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CHINA IN CONTEXT: ENERGY, WATER, AND CLIMATE COOPERATION

Elizabeth Burleson[†]

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I. INTRODUCTION

*Climate-related risks force people into trade-offs that limit substantive freedom and erode choice.*¹

—United Nations Development Programme

Global greenhouse gas emissions have risen by fifty percent since 1970 and are likely to increase another fifty percent by 2030.² China is expected to account for forty-three percent of the rise in energy demand by 2030, according to the International Energy Agency.³ In

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1. UNITED NATIONS DEV. PROGRAMME [UNDP], HUMAN DEV. REPORT 2007/2008, *Fighting Climate Change: Human Solidarity in a Divided World*, 83 (2007) (prepared by Kevin Watkins, et al.), available at http://hdr.undp.org/en/media/HDR_20072008_EN_Complete.pdf [hereinafter Human Dev. Report].

2. Krittivas Mukherjee, *U.N. Climate Chief Says Industry Keen on Deal*, REUTERS, Feb. 5, 2009, <http://www.reuters.com/article/idUSTRE5143WV20090205>.

3. *Changes in Global Oil Demand*, THE ECONOMIST, Nov. 15, 2008, at 45. See also Carolyn Cui, *Chasing After Crude In China? Just Log On*, WALL ST. J., June 8, 2009, at C1 (noting that “China is estimated to account for 9.3% of the world’s oil use, yet it releases no actual consumption data. That has led analysts to turn to Google Earth to track the movements of oil tankers and to travel across China meeting with low-level oil industry officials.”).

2007 China represented a third of the rise in worldwide oil demand.⁴ The International Energy Agency explains that “[t]he contributions to emissions reduction made by China and the United States will be critical to reaching a stabilization goal.”⁵ The international community can reach consensus on a common goal of emission reductions with specific medium-term binding targets for developed countries and mitigation actions for developing countries that are supported by funding for environmentally sound technology cooperation and adaptation.

This article analyzes China in the context of international climate change law and policy. Part II provides a background on international negotiations. Part III outlines cooperative measures that China and the United States can establish relating to energy, water, and climate. Part IV considers the role that civil society can play in addressing climate change to achieve sustainable development. This article concludes that overcoming the collective action problem and averting catastrophic climate change can occur through transboundary measures that facilitate sustainable development.

II. BACKGROUND

The First World Climate Conference took place in 1979, and the World Meteorological Organization and the United Nations Environment Programme created the Intergovernmental Panel on Climate Change (IPCC) in 1988.⁶ Carbon dioxide is believed to be a leading factor in the warming that the Earth has undergone since the last ice age.⁷ In addition to carbon, methane is a leading greenhouse

4. *Of Froth and Fundamentals*, THE ECONOMIST, Oct. 11, 2008, at 64 (noting that “[i]n 2003 the IMF expected China’s economy . . . to grow by 7.5% a year, but in fact it has grown at an average annual rate of 10.6% a year since then.”).

5. INT’L ENERGY ASS’N, WORLD ENERGY OUTLOOK 2008: EXECUTIVE SUMMARY 12 (2008), available at <http://www.worldenergyoutlook.org/2008.asp>. See also Alister Doyle, *Obama Climate Shift Could Add Pressure On China*, REUTERS, Nov. 6, 2008, <http://www.reuters.com/article/idUSTRE4A54IU20081106> (noting that “China and the United States are the top emitters, but US emissions per citizen are four times those of China.”).

6. IPCC WORKING GROUP I, CLIMATE CHANGE 2001: THE SCIENTIFIC BASIS, VII available at http://www.grida.no/climate/ipcc_tar/wg1/pdf/WG1_TAR-FRONT.pdf (last visited Feb. 12, 2010). The objective of the IPCC is to “provide an assessment of the understanding of all aspects of climate change including how human activities can cause such changes and can be impacted by them.” *Id.* at 22.

7. See National Oceanic & Atmospheric Administration, *Greenhouse Gases: Frequently Asked Questions*, <http://lwf.ncdc.noaa.gov/oa/climate/gases.html> (last visited Mar. 21, 2010).

gas.⁸ In combination with water vapor, these natural atmospheric elements trap radiant heat.⁹ Hydrocarbons, lower atmospheric ozone, and nitrous oxide also contribute to this phenomenon.¹⁰ Beyond this targeted list, chemicals, like carbon monoxide (which disrupts the breakdown of methane), indirectly contribute to warming.¹¹

The 1992 United Nations Framework Convention on Climate Change (UNFCCC) committed 165 member states to common but differentiated responsibilities.¹² While the UNFCCC did not bind parties to quantified domestic or international targets, Article 4 states that developed countries “shall provide . . . financial resources, including for the transfer of technology.”¹³ Developing country action is conditional on “the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology.”¹⁴ The Kyoto Protocol was adopted at COP-3 in 1997, binding parties to specific

8. *Id.*

9. *Id.*

10. *Id.*

11. *Id.*

12. United Nations Conference on Environment and Development, New York, New York, May 9, 1992, *Framework Convention on Climate Change* [hereinafter UNFCCC]. The UNFCCC entered into force March 21, 1994, and 192 countries have since ratified it. *Id.*; UNFCCC, Essential Background: Feeling the Heat, http://unfccc.int/essential_background/feeling_the_heat/items/2913.php (last visited Mar. 21, 2010).

