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**HEARING BEFORE THE SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING**

**February 4, 2009**

Thank you for the opportunity to contribute to the deliberations of this Select Committee. My name is Rob Bradley, and I am Director of the International Climate Policy Initiative at the World Resources Institute. The World Resources Institute is a non-profit, non-partisan environmental think tank that goes beyond research to provide practical solutions to the world's most urgent environment and development challenges. We work in partnership with scientists, businesses, governments, and non-governmental organizations in more than seventy countries to provide information, tools and analysis to address problems like climate change, the degradation of ecosystems and their capacity to provide for human well-being.

I am very pleased to be here to speak to what I consider the most pressing environmental issues faced by the world – and to what I consider a major opportunity for the United States to assume a role of international leadership. In this testimony, I would like to make three points, each of which I will expand on below:

First, that the time is very ripe for the U.S. to reengage internationally on the issue of climate change and take up a leadership role. Further, that the engagement between the U.S. and major developing countries will be a critical factor for success.

Second, the world has changed dramatically from the days of the Kyoto Protocol. Major developing countries are ready to take significant action on limiting emissions and the Bali Action Plan provides a solid foundation for a new international climate agreement that meets key U.S. interests.

Third, I want to discuss key features of the new agreement for engaging developing countries. These include how different countries will take on actions and commitments, and funding for international adaptation, forests and technology. In conclusion, I also want to flag some ways in which these considerations might affect features of U.S. climate legislation.

## *1. There is no time to lose*

Let me begin by commenting on the urgency of the challenge. The science is compelling. Engaging major developing countries is critical to success. Finally, conditions are right for a major reengagement by the US.

### The science is compelling

The Earth is warming, primarily due to human activities. The cheap, plentiful fossil fuels that have enabled huge increases in human productivity and great improvements in human well being over the past 200 years together with significant deforestation have been the most important causes of global warming. The buildup of carbon dioxide and other greenhouse gases (GHGs) is accelerating, and unless we act very soon to control emissions during our children's lifetimes warming will rise to very dangerous levels.

In February 2007, the Intergovernmental Panel on Climate Change (IPCC - the official science process sanctioned by the world's governments and participated in by the United States) released its report on climate change science. The report states that it is "unequivocal" that Earth's climate is warming, and confirms that the current atmospheric concentration of carbon dioxide and methane, two important greenhouse gases (GHGs), "exceeds by far the natural range over the last 650,000 years." Further, the IPCC concludes that it is now "very likely" (greater than 90% probability) that greenhouse gas emissions from human activities have caused "most of the observed increase in globally averaged temperatures since the mid-20th century."

In the two years since this alarming conclusion, further compelling evidence of the impacts of warming have been seen. Indeed, the impacts of warming have become increasingly evident to non-scientific observers. Sea ice in the Arctic is shrinking, and Greenland's massive ice sheet is melting – far faster than predicted. Glaciers are rapidly shrinking from the Rockies to the Alps. WRI annually reviews the latest in climate science. This review confirms that our climate system is changing. Jonathan Lash, WRI's president, provided several examples in his January 15, 2009 written testimony before the U.S. House of Representatives Committee on Energy and Commerce Committee. These include:

According to the National Snow and Ice Data Center (NSIDC), levels of Arctic sea ice from June through September 2007 were at a record low of 4.13 million $km^2$.1[1] In 2008, while there was some modest recovery, the world still saw the second lowest recorded ice extent since record-keeping began in 1979. Still more worrisome, the extensive losses during the past two summers have led scientists to speculate that the Arctic Ocean may be ice-free in the summertime much sooner than anticipated. Furthermore, in October 2008, scientists reported that the thickness of winter sea ice plummeted after the 2007 minimum, showing that the ice pack is not only shrinking but is decreasing in overall volume.[2]

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[1] NASA "Record Arctic Sea Ice Loss in 2007"
http://earthobservatory.nasa.gov/Newsroom/NewImages/Images/arctic_ams_2007259.jpg

[2] Geophys. Res. Lett.35, L22502; 2008

The British Columbia Ministry of Forests and Range, in their 2007 report on the mountain pine beetle outbreak[3], shows that in 2007, the impacted area had increased to 13 million hectares (from 4.2 million hectares in 2003). Mountain pine beetles prefer mature lodgepole pines and while they typically die off with cold snaps, warmer temperatures in the region have allowed them to persist. They cut off the nutrient and water supply of the trees by burrowing in trees' bark. The Ministry finds that 40% of merchantable pine volume – 12% of total merchantable volume on the timber harvesting land base in British Columbia – has been impacted from 1999 to 2006. They project that if the pine beetle outbreak continues at the same pace, it will kill off 78% of the pine volume – 23% of total merchantable volume on the province's timber harvesting land base – by 2015.

