

Gathering Momentum for U.S.-China Cooperation on Climate Change

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*Steve Wolfson**

The U.S. and China lead the world in Greenhouse Gas (GHG) emissions, accounting for more than 40% of world-wide energy-related emissions. The need for the U.S. and China to find common ground on addressing climate change is gaining increasing attention, and there is now hope for reversing the stalemate in which each country blames the other for its lack of stronger action. This article examines recent reports suggesting ways that the U.S. and China can cooperate to address climate change, highlighting common themes including 1) elevating the issue and re-framing it as reform towards a new clean energy economy, 2) mitigating coal emissions through technological improvement and increasing use of renewable energy sources, and 3) strengthening capacity for environmental governance and quantifying GHG emissions. The article examines how such cooperation can contribute towards finding common ground in multilateral negotiations. In particular, the article reviews the current constraints on effective implementation of environmental policy in China and opportunities for enhanced cooperation to contribute to overcoming these constraints. While the U.S. and China view the need to control GHG emissions differently, there has recently been evolution in both countries' views and there are signs of momentum for finding common ground on cooperative activities that could enhance the prospects for successful completion and implementation of an international agreement.

I. INTRODUCTION

The vital importance of the U.S. and China, the world's leading emitters of Greenhouse Gases (GHGs), finding common ground is gaining increasing attention. A flurry of recent reports address how the U.S. and China can cooperate to address climate change. These reports suggest the outlines of a break from the pattern of the U.S. and China both pointing to each other to justify not taking more robust steps,¹ and a possible path forward. The importance of such cooperation is underlined by the fact that the U.S. and China combined account for more than 40% of worldwide energy-related GHG emissions.²

This article first discusses the lens through which China approaches climate change. It next examines U.S. views on China and climate change. Recent evolution in both is noted. The article then examines the actions China has taken or planned to address GHG emissions. Common themes regarding U.S.-China climate change cooperation in recent reports from The Brookings Institution, Pew Center on Global Climate Change / Asia Society, the Natural Resources Defense Council, and McKinsey & Company are considered next. The common themes considered include elevating and reframing of the climate change issue, lowering coal emissions through

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¹ See, e.g., William Chandler, *Breaking the Suicide Pact: U.S. – China Cooperation on Climate Change*, 1 (Carnegie Endowment for Int'l Peace, Policy Brief No. 57, 2008), available at <http://www.carnegieendowment.org/events/?fa=eventDetail&id=1125&prog=zru> (last visited May 20, 2009) (the U.S. and China each refuse to act before the other, yet U.S.-China cooperation is *the* critical step towards addressing climate change).

² Kenneth Lieberthal and David Sandalow, *Overcoming Obstacles to U.S. – China Cooperation on Climate Change*, 1 (The Brookings Institution, 2009) (hereinafter *Brookings Report*), available at http://www.brookings.edu/reports/2009/01_climate_change_lieberthal_sandalow.aspx (last visited May 20, 2009). While the U.S. emits far more GHGs per capita than China, and has much higher cumulative emissions over time, China recently passed the U.S. as the world's leading emitter and the GHG intensity of China's economic production is far higher. *Id.* at 46.

technological improvement and increasing use of renewable energy sources, strengthening capacity for environmental governance and quantifying GHG emissions, and the importance of a green stimulus. The article then discusses the relationship of bilateral cooperation to multilateral negotiations. Finally, the obstacles posed by a variety of constraints on effective implementation of environmental policy in China are considered, and some options for enhanced cooperation to contribute to overcoming these obstacles are proposed.

A report issued by the Brookings Institution³ (hereinafter “the Brookings Report”) sets forth a plan to “promote far greater U.S.-China cooperation on climate change and clean energy along lines that realistically take into account Chinese leaders’ perceptions and concerns, and enhance their capabilities to achieve their goals”⁴ and notes some of China’s views and constraints in terms of controlling GHG emissions.⁵

A report from the Asia Society Center for China-U.S. Relations and the Pew Center on Global Climate Change⁶ (hereinafter “the Pew / Asia Society Report”) “explicates both a rationale and an outline for beginning a more comprehensive program of U.S.-China collaboration on energy and climate change” and outlines some “critical project areas that should be jointly explored.”⁷

A report by the U.S.-based environmental NGO the Natural Resources Defense Council⁸ (hereinafter “the NRDC Report”), noting that the U.S. and China are “jointly holding the key to either sustainability or catastrophe,” recommends key steps to strengthen U.S.-China engagement on energy and climate.⁹

³ *Brookings Report*, *supra* note 2.

⁴ *Id.* at 39-40.

⁵ *Id.* at 28-30.

⁶ Steven Chu and John Thornton, et al., *Common Challenge, Collaborative Response: A Roadmap for U.S.-China Cooperation on Energy and Climate Change* (Pew Center on Global Climate Change and Asia Society Center on China-U.S. Relations, 2000) (hereinafter *Pew / Asia Society Report*), available at http://www.asiasociety.org/taskforces/climateroadmap/US_China_Roadmap_on_Climate_Change.pdf (last visited May 20, 2009).

⁷ *Id.* at 5.

⁸ *Strengthening US-China Climate Change and Energy Engagement*, Natural Resources Defense Council (Feb. 2009) (hereinafter *NRDC Report*), available at http://docs.nrdc.org/international/int_09021801.asp (last visited May 20, 2009).

⁹ *Id.* at 1.

Finally, a report by McKinsey & Company¹⁰ (hereinafter “the McKinsey Report”), while not focused on U.S.-China cooperation *per se*, assesses opportunities for China to markedly contain its contribution to climate change and its dependence on imported energy sources by adopting an ambitious “abatement” scenario of deploying credible technologies at reasonable cost.