13. UNFCCC, at Art. 4, ¶ 3.

14. *Id.* at Art. 4, ¶ 7. The 2000 Hague COP-6 meeting was suspended for failure to find common ground on such issues as forestry, capacity building, technology transfer, flexibility mechanisms, and compliance mechanism. Harro van Asselt & Joyeeta Gupta, *Stretching Too Far? Developing Countries and the Role of Flexibility Mechanisms Beyond Kyoto*, 28 STAN. ENVTL. L.J. 311, 326 (2009). Combined with the US back-peddling on Kyoto, climate negotiations faltered until a resumed 2001 COP-6 in Bonn agreed to a range of critical issues, set forth in the Marrakech Accords that were adopted at COP-7. See Seventh Session of the Conference of the Parties, Marrakesh, Morocco, Oct. 29 to Nov. 9, 2001, *Report of the Conference of the Parties on its Seventh Session, Held at Marrakesh From 29 October to 10 November 2001*, add. 1–3, U.N. Doc. FCCC/CP/2001/13/Add.1, FCCC/CP/2001/13/Add.2, FCCC/CP/2001/13/Add.3 (Jan. 21, 2002) [hereinafter Marrakesh Accords]; Harro van Asselt & Joyeeta Gupta, *Stretching Too Far? Developing Countries and the Role of Flexibility Mechanisms Beyond Kyoto*, 28 STAN. ENVTL. L.J. 311, 326–27 (2009).

[The] Accords established a technology framework to enhance the implementation of technology transfer commitments. The Accords also included a decision to increase funding for the Global Environment Facility, the UNFCCC’s financial mechanism, and established three new funds accessible to developing countries—the Special Climate Change Fund, the Least Developed Countries Fund, and the Adaptation Fund.

Id. at 327.

greenhouse gas emissions targets.¹⁵ The United States is one of the few countries not to have joined the Kyoto Protocol,¹⁶ which set binding emission reduction targets for six greenhouse gases.¹⁷

The United Nations Environment Program predicts that more than 8,000 Clean Development Mechanism (CDM) projects will be operational or in the pipeline by 2012, making between \$25 billion and \$30 billion available to developing countries.¹⁸ Harro van Asselt and Joyeeta Gupta note that expanding the adaptation levy from solely Clean Development Mechanism projects to Joint Implementation (JI) projects and international emissions trading would be a fair outcome across flexibility mechanisms as well as generating additional funding for adaptation.¹⁹ Roger K. Raufer explains that when CDM was established under the Kyoto Protocol, it was sometimes called the China Development Mechanism based on estimates that China would constitute a large share of the CDM market.²⁰

The international community is still building consensus on the nuances of the Bali Roadmap building blocks: (1) mitigating climate change by cutting emissions, (2) facilitating clean technology transfer, (3) adapting to such consequences of climate change as floods and droughts, and (4) financing adaptation and mitigation measures.²¹

15. Conference to the Parties to the Framework Convention on Climate Change, *Kyoto Protocol*, Dec. 10, 1997, 37 I.L.M. 32 [hereinafter *Kyoto Protocol*]. The Protocol entered into force on February 16, 2005 and, as of January 7, 2010, 184 countries had ratified the treaty. UNFCCC, *Kyoto Protocol*, http://unfccc.int/kyoto_protocol/items/2830.php (last visited Mar. 21, 2010).

16. UNFCCC, *Kyoto Protocol*, Parties to the Kyoto Protocol, <http://maindb.unfccc.int/public/country.pl?group=kyoto> (last visited Mar. 21, 2010).

17. *Kyoto Protocol*, at Art. 3. The greenhouse gases listed in Annex A of the Kyoto Protocol include: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆). *Id.* at Annex A.

18. Anna Mudeva & Michael Szabo, *U.N. Climate Talks to Speed CO2 Offset Approval*, REUTERS, Dec. 12, 2008, <http://www.reuters.com/article/idUSTRE4BA60s20081213> (noting further that “[t]he complete process of approval of offsets takes over 2 years now compared to 12–18 months in 2007, say project developers. One bottleneck is project registration by a vetting panel called the executive board (EB)”). *Id.* The Clean Development Mechanism (CDM) under the Kyoto Protocol lets industrialized countries invest in emissions reduction efforts in developing countries rather than making more costly reductions in their own countries.

19. Harro van Asselt & Joyeeta Gupta, *supra* note 14, at 356.

20. Roger K. Raufer, *Sustainable Urban Energy Systems in China*, 15 N.Y.U. ENVTL. L.J. 161, 188 (2007).

21. BALI ACTION PLAN, DECISION -/CP.13 1 (2007), *available at* http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_action.pdf.

