Global Climate Change and Leadership

The Role of Major Players in Finding Solutions to a Common Problem

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Introduction

Who leads the world in the search for a solution to global climate change? Why was there only a weak agreement after the two-week long Copenhagen Conference? This paper attempts to answer these questions by applying a game theory approach. It sets out to prove that, given the way climate change negotiations are conducted, finding commonly agreeable solutions to the global warming problem through negotiations at a global level in an increasingly multipolar world is almost impossible. After outlining the theoretical framework, I will consider the most important parties to the climate change negotiations and analyze their goals and strategies.

A theoretical framework

Why is real progress absent in the post-Kyoto negotiations, despite the widely recognized need to act swiftly to prevent dangerous levels of global warming?[1] Or, more simply stated, why are powerful countries like the US or China evidently unwilling to lead the negotiations by example? To answer this question, let us first look briefly from the neorealist[2] and institutionalist[3] perspective that states are unitary and rational actors. If states were indeed unitary and rational actors, how would they most likely behave in the climate change negotiations? Given that the climate system and greenhouse gas emission are global public goods[4] or, more narrowly defined, common-pool resources[5], the costs of polluting are not born by the emitter alone, while the benefits of a country's abatement efforts are commonly shared. In other words, countries will not do enough to limit their emissions individually as the individual costs outweigh the benefits. Thus, there is no incentive for any rational

individual, firm, or state to reduce emissions. Stern therefore calls greenhouse gas emissions externalities indicating a market failure.[6] In such settings, externalities combined with rational unitary actors, the expected outcome is agent free-riding, insufficient action to combat the adverse effects of the externality, and the eventual need for a central authority to control the externality.

If this rational choice approach were applied to climate change, we would indeed expect relatively little action taken by individual states. No state alone can secure the global action needed to prevent the planet from warming, hence every state would be expected to be reluctant to reduce its own emissions.[7] However, this does not mean that there would be no action at all; instead of climate change mitigation, the more likely course taken by countries would be unilateral self-protection, e.g. adequate measures to adapt to future impacts triggered by global warming.

An overuse of common-pool resources, known as the tragedy of the commons[8], can be formalized using a game theory approach[9], [10]. The matrix for this game, a classical prisoner's dilemma, might look as follows:

		Party B	
		Cooperate	Defect
Party A	Cooperate	1,1	-3,3
	Defect	3,-3	-2,-2

The best outcome for both parties would be to cooperate. However, no matter whether the other party defects or not, each county has a dominant strategy to free ride on the other's

effort and thus not implement strong mitigation efforts itself. Nalebuff and Dixit state this problem this way: "The *jointly* preferred outcome arises only when each [party] chooses its *individually* worse strategy." [11] Therefore, the most likely outcome is the lower right box of the above diagram. From a common perspective, this outcome is the least favorable one. Of course this game is oversimplified, in reality there are more than two players. Furthermore, actions to prevent climate change should be seen as a cooperative game, while the prisoner's dilemma is a non-cooperative game. Regarding these aspects, Brennan notes:

> It seems that in analogous n-prisoner's dilemma experiments, some proportion of experimental subjects will act 'co-operatively' even in tolerably large number settings – and this is especially so if there is prior discussion and a capacity to punish at some cost to the punisher. Even so, in almost all such experiments, the proportion of 'co-operators' is less than half the population of players; and the proportion tends to decline over repetitions of play.[12]

For climate change this implies that although cooperation is possible and a large number of players are involved, the dominant strategy of defecting is still expected to prevail. This is in line with game theory's prediction that existing dominant strategies will be played even in co-operative game settings, as well as with the introductory claim that finding solutions to prevent global warming through global negotiation rounds is extremely difficult.

Barrett notes that there are three possibilities to overcome the free-rider problem[13]: a) leadership of one or more parties in the hope that others follow suit, b) making a country's climate policy contingent on those of others, and c) a legally binding international agreement. The first two options have failed to tackle global warming[14], hence the reliance on international negotiation rounds that aim to establish widely accepted, legally binding international treaties.