II. CHINA’S APPROACH TO CLIMATE CHANGE

A major theme of the Brookings Report is that it is important for the U.S. and China to respect that each has different views of the climate change situation, and to find pragmatic common ground for moving forward. The Brookings Report notes that in international discussions “China positions itself as a developing country,” which has “some merit,” but “does not nearly capture the full reality,” as China has both “the problems of developing countries” and “many of the attributes of an industrialized nation.”¹¹

The Brookings Report notes that China, like other developing countries, maintains that developing countries have much lower per capita emissions and much smaller contribution to existing GHG loading due to far smaller cumulative historical emissions. While developed countries have already gone through the high-emissions stages of economic development, including building of infrastructure, developing countries are still in the critical (high GHG emitting) phase of development and building infrastructure. Based on these arguments, China and other developing countries argue that developed countries bear the major burden for mitigating global warming.¹²

Given that the U.S. is wealthier, on a per capita basis, than China and has greater institutional capacity and infrastructure, China finds it “galling” when the U.S. bases its reluctance to make specific international GHG control commitments on the fact that China has not

¹⁰ *China’s Green Revolution: Prioritizing Technologies to Achieve Energy and Environmental Sustainability*, McKinsey & Company (2009) (hereinafter *McKinsey Report*), available at http://www.mckinsey.com/locations/greaterchina/mckonchina/reports/china_green_revolution_report.pdf (last visited May 20, 2009).

¹¹ *Brookings Report*, *supra* note 2, at 36-37.

¹² *Id.*

yet done so. In China, the past U.S. record “provides strong cover” for officials who prioritize economic growth over addressing climate change and “weakens those who advocate more forward-leaning Chinese postures on those issues.”¹³

Despite these views, “China’s leaders seek to be seen as constructive international players” and recognize that a constructive approach to climate change is a significant component, as long as they are not pressured to take on obligations that might impede economic growth essential to China’s stability.¹⁴ Top leaders in China have identified addressing climate change as a high priority (although economic growth remains the overarching priority) and the likely adverse impacts to China of climate change are increasingly recognized.¹⁵ When citizens of various countries were asked whether they would be willing to sacrifice some economic growth in order to improve the environment, Chinese citizens gave a higher rate of positive responses than any other country.¹⁶

Finally, outside pressure for China to deepen its commitments to addressing climate change is mounting. United Nations Secretary General Ban Ki-moon told the Delhi Sustainable Development Summit that although “China and India have . . . taken steps,” it is “not enough, they have to do more.”¹⁷ He said that climate change was a “common and shared” responsibility and that the time for arguments about who caused and contributed to global warming was

¹³ *Id.* at 38. The Brookings Report indicates that the “official mantra is that the country’s current economic trajectory is unsustainable, and China must therefore adopt a more sustainable model – dubbed ‘scientific development.’” *Id.* at 28.

¹⁴ *Id.* at 36.

¹⁵ *Id.* at 10-12. Anticipated adverse effects of climate change in China include more frequent droughts in the thirsty north of China, increased flooding in the vulnerable south, shrinkage of glaciers in the Himalayas with associated disruptions of water supply in agricultural areas, and sea-level rise threatening coastal areas such as the Yangtze River Delta and Pearl River Delta. *Brookings Report, supra* note 2, at 11.

¹⁶ Kenneth Lieberthal, et al., *U.S.-China Climate Change Cooperation: Overcoming Obstacles*, (Presentation at The Brookings Institution) 51 (Feb. 5, 2009), transcript available at http://www.brookings.edu/~media/Files/events/2009/0205_china/20090205_china_climate.pdf (last visited May 20, 2009) (Professor Lieberthal went on to note that while there are some questions about the data, it does reflect a growing environmental consciousness in China).

¹⁷ Randeep Ramesh, “*Strong arm*” tactics to get India to agree to strict emissions cuts criticized, *THE GUARDIAN*, Feb. 5, 2009, available at <http://www.guardian.co.uk/environment/2009/feb/05/climatechange-carbonemissions> (last visited May 20, 2009).

over.¹⁸ “We should not argue who is more responsible, who is less responsible, who should do more . . . This is a common, shared responsibility.”¹⁹

III. U.S. VIEWS ON CHINA AND CLIMATE CHANGE

In 1997 the U.S. Senate passed a “sense of the Senate” resolution expressing the view that the U.S. should not sign the Kyoto Protocol if it would mandate new commitments for the U.S. to limit GHG emissions without mandating new specific commitments for developing countries to limit emissions as well.²⁰ The Clinton Administration signed the Protocol, but never submitted it to the Senate for advice and consent. President Bush repudiated the U.S. Kyoto commitments in 2001, contending that without simultaneous action by major developing country emitters to limit GHG emissions, the agreement would not be effective.²¹ The long-festering dynamic of the U.S. and China excusing delay by pointing to the need for more robust action by the other has been heavily criticized as the “U.S.-China suicide pact.”²²

However, U.S. views on this subject, like China’s, are evolving quickly. Before leaving for Asia and her first overseas trip as Secretary of State, Secretary of State Clinton stated that:

¹⁸ *Id.*

¹⁹ *Id.*; see also Patricia Ross McCubbin, *China and Climate Change: Domestic Environmental Needs, Differentiated International Responsibilities, and Rule of Law Weaknesses*, 3 ENVTL. & ENERGY L. & POLICY J. 200, 211 (2008) (domestic political pressure and growing international scrutiny of China’s environmental record “are driving the Chinese government to address greenhouse gases and other contaminants”).

²⁰ Byrd-Hagel Resolution, S. Res. 98, 105th Cong. 1997.

²¹ Julian Borger, *Bush kills global warming treaty*, THE GUARDIAN, Mar. 29, 2001, available at <http://www.guardian.co.uk/environment/2001/mar/29/globalwarming.usnews> (last visited May 20, 2009).

In 2005 the Senate adopted a resolution which called for enactment of a “national program of mandatory, market-based limits and incentives on emissions of greenhouse gases” with no precondition of developing country action. See Daniel Bodansky, *Targets and Timetables: Good Policy But Bad Politics?* UGA Legal Studies Research Paper No. 07-014 57, 62 (Joseph E. Aldy & Robert N. Stavins eds., 2007), available at <http://ssrn.com/abstract=1033550> (last visited May 20, 2009). The Bingham-Domenici Resolution reverses course on the Byrd-Hagel approach, viewing U.S. action as a means of encouraging developing country action rather than positing developing country action as a prerequisite for U.S. action. *Id.* at 62, n.3.

²² See, e.g., Chandler, *supra* note 1, at 1.