We still lack specific emission reductions on the part of individual countries, details on new money that rich countries will provide poor countries, and agreement on MRV (monitoring, reporting, and verifying).²² China calls upon the United States to live up to its obligations under the U.N. Framework Convention on Climate Change to reduce U.S. emissions and to provide money for developing countries to curb their own greenhouse-gas output.²³ China has also made clear that international verification of Chinese emissions target progress would be viewed as an infringement upon Chinese sovereignty.²⁴

The most recent meeting of the parties to the UNFCCC and Kyoto Protocol took place in Copenhagen and resulted in the Copenhagen Accord. This three-page, non-binding statement outlined the creation of (1) the Copenhagen Green Climate Fund, (2) a technology mechanism, (3) a High-Level Panel under the COP to review implementation of funding, and (4) a mechanism on REDD-plus to address forestry.²⁵ In Copenhagen, the 2050 target was dropped and the term "verify" was reduced to the following compromise: "Non-Annex I Parties will communicate information on the implementation of their actions through National Communications, with provisions for international consultations and analysis under clearly defined guidelines that will ensure that national sovereignty is respected."²⁶ The Copenhagen Accord calls for global temperature rises not to exceed two degrees Celsius and pledges \$30 billion over the next three years and \$100 billion a year by 2020 for developing country adaptation and mitigation.²⁷ A proposal attached to the Accord calls for a legally binding treaty to be agreed upon by the end of 2010.²⁸ In an annex to the Copenhagen Accord, rich countries can list mitigation targets and funding commitments while poor countries can

22. See Jeffrey Ball et al., *Divisions Persist on Core Questions as Leaders Arrive: Sharp Disagreements on Reductions, Aid*, WALL ST. J., Dec. 16, 2009, at A16.

23. *Id.*

24. *Id.*

25. United Nations Framework Convention on Climate Change, Fifteenth Session, Copenhagen, Dec. 7–18, 2009, *Agenda Item 9: High-level Segment*, GE.09-71523 FCCC/CP/2009/L.7, (Dec. 18, 2009), available at <http://graphics8.nytimes.com/packages/pdf/science/19copenhagen.pdf>.

26. *Id.* at ¶ 5.

27. Kevin Whitelaw, *U.S., China Reach Tentative Climate Compromise*, NPR, Dec. 19, 2009,

<http://www.npr.org/templates/story/story.php?storyId=121600755&ft=1&f=1001>.

28. Emma Graham-Harrison, *Main Points Of The Copenhagen Accord*, REUTERS, Dec. 21, 2009, <http://planetark.org/enviro-news/item/56045>.

register mitigation and adaptation projects that can be monitored.²⁹

The Copenhagen Accord states that the Green Climate Fund will facilitate developed countries in providing “adequate, predictable and sustainable financial resources, technology and capacity-building to support the implementation of adaptation action in developing countries.”³⁰ Participants in the international climate proceedings continue to struggle with procedural and substantive concerns regarding the optimal means by which to address climate change given the domestic constraints facing nations including the United States and China.

III. CHINA AND UNITED STATES POTENTIAL FOR SUSTAINED COOPERATION

The United States and China can establish a joint commission consisting of high-ranking environmental, financial, and energy representatives from both countries who would regularly design and revise measures to address climate change and cross cutting issues. The Pew Center on Global Climate Change suggests that bilateral task forces could guide this process and could be

composed of senior government officials and independent experts in science, technology, business, finance, civil society, and policy from each country. Their responsibilities would involve establishing goals, designating joint-research areas, developing collaborative programs within each of the designated areas, organizing concrete joint projects in each area of cooperation, and overseeing the implementation of these projects.³¹

Priority areas of collaboration could include technology transfer of environmentally sound low greenhouse gas emissions innovations, enhancing conservation and energy efficiency, developing smart electric grids, quantifying emissions, and funding environmentally

29. See *Climate Change Deal Marks an 'Essential Beginning,' Ban Says*, UN NEWS, Dec. 19, 2009, <http://www.un.org/apps/news/story.asp?NewsID=33305&Cr=Copenhagen&Cr1=>.

30. *Agenda Item 9*, *supra* note 5, at ¶ 3.

31. PEW CTR. ON GLOBAL CLIMATE CHANGE & ASIA SOCIETY, COMMON CHALLENGE, COLLABORATIVE RESPONSE: A ROADMAP FOR U.S.-CHINA COOPERATION ON ENERGY AND CLIMATE CHANGE 7 (2009), <http://www.pewclimate.org/docUploads/US-China-Roadmap-Feb09.pdf> [hereinafter PEW CENTER REPORT]. Also note: “even during a time of global economic upheaval, a strong bilateral effort to address the twin challenges of climate change and energy security can succeed while also contributing to economic recovery and laying the foundation for a prosperous, new, low carbon economy in each country.” *Id.*

sound technology transfer.³² The Pew Center further notes that:

China was until recently making extraordinary gains in reducing energy intensity. From 1980 to 2000, China quadrupled its GDP, pulling millions out of poverty, while merely doubling the amount of energy it consumed—a dramatic improvement in energy intensity unparalleled in any other country at a similar stage of industrialization. However, this trend of decreasing energy intensity reversed between 2002 and 2005, with energy growth surpassing economic growth for the first time in decades. By 2006, China's energy demand had grown more in just four years than it had during the previous quarter-century, accompanied by a very rapid increase in greenhouse gas emissions. China is currently four times as energy intensive as the United States and nine times less efficient than Japan.³³

China, the United States, and other countries can meet energy security challenges through diversified, environmentally sound technologies and sources that do not compromise reliability.³⁴

Establishing a \$15 million project on efficient buildings, cars, and energy production, the United States and China have signed a 2009 memorandum of understanding to work together to address climate change, energy, and environmental concerns.³⁵ In addition to a

32. *Id.* at 7–8.

33. *Id.* at 19.

