



NAVIGATING CLIMATE CHANGE

An Agenda for U.S.-Chinese Cooperation

By Jacqueline McLaren Miller and Piin-Fen Kok



EASTWEST INSTITUTE

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The EastWest Institute is an international, non-partisan, not-for-profit policy organization focused solely on confronting critical challenges that endanger peace. EWI was established in 1980 as a catalyst to build trust, develop leadership, and promote collaboration for positive change. The institute has offices in New York, Brussels, and Moscow.

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Cover photo: A view of the wind turbines at the Donghai Bridge Offshore Wind Farm near the Donghai Bridge in Shanghai, China on Wednesday, March 17, 2010. The 102 MW offshore wind farm, planned to be completed in the middle of this year, is the largest one in Asia and the first offshore wind power demonstration project in China. A total of 34 Sinovel 3 MW offshore wind turbines were installed to meet the needs of over 200,000 Shanghai households, with a planned annual power output expected to reach 267 million kWh.(Photo By Zhang Ke/Color China Photo/AP Images)

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List of Abbreviations

BAP	Bali Action Plan
CAFE	Corporate Average Fuel Efficiency
COP	Conference of the Parties
DOE	U.S. Department of Energy
ECP	Energy Cooperation Program
EGTT	Expert Group on Technology Transfer
GHG	Greenhouse Gases
IEA	International Energy Agency
IP	Intellectual Property
JCCT	U.S.-China Joint Commission on Commerce and Trade
MRV	Measurement, reporting, and verification
NAMA	Nationally Appropriate Mitigation Action
OECD	Organization for Economic Cooperation and Development
PV	Photovoltaics
TPRM	Trade Policy Review Mechanism
TRIPS	WTO Agreement on Trade Related Intellectual Property Rights
TYF	Ten-Year Framework on Energy and Environmental Cooperation
UNFCCC	United Nations Framework for Climate Change Cooperation
WTO	World Trade Organization

EXECUTIVE SUMMARY

Between June 2009 and January 2010, the EastWest Institute (EWI) began exploring how the United States, China, and the international community could build strategic trust through cooperation on climate change and climate security. EWI examined this issue through policy discussions in several forums: Track 2 processes such as the U.S.-China High Level Security Dialogue and the U.S.-China-Europe Trialogue²¹ initiative; a roundtable session in New York; and the U.S.-China Working Group on Climate Change—a group of Chinese and American experts convened with the support of the Connect U.S. Fund who met before and after Copenhagen to assess progress and to determine ways to move forward.

The timing has been fortuitous. The United States is re-engaged, domestically and internationally, on climate change issues; the Obama administration has moved climate and clean-energy cooperation to the top of the bilateral agenda with China; and the disappointing Copenhagen climate change negotiations have left the United States, China, and the global community with much to do to find a new international framework on climate change before the Kyoto Protocol expires in 2012.

This paper captures key observations from those discussions, focusing on two areas that pose the biggest obstacles to progress in bilateral and multilateral efforts to address climate change concerns. These areas are:

- The trade-off between emission caps and development goals;
- Technology transfer and intellectual property (IP) rights.

An important caveat: while the paper draws heavily on the discussions of the EWI-convened U.S.-China Working Group on Climate Change, the views in this paper should not be ascribed, individually or collectively, to members of the group. The group's debates and discussions helped inform this paper's analysis and recommendations, but the paper does not reflect a consensus in the group, because indeed consensus was lacking.

The main challenges and recommendations relating to the main points of contention are summarized in Table 1. Among the biggest concerns—reinforced in large part at the Copenhagen meeting—are:

- The establishment of a system for the measurement, reporting, and verification (MRV) of emissions commitments that is acceptable to both developed and developing countries;
- Fostering confidence between the United States and China in each other's carbon reduction commitments;
- Overcoming market, regulatory, and political barriers to technology transfer, including concerns over signs of “energy protectionism;”
- Reconciling different notions and expectations between developed and developing countries about each other's role in technology transfer and financing;
- Building confidence in China's IP protection regime and the broader international debate about the role of IP in clean energy technology¹ transfer under the United Nations Framework for Climate Change Cooperation (UNFCCC).

Evident in the discussions was a stark contrast in the underlying American and Chinese assumptions that frame the debate. The two countries differ in their views of their obligations to reduce carbon emissions, their relative willingness to compromise national sovereignty for verification regimes, their contrasting notions of technological transfer from developed to developing countries, and their assessment of the role of IP (including China's IP system) in the facilitation of such transfers.

Politics also play a role. Prospects of climate change legislation in the United States are dim: the divisive battle over health care reform and upcoming mid-term congressional elections have hardened divides within the U.S. And the politics of U.S.-China relations, which have affected mutual perceptions and cooperation in areas such as security and trade, have spilled over to the realm of climate change and clean energy as well.

The recommendations in this paper primarily address U.S.-China cooperation. The two countries are the world's largest carbon emitters and have a critical role to play in moving the international process ahead. While the United States

¹ Clean energy technology is understood to mean low-carbon technologies that are expected to have long-term greenhouse gas emissions savings. It includes nuclear energy, high-efficiency fossil fuel technology, and technology that leverages renewable energy sources such as solar, wind, hydro, etc.

and China do not speak for all developed and developing countries respectively, we hope that these recommendations will help shape a framework that both developed and developing countries can accept.

Table 1: Summary of Main Challenges and Recommendations

Challenges	Recommendations
Emissions Caps and Development Goals	
Building a structure for MRV that is acceptable to both developed and developing countries.	<ul style="list-style-type: none"> ■ Measure, report, and verify specific actions and policies rather than emissions. ■ Use existing systems as models. Examples include the World Trade Organization’s (WTO’s) Trade Policy Review Mechanism (TPRM) and the International Energy Agency (IEA) and Organization for Economic Cooperation and Development (OECD) voluntary reporting mechanisms. ■ Work towards an equitable MRV system that monitors both developed and developing countries.
Building confidence between the United States and China in each other’s carbon-reduction commitments.	<ul style="list-style-type: none"> ■ Continue and possibly increase bilateral dialogues. ■ Communicate underlying policy assumptions in a transparent way.
Technology Transfer and IP Rights	
“Energy protectionism,” regulatory and trade barriers, political barriers, and concerns about competition.	<ul style="list-style-type: none"> ■ Use the climate change imperative to promote U.S.-China cooperation and break through existing barriers to technology transfer. ■ Build confidence in both markets’ openness to investment, for example by promoting joint ventures on key technologies such as carbon capture and storage, energy storage for intermittent renewables, and concentrated solar power. ■ Sponsor joint research between U.S. and Chinese scholars.
Different notions of technology transfer and financing.	<ul style="list-style-type: none"> ■ Use the sixteenth Conference of Parties meeting (COP16) in Cancun to lay the groundwork for clearer articulation of obligations and expectations by both developing and developed countries.
Determining the role of IP in UNFCCC discussions on technology transfers.	<ul style="list-style-type: none"> ■ Promote further discussions, especially among industry, to build confidence in the role of IP in promoting clean energy technology transfer. ■ Consolidate at all levels the many IP discussions underway in various forums, including business groups, governments, and intergovernmental organizations. ■ Commit to seriously addressing IP in both bilateral forums and in the COPs.

Introduction

Years of efforts to reduce harmful carbon emissions and to mitigate climate change have perhaps their best chance for meaningful progress in years. But there is much to be done. Developed and developing countries must quickly agree on a cooperative framework to address the issue, which is still a daunting task in the wake of the fifteenth Conference of the Parties (COP15) in Copenhagen.

This policy paper gives an overview of current efforts to create this cooperative framework and offers recommendations that could contribute to a platform from which to launch joint initiatives to address climate change.

The timing is opportune. The United States is reengaged, both domestically and internationally, in the climate change process—although a lack of domestic consensus, especially in the Senate, will limit this engagement. President Hu Jintao committed China to making substantial cuts in carbon intensity at a 2009 speech at the United Nations.² Soon thereafter, China's State Council's announced that carbon intensity reductions would be in the 40-45 percent range, contributing to international confidence in China's commitment to engage as a major player on climate change.

The accord to emerge from Copenhagen was relatively weak, but it has also served a useful purpose. It has tempered expectations that renewed U.S. and Chinese engagement alone can speed the process forward. Copenhagen highlighted the very deep, very serious differences in views on the responsibilities, obligations, and the underlying assumptions about how different countries could best undertake mitigation and adaptation efforts.

The United States and China have sought to engage one another on the issue of global climate change. They are taking unilateral steps domestically that are positive but insufficient to achieve the declared two-degree stabilization goal. The United States and China must together take the lead on this issue internationally. They are the two largest carbon emitters and also the largest developed and developing countries. If they can work together, other

holdout states may be able to find the political space to come to an agreement.

At their first Strategic and Economic Dialogue in July 2009, the U.S. and Chinese governments reiterated their mutual commitment to ensure the success of the Copenhagen process in the Memorandum of Understanding to Enhance Cooperation on Climate Change, Energy and the Environment. Presidents Barack Obama and Hu Jintao also met in November and issued a joint statement in which they resolved to “take significant mitigation actions and recognize the important role that their countries play in promoting a sustainable outcome that will strengthen the world's ability to combat climate change.”

Despite such initial endeavors, challenges remain. Two significant issues have hampered U.S. and Chinese efforts to combat climate change (and indeed global efforts through the United Nations Framework Convention on Climate Change, or UNFCCC):

- The trade-off between emission caps and development goals;
- Technology transfer and intellectual property (IP) rights.

Taking advantage of a number of EWI-moderated U.S.-China Track 2 processes, EWI convened U.S. and Chinese experts, academics, and policymakers in several forums to explore proposals that address the disparity of concerns and priorities regarding climate change. EWI also convened, with funding from the Connect U.S. Fund, a working group of Chinese and American experts to discuss the two challenges identified above. This paper is informed by these discussions.

We are indebted to all who participated in these discussions, especially participants in EWI's Working Group on Climate Change,³ who were either on the phone early in the morning or late at night (due to the significant time

² Greenhouse gas intensity is “the ratio of greenhouse gas (GHG) emissions to economic output expressed in gross domestic product (GDP). This approach minimizes economic impact by allowing emissions to rise or fall with economic output; however, it provides no assurance that a given level of environmental protection will be achieved since the degree of environmental protection is measured in relation to GDP.” “Analysis of President Bush's Climate Change Plan,” Pew Center on Global Climate Change, February 2002. <http://www.pewclimate.org/federal/analysis/executive/analysis-president-bushs-climate-change-plan>.