Now, our nation has been the largest historic emitter of greenhouse gases, and we acknowledge that we must lead efforts to cut harmful emissions and build a lower-carbon economy. But each of the countries that I'm visiting also have a role to play in this effort [mentions Japan, Korea, Indonesia] . . .²³

She also addressed the matter of cooperation, noting that:

Collaboration on clean energy and greater efficiency offers a real opportunity to deepen the overall U.S.-Chinese relationship. So we will work hard with the Chinese to create partnerships that promote cleaner energy sources, greater energy efficiency, technology transfers that can benefit both countries, and other strategies that simultaneously protect the environment and promote economic growth.²⁴

While in China, Secretary of State Clinton noted that historically, the United States had the "largest carbon footprint." But in the last year, China has surpassed the U.S. because of economic growth. Secretary of State Clinton noted that "we want China to grow. We want the Chinese people to have a very good standard of living. What we hope is that you won't make the same mistakes we made."²⁵ She also indicated that the U.S. and China agreed in principle to a strategic and economic dialogue and that "among the most important issues [will be] clean energy and climate change, and what the United States and China can do together."²⁶

On the same China trip, U.S. Climate Envoy Todd Stern indicated that the U.S. recognizes its "responsibility, as the world's largest historic emitter of greenhouse gases, to be a leader in this fight" and that "China has enormous challenges, in terms of development,

²³ Secretary of State Hillary Rodham Clinton, Remarks at the Asia Society, New York, NY: *U.S.-Asia Relations: Indispensable to Our Future*, (Feb. 13, 2009), transcript available at <http://www.state.gov/secretary/rm/2009a/02/117333.htm> (last visited May 20, 2009).

²⁴ *Id.*

²⁵ Secretary of State Hillary Rodham Clinton, Remarks at Taiyang Gong Power Plant, Beijing, China (Feb. 21, 2009), transcript available at <http://www.america.gov/st/texttrans-english/2009/February/20090225145118xjsnommis0.6549188.html> (last visited May 20, 2009).

²⁶ *Id.*

development needs and development pressures.”²⁷ On the other hand, he noted that “[t]here is no way to preserve a safe and livable planet unless China plays a very important role, along with the United States.” This is not a matter of politics or morality or right or wrong. It is simply the “unforgiving math of accumulated emissions.” He went on to note that “China has already taken many important steps . . . but more needs to be done, and the United States and China can do more together.”²⁸

IV. CHINA’S ACTIONS ON ENERGY AND EMISSIONS

Any effort to understand China’s actions to date, and prospects for future progress, should take account of the ways in which China’s emissions profile differs from that of the U.S. (and other countries). The Pew / Asia Society Report notes that China is a “developing country (albeit a strong, emerging economy), with a per capita income 30 percent lower than the world average, and an enormous rural population living on far less.” As more Chinese enter the middle class, “more cars and bigger homes will account for a growing share of the country’s emissions.” However, today “China’s emissions are dominated by heavy industry.”²⁹ In contrast, U.S. GHG emissions “stem more from consumption than production” with industry accounting for just 25 percent and most of the emissions coming from transportation, commercial and residential energy use.³⁰

²⁷ Todd Stern, Remarks at Taiyang Gong Power Plant, Beijing, China (Feb. 21, 2009), *transcript available at* <http://www.state.gov/secretary/rm/2009a/02/119433.htm> (last visited May 20, 2009).

²⁸ *Id.* Reportedly, the backdrop for these statements was a new, “hyper-efficient” gas-fired power plant near Beijing that was a joint project using General Electric technology and Chinese-built turbines, which provides heat (including to the U.S. embassy) with significantly lower emissions than China’s other power plants. Keith Johnson, *China Hands: U.S. Charts new Greener Course on China Relations*, Wall Street J. Envtl. Capital Blog, *available at* <http://blogs.wsj.com/environmentalcapital/2009/02/23/china-hands-us-charts-new-greener-course-on-china-relations/> (last visited May 20, 2009).

²⁹ *Pew / Asia Society Report*, *supra* note 6, at 18. China accounts for about 35 percent of world steel production, 50 percent of world cement production, and 28 percent of world aluminum production, much of it consumed domestically. *Id.*

³⁰ *Id.* at 19.

China made “extraordinary gains in reducing energy intensity” as it “quadrupled its GDP, pulling millions out of poverty, while merely doubling the amount of energy it consumed” from 1980–2000. However, this trend reversed from 2002–2005, with energy growth exploding, leaving China “four times as energy intensive as the United States.”³¹

More recently, China has deepened its efforts to reverse this trend of increasing energy intensity. China has enacted significant clean energy measures, albeit immediate priorities such as economic growth, energy security, and air quality may be at least as prominent as climate change in motivating the Chinese leadership to take these steps.³² These actions include domestic plans to reduce energy used per unit of economic production 20% by 2010, to increase renewable energy to account for 10% of total energy consumption by 2010 and 15% by 2020, and various clean energy and clean production measures to close down plants using old, inefficient, and highly polluting technologies.³³ The World Resources Institute, an environmental NGO that is active in China, is optimistic that the energy intensity goal can be met, noting that energy intensity in China declined 1.8% in 2006, 3.7% in 2007, and 4.2% in 2008.³⁴ Of course additional efforts will likely be needed to prevent or mitigate very serious climate change impacts.³⁵

³¹ *Id.* In one sense the comparison to the U.S. is a generous yardstick, since the U.S. is considerably less efficient than other developed countries. *Id.*

³² *Preparing for Copenhagen: How Developing Countries are Fighting Climate Change: Before the H.R. Select Comm. on Energy Independence and Global Warming*, (Mar. 4, 2009) (Statement of Barbara A. Finamore, Senior Attorney and China Program Director, Natural Resources Defense Council), available at http://www.nrdc.org/globalWarming/files/glo_09030401a.pdf (last visited May 20, 2009).

³³ *Brookings Report*, *supra* note 2, at 28; see also The State Council Information Office, *China's Policies and Actions for Addressing Climate Change*, available at http://china.org.cn/government/news/2008-10/29/content_16681689.htm (last visited May 20, 2009).