34. *See id.* at 11. It is important to note, however, that China and the United States

differ in their stages of development, economic structures, political systems, resource endowments, emission drivers, and opportunities for emission reduction. To begin with, China's population is more than four times the size of the United States', and its per capita emissions are 78 percent lower (although China's per capita emissions are growing at a rate four to six times as fast as those of the United States). Despite China's rapid economic ascendancy, it remains 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 and more Chinese enter the middle class in the coming decades, more cars and bigger homes will account for a growing share of the country's emissions. But at present, China's emissions are dominated by heavy industry. China today produces about 35 percent of the world's steel, 50 percent of its cement, and 28 percent of aluminum manufactured worldwide. Steel alone emits more CO₂ than all Chinese households; the chemical industry uses more energy than all the cars on China's roads; and aluminum smelters consume more electricity than the entire commercial sector. While some of these products are exported, the vast majority are consumed domestically.

Id. at 18.

35. Sue Fleming, *U.S. and China Sign Memorandum on Climate Change*, REUTERS,

framework for climate negotiations, the memorandum covers renewable energy, efficiency, and smart grid technologies.³⁶ In response, India's special envoy for climate change, Shyam Saran, pointed out that, "[c]limate change being a cross-cutting and truly global challenge, it is difficult to see how bilateral agreements could fill the gap."³⁷ Himalayan regional cooperation is as crucial as large-emitter cooperation. India is establishing a national institute of Himalayan glaciology and will work with China to understand the health of glaciers.³⁸ The United Nations Development Programme notes that, "[s]even of Asia's great river systems will experience an increase in flows over the short term, followed by a decline as glaciers melt."³⁹ Mark Wright, World Wildlife Federation's conservation science adviser, notes that

in the Eastern Himalayas we have a region of extraordinary beauty and with some of the most biologically rich areas on the planet. Ironically, it is also one of the regions most at risk from climate change, as evidenced by the rapid retreat of the glaciers, and only time will tell how well species will be able to adapt—if at all.⁴⁰

July 29, 2009, <http://planetark.org/wen/53968>. Edward Wong of the New York Times notes that:

A Chinese government committee said Thursday that a rush to build schools during the country's recent economic boom might have led to shoddy construction that resulted in the deaths of thousands of students during a devastating earthquake in May. Local officials felt so threatened by the parents that they ordered the riot police to break up protests—officers even dragged away crying mothers—and offered the parents compensation money in exchange for their dropping their demands. Many schools in the earthquake zone crumbled while buildings around them remained standing. According to some estimates, as many as 7,000 classrooms collapsed and up to 10,000 students may have died.

Edward Wong, *China Admits Building Flaws in Quake*, N.Y. TIMES, Sept. 4, 2008, at A6.

36. *Pleming*, *supra* note 36.

37. Kritivas Mukherjee & David Fogarty, *India Says Developing World Not Split in Climate Talks*, REUTERS, Aug. 11, 2009, <http://in.reuters.com/article/worldNews/idINIndia-41681920090811>. Saran explains that "[w]e are prepared to do even more if an equitable and supportive global climate regime is put in place at Copenhagen." *Id.*

38. Kritivas Mukherjee, *New Figures Show India's Emissions a Fourth of China's*, REUTERS, Aug. 12, 2009, <http://planetark.org/wen/54196>.

39. U.N. Dev. Programme, *Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World*, 9 (2007), available at http://hdr.undp.org/en/media/HDR_20072008_EN_Complete.pdf.

40. Felicity Carus, *Flying Frogs and the World's Oldest Mushroom: A Decade of Himalayan Discovery*, GUARDIAN, Aug. 10, 2009, at 20 (noting that "[t]he WWF is asking the governments of Bhutan, India and Nepal to commit to cooperate on conservation efforts in the geographic region that transcends the borders of the three

Northern China is likely to experience an increase in drought conditions, while southern China will have to contend with increasing storms and flooding impacting harvests.⁴¹ Chairman of the National Intelligence Council Thomas Fingar reports that “South, Southeast, and East Asia will face risks of reduced agricultural productivity as large parts of the region face increased risk of floods and droughts. By 2025, cereal crop yields will decrease 2.5%–10%, according to some calculations.”⁴² Reuters notes that “China has already seen temperatures climb faster than the global average, sea levels rise along its heavily populated coast, and rainfall declining in the dry north while increasing the flood-prone south.”⁴³ In China, rapid renewable energy development expands industry and the local tax base, while air and water pollution enforcement is often met with hostility because it is seen as curbing industry profits.⁴⁴ China’s National Development and Reform Commission, the ministry tasked with economic development, strongly supports energy efficiency and diversity as they contribute to energy security.⁴⁵ Including nuclear power in the

countries to protect the landscape and the livelihoods of people living in the Eastern Himalayas”).

41. Emma Graham-Harrison, *China Says Rich Nation CO2 Cuts Key to Copenhagen*, REUTERS, July 30, 2009, <http://planetark.org/wen/53997> (noting that China sees midterm greenhouse gas targets as crucial).

42. *National Intelligence Assessment on the National Security Implications of Global Climate Change to 2030: Hearing Before the Permanent Select Comm. on Intelligence and the Select Comm. on Energy Independence and Global Warming*, 110th Cong. 8 (2008) (statement of Dr. Thomas Fingar, Chairman of the National Intelligence Council and Deputy Director of National Intelligence for Analysis).