It should be noted at this point, however, that the incentives to agree to legally binding agreements are closely correlated with the abatement payoff matrix shown above. To clarify this point I will employ the concept of *Best Alternative to a Negotiated Agreement* (BATNA), which Hopmann defines as the "value of no agreement."[15] Only if the value of an international climate treaty is higher than the value of the BATNA are parties expected to accept the deal. Hence the value of the BATNA is also known as the resistance point, as any negotiated outcome yielding a lower payoff than no agreement will be resisted by a party. One of the major problems with the climate change negotiations is that, as shown above, defecting generally yields higher payoffs than cooperation. In other words, the BATNA value is very hard to overcome through negotiations. Hence the free-riding problem is directly passed from the underlying commons problem to the climate change negotiations; the dominant strategy not to implement meaningful emissions reduction policies to solve a global public good problem translates to uncooperative behavior in the consequent negotiations aimed at breaking the deadlock.

Common but differentiated responsibility

This theoretical outline leaves little hope that any meaningful agreement can ever be reached to tackle global warming. However, as the Kyoto Protocol demonstrated, there are certain circumstances under which an understanding is possible and an agreement can be reached. What then that has changed since Kyoto?

The Rio Declaration on Environment and Development of 1992 states that "in view of the different contributions to global environmental degradation, states have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit to sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they

command."[16] This "common but differentiated responsibilities" principle is also stated several times in the UNFCCC founding document and is dogmatically repeated in climate change negotiations. This principle is also one of the major reasons why parties were able to reach agreement in Kyoto. In 1997 the developed countries accepted their historic role as CO2 emitters, as well as the notion that developing countries could not be held liable for global warming, nor would they be willing or able to pay. As no action was required from developing countries to comply with the Kyoto Protocol, they had no incentive to reject the treaty; their resistance points could be overcome. Of course the story is not that simple. At the time when Kyoto was signed, much less was known about global warming, and as it was only a first step, individual country targets for the developed world were not particularly ambitious. Additionally, the Clean Development Mechanism (CDM) was introduced, offering developing countries the prospect of attracting foreign investment and developed countries the opportunity to buy cheap offset credits abroad.[17] Common but differentiated responsibilities had helped to lower the BATNA value for both developed and developing countries in 1997 and made a positive negotiation outcome possible.

Still, the 1997 Kyoto agreement did not eradicate the commons problem. The United States infamously refused to sign up, and others such as Canada, Japan, or New Zealand, are failing to reach their targets.[18] Even within the European block there are a host of countries not meeting their obligations (most notably Spain and Italy), and the EU (the old 15) as a whole will only be able to reach its goals as a group, because some countries are over-compliant (e.g. Germany and the UK), a distinct advantage.[19] Consequently the Kyoto Protocol is seen by many, including some developing countries, as a failure. In the negotiations the EU repeatedly fended off accusations that the bloc would be unable to reach its targets. In the process, one other vital ingredient for successful post-Kyoto negotiations (and to overcome a prisoner's dilemma) was lost: trust between the North and the South.[20] The lack of confidence

in other parties, particularly the doubt of many developing nation that Annex 1 countries were willing to live up to their historic responsibilities, could be felt throughout the two weeks in Copenhagen, as well as in the previous talks in Barcelona, Bangkok, and Bonn.

The world has changed dramatically since 1992. Developing countries, now major, relevant players on the international level, are confidently expressing their national self-interest. Developed countries, on the other hand, see the time fit to shift some of the burden of emissions reduction to richer developing countries, whereas in Rio and Kyoto they were still prepared to shoulder the weight alone. The Kyoto negotiations were able to overcome the prisoner's dilemma due to a clear division between developed and developing countries. As some of these countries such as China, India, and Brazil have grown to challenge the West economically and politically, the prisoner's dilemma and thus the dominant strategy to defect is again setting the rules of the game; this makes finding a negotiated agreement extremely challenging.

Having laid out a general framework for analyzing the Copenhagen negotiations, the remainder of this paper will examine the negotiation positions and strategies of a selection of the key players (China, the USA, and the EU), as well as the most important country groups (in particular the G77 and China group).

China: Unwilling to lead?