³⁴ Deborah Seligsohn & Hilary McMahon, *Measuring Climate Change Progress in China*, World Res. Inst. (Feb. 17, 2009), available at <http://www.wri.org/stories/2009/02/measuring-climate-change-progress-china> (last visited May 20, 2009). It is not clear, however, to what extent the prediction that the target can be met takes into account uncertainties regarding the extent to which favorable figures for 2008 may be attributable to the late-2008 economic downturn that might be reversed if the economic situation improves.

³⁵ *McKinsey Report*, *supra* note 9; see also Climate Progress Blog, *China announces plan to single-handedly finish off the climate*, (Jan. 9, 2009), available at <http://climateprogress.org/2009/01/09/china-announces-plan-to-single-handedly-destroy-the-climate/> (last visited May 20, 2009).

China enacted a Renewable Energy Law in 2005,³⁶ with implementation of the law beginning in January 2006. In 2007 the National Development and Reform Commission issued “China’s National Climate Change Programme”³⁷ and a Medium and Long-Term Development Plan for Renewable Energy in China.³⁸ A long-debated new Energy Law which would further encourage energy efficiency and move towards cleaner energy is still pending.³⁹ In recent testimony before U.S. Congress Barbara Finamore of the National Resources Defense Council outlined steps that China has taken to restructure its economy in a way that improves energy efficiency and reduce carbon intensity.⁴⁰ For instance, China is “replacing smaller, less efficient power plants.”⁴¹ China is also reducing export tax rebates for energy intensive products. Measures to promote efficiency include a “Top 1,000 Program” to improve energy efficiency in the top 1,000 energy consuming enterprises in nine sectors, accounting for over 40% of China’s 2006 CO2 emissions.⁴² China is also providing funding to reward enterprises that can demonstrate significant energy savings. China is using demand side management to incentivize large-scale energy efficiency investments, reducing peak load and overall energy demand. China is implementing increasingly stringent building energy codes and stricter vehicle fuel efficiency standards. Finally, China is seeking to foster accountability for achieving China’s energy efficiency goals by con-

³⁶ P.R.C. Renewable Energy Law (promulgated by the Standing Comm. Nat’l People’s Cong., Feb. 28, 2005, effective Jan. 1, 2006).

³⁷ National Development and Reform Commission (P.R.C.), *China’s National Climate Change Programme* (2007), available at <http://www.ccchina.gov.cn/en/main.asp?columnId=44> (last visited May 20, 2009).

³⁸ National Development and Reform Commission (P.R.C.), *Medium and Long Term Dev. Plan for Renewable Energy in China* (2007), available at <http://www.chinaenvironmentallaw.com/wp-content/uploads/2008/04/medium-and-long-term-development-plan-for-renewable-energy.pdf> (last visited May 20, 2009).

³⁹ Jeffrey Greene, Michael Chen & Julie Tong, *China’s Proposed Energy Law*, ASIAN COUNSEL 1 (Mar. 2009), available at http://www.cleanergreenerchina.com/reports/DLA_Mar2009.pdf (last visited May 20, 2009); Zijun Li, *China’s Renewable Energy Law Takes Effect: Pricing and Fee-Sharing Rules Issued*, Worldwatch Institute (Jan. 18, 2006), available at <http://www.worldwatch.org/node/3874> (last visited May 20, 2009) (China’s Renewable Energy Law provides a framework for China to provide subsidies and tax incentives for development of renewable energy sources).

⁴⁰ Finamore, *supra* note 31.

⁴¹ *Id.* at 4.

⁴² *Id.* at 4-5.

sidering energy efficiency improvements in evaluating the performance of government officials.⁴³

V. U.S. – CHINA COOPERATION

The Brookings Report, Pew / Asia Society Report, and Natural Resources Defense Council (NRDC) Report all set forth recommendations for enhanced U.S.-China cooperation to address climate change. The McKinsey Report contains a set of policies for China to consider to improve its energy security and reduce its contribution to climate change.

The recommendations of the Brookings Report focus on fostering U.S.-China cooperation by developing trust and forging common ground on important matters. The Brookings Report recommends that the U.S. and China:

- 1) Acknowledge the legitimacy of each other's perspectives;
- 2) Build a clean energy framework for cooperation;
- 3) Highlight one or two major headline initiatives;
- 4) Emphasize co-development of technology;
- 5) Promote local-to-local cooperation;
- 6) Promote capacity building;
- 7) Seek common ground on the nature of future commitments;
- 8) Use and improve existing structures for cooperation; and
- 9) Highlight clean energy in a U.S.-China summit.⁴⁴

The Pew / Asia Society Report notes that U.S.-China cooperation has often been “episodic rather than sustained” and has been “undermined by insufficient funding, shifting policy priorities, and failure to significantly ‘scale-up’ promising projects.”⁴⁵ Strong actions by U.S. and Chinese leaders to surmount these limitations will be critical for U.S.-China cooperation to have a significant impact in addressing climate change.

⁴³ *Id.* at 4-7.

⁴⁴ *Brookings Report*, *supra* note 2, at xi-xiii.

⁴⁵ *Pew / Asia Society Report*, *supra* note 6, at 27.

The Pew / Asia Society Report set out the following recommendations of priority areas for targeted cooperation:

- 1) Deploying low emissions coal technologies;
- 2) Improving energy efficiency and conservation;
- 3) Developing an advanced electric grid;
- 4) Promoting renewable energy; and
- 5) Quantifying emissions and financing low-carbon technologies.⁴⁶

The NRDC, in their report, builds on its experience working in China on renewable energy and energy conservation projects and on its work with U.S. companies and other NGOs on a blueprint for climate legislation. The Report outlines both short-term and long-term cooperative actions which can help address climate change. The NRDC Report recommends the following strategies:

- 1) Bilateral meetings to address key sticking points before the U.N. Climate Change Conference in Copenhagen in December 2009 (hereinafter “Copenhagen”);
- 2) Establish a U.S.-China forum on climate change strategies that promote green jobs and economic recovery;
- 3) Mobilize untapped potential of energy efficiency;
- 4) Assist in deployment of renewable energy sources and technologies;
- 5) Promote low-carbon efficient vehicles, transport, and community development;
- 6) Expand research and investment on carbon capture and storage technology;
- 7) Improve GHG emissions monitoring and data transparency;
- 8) Conduct co-benefit analysis on GHG emissions controls; and
- 9) Share expertise to improve enforcement.