43. Emma Graham-Harrison, *China Keen To See CO2 Emissions Peak: Diplomat*, REUTERS, Aug. 6, 2009, <http://planetark.org/wen/54105>.

44. See, e.g., Christina Larson, *The Great Paradox Of China: Green Energy And Black Skies*, REUTERS, Aug. 19, 2009, <http://planetark.org/wen/54289>. Larson notes that the Ministry of Environmental Protection’s most recent annual report on the state of the environment acknowledges that cleanup efforts failed to make improvements in the water quality of China’s seven major rivers. Mortality from cancers linked with pollution—including stomach cancer and liver cancer—continues to rise, according to Ministry of Health statistics. Smog blankets large Chinese cities. The toxic industry of importing dangerous “e-waste” (used electronics and computer parts containing hazardous chemicals) continues to flourish in Guizhou.

Id. See also *World-Wide*, WALL ST. J., Aug. 22, 2009, at A1 (noting that “China is poised to end petitioning, a form of protest that is used by aggrieved people to seek justice.”). Further, the Chinese government is often unsympathetic to civil action relating to the environment. See Ben Blanchard, *China Jails Environment Activists: Rights Group*, REUTERS, July 19, 2009, <http://planetark.org/wen/53823> (reporting on the Chinese government’s handling of environmental activists).

45. Larson, *supra* note 44 (noting, in contrast, the less than active position the government takes on enforcing environmental regulation).

definition of alternative energy, China plans to increase nuclear energy capacity by a factor of ten over the next decade.⁴⁶ Despite ambitious goals, however, *Forbes* notes that roughly thirty percent of China's wind power assets are not adequately connected to the grid.⁴⁷ China agrees that global temperature should not exceed pre-industrial levels by more than two degrees Celsius, but has yet to commit to halving global carbon emissions by 2050 and has rapidly expanded the capacity of its coal-fired power plants.⁴⁸

The United States and China can enhance "cooperative R&D and large-scale demonstration projects, technology deployment projects, cooperation on specific sectors or gases, and cooperation on climate observation and warning systems for enhancing resilience."⁴⁹ Technology information could be distributed through the development of an open access international database housing green technologies and best practices.⁵⁰ A new body on technology transfer could also implement technology transfer mechanisms and such related enabling activities as technical training, capacity-building, and R&D cooperation.⁵¹ Such a technology body could facilitate sectoral technology cooperation by sharing best practices and best available technologies, both current and emerging.⁵² It could also help diffuse and transfer environmentally sound technologies to all relevant sectors.⁵³

To date, countries at the Copenhagen Climate conference have agreed to establish a technology mechanism, climate technology center, and technology executive committee.

Reuters notes that China has adopted the following goals:

- China's latest five-year plan calls for a 20 percent cut in energy intensity by the end of 2010, from 2005 levels. . . .
- Beijing also has set a goal for about 15 percent of the

46. *Id.* (noting that "[w]ith the poor economic situation, officials are thinking twice about whether to close polluting factories, whether the benefits to the environment really outweigh the dangers to social stability").

47. *Id.*

48. Richard Cowan & Doug Palmer, *FACTBOX - Comparison of US, China Climate Efforts*, REUTERS, July 28, 2009, <http://planetark.org/wen/53958>.

49. United Nations Framework Convention on Climate Change, Bonn, F.R.G., June 1–12, 2009, *Negotiating Text*, ¶ 192 U.N. Doc. FCCC/AWGLCA/2009/8 (May 19, 2009) [hereinafter *Negotiating Text*].

50. *See id.* at ¶ 195.

51. *See id.* at ¶ 196.

52. *Id.*

53. *Id.*

electricity it generates to come from renewable energy sources by 2020.

- China's fuel economy standards for its rapidly growing passenger vehicle fleet are more stringent than those in Australia, Canada and the United States. Average fuel economy for new vehicles was projected at 36.7 mpg in 2008.
- Some energy-intensive products for export no longer qualify for special tax breaks in an attempt to encourage energy efficiency.⁵⁴

In the United States, the House of Representatives has passed legislation requiring industrial greenhouse gas emissions to be lowered seventeen percent by 2020 from 2005 levels, and eighty-three percent by 2050.⁵⁵ Attention has now turned to the Senate. While substantial obstacles remain to enacting legislation in Congress, the Environmental Protection Agency (EPA) will likely regulate if Congress lacks the ability to reach consensus.⁵⁶ Congress can build upon the momentum of its \$30 billion economic stimulus for renewable energy technology and improved energy transmission.⁵⁷ Internationally, U.S. Secretary of Energy Steven Chu explains that cooperation between the United States and China related to building efficiency could reduce greenhouse gas (GHG) emissions from buildings by thirty percent.⁵⁸

Both the United States and China could sign the new protocol to the Aarhus Convention that is open to all U.N. member states and enables civil society to track pollutants.⁵⁹ The U.N. Economic

54. *Id.*

55. Cowan & Palmer, *supra* note 49.

56. *Id.*

57. *Id.* Other regions are rebounding as well. See *Asia: An Astonishing Rebound*, *ECONOMIST*, Aug. 15, 2009, at 9 (discussing Asia's rapid recovery from recent economic downturns); *Emerging Asian Economies: On the Rebound*, *ECONOMIST*, Aug. 15, 2009, at 69–70 (noting that “[a]cross the region, aggressive fiscal and monetary stimulus has helped revive domestic demand. Asia has had the biggest fiscal stimulus of any region of the world. China’s package grabbed the headlines, but South Korea, Singapore, Malaysia, Taiwan and Thailand have all had a government boost this year of at least 4% of GDP.”); Michael M. Phillips, *World Economy in Flux As America Downshifts*, *WALL ST. J.*, Sept. 20, 2007, at A1 (noting that “China, the Middle East, central Europe and Africa are absorbing more of the world’s imports.”).

