forward its view that any legally binding climate change mitigation objectives were unacceptable unless the US accepted them as well.[264] However, at COP17 in Durban in 2011, for the first time, China stated its willingness to participate in a legally binding international climate treaty, depending on the outcome of negotiations.[265] Accordingly, China would be willing to take on legally binding commitments matched with its economic development and in line with the CBDR principle under the UNFCCC,[266] but the country set out five specific preconditions:[267]

- Parties must extend Kyoto through a second commitment period;
- Developed countries must meet their funding obligations under the Green Climate Fund;
- The consensus reached in Durban on funding, technology, REDD+, adaptation, and MRV measures must be institutionalised;

260 Gupta (2007:167).
261 Oberheitmann & Sternfeld (2009:141).
262 Xinhuanet (2009).
263 (ibid.).
264 Gupta (2007:177).
265 Hsu (2011:2).
266 Xinhuanet (2011).
267 Hsu (2011:2).

- The obligation to review the adequacy of long-term goals scheduled to take place between 2013 and 2015 must be completed, and
- A framework for a post-2020 agreement must be defined that upholds the CBDR, respective capacities, and environmental integrity.

II. Policy Instruments

With growing political attention focused on the impacts of global warming, China's first National Report on Climate Change was issued in late 2006. In June 2007, China adopted a National Climate Change Programme, outlining a list of key measures until 2010.[268] With this step, China became the first developing country to have an overarching climate strategy.[269] In 2008, the State Council also issued a White Paper on Climate Change.

China's climate-related policy focuses on two main aspects:

- Lowering the energy intensity,[270] while acknowledging that coal will be the primary energy source for many more years, and
- Improving the use of green forms of energy, including nuclear energy and renewables, but also carbon capture and storage.[271]

China's 11th Five-Year Plan, covering 2006–2011, and the Medium- and Long-term Development Plan for Renewable Energy in China (DPRE) of 2007 introduced binding goals for energy intensity and the use of renewables, and describe various means to achieve these objectives.

In March 2011, the Twelfth Five-Year Plan, covering 2012–2016 (FYP12), was revealed. This formulates new targets for 2015, and outlines key measures to achieve them:

- FYP12 sets two national reduction targets: one target for reducing overall energy intensity by 16% below 2010 levels by 2015, and the other specifically for lessening carbon dioxide intensity per unit of GDP by 17%, compared with 2010, by 2015.[272] These goals are deemed in line with

268 CCES (2007c).
269 CELP (2012:1).
270 *Energy intensity* is generally defined as the amount of energy used in producing a given level of output or activity. It is measured by the quantity of energy required to perform a particular activity (service), expressed as energy per unit of output or activity measure of service. See USDA (2012).
271 Oberheitmann et al. (2008:143).
272 Seligsohn & Hsu (2011a:1).

the voluntary pledges China submitted in Denmark in 2009, and reaffirmed in Mexico in 2010.[273] In order to meet these goals, the intention is to broaden the 'Top 1,000 Enterprises' scheme to include 10,000 large energy-intensive enterprises, thus covering the entire national industrial complex.[274] Even more importantly, China announced it would undertake measures to gradually introduce provincial and regional voluntary carbon-trading schemes until 2015, by drawing on the experiences of international carbon-trading markets.[275]

- As to renewables, the FYP12 provides for increasing the share of non-fossil energy to 11.4% of overall primary energy consumption by 2015 through optimising the energy mix and the development of clean energy.[276] Measures to achieve this goal involve the installation of an additional 70 GW of wind power and an additional 30 GW of solar power by 2015. As regards nuclear power, the object is to install an additional 40 GW by 2015, which would mean China could have the world's largest installed capacity of nuclear energy by 2020.[277] However, the Fukushima nuclear disaster in Japan in March 2011 may somewhat limit China's appetite for nuclear expansion.[278] Other measures include the development and accelerated use of clean coal technology and unconventional gas-oil resources such as coal-bed gas and shale gas.

In order to implement the targets set out in FYP12, in July 2011 the Chinese Government issued a work plan under which the two national reduction targets were broken down by assigning obligatory overall energy and specific carbon dioxide reduction targets to the 28 Chinese provinces, with reductions ranging from 10% to 18%.[279] It is important to note that the work plan underscores China's intention to launch carbon-trading pilot projects, although only on a voluntary basis.[280] In July 2011, the Chinese Government announced that it would launch pilot project trading schemes in six provinces by 2013.