³ Chinese participants: Da Wei, Deputy Director, Institute of American Studies, China Institutes of Contemporary International Relations; Liu Qing, Deputy Director, Department of American Studies, China Institute of International Studies; Wang Mou, Researcher, Research Center for Urban and Environmental Studies, Chinese Academy of Social Sciences; Wang Ruibin, Deputy Director, Department of Information and Contingencies Analysis, China Institute of International Studies; Yu Hongyuan, Associate Professor and Deputy Director, Center of International Organizations and Laws, Shanghai Institutes for International Studies. U.S. participants: Michael Levi, David M. Rubenstein Senior Fellow for Energy and the Environment and Director of the Program on Energy Security and Climate Change, Council on Foreign Relations; Jay Nash, Director, East Asia Projects, Center for International Trade and Security, University of Georgia; David Pumphrey, Deputy Director and Senior Fellow, Energy and National Security Program, Center for Strategic and International Studies; Deborah Seligsohn, Senior Fellow and Principal Advisor, China Climate, Energy and Pollution Program, World Resources Institute; Katherine Silverthorne, Programme Leader, US Climate Change, E3G.

difference between the United States and China) to frankly and constructively assess the prospects for U.S.-China cooperation. An important caveat: the views in this paper should not be ascribed, individually or collectively, to members of the working group. The analysis and recommendations in this paper are not reflective of a consensus in the group, because indeed consensus was lacking. Their debates and discussions helped inform the analysis and recommendations that follow in this paper, but they are not recommendations from the group itself.

We would also like to thank those at the EastWest Institute who helped with the project, primarily William Chester for his initial research assistance and endless good cheer. We would also like to thank Ian Hawkins and Laura Wicks who stepped in to help with a flurry of last-minute research requests.

And, finally, we would like to express our appreciation to the Connect U.S. Fund, who underwrote the working group's discussions and the subsequent policy briefings.

Background

The global threat of climate change affects all countries—whether they are major contributors to climate change or not. And thus only truly global action can contribute to climate change adaptation and mitigation. Given the politics of the international system, such efforts will require an international legal framework that is binding and verifiable in some form. But since the 1992 signing of the UNFCCC, little progress has been made in developing a concrete course of action to stabilize and reduce the emissions of greenhouse gases (GHGs). Hopes were high that the December 2009 COP15 summit in Copenhagen could provide such a framework. But these hopes have been largely dashed and the finger pointing has highlighted enduring divisions between the developed and developing world, especially between the United States and China.

Developed and developing states have been unable to agree on mitigation and adaptation measures, and progress in reaching an effective climate change regime is effectively stalled. The onus falls on the two largest players in climate change—the United States and China—to take the lead. If they cannot work together, the chances of reaching a meaningful global climate change agreement are slim. As former British Prime Minister Tony Blair said: “Without America and China, the rest of the world frankly can agree whatever it wants, but it's not going to have the

effect of improving the environment.”⁴ There are significant gaps between the two parties' positions, despite the broad agreement that both states need to work together. Global climate change efforts rest on a shaky global framework. The United States and China should pursue bilateral and multilateral efforts to find meaningful common ground on climate change where they have fundamental common cause.

The UNFCCC, the Kyoto Protocol, and the Bali Action Plan (BAP) are the legal guidelines currently shaping global climate change efforts, but roles and responsibilities under these legal instruments are far from clear. The UNFCCC's objective, as stated in the text of the convention, was to stabilize “greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.” The original UNFCCC encouraged countries to stabilize emissions; it did not require them to. It contained no verification or enforcement mechanisms. The “heavy lifting” was left to updates to the treaty.

The follow-on Kyoto Protocol was designed to give more specificity to the broad goals of the UNFCCC. It set binding targets for major industrialized countries to reduce greenhouse gas emissions, primarily through national measures. It put the burden of emissions reductions prominently on developed rather than developing countries. Kyoto also provides for reporting and a compliance system.

The United States never ratified the Kyoto Protocol. The Clinton administration did not submit the Protocol for ratification after the unanimous passage of the Byrd-Hagel bill of 1997 (105 S.Res.98). That bill stated that “the United States should not be a signatory to any protocol to, or other agreement regarding, the United Nations Framework Convention on Climate Change of 1992, at negotiations in Kyoto in December 1997 or thereafter which would: (1) mandate new commitments to limit or reduce greenhouse gas emissions for the Annex 1 Parties, unless the protocol or other agreement also mandates new specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties within the same compliance period....” President George

4 “Bush sidesteps G8's climate change agenda,” *The Independent*, June 1, 2007, <http://www.independent.co.uk/environment/climate-change/bush-sidesteps-g8s-climate-change-agenda-451244.html>.

W. Bush similarly did not submit the treaty for ratification, citing grave costs to the U.S. economy and calling it fundamentally flawed because it exempted major polluters in the developing world (i.e. China and India). And although the United States continued to participate in the annual UNFCCC COPs, it opted out of additional Kyoto Protocol-related negotiations, calling the Kyoto Protocol “dead” in terms of U.S. policy. U.S. climate change policy would instead rely on domestic, voluntary actions to reduce greenhouse gas intensity by 18 percent over the next ten years.

The Lead-Up to Copenhagen

After several years of lackluster U.S. engagement in climate talks, the election of President Barack Obama raised global expectations that serious U.S. reengagement would change the dynamic of climate change negotiations. Candidate Obama promised to make the United States a leader in climate change and re-engage with the UNFCCC. President-elect Obama promised that his administration would mark a “new chapter in American leadership on climate change.” He said at the 2008 Global Climate Summit: “Few challenges facing America—and the world—are more urgent than combating climate change. Many of you are working to confront this challenge....but too often, Washington has failed to show the same kind of leadership. That will change when I take office.” And President Obama said in his September 2009 remarks to the United Nations on climate security that the United States was putting climate “at the top of our diplomatic agenda when it comes to our relationships with countries from China to Brazil; India to Mexico; Africa to Europe.” In the June 2009 meeting of the G8, the United States (along with Japan, Canada, and Russia) signed on to the two-degree stabilization goal that had been agreed to in 1996 by the European Union (including G8 members Germany, France, Italy, and the United Kingdom).

China’s national climate change efforts were also being noticed and helped raise expectations heading into Copenhagen. China’s Eleventh Five-Year Plan (2006-2010) committed the country to transitioning to a low-carbon economy. And although China will likely miss some of the targets in the plan, it was an important indicator that China is taking the issue seriously. In August 2009, China’s top legislature passed a resolution that sharply laid out differences between Chinese and American views on abatement responsibilities, but also laid out China’s commitment to the UNFCCC process. It said: “With a spirit of being highly responsible for the survival and long-term

development of mankind, China will continue constructively participating in international conferences and negotiations on climate change, and advance comprehensive, effective, and sustained implementation of the international convention and its protocol.”⁵ Most significantly, the State Council announced a carbon intensity reduction target of 40 to 45 percent by 2020 from 2005 levels. China thus joined the United States and other major countries that were making positive statements and specific commitments leading up to COP15 in December 2009.

Expectations of rapid, tangible progress were therefore high heading into Copenhagen. Perhaps overlooked was the fact that the United States and China, despite a growing track record of saying the right thing, fundamentally disagreed on core issues that could—and in some cases did—derail Copenhagen. Both to domestic and global audiences, U.S. and Chinese policymakers emphasized their dedication to working unilaterally (through adopting clean technologies, improving fuel efficiency, and adopting low-carbon development goals, for example) and multilaterally to revive global efforts at climate change mitigation and adaptation. But the parties at Copenhagen could not overcome obstacles to multilateral cooperation and could not agree on a legal framework.

Overview of Obstacles for the Multilateral Framework

Development Goals and Carbon Caps

Despite the positive spin leading up to Copenhagen, disagreements over development goals and technology transfer continued (and continue) to plague U.S. and Chinese efforts. One key challenge is balancing the legitimate growth goals of developing countries with the need to quickly reduce emissions to meet the climate stabilization target of two degrees Celsius. The fundamental question is how to divide up the abatement burden while accounting for sustainable development goals. An across-the-board requirement for all states to cut emissions to a prescribed fraction of current levels by 2050 would, the Chinese argue, unfairly target China and other developing states. Carbon emissions of such countries are expected to increase as their economies expand, while developed

5 “China’s legislature endorses climate change resolution,” *Xinhua*, August 27, 2009. http://www.chinadaily.com.cn/china/2009-08/27/content_8625536.htm

countries' emissions are expected to remain stagnant, if not decrease. Additionally, China has argued that its export sector, which has fueled its development, should be exempted from emissions caps.

Another key point of contention is verification. The BAP asked developing countries to submit nationally appropriate mitigation actions (NAMAs) that would reduce their "business-as-usual" emissions levels (i.e. if efforts were not taken to mitigate GHG emissions). Most developed countries were unwilling to accept NAMAs unless they were subject to measurement, reporting, and verification (MRV). But MRV has become another sticking point. The United States is seeking an international mechanism for countries to review each other's commitments. President Obama has described any potential agreement without such verification mechanisms as a "hollow victory."⁶ However, senior Chinese officials, including Premier Wen Jiabao, have suggested that the BAP does not oblige China and other developing countries to subject their voluntary NAMAs to international MRV; doing so, they contend, would run counter to the principles of common but differentiated responsibilities and national sovereignty. Instead, China argues that its mitigation actions would be regulated by a transparent domestic MRV regime that would be legally binding for China.

President Obama has followed Clinton and Bush in calling for developing countries—which include China and India, two of the largest carbon polluters—to step up their efforts to cut carbon emissions. In September 2009 at the United Nations, Obama agreed that developed countries are responsible for much of the damage to the climate and must lead in its mitigation. But, he continued, "those rapidly-growing developing nations that will produce nearly all the growth in global carbon emissions in the decades ahead must do their part as well.... they will need to commit to strong measures at home and agree to stand behind those commitments just as the developed nations must stand behind their own. We cannot meet this challenge unless all the largest emitters of greenhouse gas pollution act together."