58. Doug Palmer, *U.S. Officials Praise China Emissions Efforts*, *REUTERS*, July 17, 2009, <http://planetark.org/wen/53804> (noting that “China is expected to build the equivalent of the entire U.S. building stock in the next 15 years, making it a tremendous ‘laboratory’ for the two countries to work together on energy efficient designs.”).

59. See Stephanie Nebehay, *New Pact to Let European Public Track Pollutants*,

Commission for Europe notes that “[a]s the major greenhouse gas pollutants are included in the protocol, this will give decision-makers and the public powerful new tools for identifying the major industrial sources of greenhouse gas emissions.”⁶⁰ Shanghai’s industrial region is already establishing a registry of pollutants.⁶¹

China and United States technology innovation and cooperation can facilitate urgently needed climate adaptation and mitigation that remains mindful of equity as well as efficiency. Nuclear siting and waste management decision-making should be inclusive given the large stake that civil society has in the outcome of such decisions. Similarly, carbon sequestration experimentation should proceed in a manner that does not compromise public health. These are very real challenges that can be addressed through procedural and substantive legal processes that involve members of the general public, scientists, engineers, businesses, non-governmental organizations, and governments. Coordination across these groups of experts can achieve sustainable development that transitions energy use in a sensible manner to address climate change and sustainable development.

IV. CIVIL SOCIETY AND SUSTAINABLE DEVELOPMENT

“There are nearly one billion workers in Asia who earn less than \$2 per day.”⁶²

Civil society can play an important role in addressing climate change, and human rights law can facilitate public participation. Nobel Peace Prize winner and Chairman of the United Nations’ IPCC Rajendra Pachauri notes that energy remains the missing Millennium Development Goal.⁶³ Tony Blair notes that

No sensible Chinese person—including the country’s leadership—doubts there remain issues of human rights and political and religious freedom to be resolved. But neither do

REUTERS, July 17, 2009, <http://planetark.org/ark/53825> (detailing the terms of the pact and noting how it allows civil society to track pollutants).

60. *Id.*

61. *Id.*

62. Michael Phillips, *supra* note 58. See also *China to Roll Out Rural Pensions*, BBC NEWS, Aug. 5, 2009, <http://news.bbc.co.uk/2/hi/asia-pacific/8186234.stm> (noting that “[t]he Chinese government is to introduce a new pension scheme for the country’s hundreds of millions of rural workers. The minister for social security announced that a trial scheme would be extended across China by October. The government will pay for basic insurance for rural workers and farmers will contribute to a pension pot.”).

63. Matthias Williams, *Energy Neglect Hurting Poverty Fight: U.N. Climate Chief*, REUTERS, Jan. 22, 2009, <http://planetark.org/wen/51316>.

the sensible people—including the most Western-orientated Chinese—doubt the huge change, for the better, there has been. China is on a journey. It is moving forward quickly. But it knows perfectly well the journey is not complete. Observers should illuminate the distance to go, by all means, but recognize the distance travelled. . . .

We in Europe have roughly 5% of our population employed in agriculture. China has almost 60%. Over the coming years it will seek to move hundreds of millions of its people from a rural to an urban economy. Of course India will seek to do the same, and the scale of this transformation will create huge challenges and opportunities in the economy, the environment and politically.⁶⁴

Paul Joffe considers the use of human rights law to help address climate change, looking to a comprehensive approach that combines “treaties, policy initiatives, and human rights together to define the global public interest in confronting climate change and its impacts.”⁶⁵ Human rights principles can be integrated into climate

64. Tony Blair, *We Can Help China Embrace the Future*, WALL ST. J., Aug. 26, 2008, at A21. For more on the tension between religious/ethnic groups and the Chinese government, see Tania Branigan, *Al-Qaida Threatens to Target Chinese over Muslim Deaths in Urumqi*, GUARDIAN, July 14, 2009, at 17 (discussing China’s large Muslim population, its rules restricting religion, and the resulting tension with terrorist organizations); *Deadly Violence Hits West China*, BBC NEWS, Aug. 10, 2008, <http://news.bbc.co.uk/2/hi/asia-pacific/7551954.stm> (noting that “Xinjiang is home to many Muslim Uighurs, some of whom want independence in the region they call East Turkestan.”).

65. Paul L. Joffe, *Conscience and Interest: Law, Rights, and Politics in the Struggle to Confront Climate Change and the New Poverty*, 6 RUTGERS J. L. & PUB. POL’Y 269, 269 (2009).