273 Wyns (2012:1).
274 Seligsohn (2011).
275 Xinhuanet (2011:VIII).
276 Seligsohn & Hsu (2011a:3).
277 (ibid.).
278 Seligsohn & Hsu (2011b:2).
279 Finamore (2011:1–2).
280 (ibid.:3).

Besides piloting carbon-trading schemes, the Chinese Government is also reportedly considering implementing a nationwide carbon tax, according to Chinese media in January 2012.[281] While plans have yet to be finalised, the proposed tax could become operational before 2015 and could start with a rather low amount of US$1.50 per t of carbon dioxide emitted by large industrial installations, with the tax amount to be increased quickly thereafter.[282] Discussions about introducing a carbon tax have been around since the release of the FYP12 while a national natural resource tax was introduced on crude oil and gas late in 2011. In addition to these regulatory instruments, China also uses public finance incentives, tax breaks and financial support schemes to reach its mitigation objectives.

F. Least-developed Countries

Although global warming potentially threatens all countries, observers and experts concur that developing states, in particular the LDCs and the SIDSs, will be most affected.[283] Poor nations are more affected than the rich ones because of their greater vulnerability to climate shocks, and their lower adaptive capacities.[284] The biggest vulnerability is that rising temperatures affect developing countries' most important sources of national income – farming and tourism.[285] The World Bank forecasts that a 2°C warming above pre-industrial temperatures, which is the minimum to expect, could result in a permanent loss in GDP of 4–5% in Africa and South Asia, as opposed to minimal losses in high-income countries, and a 1% loss in world average GDP.[286] World farming production could fall by 16% by 2080, but by as much as 21% in developing countries.[287] Increasing temperature will have severe effects on health, particularly in developing countries, where people will be exposed to life-threatening illnesses such as malaria even more than they are at present.[288] Lastly, whereas for other regions the impacts of global

281 Gera (2012:1).
282 (ibid.).
283 Collier et al. (2009:127).
284 World Bank (2009:40).
285 *Economist* (2009:1).
286 World Bank (2009:5).
287 *Economist* (2009:2).
288 World Bank (2009b:42).

warming will only unfold in the future, in developing countries, especially those in Africa, many of the negative effects are already visible.[289]

Compounding this vulnerability to global warming is the fact that developing countries lack the institutional capacity, financial resources and technical expertise necessary to address the ever-increasing impacts of climate change. Recognising this, based on the CBDR principle, the UNFCCC obliges industrialised nations to support the developing world with finance and access to innovative technology in order to increase such vulnerable countries' adaptive capacities. It is important to keep in mind that developing countries' higher vulnerability to global warming is ironically accompanied by a much lower responsibility for GHG emissions.[290] The present carbon footprint of developing nations is extremely low.[291] The carbon dioxide per capita of a low- or middle-income country is 1.3 t to 4.5 t of carbon dioxide, respectively, compared with 15.3 t for high-income countries. [292]

I. Adaptation

Whereas the key concern for industrialised states is mitigating their GHG emissions, for developing nations, due to their higher vulnerability, the overriding concern is adaptation to the inevitable impacts of global warming. The UNFCCC urges all states parties to formulate and implement national adaptation measures as well as to cooperate internationally on adaptation issues. Article 4.9 of the UNFCCC recognises the specific needs of LDCs, in that they do not have the necessary capacities to deal with adaptation to global warming.

In 2001, at COP7 in Morocco, in order to implement Article 4.9, states parties established a working plan for LDCs in particular, including what were termed *National Adaptation Programmes of Action* (NAPAs), with the objective of communicating LDCs' urgent and immediate adaptation needs.[293] The main content of NAPAs constitutes a list of ranked adaptation measures aimed at facilitating the development of projects to implement the

289 For an overview of regional impacts of climate change, see World Bank (2009).
290 Collier et al. (2009:125).
291 World Bank (2009b:39).
292 (ibid.:44).
293 UNFCCC (2012k).

NAPAs.[294] Once a NAPA has been submitted to the UNFCCC Secretariat, the country concerned becomes eligible to apply for financial support for NAPA projects under the LDC Fund.[295] By January 2012, the UNFCCC Secretariat had received 47 NAPAs.