China is undoubtedly one of the most important players in the climate change talks. Already the biggest emitter of greenhouse gases, the country's emissions continue to grow at an astonishing rate. Recent research shows emissions growth was even faster than previously predicted.[21] Yet under the UNFCCC, China is one of the many countries that are not obliged to take any measures against global warming (apart from implementing the means to measure

the country's greenhouse gas inventory). China is thus in the ideal position for demanding strong commitments, as well as leadership from developed countries without being forced to promise anything legally binding itself. As long as this so called "firewall"[22] between Annex 1 and the developing world, of which China and most other developing countries are fiercely protective, remains China can occupy a convenient position which I would term *permitted defection*. Looking again at the payoff matrix above, this means that the world's biggest emitter of CO2 would gain from free-riding on the effort of other countries and would benefit from access to an important and globally-watched forum where it could criticize the developed world and place its demands. Thus, it is no surprise that one of the US' top priorities in Copenhagen was to break the firewall and to force China to accept commitments.

To defend their comfortable position, the Chinese negotiators repeatedly stressed the notion of common but differentiated responsibilities; China reminded the West again and again that Western countries had released most of the current CO2 content above preindustrial levels, while China was still comparably poor, much less responsible for current CO2 levels, and thus had a right to continue to pollute to ensure growth and prosperity. Unsurprisingly, China placed higher priorities on growth and development that on preventing future environmentally damages.[23] The country chose the dominant strategy to defect, although no one in the Chinese delegation or government would ever refer to it as such. A commitment to an uncooperative strategy by a major player, although explicable through theory, is a strong impediment to finding negotiated solutions and confirms the thesis that the growing influence of developing countries complicates international negotiations.

Still, China could not fail to recognize that as a future superpower it had to offer something to overcome the apparent deadlock of the negotiations and show some leadership. What China offered was to reduce its greenhouse gas intensity by 40 to 45 percent by 2020, compared to

2005 levels.[24] Greenhouse gas or carbon intensity is the ratio of a country's emissions to its economic output, i.e. the amount of emissions necessary to produce one (international) dollar of GDP. Generally there is a tendency for more developed countries to have lower carbon intensities.[25] Hence China's proposal reflects an almost natural development. Nevertheless, cutting intensities by as much as 45 percent in ten years or less is indeed a demanding task. Still, the proposal was criticized, mainly by the US, because China refused to make this target legally binding.[26] The reason, as given by the country's representatives in Copenhagen, was that if China promised something others could count on the country, the leadership and its people to keep their word.[27] This may sound like an odd argument, given that even a legally binding treaty like Kyoto failed to force (some) countries into compliance, but it allowed China to stick to its position that developed countries had an obligation to cut emissions while China and the developing world continue to emit ever higher amounts of CO2. Additionally, China was able to exhibit at least partially, the leadership expected from this rising superpower. Indeed, the Chinese do lead in certain areas, exemplified by the fact that the country is quickly moving into green technologies and is becoming one of the world's leaders in this domain. Chinese politicians, negotiators and business leaders have recognized the important roles that wind, solar, and geothermal power, and other technologies are likely to play in the country's economy in the foreseeable future, and they are moving fast to become a leader in these technologies.[28] However, as the economy and national pride and self-confidence are growing, China refuses to accept measures it understands as either politically intrusive (no outside power should be allowed to scrutinize China too closely) or economically limiting (growth as the most important goal). China would like to be seen as a leader, but when it is to the country's disadvantage, Chinese heads of state are still unwilling to show real leadership. In this way China could be called an opportunistic leader, a coming superpower not yet willing to take responsibility for the future of the world. China is therefore stuck in an uncooperative position in regard to reaching a new and comprehensive treaty to

tackle global warming, although it certainly shows leadership in certain areas such as technology. The notion of common but differentiated responsibility enables China, even as the biggest emitter of greenhouse gases, to argue for an environmentally effective post-Kyoto treaty without being coerced into committing to legally binding targets. To use game theory terms, China plays cooperatively in areas where it hopes to gain advantages and defects when this strategy is in the national self-interest. China is an unwilling and thus uncooperative leader, yet it demands more mitigation action from its Western partners. These partners cannot easily accept such a position; hence China's quick rise to become a superpower (and the accompanying propensity of all sides to return to defecting strategies) is one of the major reasons why international negotiations have become more complicated.