Mitigation and adaptation may require advanced technology and sophisticated skills currently unavailable to poor countries undergoing rapid development or most exposed to damage from global warming. Thus, there is a need for assistance to poor countries from wealthy nations as has long been recognized under the international agreement on climate change. The problem of deforestation provides an example of circumstances where there is a need for assistance to poor countries to help them deal with a problem that is undermining both mitigation and adaptation capacity. Since destruction of forests produces about twenty percent of the world’s carbon dioxide, avoiding deforestation is a major mitigation need. Also, destruction of forests simply exposes people to greater harm from global warming and forces them to adapt, without the benefits provided by healthy forests. This is another example of the heightened challenges faced in avoiding the new poverty and destruction. In order to avoid deforestation, tropical forest countries need to tackle a complex set of problems that includes monitoring forest practices, clarification of land titles, law enforcement, allocation of payments for avoided deforestation, and support of livelihoods for forest dependent people.

negotiations, “fulfilling rights (through legislative, administrative, judicial, and budgetary means), guaranteeing minimums (e.g., for food, water, shelter, and health), focusing on the vulnerable, ensuring participation and accountability, and cooperating internationally.”⁶⁶

The number of Chinese legal education programs increased from three in 1977 to over six hundred in 2007.⁶⁷ The sixteen law courses that are standard in Chinese law schools include: Administrative Law and Administrative Procedural Law, Chinese Constitution Law, Chinese Legal History, Civil Law, Civil Procedural Law, Commercial Law, Criminal Procedural Law, Economic Law, Criminal Law, Intellectual Property Law, International Law, Private International Law, International Economic Law, Environmental and Resources Law, Jurisprudence, and Labor and Social Security.⁶⁸ In both China and the United States, international environmental and human rights curriculum would go a long way to further genuine sustainable development.

Joffe also notes that

[a] cardinal error of the “realism” of the past several decades has not been the assumption that force would sometimes be needed. It is the failure to recognize the growing number of situations in which multilateral cooperation would be required and in which force could not serve as a substitute and could even be counterproductive.⁶⁹

United Nations Development Programme notes that national energy security can conflict with global climate security goals, pointing to energy policy in the Ukraine.⁷⁰ There, natural gas had been replacing coal, which creates more pollution, for a decade and a half, until Russia doubled natural gas prices in 2006.⁷¹ While favoring natural gas over coal may further global climate change efforts, the Ukraine may prefer the stability of domestic coal.⁷²

Id.

66. *Id.* at 313–14. “The critical question of how much weight to give to different interests and how to integrate them must take place through a democratic process where broader interests are recognized.” *Id.* at 322.

67. Zuo Haicong, *Legal Education in China: Present and Future*, 34 OKLA. CITY U. L. REV. 51, 57 (2009).

68. *Id.* at 54.

69. *Id.* at 308.

70. Human Dev. Report, *supra* note 1, at 68.

71. *Id.*

72. *Id.* For more on the tension between global climate security and domestic energy security, see David Winning & Shai Oster, *World News: Slowdown Depresses China’s Fuel Demand*, WALL ST. J., Nov. 18, 2008, at A12 (noting that “[s]ome analysts

While there are over 6.8 billion people in the world, and likely will be 9 billion by 2050, Jared Diamond explains that total world consumption is crucial to consider, explaining:

A real problem for the world is that each of us 300 million Americans consumes as much as 32 Kenyans. With 10 times the population, the United States consumes 320 times more resources than Kenya does. People in the third world are aware of this difference in per capita consumption, although most of them couldn't specify that it's by a factor of 32. When they believe their chances of catching up to be hopeless, they sometimes get frustrated and angry, and some become terrorists, or tolerate or support terrorists. . . . Among the developing countries that are seeking to increase per capita consumption rates at home, China stands out. It has the world's fastest growing economy, and there are 1.3 billion Chinese, four times the United States population.⁷³

China has contributed twenty-five percent of the atmospheric pollution found on the west coast of the U.S., according to the EPA.⁷⁴ The benzene spill along the Songhua River led to a serious diplomatic dispute between Russia and China.⁷⁵ The economic integration that has resulted from China's accession to the World Trade Organization has opened the legal dialogue on pollution mitigation measures, intellectual property rights, and human rights.⁷⁶ Srinivasan

also say they think that China's government is buying crude for its strategic petroleum reserve."); C. Bryson Hull, *Chinese Build New Highway To "Lost" Kenya*, REUTERS, Aug. 22, 2008, <http://www.planetark.com/dailynewsstory.cfm/newsid/49899/story.htm> (noting that "[r]esidents of some African nations, like Zambia, complain that China is undertaking a second colonisation [sic] by focusing on Africa's resources and dumping its cheapest goods here.").

73. Jared Diamond, *What's Your Consumption Factor?*, N.Y. TIMES, Jan. 2, 2008, at A17 ("The average rates at which people consume resources like oil and metals, and produce wastes like plastics and greenhouse gases, are about 32 times higher in North America, Western Europe, Japan and Australia than they are in the developing world."); see, e.g., *World Watch*, WALL ST. J., June 20, 2008, at A8.

World population is expected to reach 7 billion by 2012, further intensifying the struggle for natural resources The world's population surpassed six billion in 1999, meaning it will take only 13 years to add a billion people. By comparison, the number of people didn't reach one billion until 1800, said Carl Haub, a demographer at the Population Reference Bureau. It didn't reach two billion until 130 years later.

Id.

74. Srinivasan, *Regulating the Belching Dragon: Rule of Law, Politics of Enforcement, and Pollution Prevention in Post-Mao Industrial China*, 18 COLO. J. INT'L ENVTL. L. & POL'Y 267, 271 (2007).