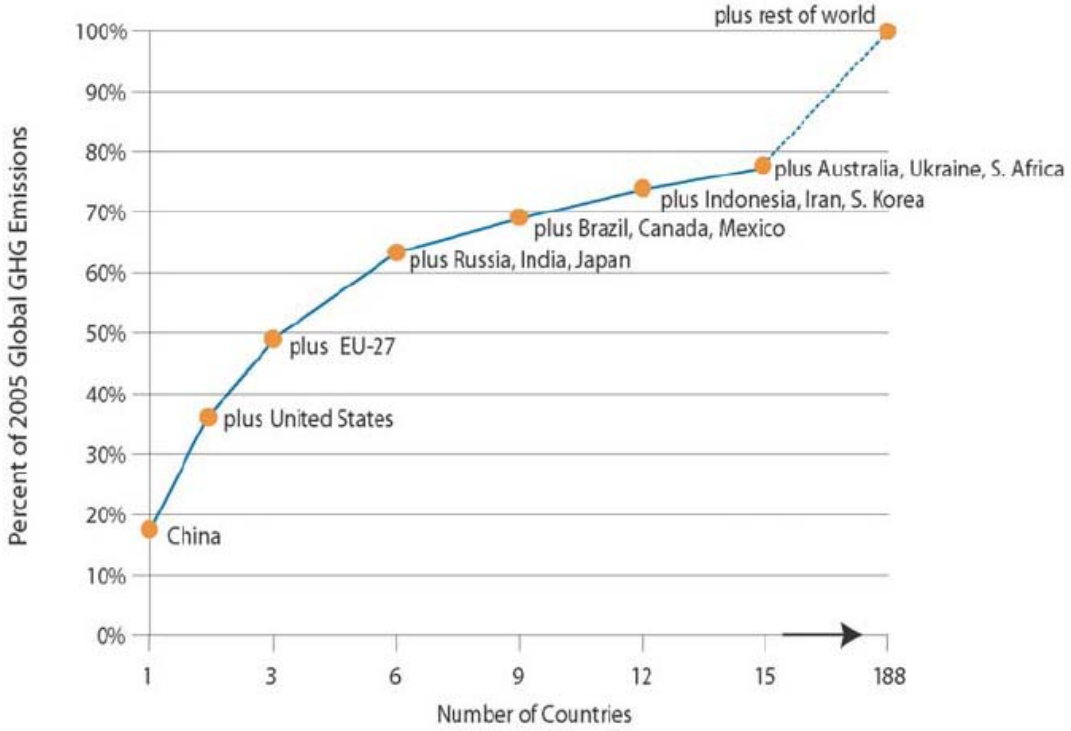
These and countless other observations make it clear that everything we thought we knew a few years ago about climate change has been superseded. All of the trends are proceeding more quickly than we anticipated. Rising temperatures and the consequent impacts are all taking place faster than the models predicted. That means that our long-range projections of what might happen are off. While of course we cannot yet know with complete certainty what will occur 20 (much less 50) years from now, according to our best current work, everything is trending to the high end. And the consequences we are observing today are the product of a mere 0.8 degrees centigrade of warming. Even very aggressive action will only barely forestall two degrees centigrade of warming. The science is telling us we have to act with extraordinary urgency – and that our action must be more than the modest marginal efforts made to date – it must fundamentally change the course of our energy infrastructure, it must address land use and forestry, and it must build a regime that can have global effect, not merely address U.S. emissions.

## The importance of developing countries

The importance of such a global effort is illustrated by Figure 1. China is of particular importance in terms of emissions, having superseded the United States as the world's largest emitter (though it remains at barely a quarter of US emissions per person). Almost 80% of global emissions are produced by fifteen countries (counting the European Union as a single country). Of these, nine are developing economies and two (Russia and Ukraine) are post-communist countries still wrestling with economic transformation. Without a viable means of engaging these countries in the effort to cut emissions we cannot avoid catastrophic climate change.