The US: Leadership and trust

With China unwilling to lead, what role did the US play in the climate change negotiations? It should be remembered that the US never ratified the Kyoto Protocol, although President Clinton signed the document in 1997. Even before the protocol was officially adapted in Kyoto, the US Senate had unanimously passed the Byrd-Hagel Resolution, which states that it is "critical for the Parties to the Convention […] to include limitations on Developing Country Parties' greenhouse gas emissions" and that the "Senate strongly believes that the proposals under negotiation, because of the disparity of treatment between Annex I Parties and Developing Countries and the level of required emission reductions, could result in serious harm to the United States economy."[29] On account of this resolution, President Clinton never submitted the Kyoto Protocol to the Senate, which must ratify all international treaties signed by the President.[30]

Therein lies the major problem with the American position to this day: the US seeks to bring down the firewall dividing developed and developing nations though it is unable to make

meaningful promises during the negotiations itself, as the Senate's consent is highly uncertain. This latter point was made clear by US Senator and climate skeptic James Inhofe, Republican of Oklahoma, who travelled to Copenhagen with the sole purpose of publicly announcing that the Senate would not adopt any bill to reduce greenhouse gas emissions and the risks of global warming.[31] While his is only one voice out of 100, President Obama needs a majority of at least 60 Senators to overcome filibusters in the Senate, and as it is highly unlikely that all Democrats would vote in line with the President's view on environmental issues (even if they still had the super-majority). In this area it is extremely difficult for the US to lead by example, due to the structure of the US congressional system.

To account for the fact that the American President is unable to commit the country to legally binding targets and to guarantee ratification, he unwillingly (in the case of Obama) has to act uncooperatively during the negotiations, as any other behavior would immediately be rebuked at home. It is possible for a US President to be a strong and highly influential leader with a positive impact on global warming negotiations; however, this would mean making climate change one of the key issues of the presidency, which Obama does not seem willing to do. Domestic issues like health care and the state of the economy, as well as the two wars in Afghanistan and Iraq have dominated Obama's first year in office and have caused many rifts between parties and within the Democratic Party itself. Global warming, another issue with potential for conflict, therefore remains a relatively low priority on the President's agenda. The hope held by many other parties to the UNFCCC that a new American president would bring inspired leadership to the negotiation table seems to have been premature. Disappointment and frustration could be felt throughout the Bella Center, the venue of the Conference of the Parties (COP) in Copenhagen, directly after Obama had delivered his long-awaited speech to other world leaders.

Observers described President Obama as "clearly frustrated"[32] directly after his speech in Copenhagen, and there are reasons to believe he was. The Chinese Prime Minister Wen Jiabao is said to have avoided Obama, and there are stories the President had to track the Premier down in Convention Center and force him to engage in direct negotiations.[33] Of course it is also highly unusual for such high level meeting that heads of state and heads of government have to draft text themselves, a task usually left to the lower ranks of negotiators. However, civil servants are only at liberty to reach agreement within clearly defined parameters. Due to domestic pressures and its own priorities, the Obama administration was unable to make the US appear to be a cooperative partner. The administration was also unable to restore the lost trust in US leadership or overcome their growing domestic distrust in other parties, particularly China. This distrust of the outside world stems from the perceived threat of so called carbon leakages, i.e. the significant increase in emissions in developing countries without emission reduction targets as domestic firms shift production (and thus jobs) to these countries to remain competitive.[34] This is not a pleasant thought for an American president at any time, but it is particularly bad in a time of economic crisis and with a combative Republican Party.