At COP12 in Nairobi, Kenya, in 2005, the UNFCCC Secretariat launched the Nairobi Work Programme on Impacts, Vulnerability and Adaptation. The Nairobi Work Programme is an international framework that initially operated from 2005 to 2010. It was extended in Mexico at COP16 in 2010 to assist developing countries in particular to better understand adaptation and to make informed decisions on practical adaptation options.[296] In Bali 2007, the Bali Action Plan identified adaptation as one of the cornerstones of the sustained implementation of the UNFCCC.[297] Since Bali, the Working Group on Long-Term Cooperative Action has mainly dealt with adaptation issues.

Also in Mexico in 2010, states parties established the Cancun Adaptation Framework (CAF). Its objective was to intensify cooperation on adaptation issues under the UNFCCC while confirming that adaption is obliged to enjoy the same priority as mitigation.[298] The CAF is meant to enable LDCs to formulate and implement national adaptation plans in order to identify their intermediate and long-term adaption needs, and to develop strategies to tackle those needs, building on their experience with the NAPAs.[299] However, as opposed to NAPAs, national adaptation plans can also be submitted by developing countries other than LDCs. As part of the CAF, the COP established a programme to investigate mechanisms and systems such as climate risk insurance to address potential damage caused by global warming.[300] In order to further the implementation of the CAF, at COP18 in Durban 2011, states parties agreed on the procedure, the work modalities, and the institutional structure of a new Adaptation Committee, as well as on guidelines for the aforementioned national adaptation plans.

294 (ibid.).
295 UNFCCC (2012l).
296 UNFCCC (2012m:1).
297 UNFCCC (2012l).
298 UNFCCC (2012n).
299 UNFCCC (2012o).
300 UNFCCC (2012n).

II. Funding

Funding is vital in order for most developing countries, in particular for LDCs and SIDSs, to implement adaptation and mitigation initiatives.

1. Adaptation Funding

Estimates for funding for adaptation initiatives vary considerably. In 2010, the World Bank projected that it would cost US$70–100 billion each year (at 2005 prices) to adapt to global warming.[301] The UNFCCC predicted that adaptation would require supplementary investments of US$60–182 billion a year. Of these funds, developing countries would need US$28–67 billion annually.[302] There has been a significant increase in adaptation funding, from US$587 million (8% of total climate funding) in 2010, to US$957 million (21% of total funding) by 2011.[303]

There are presently five multilateral funds that support adaptation in developing countries, including the following three:

- The Global Environmental Facility, the independently run funding institution established in 1991, with the World Bank serving as its Trustee, operates two climate funds, both established in 2001:
  - The Least-developed Countries Fund is tasked with funding the preparation and implementation of NAPAs. As of December 2011, this Fund had approved some US$217 million for short-term NAPA projects and mobilised millions more in co-financing arrangements. A total of 52 projects had been funded as at that date.[304]
  - The Special Climate Change Fund was established to fund long-term adaptation measures and access to innovative technology. This Fund has approved some US$150 million for 39 projects, of which US$80 million has been disbursed.[305] The Fund has also leveraged about US

301 World Bank (2009).
302 UNFCCC (2007:38).
303 Nakhooda et al. (2011a:2).
304 GEF (2012a).
305 Nakhooda et al. (2011a:3).

$1 billion in co-financing deals.[306] The demand for support from this Fund is high and exceeds current resources.[307]

- The Adaptation Fund under the Kyoto Protocol began operating in 2008 and is managed by the Adaptation Fund Board, with the Global Environmental Facility as its Secretariat and the World Bank as its Trustee. The Fund was established to support adaptation projects in developing countries and is fed by a 2% levy on sales under the CDM and through contributions by governments, businesses and individuals.[308] Since 2010, the Fund has approved financial support packages of over US$100 million for 17 adaptation projects,[309] of which US$22 million has been disbursed.[310] Projections indicated that demand for funding would be US $341 million in 2012, while the Fund only had US$146 million available at the time of writing.[311]

Apart from multilateral funding vehicles, climate funding in general – including those for adaptation – are increasingly received through bilateral instruments or national trust funds.[312]

2. Mitigation Funding

Estimates of the costs of climate change mitigation initiatives vary considerably. The UNFCCC projected in 2007 that US$176 billion would be required by 2030 to fund mitigation activities. Between 2004 and 2011, US $2.97 billion was approved for mitigation initiatives, of which US$1.17 billion has been disbursed.[313] Today, mitigation represents about 66% of total climate funding, much of which has been directed at India and China, where emissions are growing rapidly.[314]