The McKinsey Report assesses scenarios for China deploying new technologies.⁴⁷ It notes the prospect that China’s “extensive body of regulations and policies aimed at improving energy efficien-

⁴⁶ *Id.* at 28-40.

⁴⁷ *McKinsey Report*, *supra* note 9.

cy,” together with technological advances and industry efforts, will “yield substantial improvements” amounting to on average more than a 3% reduction in energy intensity per year over the next 20 years. However, that level of effort would leave China heavily dependent on imported oil and even on imported coal (despite China’s abundant coal supply), and with an enormous contribution to the atmospheric load of GHGs.⁴⁸ The McKinsey Report sets out as an alternative an ambitious “abatement scenario” of deploying credible (rather than speculative) technologies to enhance China’s energy security and help China hold its GHG emissions to roughly 10% above 2005 levels.⁴⁹ While the abatement scenario would require “considerable investment” with about 1/3 of the necessary investments coming at substantial cost, another 1/3 would have slight to moderate cost and 1/3 would have positive economic returns over time.⁵⁰

The key technological advances included in the McKinsey Report abatement scenario fall into the following categories:

- 1) Replacing coal with clean energy sources;
- 2) Comprehensively adopting electric vehicles;
- 3) Managing waste in high-emission industries;
- 4) Designing energy efficient buildings;
- 5) Restoring and protecting China’s carbon sinks; and
- 6) Rethinking urban design and consumer behavior.

The McKinsey Report also frames these concepts as “green power,” “green [vehicle] fleet,” “green industry,” “green buildings,” “green ecosystem,” and “green mindset.”⁵¹

VI. COMMON THEMES

Several important common themes emerge from comparing the recommendations proposed by these reports.

⁴⁸ *Id.* at 9.

⁴⁹ *Id.* at 10-11.

⁵⁰ *Id.*

⁵¹ *Id.* at 13-19.

A. Elevate and Re-Frame Efforts

A number of the recommendations focus on elevating the climate issue in U.S.-China relations and re-framing the issue in terms of clean energy and economic revitalization. The Brookings Report suggests engaging high-level leaders and launching attention-galvanizing headline initiatives such as electrifying vehicle fleets and maximizing energy efficiency.⁵² The Pew / Asia Society Report suggests also setting up task forces with senior government officials, independent experts, industry and financial community leaders, and NGOs to develop programs and guide implementation.⁵³ The NRDC Report suggests instigating a series of high-level bilateral discussions to improve prospects for the U.N. climate negotiation process expected to culminate in Copenhagen. The NRDC Report identifies as key issues for these discussions improving access to technologies and addressing related intellectual property issues, finding common ground on appropriate emission reduction commitments by both the U.S. and China, and stressing the need for the commitments to be measurable, reportable, and verifiable.⁵⁴

B. Lower Coal Emissions Through Technologies and Increasing Renewables

Coal accounts for large percentages of electricity generation in China (80 %) and the U.S. (almost 50%).⁵⁵ The Pew / Asia Society Report notes that while an “increasing number of supercritical plants are coming online – accounting for 20 percent of those built in 2006 – the majority of new plants being deployed in China are still subcritical plants.”⁵⁶ Similarly, in the U.S., while “many new coal plants in the approval stage propose using integrated gasification combined cycle (IGCC) and supercritical technology, the majority of projects in the pipeline still plan to use less efficient subcritical technology.”⁵⁷ The report also notes that despite halting efforts so far, an “ul-

⁵² *Brookings Report*, *supra* note 2, at 49.

⁵³ *Pew / Asia Society Report*, *supra* note 6, at 46.

⁵⁴ *NRDC Report*, *supra* note 8, at 3.

⁵⁵ *Id.* at 10.

⁵⁶ *Pew / Asia Society Report*, *supra* note 6, at 28.

⁵⁷ *Id.* at 28-29. Supercritical and Ultra-Supercritical coal plant technologies offer opportunities for producing electricity from coal with somewhat lower levels of GHG emissions. See, e.g., *Technologies for Reducing Greenhouse Gas Emissions – Strategic Outlook*,

timate goal in both countries must be the commercialization and widespread deployment of carbon capture-and-storage technology.”⁵⁸ According to the ambitious McKinsey Report abatement scenario, China can stabilize its coal use at 2007 levels by 2030 at reasonable cost if it were to increase solar power from 0% to 8%, wind power from 0% to 12%, nuclear power from 2% to 16 %, hydropower from 16% to 19%, and natural gas power from 1% to 8%.⁵⁹

C. *Strengthening Capacity for Environmental Governance and Quantifying Emissions*

The Brookings Report notes that China’s current capacity to audit and report emissions numbers is limited and anticipates that there could be “distortions in reporting of accomplishments as information travels from local to national level.”⁶⁰ The Pew / Asia Society Report stresses the importance of cooperation to improve capacity to collect energy data, inventory GHG emissions, and project future emissions trajectories, as well as to contribute to measurement, reporting, and verification of actions taken as part of a post 2012 climate agreement.⁶¹ The report notes that reliable data is “critical” to identifying energy and emissions patterns and opportunities for improvement and monitoring implementation.⁶² The NRDC Report

WORLD GROWTH 6 (Nov. 2007), available at <http://www.worldgrowth.org/assets/File/WG-GreenhouseGasEmissions.pdf> (last visited May 20, 2009).

⁵⁸ *Id.* at 30. The European Union is currently working with China on carbon capture and storage matters. See, e.g., François Kalaydjian, *COACH: An R&D Cooperative Action on CCS Between the EU and China*, Int’l Conference on CCS regulation for the EU and China (Feb. 18-19 2009), available at http://www.euchina-ccs.org/media/docs/2009_02_18-19/Kalaydjian.pdf (last visited May 20, 2009).

⁵⁹ *McKinsey Report*, *supra* note 9, at 13.