Meanwhile, some countries, including China, have condemned U.S. efforts as too little too late. China expressed disappointment at the United States' commitment to reduce GHG emissions by approximately 17 percent by 2020. China has consistently refused to budge from its "right to development," and maintains that it has done its

share to meet its climate change commitments, including at Copenhagen. It is the West, many Chinese officials suggest, that must achieve greater emissions reductions and support mitigation and adaptation efforts with financing and technology transfers to support sustainable development goals.

There is also disagreement about the applicable international agreements. China does not view the Copenhagen process as a "post-Kyoto" process, arguing that the principles enshrined in the UNFCCC and the Kyoto Protocol are not a negotiating point, but accepted parameters of cooperation. The United States, on the other hand, sees Copenhagen as a step beyond Kyoto—which it never ratified. And although the United States accepts the common-but-differentiated-responsibilities approach that China says is immutable, it maintains that developing countries must set targets and verify they have met their commitments, whether through unilateral NAMAs or other processes.

Transitioning to Clean Technology

The Obama administration has repeatedly stressed that the United States is working not just towards a limit on GHG emissions, but towards an agreement that will allow developing states to grow and raise living standards without exacerbating climate change. One track in the U.S. strategy is negotiating the division of the burden of emission reductions in the context of sustainable development, as briefly discussed above. Another track is helping developing countries leapfrog from dirty energy technologies to clean technologies. But the dissemination of this technology gets to the heart of long disputes between China and the United States over a range of issues from market barriers to IP rights.

The issue of technology transfer has been an integral part of global climate change negotiations and agreements, from the UNFCCC to the Bali Roadmap to the Copenhagen Accord. The UNFCCC's Expert Group on Technology Transfer (EGTT) provided a road map for technology transfer and offered a series of performance indicators. The Bali Roadmap and the Copenhagen Accord started laying out the broad needs for technology transfer and the financing to meet those needs. At Copenhagen, for instance, developed countries committed to jointly mobilize US\$100 billion a year by 2020 to address the needs of developing countries. But critical details, such as the allocation of these funds and the amount each country needed to contribute, were all kicked down the road. A new development at Copenhagen was the establishment

⁶ Remarks by the President at the Morning Plenary Session of the United Nations Climate Change Conference, December 18, 2009. <http://www.whitehouse.gov/the-press-office/remarks-president-morning-plenary-session-united-nations-climate-change-conference>.

of a Technology Mechanism “to accelerate technology development and transfer in support of action on adaptation and mitigation that will be guided by a country-driven approach and be based on national circumstances and priorities.”⁷ Despite this mechanism, the Chinese left Copenhagen with the lingering impression that the United States was not pulling its weight on financing and technology transfer.

Post-Copenhagen

After Copenhagen, encouraging early signs the United States and China might work together and separately to tackle climate change gave way to the reality that a legal framework for binding commitments on mitigation and adaptation will be a long, hard negotiation. The next COP in Cancun in December 2010 is not expected to provide the sought-after legal framework. It is expected to lay the base for a treaty at the next COP in 2011, shortly before the Kyoto Protocol expires in 2012. Additional multilateral and bilateral efforts must supplement efforts within the UNFCCC to break the logjam on development goals, MRV, IP concerns, and technology transfer and financing. Time is running short.

Balancing Emissions Caps And Development Goals

The International Framework

The world is getting warmer; by how much and how soon is still a matter of scientific debate. What is clear is that immediate and significant global mitigation efforts are essential. But the question of who should shoulder the burden of reducing GHG emissions, and how such reductions can—or even should—be verified, is fiercely contested. Since global climate change talks began, developed and developing countries have been sharply divided on this core set of issues. And the Copenhagen summit was the latest international effort to fall victim to the contentious issues of balancing legitimate development goals against the need for emissions in GHG reductions.

Hopes have now turned to the next COP in Cancun, Mexico in December 2010. But a UN climate change treaty will be elusive as long as the fundamental divide between

developed and developing states remains on how to share the burden of curbing emissions and how to codify those burdens.

Yvo de Boer, who will step down as head of the UN climate change secretariat on July 1, 2010, is keenly aware of the pitfalls of the burden-sharing issue in climate change mitigation. Before his announced resignation, he counseled that COP16 in Cancun should be viewed as an opportunity to establish a framework for a climate treaty with an eye towards an ultimate agreement in 2011. A treaty is simply not realistic this year, De Boer suggested, arguing that “more time was needed to establish a framework of mitigation steps, along with financial and climate change aid that can convince developing countries to support a new deal.”⁸

The basic issue can be summarized as follows: the developed world fueled its economic growth through industrialization and put significant amounts of greenhouse gases into the atmosphere, the implications of which we are dealing with today. For the most part, developed countries have taken responsibility for their decades of uninhibited emissions increases and have been willing to take the lead in combating the threat of climate change. Given the impact of industrialization, developing countries thus see the burden of climate change mitigation falling squarely on the developed world, as the developing countries’ history of industrialization, and thus climatic impact, is far less pronounced.

But the equation is changing. In 2006, China surpassed the United States as the largest carbon emitter.⁹ Future growth in carbon emissions is expected to be concentrated in the developing world, with much of the emissions coming from India and China. And thus, the developed world insists, if GHG concentrations are to stabilize, the developing world must also cut their emissions. Given the absence of widespread clean technology to fuel sustainable economic development, the major countries of the developing world contend that this assertion threatens their ability to raise living standards of their large populations.

7 Text of the Copenhagen Accord. <http://unfccc.int/resource/docs/2009/cop15/eng/107.pdf>.

8 “Yvo De Boer: Climate Change Treaty Unlikely This Year,” Associated Press, February 24, 2010. http://www.huffingtonpost.com/2010/02/25/yvo-de-boer-climate-change_n_476512.html.

9 “China now no. 1 in CO2 emissions,” Netherlands Environmental Assessment Agency dossier, June 2007. <http://www.pbl.nl/en/dossiers/Climatechange/moreinfo/Chinanowno1inCO2emissionsUSAinsecondposition.html>.

Voluntary Measures in the United States and China

In the absence of a binding international agreement on mitigation measures, both China and the United States have promised robust individual efforts to mitigate climate change. But the global financial picture and, in the United States, the domestic political climate are complicating these efforts. Both countries are investing heavily in clean energy technology and have undertaken several joint efforts on this front.⁵

But clean technology is still in its infancy. The most efficient way to halt current trends in climate change is to cap the emission of greenhouse gases, especially carbon dioxide. Many countries are taking individual voluntary actions to reduce carbon emissions or their carbon intensity—the ratio of carbon emissions to a country’s economic output—but these actions are simply not enough. A global climate change regime would require much greater reductions than those currently promised—and those promises are not legally binding.

The United States

U.S. efforts to cap greenhouse gases have widely been considered insufficient. Presidents Bill Clinton and George W. Bush both failed to submit the Kyoto Protocol to the U.S. Senate for ratification, making the United States one of the few countries to not adopt the document. The United States has therefore been free of the Protocol’s requirement for industrialized states to reduce emissions by five percent by 2012 (with 1990 levels as the baseline). Under Bush, U.S. climate change policy sought to reduce greenhouse gas intensity by 18 percent through 2012 entirely through voluntary measures. But this reduction in GHG intensity allows net U.S. GHG emissions to increase.¹⁰ And since U.S. GHG intensity has been declining for three decades, the 18 percent goal was not much of a step in reducing U.S. contributions to climate change. On the issue of actual emissions, Bush called for U.S. emissions to slow over the next decade, peak by 2025, and begin to reverse thereafter.

The Bush administration’s reluctance to acknowledge the role of human activity in accelerating climate change contributed to the perception of the United States as a hurdle to global climate-change mitigation efforts. But the Bush administration would not sign on to any agreement that gave any country (i.e. China) a “free ride.”

Barack Obama came to office with promises to renew American leadership on the issue. In his first week in office, he signaled the change coming in U.S. policy: “We will make it clear to the world that America is ready to lead. To protect our climate and our collective security, we must call together a truly global coalition. I’ve made it clear that we will act, but so too must the world. ... And that’s how we will ensure that nations like China and India are doing their part, just as we are now willing to do ours.” Speaking before the United Nations in September 2009, he said, “the United States has done more to promote clean energy and reduce carbon pollution in the last eight months than at any other time in our history.” And rather than committing to slow the growth of U.S. carbon emissions by 2025, the administration supported the more ambitious goal to reduce developed-country GHG emissions by 80 percent by 2050.

Obama’s climate change proposal calls for carbon emissions reductions of 17 percent (from 2005 levels) by 2020 and of 83 percent by 2050. A key component of the administration’s agenda is an economy-wide cap-and-trade system that includes the establishment of a price on carbon emissions. In June 2009 the House of Representatives passed a climate change bill (the Waxman-Markey bill) with 44 Democrats in opposition and eight Republicans in support. This bill matched the president’s reduction goals and provided for a cap-and-trade system in key sectors. It also provided for improved renewable electricity and energy efficiency standards and “green economy” investment of \$100 billion over ten years (compared to the \$150 billion sought by Obama). Even though it was a close vote, many thought the bill would provide a boost for global efforts going in to Copenhagen.

But a climate change bill still needs to pass the U.S. Senate, where it faces stiff opposition, not just from Republicans stinging from the health care defeat, but also from moderate Democrats in coal and manufacturing states concerned about midterm elections in November. Disagreements between Senate Republicans and Democrats over immigration reform also derailed the Senate’s alternative, “tri-partisan” climate change bill—sponsored by Senators John Kerry (D-MA), Joe Lieberman (I-CT) and Lindsey Graham (R-SC)—when Graham dropped his sponsorship, leaving the bill without a Republican backer. The Kerry-Lieberman bill, while aspiring to similar emissions targets as the House bill,

¹⁰ “Analysis of President Bush’s Climate Change Plan.”

employed a limited cap-and-trade system for some sectors (utilities in 2013, industries in 2016).¹¹

The Obama administration has implemented important steps to curb emissions independent of congressional action. It included billions of dollars in the February 2009 economic stimulus package for high-speed rail, smart grid investments, research for electric car batteries, energy efficiency research, weatherization programs, and tax credits for alternative energy. In April 2010, it instituted the first national rules to curb GHG emissions by implementing new fuel-efficiency standards on the vast U.S. automobile fleet. The new Corporate Average Fuel Efficiency (CAFE) requirement of 35.5 miles per gallon by 2016 is expected to result in a 21 percent reduction on carbon emissions from automobiles and light trucks in the United States.