Due to the reasons outlined above, the US and China were entrenched in their mutual positions, unable to break the deadlock and find a meaningful deal in Copenhagen. Although Obama was able to broker the Copenhagen Accord, he was widely seen to be the loser in the face-off with China, as it was his declared goal to find a solution to the climate crisis. His own unwillingness to make global warming a higher priority is key in explaining this failure and international actors' consequential loss of confidence in the new administration. Is it now correct to assume that the US is unable to lead the world on climate change issues? To some degree the answer must be yes, as the constitutional arrangement makes ratifying an international agreement a troublesome affair, particularly now that the public opinion (and to

some degree Congress) seems to have lost confidence in the science of global warming,[35] a trend that has not abated due to recent scandals like "Climategate"[36] and "Himalaya-Gate."[37] Consequently, the inability to lead in the climate change negotiations due to the structure and functioning of US democracy, and the distraction of other higher-priority issues at home and abroad led the Obama administration to play an uncooperative strategy, despite Obama's personal rhetoric to the contrary. Yet with the US and China playing uncooperative strategies, and both sides perceiving each other as a future competitor, the likelihood of finding negotiated solutions diminishes.

The EU and the G77: Made to look like fools?

The G77/China group appeared to behave in a relatively unified manner throughout the negotiations, standing together against what they saw as a plot by developed nations to "kill the Kyoto Protocol."[38] The negotiations up to and during Copenhagen had two tracks: to find a post-Kyoto agreement (without the Americans) and to define the long-term cooperative action to tackle climate change (joined by the US). The wish of the EU and other Annex 1 countries to merge the two priorities separated negotiations and was seen by most developing nations as an attempt to kill the only existing and binding agreement to tackle climate change. It was also viewed as an attack on the principle of common but differentiated responsibilities, and therefore an assault on their right to continued growth and development. Bolivia and Venezuela even started to call it the "air grab" by rich nations.

Yet in the final days of the negotiations, friction within the G77/China alliance became increasingly apparent. While China, along with its peers India, Brazil, and South Africa (sometimes called BASIC), directly brokered the Copenhagen Accord with President Obama[39], others were left out of direct consultations. For BASIC the looming dangers were legally binding targets for rich developing countries, something the Copenhagen Accord

managed to achieve without portraying them as being too destructive. For many other members of the group this accord was an outrage. The small island states (gathered together in their own group called AOSIS) demanded a much more ambitious agreement, with binding targets for many countries and particularly tough ones for Annex 1 countries. Left leaning governments from Bolivia, Cuba, and Venezuela, supported by others, denounced the deal as proof that the rich world's only goal was to destroy the South and kill its people.[40] Sudan's main negotiator, Lumumba Di-Aping, even compared the deal to the Holocaust.[41] Many other countries were unsure whether to accept or reject the Accord, as it offered them relatively little in terms of safety from a warming atmosphere, but included some carrots such as $100 billion for an adaptation fund, as well as a vague promise to implement a REDD+ scheme[42] over the coming years (with the potential of further financial transactions to developing nations). The new approach adopted in the Copenhagen Accord to deal with climate change is bottom-up, in contrast to the Kyoto-style top-down method, and it allows all developing countries to play their dominant strategy to defect while hoping that others implement meaningful emission targets. Combined with the incentives mentioned above, this eventually led most countries to sign the Accord. However, as some governments could not be convinced to accept the agreement,[43] the final trick used to accomplish something in Copenhagen was for the plenary to "take note" of the accord[44] instead of approving it unanimously as normal procedure dictates.

So far, all parties to the COP in Copenhagen discussed in this paper were basically playing a more or less non-cooperative strategy, apart from some of the very small island states such as Tuvalu and the Maldives. The big exception to the rule is the European Union, which tried to lead by example together with some of its close allies including Switzerland, Norway, and Japan. Yet the EU's strategy, promising to cut emissions by 20 percent of 1990 levels by 2020 and to beef up this promise to 30 percent if others adopted similarly ambitious targets, seems

not to have succeeded. The question is why? Perhaps the EU's targets were not ambitious enough to lure others to follow suit. This is indicated by the developing countries delegations' ferocious criticism of Europe's lack of leadership and concern for the future of the poor. This criticism also reveals that what divided the rich and the poor, the big and the small emitters, the powerful and the powerless, was and still is, a lack of trust in each other. This was strikingly apparent when a document prepared by the Danish hosts was leaked to members of the media, NGOs, and party delegates. There was an enormous outcry against this document, which allegedly only catered to Western wishes and disregarded the views, proposals, and vital interests of developing nations.[45] In any case, the feeble attempt of the EU to show leadership backfired and EU members only played a marginal role in the talks that led to the Copenhagen Accord.[46] It is not an overstatement to say that Europe is presently incapable of leading the world on environmental issues. Whether this weakness could be mitigated via a stronger display of unity, increased direct dialogue with other parties to overcome the lack of trust, or even a tougher and more self-confident appearance to gain respect, is another matter to examine. Here it suffices to say that the EU lacks the ability to lead the effort to prevent global warming.