⁶⁰ *Brookings Report*, *supra* note 2, at 34. Indeed, two U.S. Congressmen recently requested that the General Accounting Office investigate the quality of GHG inventories of China and other key developing countries (India, Indonesia, Mexico, and Brazil) and the limitations of international auditing and validation of national GHG inventories. See Letter from Joe Barton and Greg Walden to the Honorable Gene Dodaro, Acting Comptroller General of the U.S. (Feb. 10, 2009), available at http://republicans.energycommerce.house.gov/Media/File/News/2.10.09_GAO_International_Emissions.pdf (last visited May 20, 2009).

⁶¹ *Pew / Asia Society Report*, *supra* note 6, at 40. The Report points out that China’s only GHG inventory submitted to the UNFCCC to date, in 2000, was based on 1994 data. *Id.* However, China is now working with the World Resources Institute, Business Council for Sustainable Development, International Energy Agency, Lawrence Berkeley National Laboratory, Asia Pacific Partnership cement task force, U.S. EPA, and California on projects concerning GHG emissions measurement and verification. *Id.* at 41.

⁶² *Id.*

calls for “[j]oint programs to improve environmental monitoring and reporting, training of environmental regulators and enforcement officials, public supervision and greater transparency.”⁶³

The importance of capacity building is further highlighted in the discussion of constraints on effective implementation of environmental policy in China below.

D. The Importance of a Green Stimulus and Energy Efficiency

The NRDC Report calls for capacity building to adapt and implement energy efficiency programs in industry, protocols and training for energy audits, program evaluation, monitoring, reporting, and verification, and incentives and R&D investment for energy efficient technologies, cooperation in the development of energy efficiency programs for buildings and appliances, common protocols for measuring and accounting for energy saved and GHG emissions reduced, and creation of certified third-party energy rating communities to supplement government enforcement efforts.⁶⁴ While the government of China is aware of the problems and seeking to make changes, effective implementation of a multilateral pact on climate change may depend on legal reforms backed by the promise of aid and the threat of sanctions.⁶⁵

The NRDC Report calls for China to develop criteria to ensure that the 280 billion yuan proposed spending on housing projects be spent only on green energy and water-efficient building projects sited using smart growth policies and that the funding proposed for transport focus on public transit rather than highways.⁶⁶

The McKinsey Report notes the challenge presented by the small window of opportunity for China to achieve the emissions improvements envisioned in the abatement scenario. In the building, industry, and power generation sectors, it will be critical to “build it right the first time.” A mere 5-year delay in starting to implement the needed technologies would lead to a loss of as much as one-third of the total abatement potential by 2030.⁶⁷ This illustrates the high cost

⁶³ NRDC Report, *supra* note 8, at 5.

⁶⁴ *Id.* at 8.

⁶⁵ McCubbin, *supra* note 18, at 203.

⁶⁶ NRDC Report, *supra* note 8, at 4.

⁶⁷ McKinsey Report, *supra* note 9, at 13. Avoiding “carbon lock-in” is a key theme of research conducted by the “Interdependencies on Energy and Climate Security for China and

that would be incurred if we were to wait for an improved economic climate rather than addressing these issues *urgently* during the stimulus / recovery phase. Thus, while the McKinsey Report does not focus on U.S.-China cooperation per se, it provides a compelling argument for the benefit of an ambitious cooperation agenda to help jump-start movement towards the abatement scenario.

E. The Relationship of Cooperation to Negotiations

The Brookings Report notes that bilateral cooperative efforts can contribute to the success of multilateral climate change negotiations, and both the Brookings Report and Pew / Asia Society Report call for the U.S. to take the lead by adopting a cap on carbon emissions with commitments to substantially reduce emissions over time.⁶⁸ The Brookings Report suggests that if the U.S. leads, China will follow, and that China should respond to caps instigated by the U.S. and reduce actions by accepting binding commitments of its own. We may already be seeing signs of this hopeful dynamic, as Beijing recently welcomed U.S. promises of action to address climate change and indicated that China would also do its share while ensuring that its people are not “left in the dark without electricity.”⁶⁹ The Brookings Report lists several measures that could be part of such a response on the part of China:

Europe” project undertaken by Chatham House with the Chinese Energy Research Institute and others. See *Interdependencies on Energy and Climate Security for China and Europe*, CHATHAM HOUSE, available at <http://www.eu-china-energy-climate.net/#project> (last visited May 20, 2009).

⁶⁸ The Brookings Report notes that U.S. negotiators at Kyoto agreed to targets “without a clear basis for implementing those targets in domestic law” and that a domestic political consensus in favor of implementing legislation did not ensue in the following years, suggesting that some draw the conclusion that “the United States should only agree abroad to what can clearly be implemented at home.” *Brookings Report*, *supra* note 2, at 25. Of course the U.S. is not the only country whose level of ambition in international obligations may be tempered by concerns regarding the political feasibility of domestic implementation. Nonetheless, this note of political realism should not be considered in isolation from the warnings of the dire human, environmental, and economic consequences of inadequate action. See, e.g., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT (SUMMARY FOR THE POLICYMAKERS), 7-14 (2007).

⁶⁹ Alistair Doyle, *China hails U.S. climate promises, says to act*, THOMPSON REUTERS, (Mar. 30, 2009), available at <http://www.reuters.com/article/environmentNews/idUSTRE52T2Q820090330?feedType=RSS&feedName=environmentNews> (last visited May 20, 2009).

- “intensity targets” (limiting emissions per unit of GDP);
- renewable energy requirements;
- emissions limits in specific sectors; and
- “policies and measures” such as shutting down old inefficient plants or adopting and enforcing appropriate building efficiency standards.⁷⁰

These measures would include “metrics to gauge level of effort and results.”⁷¹ While these measures would not cap or reduce China’s overall carbon emissions, they would slow the rate of growth of emissions below “business-as-usual levels.” While these measures are already, to some extent, Chinese policy under China’s 11th Five Year Plan and China’s Climate Plan, the Brookings Report contends that commitments to strengthen these policies, backed up by metrics for authentication and supported by cooperative efforts to build capacity, might provide a starting point for China to contribute constructively to multilateral climate efforts.⁷² Down the road China could join the developed countries in committing to meaningful “cap and reduce” targets as its economy develops and as cooperative actions build capacity and mutual trust.