These are important steps to create a greener domestic economy. But if, as many expect, the Senate does not pass climate change legislation this year, the ability of the United States to make strong international commitments in accordance with existing domestic legislation is weakened, as is its hope to regain leadership in global efforts.

China

Like the United States, China has recently made some of its most positive moves to mitigate climate change. Chinese leaders have been framing their firm commitment to economic growth in terms of sustainability. China's Eleventh Five-Year Plan, which ends in 2010, established a 20 percent carbon-intensity-reduction target over five years (although the Chinese government has expressed concern that current efforts are not enough to meet that target.)¹² China has been investing heavily in clean technology and has enacted numerous clean energy measures. An August 2009 resolution from the National People's Congress further committed China to "energy-saving and emissions reductions by promoting energy-efficient technology and products, exploiting renewable and clean energy, developing a recycling economy, and further advancing afforestation and forestry carbon sequestration." In November 2009, the State Council announced, to some surprisingly vocal internal dissent, that China would decrease its carbon intensity by 40-45 percent (from 2005 levels) by 2020. It should be noted, however, that this

reduction in carbon intensity, if achieved, would still allow for an increase in carbon emissions.

Among the highlights of China's efforts as reflected in its 2007 National Climate Change Program:

- **Clean and efficient energy legislation:** In 2005, China enacted a renewable energy law that, among other things, specifically designates wind, solar, biomass, and hydraulic power as priorities; mandates power companies to connect renewable energy to power grids; and authorizes the State Council's energy authorities to set national volume targets for development and use of renewable energy resources. The target the Chinese government has set since then is for renewable energy to constitute 10 percent of primary energy consumption by 2010 and 20 percent by 2020.
- **Methane gas projects:** The Chinese government has promoted a nationwide campaign to help farmers build household methane gas projects and comprehensive farming projects. These campaigns are meant to help farmers switch to clean power and reduce the exploitation of trees—critical for carbon capture and storage—for firewood. According to the Agriculture Ministry, as of 2008, rural household methane pools and biogas projects have produced a total of 12.2 billion cubic meters of methane per year. Total methane burned in rural areas is now equal to 18.5 million tons of coal, which would have produced more than 45 million tons of CO₂.¹³
- **Hydropower:** The Chinese government has also developed a plan to increase hydropower utilization to two-thirds of the potential (i.e. actual or rated) capacity nationwide. By the end of 2005, the installed capacity of hydropower generation accounted for 16.2 percent of total electricity generation.¹⁴
- **Nuclear energy:** China is also planning to substantially increase its nuclear industry by building nine new generators by 2011 and thirty (or more) in the next decade. By 2020, China's nuclear power share is expected to increase to five percent.
- **Clean technology:** Chinese efforts in clean technology will be explored in the next section, but by many accounts, China is becoming a leading provider of clean technology. Chinese efforts are underpinned by its 2005 Renewable Energy Law.

¹¹ For a side-by-side comparison of the administration's proposal the Waxman-Markey bill and the Kerry-Lieberman bill, please see <http://wonkroom.thinkprogress.org/2010/05/11/kerry-lieberman-short-summary/>.

¹² "China warns recovery threatens energy, emission goals," *Reuters*, April 28, 2010. <http://in.reuters.com/article/oilRpt/idINTOE63R0AK20100428>

¹³ "China's methane-burning farmers expect 'reward' from Copenhagen," *Xinhua*, December 9, 2009. <http://cdm.ccchina.gov.cn/english/NewsInfo.asp?NewsId=4094>

¹⁴ China's National Climate Change Programme, June 2007, 9. <http://en.ndrc.gov.cn/newsrelease/P020070604561191006823.pdf>.

The Copenhagen Climate Change Summit

Efforts to find compromise on climate change have become increasingly complicated as both sides have firmly dug in their heels on the issue. The United States will not sign an international agreement unless it requires measured, reported, and verifiable efforts from developing countries to curb their emissions. Meanwhile, developing countries including China argue that they lack the resources—both economic and technical—to commit to binding emissions caps and are not responsible for the current state of climate change anyway. China agrees that developing countries should also take action to fight climate change and proposed a 40 to 45 percent per-capita-GDP carbon intensity reduction target, but with no clear indication of the peak year of emissions. As recently as March of this year, Chinese officials reiterated that voluntary NAMAs should not be subject to international measurement, reporting, and verification, as this is an issue of sovereignty.

Due to these disagreements, what emerged from Copenhagen was a three-page document that set a two degree Celsius stabilization goal with no road map, binding or otherwise, to achieve that goal. The accord pledged US\$30 billion over the next three years to provide assistance for adaptation efforts in developing countries and set a longer term goal of annually raising US\$100 billion by 2020 to assist such efforts. It also asked countries to submit voluntary measures for carbon emission curbs by January 31, 2010.

On March 31, 2010, the UN climate secretariat released its report on the Copenhagen conference, noting that:

- A hundred and twelve parties have indicated their support for the accord, including the United States, China, and most other major players in the developed and developing camps.
- The UNFCCC has received 75 national pledges to cut or limit GHG emissions by 2020. These pledges together account for more than 80 percent of global emissions from energy use. Forty-one of these pledges are from developed countries. Thirty-five developing countries have submitted the NAMAs they will take, contingent on financial and technological support.

While these are positive developments the reality is that these voluntary curbs are not enough to meet the two-degree stabilization goal.

In some sense, COP15's engagement of all major players set a new direction in climate change. It is a start, but

it is not, as most have admitted, the basis for a legally binding agreement. COP15 with an engaged United States and China was a positive development, but it left many unanswered questions in need of resolution, including:

- How should contributions from Annex I¹⁵ countries be collected?
- How should targets be listed?
- Without clear targets, how will a global carbon market be established?
- Should the next round of negotiations be based on the Copenhagen Accord?

Obstacles

Among the obstacles to U.S.-China cooperation on emissions caps are:

- **Lack of a structure for MRV** that is acceptable to both developed and developing countries. The Copenhagen Accord calls for “rigorous, robust, and transparent” MRV, which China views as a concession to developed countries. But the accord calls for domestic, not international, MRV for voluntary NAMAs, potentially obscuring the transparency of unilateral efforts.
- **Lack of confidence between the United States and China** in each other's carbon reduction commitments. Many issues inhibit confidence, including:
 - A reduced sense of urgency in the United States. Recent polling data show that only 72 percent of Americans believe in global warming, down from 80 percent a year ago.¹⁶ Just 39 percent think that developed countries should contribute significant money to help developing countries mitigate their GHG emissions.¹⁷
 - The U.S. Senate. At least some U.S. allies thought that the fierce health care debate in the United States was distracting Obama from foreign policy. They breathed a sigh of relief when the health care bill passed, freeing

¹⁵ Annex I countries are the industrialized countries listed in the UNFCCC annex that committed to reduce their GHG emissions to 1990 levels by 2000. Annex I countries include the 24 original OECD states as well as the European Union.

¹⁶ Fewer Americans believe in global warming, poll shows," *Washington Post*, November 25, 2009. <http://www.washingtonpost.com/wp-dyn/content/article/2009/11/24/AR2009112402989.html>.

¹⁷ "On environment, Obama and scientists take hit in poll," *Washington Post*, December 18, 2009. <http://www.washingtonpost.com/wp-dyn/content/article/2009/12/18/AR2009121800002.html>.

Obama to turn his attention to other pressing issues. Now, however, reeling from a narrow health care defeat, many Senate Republicans have refused cooperation for the rest of the term of the 111th Congress, endangering the administration's efforts on climate change and many other issues. Cap-and-trade is unlikely to become a part of U.S. domestic legislation before Cancun. Senator Byron Dorgan (D-ND) argued that after the heavy lifting of the health care bill, the Senate would not be likely to take on the "complicated and very controversial subject of cap-and-trade, climate kind of legislation."¹⁸ Optimism that surfaced with the proposed "tri-partisan" bill was dashed when Senator Lindsey Graham withdrew his support citing disagreements with the Democratic leadership over immigration reform. And if the mid-term elections follow historical trends, they will return a Congress that is even more hostile to the president. The U.S. Senate's paralysis on climate change gives other countries—including China—a rationale to avoid further serious measures.

- A strong sense in the United States that China is simply not transparent and not serious in its efforts to curb emissions. Many in the United States believe that a regime without legally binding targets is not politically sustainable. "Developed countries who do agree to take strong action won't long accept a world in which economic competitors are allowed to free-ride with respect to CO2 emissions," said Todd Stern, the lead U.S. climate negotiator.¹⁹
- **Constraints of the UN Framework itself.** The UNFCCC has repeatedly failed to translate climate change goals into tangible reductions targets, mostly because the need to obtain agreements from 194 countries inevitably dilutes UN resolutions. The United States has therefore looked to supplement the UNFCCC process with bilateral and multilateral

discussions.²⁰ But China has consistently preferred negotiations in the UN context—in part, some in the United States argue, because the UN allows it to continue to play a developing-country role it has already outgrown. As a developing country, China can avoid requirements imposed on other states in the Kyoto Protocol, BAP, and other international agreements. For some in the United States, the Copenhagen summit highlighted how difficult the UNFCCC process is to work through.

- **The Kyoto Protocol can also be viewed as an obstacle.** The United States has consistently argued that Kyoto cannot be the way forward for global efforts on climate change, whereas China sees it as the binding framework. The U.S. Senate will not ratify any agreement that exempts developing countries from targets for emissions reduction, a key exemption in the Kyoto framework. Yvo de Boer himself has called for policymakers to honestly address the question of the future of the Kyoto Protocol—what he refers to as "the question that's on everybody's mind, but, unfortunately, on no-one's lips."²¹

Recommendations

- The United States and China have taken the critical first step to start the dialogue on climate change. They must now refine and extend this dialogue to achieve meaningful progress on the obstacles described above. A fruitful avenue could be more U.S.-China bilateral dialogues. Climate change should not be hostage to the other issues that threaten to undermine the U.S.-China relationship. If the United States and China can agree to share a key mobilizing role in bringing the major players together, there may be a better chance of finally getting beyond the issues that have slowed down climate change negotiations since the 1992 Rio Earth Summit.