The CDM, which was established under the Kyoto Protocol and has been operational since 2008, provides an incentive-based mechanism linking mit-

306 GEF (2012a).
307 (ibid.).
308 AF (2012a).
309 AF (2012b).
310 Nakhooda et al. (2011a:3).
311 (ibid.).
312 For more information, see Nakhooda et al. (2011b).
313 Nakhooda et al. (2011c:2).
314 (ibid.).

igation to financing for sustainable development.[315] The CDM has already registered more than 3,497 projects in 72 countries and has issued CERs of almost 750 Mt. Transactions involving CERs were valued at approximately US$20 billion in 2010.[316] However, a major difficulty of this instrument today is that the price of one CER has fallen below €1 due to a vast oversupply on the carbon market. Unfortunately, CDM ventures are mainly located in a few of the larger developing countries of the BASIC group, especially in China (46%), India (21%) and Brazil (6%), while LDCs have generally been bypassed: Africa, for example, represents less than 2% of CDM projects.[317] The scope of CDM, which is currently very restrictive, has to be broadened not only to include the power-generating industry (hydropower), but also to exclude deforestation, thus opening up new opportunities – especially for Africa.[318]

A number of additional multilateral funds to support mitigation efforts in developing countries have emerged since 2008, including the Clean Technology Fund and the Scaling Up Renewable Energy Program, both of which operate under the World Bank's Climate Investment Funds.[319]

3. Funding Gap

However, on the whole, the funding that is presently offered under the UNFCCC and the Kyoto Protocol is minimal compared with the scale of the adaptation and mitigation costs identified. In 2007, the UNFCCC estimated that the annual funds needed in 2030 are likely to be around US$28–67 billion for adaptation, and US$176 billion for mitigation. At present, there is a vast funding gap that needs to be closed. For instance, funding for adaptation and mitigation efforts in developing nations – as per the commitments made by wealthier nations – amounts to less than 5% of what may be needed annually by 2030.

In light of this funding gap, at COP15 in Copenhagen in 2009, industrialised countries pledged to grant new and additional resources of US$30 billion, to be operational almost immediately, from 2010 to 2012, and to

315 UNFCCC (2012o).
316 CDM Executive Board (2011:4–5).
317 Nakhooda et al. (2011d:1).
318 Collier et al. (2009:138).
319 Nakhooda et al. (2011c:2).

mobilise long-term funding together with developing countries of US$100 billion a year by 2020. The informal pledge was incorporated into the final decisions of COP16 in Mexico in 2010, and the states parties reaffirmed that funding for climate change adaptation would be prioritised for the most vulnerable developing countries, namely LDCs, SIDSs and Africa. While COP17 in Durban in 2011 saw the launch of the Green Climate Fund, the question of medium- and long-term funding remains unresolved and needs urgent attention. As outlined before, states parties in Qatar at COP18 in 2012 were unable to make any headway whatsoever, especially with a view to committing to the mid-term funding between 2013 and 2020.

G. Concluding Remarks

Regardless of having created a new window of opportunity, the success of the Doha Gateway is far from certain, given the existing differences between the major GHG emitters – the BASIC group, the EU, and the US. Hence, some observers argue that the issue is not the format of the international negotiations process – the top-down Kyoto approach or the bottom-up Copenhagen model – but the lack of national political will in some countries to tackle global warming and climate change.[320] Canada, Russia and the US are bringing nothing constructive to the table at the moment, and the only intention of Saudi Arabia and other oil-exporting countries is to block any further progress on mitigation measures that impact on their sales.[321]

In addition, what unfortunately has become clear over time is that the voluntary climate change mitigation targets and NAMAs pledged by states parties and integrated into the Cancun Agreements are not enough to limit the temperature increase to 1.5°C or 2°C over the course of the 21st Century and urgently need to be intensified. According to most climate scientists, global GHG emissions need to peak by 2015 at the very latest in order for there to be a meaningful chance of limiting the global temperature rise to 2°C. Instead, GHG emissions actually rose by 6% in 2010.[322]

320 Sterk et al. (2011b:35).
321 (ibid.).
322 Bodanksy (2012:1).

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