The Pew / Asia Society Report notes that the “very wide fluctuations apparent in recent projections of future Chinese emissions underscore the difficulty of generating reliable forecasts, particularly in developing economies.”⁷³ The report links U.S.-China cooperation to collect energy data, inventory GHG emissions, and project future emissions to contributing to the measurement, reporting, and verification of actions taken as part of a post-2012 climate agreement.⁷⁴ Cooperation to strengthen capacity for quantifying emissions and environmental governance may be a key building block towards developing this trust as well as creating the necessary preconditions for success in addressing climate change.

⁷⁰ *Brookings Report*, *supra* note 2, at 53-54.

⁷¹ *Id.* at 54.

⁷² *Id.*

⁷³ *Pew / Asia Society Report*, *supra* note 6, at 40.

⁷⁴ *Id.* As the Report notes, “Measureable, reportable and verifiable” (MRV) is the language used in the 2007 Bali Action Plan (which set the course for post-2012 climate negotiations) to describe “nationally appropriate mitigations commitments or actions.” *Id.*, *citing*, http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_action.pdf (last visited May 20, 2009).

The World Resources Institute has recognized the gap between ambition and performance, noting that:

Setting targets is one thing, but achieving them is quite another, and one of the fundamental challenges is measuring and tracking progress. Developed countries—including the U.S.—have been measuring greenhouse gas emissions for quite some time using tested, economy-wide accounting practices. As a result, the U.S. has a good idea of which sectors are contributing to national GHG emissions, which in turn helps to inform important policy choices. But this has not generally been the case in developing countries, which often don't have the experience, history, or institutional capacity to measure GHG emissions with the precision necessary to support a target expressed in those terms.⁷⁵

The importance of strengthening capacity in this area is discussed in the section on Constraints below.

VII. CONSTRAINTS ON EFFECTIVE IMPLEMENTATION OF ENVIRONMENTAL POLICY IN CHINA

China has made significant strides in enacting environmental laws, improving energy intensity, and slowing the pace of pollution. However, important gaps in China's legal regime and China's weak environmental regulatory system pose significant barriers to successfully addressing climate change.⁷⁶

The State Council of China has recognized the need for environmental law reform, stating that:

Chinese environmental protection laws and regulations are not up to the task. The environmental protection legal system is not complete . . . and where laws exist they are not followed and enforcement is not strict.⁷⁷

⁷⁵ Seligsohn & McMahon, *supra* note 33.

⁷⁶ McCubbin, *supra* note 18, at 228.

⁷⁷ Decision on Implementation of Scientific Dev. and Strengthening on Env'tl. Prot., *available at* http://english.mep.gov.cn/Policies_Regulations/policies/Frameworkp1/200712/t20071227_115531.htm (last visited May 20, 2009).

Wang Canfa, the Director of the Chinese NGO the Center for Legal Assistance to Pollution Victims, has noted that many Chinese environmental laws lack fully developed procedural and implementation mechanisms.⁷⁸

The NRDC Report notes the importance of strengthening environmental governance, stating that:

No nation has successfully tackled its environmental problems without a solid foundation in the basic building blocks of environmental enforcement, including clear environmental legislation, robust information gathering and reporting systems, well-trained enforcement and regulatory staff, sufficient budget, public participation, and measures to promote compliance.”⁷⁹

Weaknesses in China’s environmental law system that could impair effective implementation of climate change policies and commitments include “reliance on local officials who are often reluctant to act”, “limited opportunities for citizens to sue polluters”, and a judiciary that often lacks training and independence from political pressures to ignore the law.⁸⁰ Most of the governmental infrastructure for implementation of environmental law and policy is at the provincial and local level. The effectiveness of these local and provincial Environmental Protection Bureaus (EPBs) varies widely. Some are quite limited in capacity and political will, as their actions are often driven more by local economic interests than by environmental objectives, while the national Ministry of Environmental Protection (MEP) often plays little or no role in oversight. Nor are there strong mechanisms for accountability to the public.⁸¹ While the development of new

⁷⁸ Wang Canfa, *Chinese Environmental Law Enforcement: Current Deficiencies and Suggested Reforms*, 8 VT. J. ENVTL. L. 159, 170 (2007). Professor Wang also notes that “[d]espite passage of several years since their approval, many environmental laws still have no viable means of implementation,” e.g. via regulations or directives. *Id.* at 171.

⁷⁹ NRDC Report, *supra* note 8, at 9.

⁸⁰ McCubbin, *supra* note 18, at 202-203

⁸¹ Minxin Pei, Statement to the Senate Foreign Relations Committee, (June 7, 2005), *transcript available at* <http://foreign.senate.gov/testimony/2005/PeiTestimony050607.pdf>. See also Alex Wang, *The Role of Law in Environmental Protection in China: Recent Developments*, 8 VT. J. ENVTL. L. 195, 203 (2007); Steve Wolfson,

Environmental Law Cooperation with China, 10 INT’L ENVTL. L. COMM. NEWSLETTER 10,

MEP Regional Offices is a positive sign that MEP sees a need to address this kind of “*local protectionism*”, their effectiveness may be constrained until trained staff, oversight mechanisms, and legal authority are further developed.⁸² Efforts to improve the implementation of environmental law in China are affected by the overarching challenge of the developing nature of the Chinese legal system.⁸³

While China’s Air Pollution Control Law requires enterprises in some areas to obtain permits for emissions of other (non-GHG) pollutants, the implementation of this system has not been robust.⁸⁴ An analysis of pollution controls applied to the steel industry in the U.S. and China contends that Chinese law provides very little statutory basis or direction for a pollutant permitting system and that neither the law nor permits typically specify monitoring requirements. Those permits that are issued often lack details needed to provide direction to regulated facilities.⁸⁵

11-12 (Aug. 2008), available at <http://www.abanet.org/environ/committees/intenviron/newsletter/archive/> (last visited May 20, 2009) (noting that effective implementation of China’s environmental laws and policies is limited by lax or nonexistent national supervision of local and provincial implementation of environmental laws and policies).