18 "Senate not seen passing climate bill in 2010," Reuters, January 19, 2010. [http://www.reuters.com/article/idUSTRE60I3NA20100119?type=politicsNews%3FfeedType%3DRSS&feedName=politicsNews&utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+Reuters/PoliticsNews+\(News+US+Politics+News\)](http://www.reuters.com/article/idUSTRE60I3NA20100119?type=politicsNews%3FfeedType%3DRSS&feedName=politicsNews&utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+Reuters/PoliticsNews+(News+US+Politics+News)).

19 Todd Stern, Remarks as Prepared, Center for American Progress, June 3, 2009. http://www.americanprogress.org/events/2009/06/av/stern_remarks.pdf.

20 It is important to note, however, that the United States is not looking to reinvent a new parallel international coordination mechanism.

21 Address by Yvo de Boer, Petersberg Climate Dialogue, Koenigswinter, May 3, 2010. http://unfccc.int/files/press/statements/application/pdf/100503_speech_petersberg.pdf

- On MRV:
 - The United States and China should focus discussions on measuring, reporting, and verifying actions and policies rather than emissions. Policies are directly under the control of governments, whereas outcomes (emissions reductions or reduced carbon intensity) are not necessarily under similar control. Other factors such as economic growth come into play. Emissions targets are themselves hollow without policies in place to implement those goals, so a focus on policies rather than outcomes could be a way forward that both the United States and China would sign on to.
 - The World Trade Organization's (WTO's) Trade Policy Review Mechanism (TPRM) could provide a model. The TPRM relies primarily on countries' own submissions fed through an international analytical process. If the United States has signed on to the WTO process, which explicitly excludes any legally binding options, it could make such a concession on climate change. The fears of cheating are great, as is the free-rider problem, but a non-intrusive MRV regime that relies on self-reporting may be the best way forward.
 - Other models to consider are the voluntary mechanisms of the International Energy Agency (IEA) and the Organization for Economic Cooperation and Development (OECD). OECD countries have employed a variety of domestic and international voluntary agreements to achieve environmental goals or to limit GHG emissions. The IEA has argued that voluntary agreements are often easier and faster to implement than regulatory approaches and can lead to enhanced transparency. They do note, however, that the lack of monitoring and performance standards creates opportunities for free-riding.
 - Any MRV system that is put in place should be equitable and monitor both developed and developing countries. The current debate over MRV has focused on how to hold developing countries such as China and India accountable for their commitments to climate change mitigation. However, developing countries note that many industrialized countries have missed their emissions reduction targets un-

der the Kyoto Protocol because they did not have specific actions in place to meet those targets.

- The United States and China should communicate their underlying policy assumptions in a transparent way. For example, China's announced carbon-intensity-reduction target of 40 to 45 percent has garnered mixed reactions, in part because of uncertainty over the country's projected economic growth rate in the next decade. A high GDP growth rate would make it easier to meet the carbon intensity target, but absolute emissions could still be high. If China meets its carbon intensity target while experiencing a lower GDP growth rate, this would mean that the carbon intensity reductions have been significant. By clarifying the economic policy assumptions underpinning its carbon-intensity-reduction target, China would go a long way toward building confidence in its climate change commitments. By the same token, the United States should articulate how it will meet its emissions reduction goals without a binding domestic climate framework.

Technology Transfer

The International Framework

New cleaner technology is a crucial vehicle to mitigating climate change, both by increasing the efficiency of fossil fuels and by providing cleaner alternatives such as wind, solar, nuclear, or hydrogen power. Both developed and developing countries must employ such technology to achieve the two-degree climate-stabilization target. But many developing countries cannot afford to buy or build it. Technology transfer is the price developed countries will have to pay for a commitment from developing countries to curb GHG emissions.

In 2009, Chinese investments in clean energy technology surpassed the investments of the United States.²² China's dominant role in clean energy efforts complicates the ability of the United States and China to agree on technology transfers from the developed to the developing world in multilateral frameworks. It also makes the Chinese demand for rapid diffusion of technology a very hard sell in the United States. China's leading role in clean

²² "Who's Winning the Clean Energy Race? Growth, Competition and Opportunity in the World's Largest Economies," The Pew Charitable Trusts, 2010, 4. <http://www.pewglobalwarming.org/cleanenergyeconomy/pdf/PewG-20Report.pdf>, 4.

energy investments also means that its views on technology transfer are not necessarily the same as those of the developing world at large.

Two key questions frame the technology transfer issue: the first is how such transfers will be governed. The second is how much money will be made available, by whom, and who will decide where and how this money is spent. The multilateral frameworks that have been addressing technology transfer in the context of climate change have had little success addressing either the architecture issue or the financing issue.

The UNFCCC and subsequent agreements have prominently featured requirements for parties to cooperate on the development and transfer of GHG mitigation technologies. But these requirements have not translated into widespread technology transfers. This failure represents another key divide between developed and developing countries: regulatory and financial barriers have frustrated developing countries, while developed countries have expressed serious concerns about the protection of IP rights.

The EGTT and BAP have instituted several valuable mechanisms for technology transfers. The EGTT laid out a road map for cooperation among various stakeholders (the private sector, governments, foreign aid donors, international institutions, non-governmental organizations and academic and research institutions), including activities related to technology needs assessments, information sharing, capacity building, and mechanisms for technology transfer.

In a 2007 report, the EGTT noted, “[m]uch of the work of the EGTT to date has provided understanding of technology transfer at a conceptual level.” That is, not much had been accomplished at the practical level.

The BAP called for consideration of mechanisms that would:

- remove obstacles and provide financial and other incentives to transfer clean energy technology to developing countries;
- accelerate the deployment, diffusion and transfer of affordable technology;
- facilitate cooperation on research and development;
- promote technology cooperation in specific sectors.

The BAP also called for enhanced action on the provision of financial resources and investment to support technology cooperation on mitigation and enhancement, including “improved access to adequate, predictable and sustainable financial resources,” “positive incentives,” “innovative means of funding to assist developing country

Parties,” and “mobilizing of public- and private-sector funding and investment.”

But the BAP left the key questions unanswered, including:

- What mechanisms will be created to accelerate the deployment, diffusion, and transfer of affordable, environmentally sound technologies?
- How will these mechanisms ensure that transfers of technology are measurable, reportable, and verifiable, and meet the UNFCCC objectives of serving the needs of the least-developed countries and developing countries with particularly acute sensitivities to climate change?
- How will adequate and reliable funding for such mechanisms be secured?
- How will technology needs be identified and prioritized?
- How can impediments posed by international trade rules and IP rights be overcome to allow technology transfer at the scale and cost necessary to make a meaningful impact?
- How can cooperation on research and development of new environmentally sound technologies best be facilitated?²³

In a 2009 report, the EGTT pointed to further shortfalls in the legal framework for technology transfer, mentioning a lack of information on the resources available for the development, deployment, diffusion, and transfer of mitigation and adaptation technologies. “This is partly because there is no agreed list of technologies for mitigation and adaptation and no agreed definition of the costs that should be financed,” said the report.²⁴

U.S.-China National and Bilateral Measures

Investment in clean technologies makes sense even outside a well-articulated legally-binding framework, and there have been robust national and bilateral efforts to improve research and development in clean technologies. China and the United States are becoming fierce competi-

²³ Steve Herz, “A Clean Solution: Tackling Climate Change and Sustainable Development Through Clean Technology,” ActionAid, 2008, 4-5. http://www.actionaid.org/assets/pdf/Clean_Solution_final.pdf.

²⁴ “Recommendations on future financing options for enhancing the development, deployment, diffusion and transfer of technologies under the Convention,” Report by the Chair of the Expert Group on Technology Transfer, June 2009. <http://unfccc.int/resource/docs/2009/sb/eng/O2.pdf>

tors in this field, but they are also undertaking joint efforts to fill the growing demand for clean technology.

Chinese National Measures

“China is emerging as the world’s clean energy powerhouse,” said a recent report by the Pew Charitable Trusts. “Having built a strong manufacturing base and export markets, China is working now to meet domestic demand by installing substantial new clean energy-generating capacity to meet ambitious renewable energy targets.”²⁵

China leads the world’s major economies in clean energy investments. In 2009, China invested nearly twice as much as the United States in the clean energy economy. China has already overtaken countries in the West to become the world’s largest manufacturer of wind turbines and solar panels. Wind energy is the fastest growing component of China’s renewable energy market, which is expected to reach \$100 billion by 2020. It is also pushing hard to build nuclear reactors and the most efficient coal power plants.

In addition, China is utilizing its strengths in battery technology and its status as the world’s largest automobile market to become a leader in hybrid and electric transportation. It aims to raise its annual production capacity of hybrid and electric cars and buses to 500,000 by the end of 2011. It is the world’s leader in electric scooters and bicycles. It is also building the largest high-speed rail network in the world. Other efforts include the development of smart grid technology and energy-efficient lighting and appliances.²⁶

By 2020, the Chinese government hopes to derive 20 percent of its energy from renewable sources. However, the overwhelming majority of its energy would still come from coal—an energy source that is expected to remain toxic and will contribute to continued growth in Chinese GHG emissions. A move away from coal is not imminent: China has made energy affordability “a priority over resource conservation or technological innovation.”²⁷

Other challenges exist as well. China has not been able to produce wind turbines larger than 1.5 megawatts. Chinese expertise is lacking in several areas, including

regulation, management, standards, monitoring, and high-tech design and manufacturing. China also lacks the experience and necessary frameworks to develop a smart grid, which has impeded the connectivity of solar and wind power to a grid.²⁸

Financing is another challenge. The Chinese government has attempted to secure diverse sources of financing, including green credit from banks, energy management companies, the Clean Development Mechanism under the Kyoto Protocol, and joint initiatives with global financial institutions such as the International Finance Corporation’s China Utility-Based Energy Efficiency Finance Program. Unfortunately, these attempts have achieved limited success. China still has a long way to go in raising the estimated 40 to 45 trillion yuan (US\$5.9 to 6.6 trillion) needed by 2030 to finance China’s green economy.²⁹

U.S. National Measures

The United States has recently strengthened its efforts to invest and innovate in clean technology, due to both environmental and economic concerns. In a February 2010 speech, President Obama said: “If we fail to invest in the technologies of tomorrow, then we’re going to be importing those technologies instead of exporting them. ... We will fall behind. ... And that’s not a future that I accept.”³⁰

Despite the United States’ continued dominance in venture financing and technology innovation, U.S. investment in clean technology was battered by the economic downturn—its 2009 investment in clean energy (US\$18.6 billion) was a drop of 42 percent from 2008.³¹ Tight credit and uncertain prospects for a Senate climate change bill are adding to concerns about U.S. investment and innovation, creating uncertainties for public-sector initiatives to promote cleaner energy. The 2009 American Recovery and Reinvestment Act (widely known as the stimulus act) provides subsidies and long-term production and investment tax credits to key renewable energy industries, including nuclear, solar, wind, and next-generation biofuels. According to the Pew Charitable Trusts, the 2009 stimulus tax credits for wind and solar energy salvaged what would

25 “Who’s Winning the Clean Energy Race,” 7.