[3] B.C. Ministry of Forests and Range, Forest Analysis and Inventory Branch. 2007. "Timber Supply and the Mountain Pine Beetle Infestation in British Columbia: 2007 Update http://www.for.gov.bc.ca/hfp/mountain_pine_beetle/Pine_Beetle_Update20070917.pdf

**Figure 1: Aggregate GHG emissions by country, 2005**




*Sources and Notes:* WRI, CAIT. Percent contributions are for year 2005 GHG emissions only. Moving from left to right, countries are added in order of their absolute emissions, with the largest being added first. Figures exclude emissions from land-use change and forestry and bunker fuels.Adapted from Figure 2.3 in Baumert et al. (2005).

## The UNFCCC action on climate change to date

The need for global action has been recognized for at least two decades, and was the basis for the 1992 United Nations Framework Convention on Climate Change (UNFCCC), to which the U.S. is a Party. The UNFCCC commits all countries to the fight against climate change on the basis of "common but differentiated responsibilities." This puts the responsibility of the richest and most polluting countries to lead, and to provide support to the less capable, but for all to participate.

While the UNFCCC commands wide support as an articulation of the climate challenge and a global response, it did not set specific goals for individual countries to deliver emission cuts. For that reason the Kyoto Protocol was agreed in 1997, including binding emissions targets for industrialized and post-communist countries.

The Kyoto Protocol has had a significant impact, in particular in moving the European Union to adopt climate policies, including a cap-and-trade system. It has generated an international market for carbon offsets, and has given a major signal to business in many countries that a world of constrained emissions is coming.

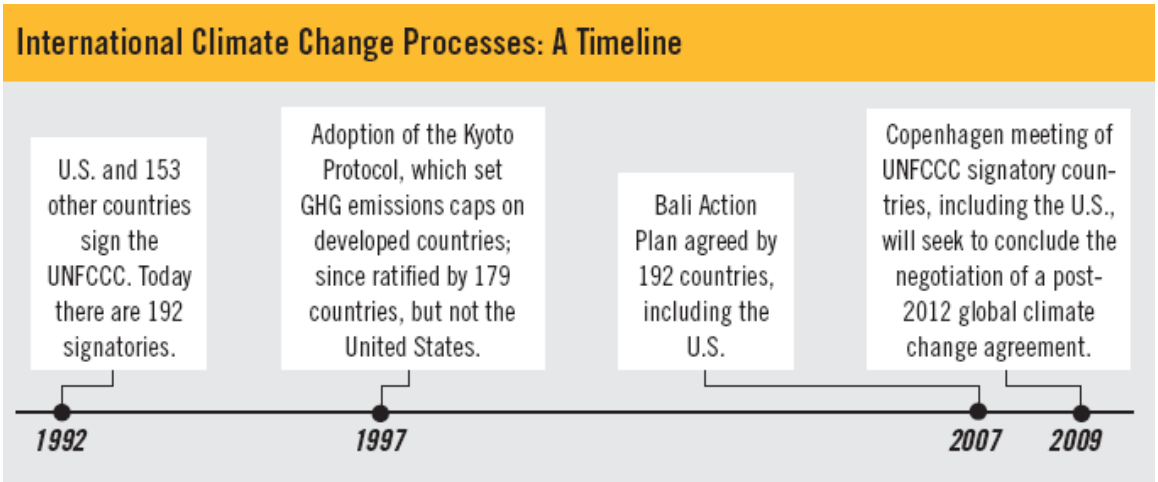
However, Congress raised several concerns with the Kyoto Protocol structure, and the treaty was not ratified by the United States. The concerns included:

- Concerns about economic impacts. At the time targets were set, few countries had a clear understanding of what meeting those targets would mean in economic terms. Congress feared that Kyoto would cause undue damage to the U.S. economy.
- Lack of developing country commitments. Congress similarly insisted that major developing countries such as China and India should have commitments to limit emissions.

These objections were most famously expressed in the Byrd-Hagel resolution of 1997. Although this Resolution was adopted before the Kyoto Protocol was agreed, there has been a wide perception that the Protocol did not meet Byrd-Hagel's provisions. The Protocol was never submitted to the Senate for ratification. In fact, diplomatic leadership by the Clinton Administration may have overreached Congressional support for legislative action domestically.

### A new opportunity

The Kyoto Protocol sets targets until 2012. The United Nations, including the U.S., have agreed to a timetable (the so-called "Bali Action Plan") for negotiating the post-2012 climate arrangements, with the deadline of a meeting to be held in Copenhagen, Denmark, in December 2009. This Fifteenth Conference of the Parties to the UNFCCC (COP15) aims to bring together the countries within and outside the Kyoto Protocol in a more inclusive agreement, although it is not yet clear exactly what form that agreement will take.