⁸² *MEP’s Regional Centers*, China Env’tl. L. Blog (Dec. 22, 2008), available at <http://www.chinaenvironmentallaw.com/2008/12/22/meps-regional-centers/#more-889> (last visited May 20, 2009); see also *Environmental Performance Reviews China (2007)*, ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, 3-4 (2007) (noting insufficient implementation of environmental regulations at the local level and recommending more consistent implementation nationwide, including making local leaders more accountable to higher-level government officials, strengthening China’s permitting system for pollution prevention and control and expanding the legal basis for, and use of, pollutant trading and other market-based instruments).

⁸³ Joseph W. Dellapenna, *A Few Words on Law and the Environment in China*, 24 TEMP. J. SCI. TECH. & ENVTL. L. 367, 369 (2005); see also Wang, *The Role of Law*, *supra* note 80, at 204. However, the relative importance in Chinese environmental policy implementation of legal mechanisms familiar to western environmental lawyers, as compared to administrative planning mechanisms, is an unsettled question. The national planning process led by the China’s National Development and Reform Commission and implemented through local government plans and performance evaluations may play a larger role than such legal mechanisms, at least for now. See Dan Guttman, *Making Central-Local Relations Work: Comparing America and China Environmental Governance Systems*, 1 *Frontiers of Env’tl. Sci. & Eng’g in China* 4, 418-433 (2007).

⁸⁴ Wanxin Li, *Environmental Governance: Issues and Challenges*, 36 ENVTL. L. REP. 10505, 10519 (2006).

⁸⁵ Alliance for Am. Mfg., *An Assessment of Env’tl. Regulation of the Steel Industry in China*, (Mar. 2009), available at <http://www.americanmanufacturing.org/wordpress/wp-content/uploads/2009/03/chinaenvironmental-report-march-2009.pdf> (last visited May 20, 2009).

Recent efforts to develop pollutant permitting and trading systems to control emissions of non-GHG air pollutants reinforce the importance of addressing institutional issues constraining environmental protection efforts in China. The U.S.-China Joint Economic Study notes that for any air pollution control program to succeed, effective institutions, infrastructure, and incentives are critical. These include emission measurement protocols to ensure accuracy and consistency, non-compliance penalties high enough to provide an incentive to comply with program rules, and consistent implementation across the country.⁸⁶ Similar challenges exist for implementing climate change commitments and actions.⁸⁷

There is considerable work underway to strengthen the legal and institutional framework for environmental protection in China. Signs of progress include recognition by “some segments of the central government” of “the need for broad reforms of the legal system,” the recent elevation of the former State Environmental Protection Administration to the Ministry level as the Ministry of Environmental Protection, efforts by the central government to consider environmental factors when evaluating the performance of local officials, increases in penalties for environmental violations (albeit not to the point where the penalties are sufficiently high as to recoup the economic benefit of noncompliance), consideration given to expanding environmental litigation beyond a narrow range of cases presently allowed,⁸⁸ and efforts to enhance MEP’s role in the regions and prov-

⁸⁶ *U.S. – China Joint Economic Study*, US-CHINA JOINT ECONOMIC RESEARCH GROUP, 30 (Dec. 2007) available at http://www.epa.gov/AIRMARKET/international/china/JES_Summary.pdf (last visited May 20, 2009); see also Richard Morgenstern, et al., *Demonstrating Emissions Trading in Taiyuan, China*, 148 *RESOURCES* 7, 7-8 (2002); Eric Zusman, *The Difference a Legislature Makes: Administering Market-Driven Air Pollution Control regulations in Taiwan and China*, 8 *CHINA ENV’T SERIES* 130, 132 (2006), available at http://www.wilsoncenter.org/topics/pubs/CEF_SpecialReport.8.pdf (last visited May 20, 2009).

⁸⁷ See, e.g., *Thirteenth Session of the Conference of the Parties to the U.N. Framework Convention on Climate Change and Third Session of the Meeting of the Parties of the Kyoto Protocol*, 4 (Pew Center on Global Climate Change 2007), available at http://www.pewclimate.org/docUploads/Pew%20Center_COP%2013%20Summary.pdf (last visited May 20, 2009) (discussing decision that developed and developing country national mitigation actions will be “Measureable, Reportable, and Verifiable”).

⁸⁸ McCubbin, *supra* note 18, at 231.

inces, increase transparency and public participation, strengthen the legal framework, permitting, monitoring, and enforcement.⁸⁹

VIII. CONCLUSION

The recent flurry of reports on U.S.-China cooperation to address climate change focuses much-needed attention on this important issue. Key common themes in the reports include emphasis on the value of:

- elevating and re-framing climate cooperation efforts;
- ensuring a green stimulus and energy efficiency;
- enhancing cooperation on low emissions coal technologies and renewable energy resources; and
- enhancing cooperation on quantifying emissions and governance, including through expanded capacity building.⁹⁰

Can the pragmatic steps outlined in these reports move ahead even as China and the U.S. continue to view the equities of apportioning responsibilities to address climate change from markedly different vantage points? Can these steps also help to build trust and mutual understanding and enhance the prospects for progress on the U.N. negotiations? The welcome recent surge in attention to the UN negotiations under the Bali Roadmap, which aim to result in a major milestone at the Conference of the Parties in Copenhagen in December, 2009, should not obscure the important complementary role of enhancing environmental governance reform and building capacity. The reports discussed in this article, by highlighting constraints in environmental governance and the need to build capacity, remind us that implementation will be a critical challenge. The road to addressing climate change is not simply a direct road to the Copenhagen negotiations, but a road that passes through Beijing and Shanghai and Wuhan and Nanjing and Chongqing and Tianjin and smaller cities and jurisdictions where implementation will take place throughout

⁸⁹ See Robert Percival, *The Challenges of Chinese Envtl. Law*, 10 INT'L ENVTL. L. COMM. NEWSLETTER 2, 6 (Aug. 2008); see also Wolfson, *supra* note 80, at 11-12.

⁹⁰ See *infra* notes 52-75.

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the vast territory of China, and cities in other major GHG emitting countries as well.