26 “From Crisis to Opportunity - How China is addressing climate change and positioning itself to be a leader in clean energy,” Natural Resources Defense Council, revised July 29, 2009. http://www.nrdc.org/international/Chinacleanenergy/files/China%20Clean%20Energy%20FS_web.pdf.

27 David Wendt, “Clean Coal: U.S.-China Cooperation in Energy Security,” EastWest Institute, August 2008, 4. <http://docs.ewi.info/Publications/CleanCoalEng.pdf>.

28 Changhua Wu, “China’s Clean Revolution,” Hands on China Report, J.P. Morgan, December 7, 2009, 3. <http://www.jpmorgan.com/directdoc/HOC7Dec09.pdf>.

29 “China’s Clean Revolution,” 3.

30 “Obama offers loan to help fund two nuclear reactors,” Washington Post, February 17, 2010. <http://www.washingtonpost.com/wp-dyn/content/article/2010/02/16/AR2010021601302.html>

31 “Who’s Winning the Clean Energy Race?” 49.

otherwise have been a “disastrous” year for U.S. clean energy investments.³²

U.S. clean technology investments are expected to rise, especially as one-third of the clean energy funds from ARRA are slated to be spent in 2010. Other clean energy measures are also underway. The president’s FY2011 budget includes “an expanded commitment to global change research as part of a government-wide effort to mitigate U.S. greenhouse gas emissions and move toward a clean energy economy.”³³ The U.S. Global Change Research Program,³⁴ established by congressional mandate, has enjoyed new attention and new appropriations after several years of stagnant or declining funds. Its FY2011 budget provides for a 21 percent increase over the 2010 enacted level.

Part of President Obama’s “Strategy for American Innovation,” which is meant to address perceptions that the United States is falling behind other countries in the innovation race, provides support for “transformational” clean energy research. The FY2011 budget includes funding for research and development to “support renewable energy and energy efficiency technologies such as advanced batteries, solid-state lighting, solar, biomass, geothermal, and wind power.” It aims to fund projects to develop coal-fueled power systems, carbon capture and storage technologies, nuclear energy and bioenergy research.³⁵

The 2005 Energy Policy Act also contained several clean energy provisions. It promoted the use of renewable energy sources by providing tax credits for wind, solar, and biomass energy, including the first-ever tax credit for residential solar energy systems. It also expanded research on hydrogen technologies, established a national Renewable Fuels Standard to encourage greater use of renewable fuels and authorized funding for new clean coal technology.³⁶

The bill had a heavy emphasis on nuclear power. It created the Nuclear Power 2010 Partnership between government and industry to start building new nuclear

power plants in the United States. It also offered federal risk insurance for nuclear power-plant builders as well as subsidies for research, waste reprocessing, construction, operation, and decommission. Obama has continued to focus on nuclear energy, and has proposed tripling the loan guarantees of the 2005 energy policy to \$54.5 billion, an amount that is expected to help spur the construction of seven to ten new nuclear power reactors.³⁷

Bilateral Measures

Besides cooperation at the UN, the United States and China have worked together in multilateral forums, most notably the Asia Pacific Partnership on Clean Development and Climate, to promote the adoption of clean energy technologies and build the capacity to utilize these technologies. Encouragingly, numerous U.S.-China bilateral frameworks for energy and environmental cooperation have also incorporated the joint research, development, and deployment of clean technologies. Key initiatives implemented before 2009 include:

- The 31-year-old U.S.-China Science and Technology Agreement, which has resulted in several protocols to promote technical cooperation on fossil energy, renewable energy, and energy efficiency.
- The Energy Policy Dialogue, established in 2004, which has facilitated policy exchanges on development and deployment of renewable energy technology.
- The Ten-Year Framework on Energy and Environmental Cooperation (TYF), established in 2008, which seeks to foster cooperation on several fronts: clean, efficient, and secure electricity production and transmission; clean water; clean air; clean and efficient transportation; conservation of forest and wetland ecosystems; and energy efficiency. A key aspect of this action plan is technical cooperation.
- The U.S.-China Peaceful Uses of Nuclear Technology Agreement, signed in 1998, which facilitates exchanges, research, and development concerning nuclear energy and nuclear non-proliferation technologies.
- Cooperation on clean energy technology for the 2008 Beijing Olympics. In 2004, the U.S. Department of Energy (DOE) and China’s Ministry of Science and Technology developed the “Protocol for Cooperation

32 “Who’s Winning the Clean Energy Race?” 49.

33 “A New Era for Research on Climate and Global Change: The U.S. Global Change Research Program in the 2011 Budget,” Office of Science and Technology Policy, Executive Office of the President, February 1, 2010. <http://www.whitehouse.gov/sites/default/files/climate%2011%20final.pdf>.

34 THE GCRP does not focus solely on researching clean energy technology—its mandate is to assist the government and society to understand, predict, project, mitigate, and adapt to climate change. Increased resources for the GCRP are indicative of enhanced efforts to move towards a clean energy economy.

35 “Technology Investments to Spur Economic Growth Technology Highlights in the 2011 Budget,” Office of Science and Technology Policy, Executive Office of the President, February 1, 2010. http://www.whitehouse.gov/sites/default/files/Tech%2011Budget_FactSheetupd.pdf

36 “Fact Sheet: President Bush Signs Into Law a National Energy Plan,” August 8, 2005. <http://georgewbush-whitehouse.archives.gov/news/releases/2005/08/20050808-4.html>

37 Obama offers loan to help fund two nuclear reactors.” *Washington Post*, February 17, 2010. <http://www.washingtonpost.com/wp-dyn/content/article/2010/02/16/AR2010021601302.html>

in Clean Energy Technologies for the 2008 Summer Olympic Games in Beijing,” also known as the Green Olympics Protocol, where DOE provided technical support to promote green technologies. The United States and China also created a Joint Working Group, which identified ten areas for cooperation: natural-gas technology; combined cooling, heating and power; clean coal; hydrogen and fuel-cell vehicle demonstration; environmentally friendly buildings; urban transportation; air quality; water quality; solar photovoltaics (PV); and a Beijing-Chicago Friendship Cities Initiative to promote local environmental activities.

The Obama administration pushed climate change and clean energy cooperation to the top of the bilateral agenda. In a relatively short period of time, China and the United States have signed concrete agreements promoting bilateral cooperation in this area, including:

- The July 2009 Memorandum of Understanding to Enhance Cooperation on Climate Change, Energy and the Environment. The memorandum refers to cooperation between the United States and China as “critical to enhancing energy security, combating climate change, and protecting the environment and natural resources.” The two countries agreed to cooperate “where joint expertise, resources, research capacity and combined market size can accelerate progress towards mutual goals.” These goals include:
 - Energy conservation and energy efficiency;
 - Renewable energy;
 - Cleaner uses of coal and carbon capture and storage;
 - Sustainable transportation, including electric vehicles;
 - Modernization of the electrical grid;
 - Joint research and development of clean energy technologies;
 - Clean air;
 - Clean water;
 - Natural resource conservation, e.g. protection of wetlands and nature reserves;
 - Combating climate change and promoting low-carbon economic growth.

This bilateral cooperation is to be facilitated through a range of mechanisms, including the TYF, the formation of a Climate Change Policy Dialogue and Cooperation platform, and regular bilateral consultations.

- The U.S.-China Clean Energy Announcements of November 2009. They included the establishment of the U.S.-China Clean Energy Research Center

that will facilitate joint research and development of clean energy technologies. Initial research priorities are to build energy efficiency, clean vehicles, and clean coal, including carbon capture and storage. Other aspects of the announcement included an electric-vehicle initiative, an energy efficiency action plan, a renewable energy partnership, 21st Century Coal, and an Energy Cooperation Program.³⁸

- The U.S.-China Joint Commission on Commerce and Trade (JCCT), at its 20th meeting in October 2009, began to overcome several obstacles to greater clean energy cooperation between the two countries. China agreed to remove local content requirements on wind turbines. The two countries also announced the launch of the Energy Cooperation Program (ECP), “a public-private partnership focused on commercialization of clean energy solutions.”³⁹

Such efforts have led to some concrete progress on clean energy technology cooperation, particularly in the form of private-public partnerships. For example, the Taiyanggong geothermal power plant, built in the run-up to the 2008 Beijing Olympics, is the first tri-generational facility in Beijing’s city center and has been hailed as a showcase for cooperation between U.S. and Chinese companies.⁴⁰ Under the TYF, local “EcoPartnerships” have been formed involving U.S. and Chinese companies, governments, and universities to develop technologies relating to hybrid cars, clean coal, wind energy, clean air and water, among other green initiatives. China has also awarded U.S.-based Westinghouse a \$5.3 billion contract to build four nuclear reactors, a step towards China’s goal to have nuclear power account for five percent of its power-generating capacity.

Copenhagen

The Copenhagen conference did not produce the binding legal framework many had hoped for. Still, there were some glimmers of progress in the issue of technology transfer.

The Copenhagen Accord reiterated the need for technology transfers mentioned in the Bali agreement and finally specified a dollar amount in the call for “scaled up,

38 Fact sheets on each of these initiatives are available at <http://www.whitehouse.gov/the-press-office/us-china-clean-energy-announcements>.

39 Fact Sheet: U.S.-China Joint Commission on Commerce and Trade, October 29, 2009, http://www.commerce.gov/s/groups/public/@doc/@os/@opa/documents/content/prod01_008570.pdf.

40 It should be pointed out, however, that with the spotlight from the Olympics gone, this project is struggling to break even, even with \$12 million in 2009 from the UN’s Clean Development Mechanism. See http://www.economist.com/displaystory.cfm?story_id=14678515.

new and additional, predictable and adequate funding as well as improved access.” In the short term, developed countries agreed to provide US\$30 billion for adaptation and mitigation assistance through 2012. They additionally committed to mobilizing US\$100 billion a year by 2020 to address the needs of developing countries. This funding will come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance. This figure is not considered sufficient for wholesale change, and the details of the financing regime are still undefined, but it is a good start. Also positive is the creation of a high-level panel that will look for alternative sources of funding.