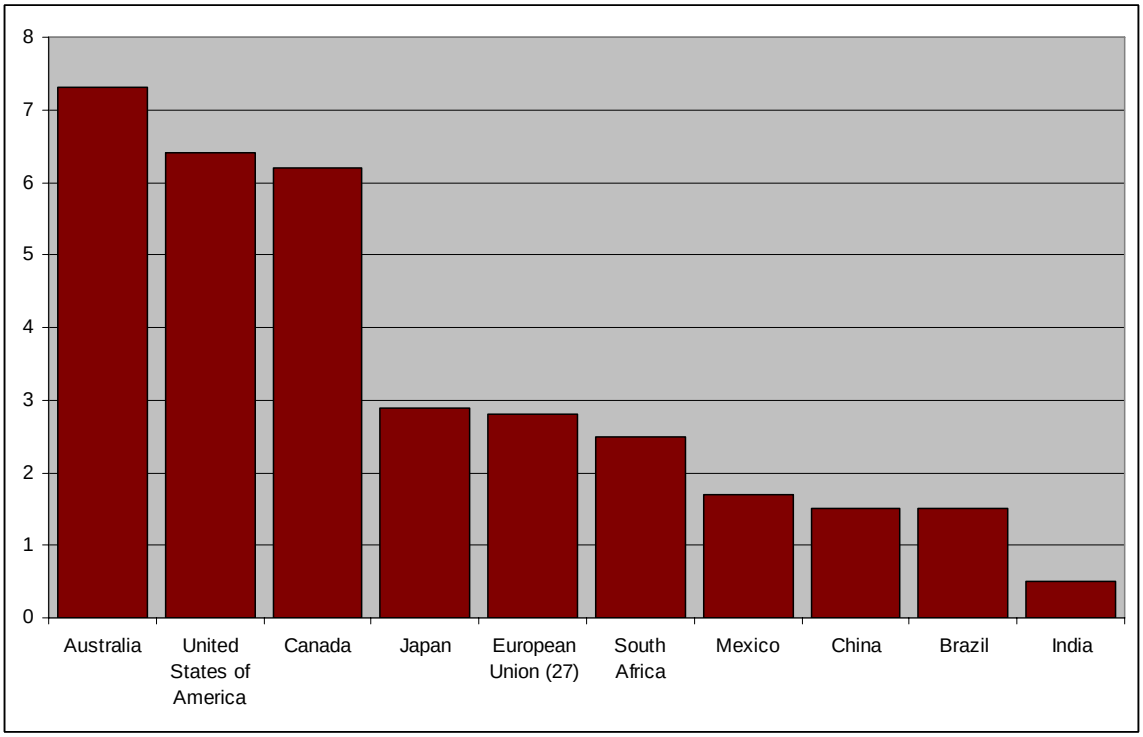

What is clear, however, is that the negotiating mandate provided by the Bali Action Plan provides for a radically different agreement from the Kyoto Protocol. In particular, it provides for mitigation actions from both developed and developing countries. This is a major departure from earlier models of climate action internationally, and it reflects real changes in the world outside the negotiations. In the next section I will discuss those changes and what they mean for an international climate agreement.

## *2. The transformation in developing country action*

For many years, developing countries have been clear in their view that they expect a clear lead from rich countries before they take action on emissions. There are sound reasons for this stance.

They are far poorer than developed countries; they have played a far smaller role in creating the climate problem; and their emissions per person remain in the main much lower than those of developed countries (see Figure 2).

**Figure 2: Emissions in tons carbon per person in selected countries (2005, excludes land use)**




*Source: Climate Analysis Indicators Tool (CAIT) Version 6.0. (Washington, DC: World Resources Institute, 2009). See http://cait.wri.org*

However, in the last 2-3 years there has been a flood of developing country plans for addressing climate change. Most major developing countries have now brought forward climate plans. I want to highlight some interesting examples:

**Brazil** announced it would reduce its deforestation rate over 50 percent from recent levels by 2017, avoiding an estimated 4.8 billion tons of CO2 emissions. Deforestation accounts for about two thirds of Brazilian GHG emissions.