Conclusion

In search of a global agreement to prevent the earth's atmosphere from warming every country has an incentive to free-ride on others' efforts, while failing to implement stringent emission targets domestically. This incentive, in combination with the rules that were established throughout almost 20 years of climate change negotiations, make it easy for developing countries like China, Brazil, and India to reject any legally binding measures. Since the world has changed dramatically since 1992, when the UNFCCC was adopted, this position is unacceptable to some developed countries, most prominently the United States. Presently, no party seems capable of leading the world out of this deadlock; China and the US

are unwilling, while Europe appears to be too weak. The increasing multipolarity of the world gives big developing countries more influence in the negotiations, yet they lack incentive to play a more cooperative strategy. As their influence and power increase, developed countries are growing reluctant to play cooperative strategies themselves. These reasons explain why international negotiations under present conditions are prone to fail.

Additionally, the principle of common but differentiated responsibility, which helped in drafting the Kyoto Protocol, is now one of the major obstacles to a new treaty. The combination of these factors has resulted in an almost poisonous atmosphere of distrust, amplified by the failure of Copenhagen. This is exemplified by the leaked paper commissioned by the Chinese environmental ministry that discusses the rich nation's "climate conspiracy" to divide developing nations.[47] Many Western countries, on the other hand, try to pass the blame onto China.[48] [49] Unless the present circumstances change dramatically, i.e. unless the mutual finger pointing stops[50] and reason and some willingness to make concessions returns to the negotiation table, no major breakthrough should be expected when parties meet again next December in Mexico.

One possible solution for the problem could be smaller scale negotiations between the major polluters. As the new Copenhagen regime is bottom-up, the major players have the ability to negotiate their respective emissions targets with each other . Hence, the US and China could sit down in old fashioned one-on-one negotiations, go over the different issues in question, and negotiate in a classical tit-for-tat manner. It is also possible that this could be done on a larger scale, bringing together the world's biggest emitters. Such an approach would be criticized by smaller developing countries, as well as most NGOs, yet the prospect for successful negotiations might improve dramatically. The odds could increase further if the organizers were able to avoid the creation of an hysterical atmosphere, as was the case in

Copenhagen, a task that is far easier in fenced-off meetings, e.g. at the G20 level, than at UNFCCC meeting with 20,000 participants. The question then becomes, who would speak for the poor?