75. *Id.* at 304.

76. *Id.* at 271.

notes that “[o]ne of the most environmentally damaging aspects of the Great Leap Forward was the scheme to produce iron and steel in backyard furnace operations” that produced unusable steel and contributed to the famine that killed roughly thirty to forty million people.⁷⁷

China has released a human rights action plan to improve civil liberties protection. The New York Times notes that

China promised to protect the rights to a fair trial, to participate in government decisions and to learn about and question policies. It calls for measures to discourage torture, like requiring interrogation rooms to be designed to physically separate interrogators from the accused. . . . Lawyers and others in China have been increasingly assertive in recent years regarding rights already promised under China’s Constitution. The release of the action plan could help these individuals by providing clearer guidance to local and provincial governments of the long-term direction of national policy. It does not propose phasing out the system of administrative detention, which gives broad powers to local law enforcement officials, including the ability to send people to prison camps for “re-education through labor” without a trial.⁷⁸

Against this backdrop, Karla Simon proposes an integrated approach to creating more space for civil society organizations (CSOs) in China, noting that “[l]egal questions around the status of CSOs and their relationship with the party-state must be dealt with if China is going to be able to address the social and economic needs of its people in the twenty-first century.”⁷⁹ After the 2008 Sichuan Earthquake, it may be possible for legal/regulatory changes to occur, at least with respect to civil society organizations, their volunteers, and donors. Simon suggests that regulations on civil society organizations be designed so that these organizations can play their role, in public, without strict registration and sponsor requirements, and that public-benefit CSO status be decoupled from the ability to form ad hoc grassroots volunteer networks to respond to natural disasters.⁸⁰

Inclusive environmental decision-making that involves a wide

77. *Id.* at 285.

78. Keith Bradsher, *China Releases Human Rights Plan*, N.Y. TIMES, April 13, 2009, at A8.

79. Karla W. Simon, *Regulation of Civil Society in China: Necessary Changes After the Olympic Games and the Sichuan Earthquake*, 32 FORDHAM INT’L L.J. 943, 944 (2009).

80. *Id.* at 986.

array of stakeholders in a participatory manner can avert conflict. This is true at the local, regional, and international level. Countries continue to struggle with carrying out procedural and substantive climate change measures. Given that the legal status of the Copenhagen Accord is comparable to a letter of intent, Yvo de Boer notes that “we have a lot of work to do on the long road to Mexico.”⁸¹ First and foremost, the international community should channel a substantial portion of the recently pledged \$30 billion in climate funds into environmentally sound technology innovation for mitigation and adaptation. In support of the ongoing multilateral process, strategic countries including the United States and China can work together closely to enhance cooperation on environmentally sound energy innovation and efficiency.

V. CONCLUSION

Climate resilient communities can be achieved with the support of global research, development, deployment, and diffusion of environmentally sound low GHG emission technologies and processes.⁸² The U.N. Deputy High Commissioner for Refugees, L. Craig Johnstone, points out that “[y]ou can expect that as you have droughts, as you have scarcity of resources[,] . . . it will increase tensions and it will increase conflict.”⁸³ He explains that climate change is likely to displace six million people each year, forcing up to 250 million people to become refugees by 2050.⁸⁴ Yet, energy innovation cooperation is occurring to avert this scenario. Technolo-

81. Dominic Evans & Alister Doyle, *U.N. Climate Talks End With Bare Minimum Agreement*, REUTERS, Dec. 19, 2009 <http://planetark.org/enviro-news/item/56047>.

82. See U.N. Framework Convention on Climate Change, Submission to Ad Hoc Working Group on Long-Term Cooperative Action (AWG-LCA) on Finance for Mitigation and Low Carbon and Climate-Resilient Development, at 4 (Feb. 6, 2009), available at <http://unfccc.int/resource/docs/2008/smsn/ngo/093.pdf> (noting that “[a] key issue for the negotiations is how the scaled-up public financing will be invested in such a way that it leverages and mobilizes much larger amounts of private financing and investments in clean energy and development.”).

83. Megan Rowling, *U.N. Says Climate Change May Uproot 6 Million Annually*, REUTERS, Dec. 9, 2008, <http://planetark.org/wen/50823>. The total number of people uprooted in 2007 was sixty-seven million, of which twenty-five million were forced to move by natural disasters. *Id.* See also Andrew Dobbie, *Climate Change Could Force Millions From Homes*, REUTERS, Oct. 08, 2008, available at <http://www.planetark.com/dailynewsstory.cfm/newsid/50568/story.htm> (citing research that “[a] study of 22 developing countries by Bogardi’s institute and several other European research institutes into reasons for migration showed worries that human trafficking networks could gain from damage to the environment.”).

84. *Id.*

gy cooperation should lower emissions remaining mindful of biodiversity, ecosystem services and livelihoods.⁸⁵ China and the United States need to respond effectively to both economic and climate crises and can do so in part by cooperating on environmentally sound technology that transforms the global use of energy.

85. See International Union for Conservation of Nature (IUCN), Climate Change Mitigation and Adaption, http://cms.iucn.org/about/work/programmes/marine/marine_our_work/climate_change. See also David Adam, *Analysis Has the Kyoto Protocol Worked*, THE GUARDIAN, Dec. 8, 2008, at 10.