But there is much that Copenhagen did not do, as Yvo de Boer pointed out. The UNFCCC needs to set the parameters for finance, identify countries and issues that should receive priority support, and determine how support should be provided, for example in the context of NAMA strategies.⁴¹

Obstacles

Despite recent advances, technology transfer still remains a sensitive issue in bilateral climate change cooperation and impedes multilateral efforts within the UNFCCC framework. Among the obstacles to technology transfer:

- **Energy protectionism:** Some Chinese experts are concerned by what they see are signs of “energy protectionism” from the United States. For example, Senator Charles Schumer (D-NY) called on the Obama administration to block the use of stimulus funds for a U.S.-China joint-venture wind farm project in west Texas, citing concerns that the venture would generate more jobs in China than it would in the United States. The global economic downturn and perceptions of China as the United States’ main economic competitor means that barriers for Chinese companies into U.S. markets may continue to increase.
- **Regulatory and trade barriers:**
 - The U.S. Department of Commerce controls exports of certain “sensitive” dual-use technologies to China (among other countries). Export controls influence the ability of the United States and China to cooperate on

emissions reductions. Many clean-energy technologies are subject to export controls, including nuclear technologies, carbon fiber materials for wind turbines, and technologies for the production of solar cells. Further, U.S. space and satellite export controls may limit the ability of China and other countries to undertake environmental monitoring from space.

- Access to education in the United States is limited. Since September 11, 2001, the United States has tightened the availability of visas, in effect denying many foreign students and scholars access to the strong U.S. educational system and research and collaborative opportunities. This, in turn, hampers China’s ability to develop a stronger cadre of engineers and scientists who can help innovate clean technology.
- U.S. companies also chafe at barriers to accessing China’s fast-growing clean energy market. Such barriers include local content requirements for wind turbines (although China has announced it would scrap these requirements) and solar equipment, restrictions on foreign direct investment that includes biofuels manufacturing, effective tariffs on clean coal technology, and a government procurement process that U.S. companies still find too opaque, despite recent Chinese efforts that appear aimed at leveling the playing field for domestic and foreign companies.⁴²
- **Political barriers and competitive concerns:** Many in China believe that U.S. companies are seen as holding back on first-tier technologies to protect their ability to compete in global markets. The Chinese stress the urgent need for transfer of affordable low-carbon technology and technical capacity from the United States to China in order to avoid the detrimental lock-in effects of China’s current energy-intensive economy. However, many in the United States do not see China as a developing

41 “De Boer: UN climate deal ‘possible in 2011,’” EurActiv.com, March 25, 2010. <http://www.euractiv.com/en/climate-environment/unfccc-chief-urges-eu-show-climate-leadership-moving-funding-news-376558>

42 For example, in April 2010, the Ministry of Science and Technology published new draft rules on its Indigenous Innovation Scheme, eliminating prior provisions that gave preference to companies adopting domestic IP in the bidding of government procurement projects. The old provisions, which were passed in November 2009, generated strong objections from the international business community that foreign firms could be shut out of a government procurement market worth \$85 billion a year. “China: Government Rewrites Rules On Procurement,” *China Sourcing News*, April 15, 2010. <http://www.chinasourcingnews.com/2010/04/15/142135-china-government-rewrites-rules-on-procurement/>

country in need of U.S. assistance. Fifty-one percent of Americans see China as a military threat and 71 percent see it as an economic threat.⁴³ And a third of Americans view China as the world's leading economic power.⁴⁴ China's clean energy progress is viewed by some as a model and by others as a threat. In his 2010 State of the Union speech, President Obama warned that the United States was at risk of falling behind: "From the first railroads to the interstate highway system, our nation has always been built to compete. There's no reason Europe or China should have the fastest trains, or the new factories that manufacture clean energy products."

- **China's IP regime:** Despite improvements in IP protection in China over the years, concerns remain over China's spotty enforcement record, as well as national measures that favor "indigenous innovation." (See the next section for an expanded discussion of the role of IP in technology transfer.)
- **Differences in U.S. and Chinese views on technology transfer:** For some in the United States, technology transfer means helping build indigenous capacity in other countries. The Chinese view tends to favor outright transfer of existing technology. The disparity of U.S. and Chinese views contributes to the differences over about the role of financing in technology transfer and has serious implications for the United States' IP concerns. It reinforces the notion that the United States and China are, in several areas, bringing different but unarticulated assumptions to the table.

Recommendations

- The United States and China should use the climate change imperative as an opportunity to promote bilateral cooperation and break through existing barriers to technology transfer. There are some promising signs: Commerce Secretary Gary Locke's comments since the October 2009 JCCT indicate that the United States sees clean energy technology cooperation as an opportunity to strengthen the bilateral relationship. And as the United States seeks to increase its exports, Locke has stated that

promoting access to China's energy market will be a focus of U.S. trade policy on China. In May 2010, he led a U.S. trade mission to China to promote U.S. technologies in clean and efficient energy.

- Both countries should confront barriers to bilateral trade and overcome perceptions that their markets are not open to investment. A possible course is the promotion of more joint ventures between U.S. and Chinese firms in key clean technology areas such as carbon capture and storage, energy storage for intermittent renewables, and concentrated solar power.
- The United States and China should sponsor joint research between U.S. and Chinese scholars. Part of this endeavor should be an increase in the number of U.S. visas available to foreign scholars and experts, perhaps highlighting clean technology as a priority area of study. The newly-established U.S.-China Clean Energy Research Center also presents opportunities for greater research collaboration.
- The United States and China should work with other countries to use the Cancun meeting to lay the groundwork for clearer articulation of obligations and expectations relating to technology transfer and financing. Developing countries must clearly communicate their technological and financial needs. They must further specify how fulfillment of these needs will impact their ability to reach domestic climate change goals. Developed countries should clarify specific arrangements for financial and technical support for climate change mitigation and adaptation. Such a clarification of expectations would enable developed and developing nations to start collaborating on IP rights, transparency, accountability, and other barriers that are slowing negotiations.

IP Rights And Technology Transfer

The International Debate

The verdict appears to be mixed on the degree to which IP concerns affect the effectiveness of clean-energy technology transfers. The World Resources Institute cites past studies, such as those conducted by Copenhagen Economics and the IPR Company and by John H. Barton, which have concluded that IP rights in itself may not be a

⁴³ "Americans see China as economic threat," CNN, November 17, 2009. <http://www.cnn.com/2009/US/11/17/obama.china/index.html>.

⁴⁴ Pew Global Attitudes Project, Key Indicators Database, 2009. <http://pew-global.org/database/?indicator=17&survey=10&response=China&mode=chart>

significant barrier to the transfer of a range of technologies including carbon-abatement, solar PV, biofuels, and wind energy technologies.⁴⁵ A 2006 UNFCCC report concluded that IP issues were not among the major economic and market barriers to the transfer of environmentally sound technologies to developing countries.⁴⁶ On the other hand, the Climate Technology Initiative, the IEA and the United Nations Environment Program have compiled detailed case studies that include the lack of protection of IP rights in some developing countries among the most significant obstacles to the successful transfer of climate-friendly technologies.⁴⁷ Yet, several experts are of the view that IP rights per se are not sufficient deterrents or facilitators of technology transfer; more important factors include infrastructure, absorption capacity (including human capital), and governance.⁴⁸

Nevertheless, IP remains a polarizing issue. In the developing world, IP rights are seen as a barrier to technology transfer due to higher prices of patented technologies. In most of the developed world, they are viewed as a catalyst for technology transfer; they promote technological innovation by protecting IP owners' rights and build confidence in joint ventures and licensing arrangements. In the United States, for example, lawmakers are evidently alarmed about the prospect of weakening American IP owners' rights in any international climate change treaty. On June 10, 2009, the House passed an amendment to the House Foreign Relations Authorization Act for Fiscal Years 2010 and 2011 (H.R. 2410), stating that "the policy of the United States, with respect to the UN Framework Convention on Climate Change, shall be to prevent any weakening of, and ensure robust compliance with and enforcement of, existing international legal requirements for the protection of intellectual property rights, related to energy or environmental technologies." On December 17, 2009, while the Copenhagen talks were ongoing, Senator

Kirsten Gillibrand (D-NY) introduced a bill calling for the protection of IP rights for energy and environmental technologies in any global climate treaty.

Much of the debate on IP and climate change has revolved around calls for exceptions to IP protection principles under the WTO Agreement on Trade Related Intellectual Property Rights (TRIPS Agreement), in order to facilitate the transfer of clean technologies.⁴⁹ Proponents of TRIPS flexibilities in the context of climate change point to precedence in the public sector with public health and pharmaceuticals. The Doha Declaration on TRIPS and Public Health reaffirmed the right of member states to use flexibilities built into the TRIPS Agreement, including compulsory licensing and parallel importing; extended exemptions on pharmaceutical patent protection for least-developed countries until 2016; and led to legal changes that would make it easier for countries to import cheaper generic medicines made under compulsory licensing if they were unable to manufacture medicines themselves.

There is however a difference between patents for pharmaceuticals and those for climate technologies. According to a report by the Brookings Institution: "Japan and the EU argue that while there is generally only one patent per pharmaceutical product, climate change mitigation technologies almost always require numerous patents held by many different firms. Also, the climate change abatement technology market is relatively substitutable: generally there is only one drug that can provide a particular medical benefit, compared to the abundant competition for similar clean energy products. For example, a recent market research study found 47 different solar

45 Deborah Seligsohn, Lutz Weischer, Shane Tomlinson and Pelin Zorlu, "Key Functions for a UNFCCC Technology Institutional Structure: Identifying Convergence in Country Submissions," World Resources Institute, November 2009, 14-15. http://pdf.wri.org/working_papers/key_functions_for_a_unfccc_technology_institutional_structure.pdf.

46 "Climate Change, Technology Transfer and Intellectual Property Rights," International Centre for Trade and Sustainable Development (ICTSD), August 2008, 4. http://www.iisd.org/pdf/2008/cph_trade_climate_tech_transfer_ipr.pdf.