[1] For a general critique of the Copenhagen Accord see Rajamani, Lavanya (2010): Neither Fish nor Fowl. Seminar Article. Available at http://www.cprindia.org/morepapers.php?s=158. For a more positive assessment of the Copenhagen Conference see Bodanski, Daniel (2010): The Copenhagen Conference: A Post-Mortem. Working Papers Series. Available at http://ssrn.com/abstract=1553167.
[2] Kenneth Waltz, *Theory of International Politics*, (New York: Random House, 1979).
[3] Robert Keohane, "Theory of World Politics: Structural Realism and Beyond," in Robert Keohane, ed., *Neoliberism and its Critics* (New York: Columbia University Press, 1986).
[4] Nicolas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge: Cambridge University Press, 2007)..
[5] Elinor Ostrom, *Governing the commons. The evoluton of institutions for collective action* (Cambridge: Cambridge University Press, 1990).
[6] Nicolas Stern, "The Economics of Climate Change," *American Economic Review* 98, no. 2 (2008): p. 1-37.
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[8] Garrett Hardin, "The Tragedy of the Commons," *Science*, 162, no. 3859 (1968): p. 1243-1248.
[9] Ostrom.
[10] P. Terrence Hopmann, *The Negotiation Process and the Resolution of International Conflicts* (Columbia: University of South Carolina Press, 1996): p. 37-52.
[11] Avinash Dixit and Barry Nalebuff, *Thinking Strategically: The Competitive Edge in Business, Politics and Everyday Life*,(New York, London: W. W. Norton & Company, 1991), p.13.
[12] Brennan (2009), p. 311.
[13] Scott Barrett, "Negotiation Strategies for a Post-Kyoto Regime," Bologna Center Journal of International Affairs (Special Volume/Fall 2008): p. 9-20.
[14] Ibid, p. 12.
[15] Hopmann, p. 57.
[16] UNFCCC, Rio Declaration on Environment and Development (Rio de Janiero, Brazil, 1992)
[17] The CDM is one of three market mechanisms introduces in Kyoto, the others being emissions trading within developed countries and Joint Implementation projects in economies in transition to market economies. The main idea of the CDM is that projects to reduce CO2 emissions are implemented with funds stemming from the developed world, the certified emission reductions (CERs) can then be sold on the carbon market. With the thus generated funds people in developing countries can be compensated for eventual losses due to the projects. The major critique of the CDM is that Western developers mainly focus on the "long hanging fruits", i.e. they implement projects where emission reductions are cheapest. Economically, this makes sense, as to obtain efficiency emissions should be reduced where it is cheapest (indeed this is the basic idea behind CDM). Yet it also means that should developing countries ever take up emission reduction commitments themselves, the lowest cost opportunities will already be gone, exploited by developed countries. For a more detailed analysis of the CDM and other market mechanisms see Cameron Hepburn, "Carbon Trading: A Review of the Kyoto Mechanisms," *Annual Review of Environment and Resources*, no.32 (2007): p. 375-393.
[18] Barrett, p. 13.
[19] See also "Who's meeting their Kyoto targets?," David Suzuki Foundation, May 2006, <http://www.davidsuzuki.org/files/climate/kyoto_progress.pdf>.
[20] Dubash, Navroz, "Copenhagen: Climate of Distrust," *Economic & Political Weekly*, 44 no. 52 (2009): p. 8-11.
[21] "China's emissions growth 2-4 times greater than expected," Mongabay, 2008, <http://news.mongabay.com/2008/0311-china.html>.