**China** set a target of reducing national energy intensity (energy use per unit GDP) by 20% in the five years to 2010. It has already reduced in each of the past three years: by 1.6% in 2006, 3.7% in 2007, and 4.3% in 2008. Thus China looks likely to be approximately on target to meet its goal. Together, the industrial and building efficiency programs supporting this goal are expected to yield 550 million metric tons $CO_2$ in GHG savings. Addition savings are expected from measures in the transport sector. China also has ambitious non-fossil plans, including wind, hydro, nuclear and biomass, all of which are expected to save 640 million metric tons $CO_2$ by 2010.

**Mexico** pledged to halve its greenhouse gas emissions by 2050, employing a "cap-and-trade" policy like the one recently considered by the U.S. Congress.

**South Africa** has presented a detailed plan to peak its national emissions by 2020.

## Motivations

Why are developing countries taking these actions? As in the United States, there are a number of drivers that interact.

First, they are increasingly aware of the risks that climate change presents to their development. China's National Climate Change Programme goes into considerable detail on the risks to its coasts, fresh water supply, agricultural output and other critical concerns. There can be little doubt that even in the midst of pressing development concerns climate change is viewed as an important challenge. However, it is important to recognize the limits of this thinking. Although, to differing degrees, these countries are taking action, they all still look to the United States to lead, given its wealth and historical emissions.

Second, climate concerns align in many instances with broader worries about energy. With the greater energy intensity of their economies, high energy prices have been even more onerous of developing economies than on the U.S. energy security, costs, and pollution are top-level political concerns. Just as here, policy makers are looking for ways to intelligently tackle all these issues.

Third, many countries see opportunity in the new energy technology landscape that is emerging. Countries such as China and India do not see their future in old technologies and businesses. They are keen to position themselves as leaders in the clean energy revolution. Indian wind companies, Chinese solar manufacturers, and Brazilian biofuels companies are all among the world's leaders.

It is important to keep these motivations in mind. Any international agreement depends on the signatories choosing to carry out the provisions of the agreement. An alignment of national and international interests provides at least some prospect of genuine participation, and the Bali Action Plan provides a new way to take advantage of this growing alignment. There is a broad interest in seeing the climate agreement succeed, suggesting that countries will take their international commitments seriously.

However, significant questions do remain. Many of these countries have a very mixed record of implementing the goals in their national plans. Reliable data are hard to obtain even on such broad indicators as energy use or economic growth. There are important initiatives in all these countries to implement GHG monitoring, but today very large uncertainties remain in a lot of the emissions data. Furthermore, standards of enforcement, governance and transparency are very viable. It will certainly not be enough for countries to take each others' plans at face value.

## How the Bali Action Plan includes developing country action

This is where the international negotiations are important. Creating robust reporting and verification structures can help build trust among countries that bold commitments are really being turned into action. The opportunity provided by the Bali Action Plan (BAP) structure is to align international commitments with national development goals and to create reporting programs that also align with the countries' own abilities to collect and disseminate information. The BAP calls for

*"enhanced national/international action on mitigation of climate change, including consideration of:*

> *(i) "Measurable, reportable and verifiable nationally appropriate mitigation commitments or actions, including quantified emission limitation and reduction objectives, by all developed country Parties, while ensuring the comparability of efforts among them, taking into account differences in their national circumstances;*
> *(ii) "Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner."*

The phrase "measurable, reportable, and verifiable" (MRV) was critical to the agreement of the BAP, and how MRV is reflected in the post-2012 agreement will have significant implications for the effectiveness of that agreement for stakeholders in both developing
as well as developed countries.

At the heart of the new agreement therefore is the question of how to measure, report, and verify different actions in a way that gives real confidence that promises are being kept and that real action is being undertaken. In the next section I will discuss the key elements of a successful deal.

## *3. What is needed in the new agreement*

Much like the United States, most countries are not going to design their domestic energy and climate policies in a United Nations negotiation. A new agreement will not – and cannot – force countries to take actions that they actively want to avoid. Rather, it can build trust by allowing countries to compare and assess their own progress in implementing agreed commitments, and those of their international partners. And it can provide structures for specific international needs, such as support for adaptation efforts or international registries for emissions trading.

For the engagement of developing countries, my particular focus here, I want to discuss two issues in particular.

1. What to expect in terms of the actions that countries bring to the table, and the ways in which they are measured, reported and verified.
2. Support, in particular financial support, that the U.S. will need to bring to the table.

## What should we expect from developing countries?

There are three things to think about as we look at a country's climate commitments:

1. How *ambitious* are they? What do they deliver in terms of lower carbon emissions?
2. What *form* do they take?

3. How *credible* are they? Do countries have confidence in each others' capacity and intent to implement the actions, and is there a reliable and transparent way of measuring this?