47 "Climate Change – The Technology Challenge," WIPO Magazine, March 2009. http://www.wipo.int/wipo_magazine/en/2009/02/article_0003.html.

48 Charles Ebinger and Govinda Avasarala, "Transferring Environmentally Sound Technologies in an Intellectual Property-Friendly Framework," Brookings Energy Security Initiative, Policy Brief 09-08, November 2009, 10. http://www.brookings.edu/~media/Files/rc/papers/2009/11_environmental_technology_ebinger/11_environmental_technology_ebinger.pdf.

49 The TRIPS Agreement itself does not differentiate between climate-related and non-climate-related technologies, although it has several provisions for technology transfer. For example, Article 7 states that "(t)he protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations." Article 8 allows member states to adopt measures "to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development" (Art. 8.1), as well as to prevent the abuse of IP rights "which unreasonably restrain trade or adversely affect the international transfer of technology" (Art 8.2). These measures should, however, be consistent with TRIPS requirements. Article 66 recognizes the special needs of least-developed country members: Such members are not required to implement the provisions of the TRIPS agreement until 2013 based on "their need for flexibility to create a viable technological base" (Art 66.1) and thus have access to a range of channels for technology transfer. In addition, developed country members of the WTO are required to "provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members" (Art 66.2).

panel manufacturers.”⁵⁰ In addition, Barton’s study on the solar, biomass and wind sectors found that most basic technologies in those sectors are off-patent; only specific improvements or features added over time are patented.⁵¹

Other proposals relate to financing schemes. For example, when the mandate of the EGTT expired at COP12 in Nairobi, developing countries suggested replacing it with a multilateral technology acquisition fund to buy out IP rights and facilitate technology transfer. Developed countries vehemently objected to the proposal.

In November 2009, the COP preparatory meeting in Barcelona produced a “non-paper no. 47” that recommended, among other things, the creation of a Global Technology IP Rights Pool for Climate Change to promote developing countries’ access to IP on non-exclusive, royalty-free terms; sharing publicly-funded technologies on a royalty-free basis; excluding from or revoking IP protection on adaptation and mitigation technologies in developing and least-developed countries; and allowing developing countries to use the full flexibilities in the TRIPS Agreement, including compulsory licensing. “Non-paper no. 47” formed the basis of intense, heated debate on IP during the first week of the Copenhagen climate talks. Eventually, IP was excluded from the final accord. This reflected the ongoing divide between developing and developed countries: The former wanted explicit language on IP in the Copenhagen accord under the functions of the Technology Mechanism. The latter preferred no mention of IP in any text relating to technology due to concerns that disagreements over IP would stall talks.⁵²

IP Obstacles to U.S.-China Technology Transfer

On the bilateral front, IP concerns relate primarily to China’s IP enforcement record and other national measures. Since joining the WTO in 2002, China has taken concerted steps to improve its IP system in line with its TRIPS obligations. Such efforts include a national IP

strategy, an annual white paper on China’s IP protection efforts, lowered criminal liability thresholds for counterfeiting, joint training and exchanges with other countries including the United States (under the auspices of the JCCT and elsewhere), and public awareness campaigns to promote a respect for IP rights. In the area of clean energy, the Chinese government is encouraging government ministries to incorporate innovation and diffusion of adaptation and mitigation technologies in the implementation of the national IP strategy; providing financial support to patent applicants for such technologies; using China’s 42 patent exhibition and trading centers to promote the commercialization of these technologies; and strengthening IP training for green enterprises.⁵³

Despite these efforts, the United States and other countries continue to voice concerns over the inadequate enforcement of patent and licensing rights in China. These concerns translate into worries by foreign investors about whether their IP rights will be sufficiently protected when they enter into joint ventures with Chinese companies. And while the Chinese government has recently unveiled draft rules—apparently aimed at assuaging concerns of foreign investors regarding national measures that favor “indigenous innovation”—the latest Special 301 Report by the Office of the United States Trade Representative, released two weeks after the publication of the new draft rules, states that the United States is “deeply troubled” by such policies that may unfairly disadvantage U.S. rights holders.⁵⁴

Recommendations

Because IP remains a divisive issue in climate negotiations, recommendations to address IP in the context of technology transfer will continue to incite debate and disagreement. Nevertheless, there is an obvious need to determine how IP can be adequately addressed in a way that would facilitate progress on a post-2012 international framework on climate change. Recommendations include:

⁵⁰ Ebinger and Avasarala, 7-8.

⁵¹ John H. Barton, “Intellectual Property and Access to Clean Energy Technologies in Developing Countries: An Analysis of Solar Photovoltaic, Biofuel and Wind Technologies,” International Centre for Trade and Sustainable Development (ICTSD), December 2007, viii. http://ictsd.org/downloads/2008/11/intellectual-property-and-access-to-clean-energy-technologies-in-developing-countries_barton_ictsd-2007.pdf.

⁵² “Tough Talks on IP In Technology Paper At Copenhagen; No Mention In Latest Draft,” Intellectual Property Watch, December 14, 2009. <http://www.ip-watch.org/weblog/2009/12/14/tough-talks-on-ip-in-technology-paper-at-copenhagen-no-mention-in-latest-draft/>.

⁵³ Li Yuguang, “Policy Assessment for Adaptation and Mitigation Technologies—A Close Look at the Role of IP System,” (speech at Conference on Intellectual Property and Public Policy Issues, Panel discussion: Adaptation and Mitigation Technologies: Towards a Global Needs Assessment for National and International Policies), July 13, 2009. http://www.wipo.int/meetings/en/2009/ip_gc_ge/presentations/li_yuguang.html.

⁵⁴ 2010 Special 301 Report, Office of the United States Trade Representative, April 30, 2010, 19. http://www.ustr.gov/webfm_send/1906.

- Promote further discussions, especially among industry, to build confidence in the role of IP in promoting clean energy technology transfer;
- Consolidate at all levels the many IP discussions in various forums, including business groups, governments, and intergovernmental organizations;
- The United States and China should commit to seriously addressing IP in both bilateral forums and the COPs. Continued neglect of IP concerns, especially in multilateral forums, ultimately means that core technology transfer issues will remain unresolved.

Conclusion

To many, COP15 at Copenhagen was a significant disappointment in efforts to build a legal framework for global efforts to mitigate and adapt to the effects of climate change. Expectations had been raised that the United States and China—who must lead in the process—would be able to find previously elusive common ground given recent positive trends domestically and in the bilateral relationship. But despite the setback, there are some positive takeaways from the latest COP:

- Most countries present supported an accord, even if it provides an insufficient basis for a legally binding agreement.
- Developing countries had a significant voice in the process. In fact, some argue that the only reason the Copenhagen summit managed to produce any sort of accord at all is that Brazil, South Africa, India, and China managed to work with the United States to hammer out a compromise (but weak) document.
- The accord provides an opportunity for developing countries to make commitments to curb their GHG emissions. Although such voluntary mitigation efforts would only be subject to domestic MRV, these commitments are to be compiled and progress communicated through national communications every two years on the basis of guidelines to be adopted by the Conference of the Parties.
- There is a greater awareness that U.S. and Chinese engagement is a necessary, but not sufficient, condition for a revitalized global climate change process.
- Copenhagen represented a new direction in global climate change talks in that all major countries were involved. The conference firmly positioned China, somewhat to its discomfort, as a central player on a major global issue. A more prominent role for China is crucial to global efforts, but this increased

prominence has also highlighted the gap between the obligations that China is willing to undertake and those that others expect it to undertake.

Also clear were the deep divisions between developed and developing countries. There will be no consensus any time soon on many core issues and details. Nevertheless, efforts are ongoing to facilitate progress following Copenhagen, and there have been encouraging signs on some other issues. For example, the May 2010 meeting of environmental ministers at the Petersberg Climate Dialogue has led to the possibility of a final agreement on reforestation and technology transfer in time for COP16 in Cancun.⁵⁵ And in the run-up to Cancun, China and other developing countries see the possibility for progress in these and other areas, including fast-start financing; an adaptation framework; and a program to measure and verify developed-country commitments to support finance, technology, and capacity-building. They are also calling for a legally binding outcome by COP16 this year, or next year at the latest. However, international expectations have been deflated, and some are warning, perhaps most prominently the current executive secretary of the UNFCCC, that the earliest we should expect a legally binding framework is COP17 in 2011.

The deadlock at Copenhagen covered familiar ground and is, at its most basic, reflective of unresolved differences between the United States and China over their respective obligations to mitigate and adapt to climate change.

Copenhagen also engendered some bitter feelings between the United States and China. China reacted angrily to the perception by some countries that it had placed too many obstacles in the way. In China, there was a perception that China had in fact made significant concessions, especially on MRV, and that the United States had emerged, for lack of a better term, as “the winner” at Copenhagen. China had sought a new agreement based on the Kyoto Protocol and the BAP.

The much-publicized disagreements in Copenhagen and the rising bilateral tensions in the following months have not helped matters much. The two countries have already stated in no uncertain terms their common commitment to fighting the effects of climate change and to the UN process. They should now commit to confidence-building measures that will bring them closer to reaching a

⁵⁵ “Germany, Mexico Call Climate Change Meeting Helpful,” *Associated Press*, May 6, 2010. <http://www.npr.org/templates/story/story.php?storyId=125757736>

common understanding on MRV and other issues, including technology transfer, financing, and IP.

Many of these issues need to be addressed well before Cancun—both within the UNFCCC and also bilaterally between the United States and China. Copenhagen demonstrated that vigorous bilateral efforts must supplement the multilateral framework. Both sides must continue to maintain open channels of communication and engage in honest discussions about each other's underlying assumptions. And they should do all this despite the political twists and turns that affect the bilateral relationship on an ongoing basis. Some positive overtures, including those that seek to break through barriers to bilateral technology

transfer, are encouraging. They would be even more so if translated into positive action at the UNFCCC.

Meanwhile, it should be noted that there continues to be a mixed view of the role of these two countries in global discussions on a new climate framework. On the one hand, their critical role is recognized; on the other hand, other countries may be wary of the prospect of a "G2 deal" at the exclusion of others. Many have expressed skepticism over the fact that the Copenhagen Accord was based on a draft agreed upon by China, the United States, and a handful of large developing countries. U.S.-China confidence building, essential as it is, will have to be a part of a global effort.

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Forging Collective Action for a Safer and Better World

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