[22] See for example: Jan van der Goltz, "High Stakes in a Complex Game: A Snapshot of the Climate Change Negotiation Positions of Major Developing Country Emitters," Center for Global Development Working Paper No. 177 (2009): p. 11.
[23] China, supported by Brazil and India, explicitly opposes any reclassification of developing countries with higher emissions, GDP, and abatement capacity into a separate country group (including a gradual transition process). See van Goltz (2009), p. 8-13
[24] This offer is also reflected in China's submission to the UNFCCC under the Copenhagen Accord. See http://unfccc.int/files/meetings/application/pdf/chinacphaccord_app2.pdf: p. 1.
[25] Timothy Herzog, Kevin Baumert, and Jonathan Pershing, "Target: Intensity. An Analysis of Greenhouse Gas Intensity Targets," World Resource Institute, November 2006: p. 3-7.
[26] See the Chinese submission (endnote 22). China stressed that "the above-mentioned autonomous domestic mitigation actions are voluntary in nature."
[27] The Guardian, Dec. 18, 2009 (http://www.guardian.co.uk/environment/2009/dec/18/china-wen-jiabao-copenhagen)
[28] The Wall Street Journal, Dec. 15, 2009. Available at http://online.wsj.com/article/SB126082776435591089.html
[29] Byrd-Hagel Resolution, 105th Congress, 1st Session. Available at http://www.nationalcenter.org/KyotoSenate.html
[30] See US Constitution Art. II, §2, cl. 2.
[31] New York Times, Jan. 29, 2010. Available at http://www.nytimes.com/cwire/2010/01/29/29climatewire-nations-take-first-steps-on-copenhagen-accor-35621.html
[32] The Associated Press, Dec. 18, 2009. Published by the Huffingtion Post at http://www.huffingtonpost.com/2009/12/18/obama-in-copenhagen-no-fi_n_396752.html
[33] New York Times, Dec. 18, 2009. Available at http://www.nytimes.com/2009/12/19/science/earth/19climate.html?pagewanted=1
[34] Mustafa Babiker, "Subglobal climate-change actions and carbon leakage: the implication of international capital flows," Energy Economics 23, no. 2 (2001): p. 121-139.
[35] Pew Research Center Publications (2009): Fewer Americans See Solid Evidence of Global Warming. Available at http://pewresearch.org/pubs/1386/cap-and-trade-global-warming-opinion
[36] The Guardian, Nov. 20, 2009. Available at http://www.guardian.co.uk/environment/2009/nov/20/climate-sceptics-hackers-leaked-emails
[37] The Guardian, Jan. 15, 2010. Available at http://www.guardian.co.uk/environment/2010/feb/15/ipcc-errors-facts-spin
[38] The Guardian, Dec. 14, 2009. Available at http://www.guardian.co.uk/environment/2009/dec/14/copenhagen-g77-africa-kyoto-suspended
[39] Reuters (AlertNet), Jan. 31, 2010. Available at http://www.alertnet.org/thenews/newsdesk/LDE60U072.htm
[40] Müller, Benito, "Copenhagen 2009: Failure or final wake-up call for our leaders?," Oxford Institute for Energy Studies, EV 49, February 2010, <http://www.oxfordenergy.org/pdfs/EV49.pdf>: p. 13-17.
[41] The Guardian, Dec. 19, 2009. Available at http://www.guardian.co.uk/environment/2009/dec/19/copenhagen-closes-weak-deal
[42] Reduced Emissions from Deforestation and Forest Degradation (REDD+) is a scheme to protect forest areas in developing countries. Similar to the CDM (see footnote 17), carbon credits can be earned by reducing deforestation and land degradation below an established baseline. These credits can then be sold to developed nations and firms in these countries in need of carbon offsets, although it has yet to be determined whether the generated certificates will be traded on carbon markets (could potentially destroy the market if too certificates are released) or an alternative means of funding will be established. See Wertz-Kanounnikoff, Sheila, and Arild Angelsen, "Global and national REDD+ architecture: Linking institutions and action," in Arild Angelsen, ed., *Realising REDD+: National strategy and policy options* (Bogor, Indonesia: Center for International Forestry Research, 2009).
[43] "The main opposition came from the ALBA bloc of Latin American countries to which Nicaragua and Venezuela belong, along with Cuba, Ecuador and Bolivia." See BBC, Dec. 19, 2009. Available at http://news.bbc.co.uk/2/hi/8422133.stm
[44] New York Times, Dec. 19, 2009. Available at http://www.nytimes.com/2009/12/20/science/earth/20climate.html
[45] For a more detailed description of the views expressed by developing countries regarding the "Danish Text" see Müller, p. 9-12.
[46] "I have remarked to some people that there is something about being a community organizer which gives you the confidence to walk into a room and sit down at a table and engage in a conversation. Except that his

[President Obama's] table consisted of four players. His table was President Lula from Brazil, and President Singh from India, and President Zuma from South Africa, and Wen Jiabao who is the Premier of China. That is the table he walked into. And he created an outcome with that community, having first gone through consultations with Gordon Brown from the UK and with Sarkozy from France and a set of our allies, Hatoyama from Japan, and created an outcome that did not exist until he came there!" Jonathan Pershing, Center for Strategic and International Studies, 13 January 2010, transcribed by Benito Müller from the webcast at http://csis.org/event/post-copenhagen-outlook and cited in Müller (2010), p. 13.

[47] The Guardian, Feb. 11, 2010. Available at http://www.guardian.co.uk/environment/2010/feb/11/chinese-thinktank-copenhagen-document?&CMP=EMCENVEML699

[48] The Guardian, Dec. 22, 2009. Available at http://www.guardian.co.uk/environment/2009/dec/22/copenhagen-climate-change-mark-lynas

[49] The Guardian, Dec. 20, 2009. Available at http://www.guardian.co.uk/environment/2009/dec/20/ed-miliband-china-copenhagen-summit

[50]For a more indebt description of this "blame game" see Müller (2010), p. 17-21