As I discussed above, many developing countries are indeed bringing forward such actions. The role of an international agreement is to turn these actions into a set of commitments that can be mutually verified, so that all countries can have confidence that what is being promised is also being delivered.

**Ambition**

How much effort should each country make? This is a complex and highly politically-charged question - I want to offer a caution on what can be expected.

While all major emitters will be expected to bring actions to the table, it does not follow that all make the same effort. The average Indian still produces just over one twentieth of the emissions of the average American. Some 550 million Indians still lack any access to electricity. Vehicle ownership in developing countries remains a small fraction of levels in the United States or even Europe or Japan. It follows that developing country actions are mostly going to be about reducing rates of emissions growth, at least at first, rather than absolute emission cuts from today's levels.

**Form**

The United States should seek commitments from our international partners that they will undertake ambitious actions to reduce emissions. We need to recognize that the solutions that we adopt here, such as cap-and-trade, are not necessarily going to be the most suitable right now in developing countries, and that their actions may therefore take a different form. The types of actions a country undertakes will be driven in significant part by the institutional capacity in that country, as well as by political traditions and priorities. Indeed, as I argued above, actions that are firmly rooted in national priorities will be more likely to be effectively implemented.

In the longer term, we need to ensure that the world is moving on the right low-carbon path, and should help all countries to develop the capabilities to cap emissions. But in the post-2012 climate agreement it is important to recognize ambitious actions of all kinds.

**Credibility**

Making climate actions into credible and verifiable parts of a deal is at the center of the "measurable, reportable and verifiable" approach of the Bali Action Plan.

Although the Kyoto Protocol includes targets that are legally binding, and is equipped with compliance mechanisms, the teeth of an international agreement are generally not sharp. Kyoto's penalties for not meeting a target are not strongly dissuasive: they amount to a penalty against a later target, which itself has not yet been negotiated. It is striking therefore that most countries are on course to meet their Kyoto targets, and in some cases have made considerable efforts to do so. An international agreement does seem to bring a significant political incentive to comply. Enforcement of commitments within a climate agreement is likely to be based on two trade-offs:

***Mitigation action based on recognized mitigation action by others***. Countries will feel bound to their own emissions cuts to the extent that others are delivering theirs. Experience with the Montreal Protocol suggests that a progressive building of trust as countries see each other meeting their commitments can be a powerful means of encouraging international action.

***Mitigation action linked to financial or technological support.*** Countries hoping for support in the form of finance or technology cooperation (see below) will need to demonstrate real action on emissions, or lose that support.

One vital role for the agreement is to a credible mechanism for sharing and monitoring national actions. This "registry" of actions will be needed that sets metrics by which implementation will be measured, reported and verified. Frequent reporting and robust verification should help build trust among participants.

In addition, the registry would be used to measure, report and verify the support being given to developing countries in undertaking their mitigation actions. It is important to note that such support is a critical part of the BAP deal in the eyes of developing countries. Specific needs will vary considerably. Richer developing countries may need assistance primarily with the monitoring systems that will help them implement their policies. Poorer countries will look for more direct support in reducing emissions. The G77, a grouping of developing countries within the negotiations, has placed significant emphasis on access to cleaner technologies. Finding appropriate structures for this will require further negotiation, not least because countries have very different expectations. Some may seek mainly to acquire clean technologies on favorable terms. Others have a greater interest in building the capacity to manufacture and innovate in new sectors.

## Financial and other support

Although both developed and developing countries are called on to take mitigation action under the Bali Action Plan, the Plan promises developing countries support for their actions. Furthermore, that support also needs to be "measurable, reportable and verifiable."

Financial support is the most obviously measurable of these, and contributions from the U.S. and other developed countries will be essential to a successful deal. Perhaps the most important priority in this regard is adaptation. With climate impacts already being felt, and with the poorest countries and communities likely to be hit hardest, there is a real need for such support. But support will also be needed in developing countries to mitigate emissions, and to implement the measuring, reporting and verification systems needed to enshrine these actions in an agreement.

There is a wide range of assessments about the scale of resources required for mitigation and adaptation globally. Within the context of the UNFCCC negotiations, there are high expectations on the part of the developing countries for support and finance for mitigation and adaptation from Annex I countries. This expectation is based on the principle of "common but differentiated responsibilities" from the 1992 Framework Convention. Non-Annex I countries feel that Annex I parties should be responsible for a greater portion of the solution to climate change, given that

their historical contribution to the problem outweighs the contribution by Non-Annex I countries. Responsibility for the solution would take the form of financial support for developing country mitigation and adaptation.

Figure 3 shows the needs and expectations for global mitigation, based on the UNFCCC's 2007 assessment of the level of funding required for global mitigation, and on the G77 and China's proposal on finance submitted to the UNFCCC, which calls for Annex I countries to commit to funding equal to 0.5-1% of their GDP to cover mitigation and adaptation. The figure compares some of the existing and proposed sources of mitigation funding, including existing clean technology funds, the UNFCCC's Clean Development Mechanism (CDM), Official Development Assistance (ODA), and global investment figures, against these expectations and needs. Clearly, the existing financial flows for climate change mitigation are inadequate relative to the scale of the challenge. However, ODA and foreign direct investment (FDI) are both adequate in terms of scale, which indicates that the necessary finance for mitigation is available but must be steered toward climate-friendly investments.

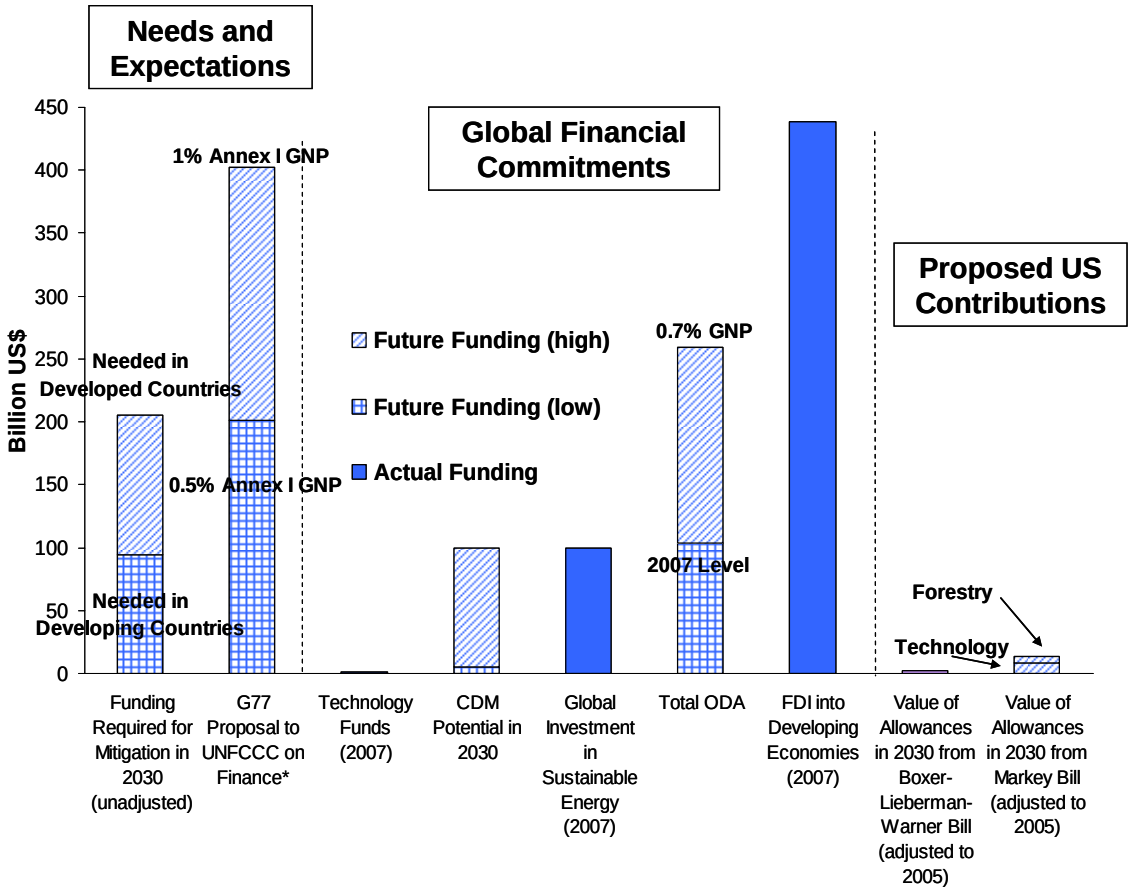
The figure also shows an indication of possible U.S. contribution to developing country mitigation, based on provisions in recent legislative proposals. The figure includes the 2030 values for allowances allocated to international mitigation and adaptation efforts from the 2008 Boxer-Lieberman-Warner Climate Security Act (S.3036) and from Representative Markey's 2008 bill, Investing in Climate Action and Protection Act (H.R.6186). These bills reserved a portion of allowances to fund international forestry, international technology deployment, and international adaptation.[4] This illustrates the size of the gap between the needs and expectations of the developing world for finance from Annex I countries versus what the U.S. has offered to date.

However, it is not clear at this stage what level of finance will be needed in the near term to ensure a successful climate deal.

**Figure 3. International Funding for Climate Change: How do U.S. proposals stack up against the need and expectations and against other global financial flows?**

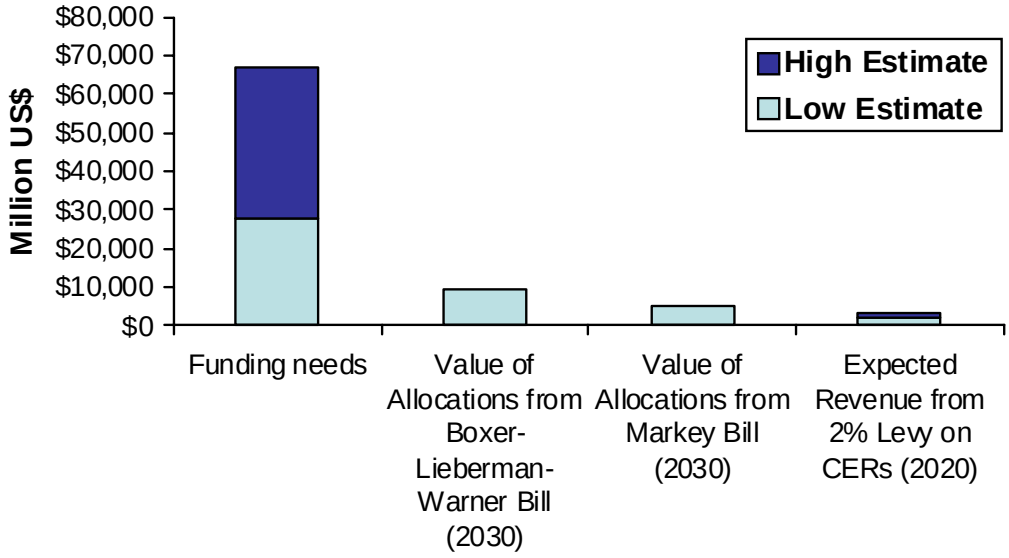
***Mitigation:***

[4] Note: The Boxer-Lieberman-Warner Climate Security Act (S.3036) included allocations for international forestry and adaptation, but did not include allocations for technology deployment. Markey's Investing in Climate Action and Protection Act (H.R.6186) was probably the most aggressive bill in terms of funding for international technology deployment, and these numbers are likely an understatement.




*Note: G77's proposal references a percentage of Annex I GDP. GNP is used here for consistency. Figure includes funding for both mitigation and adaptation.
Sources: EIA, New Energy Finance, OECD, UNCTAD Statistics, UNFCCC, The World Bank, and WRI analysis.

Adaptation:




Sources: EIA, OECD, UNFCCC, and WRI analysis

Although finance is likely to be important, some countries, notably China, put as much or more emphasis on technology cooperation. In many cases this is not a question of funding, but of combined efforts in R&D (with a sharing of the resulting intellectual property) or joint support of demonstration projects. These efforts need not all be pursued within a multilateral agreement, but their presence will help create a more constructive deal.

## *Conclusions*

The U.S. is seeking a new leadership role on climate change, both through adopting national climate policy and by engaging internationally. These two aims are linked: domestic policy will give the U.S. credibility abroad, and participation by other major emitters will help the U.S. undertake ambitious action itself.

The moment is ripe for international engagement. Other major emitters, including all the largest developing economies, have presented national climate change plans, targets or policies. Some have gone much further than others in implementing these, but all have made a major leap from the era of Kyoto.

The international agreement to be negotiated under the Bali Action Plan offers scope to include actions by developing and developed countries that are measurable, reportable and verifiable. This, combined with the national plans being brought forward by developing countries, should answer Congress' major criticism of Kyoto.

In national policy, Congress should seek to support constructive international engagement. Provisions that take a more confrontational approach, for instance through trade measures, should be considered with caution. A successful climate negotiation will also require financing. Use of allowance value, as has been considered in a number of recent climate bills, may provide one way to address this.