

**House Committee on Energy and Commerce**

Hearing on “Climate Change -- International Issues, Engaging Developing Countries”

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Testimony of

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Mr. Chairman, and members of the committee, thank you for the opportunity to appear before you today to discuss China’s energy sector development and its implications for global climate change. My comments are drawn from two decades of research on China’s industrialization process, as well as my participation as one of eleven principal authors in the recently released MIT study “The Future of Coal: Options for a Carbon-Constrained World.”

A major premise of MIT’s “Future of Coal” study is that the risks of global warming are real, and that action should be taken to restrict the emission of carbon dioxide and other greenhouse gases. A second and related premise is that coal will continue to play a major role in meeting global energy needs, particularly in developing countries, and most clearly of all in China. Over the long run, global carbon mitigation efforts, to be successful, must encompass China.

China over the next twenty-five years is expected to account for more than half of global growth in coal supply and demand. The country today is world's largest producer of coal (2.23 billion tones in 2005), and coal accounts for over two-thirds of China's primary energy supply. Electricity generation accounts for just over half of all coal utilization in China, and about 80 percent of Chinese electricity generation is fueled by coal. Indeed, the supercharged growth of the power sector is arguably the single most important factor driving China's impact on carbon emissions and global climate change. In 2005, approximately 70 Gwe of new generating capacity was brought into service (an addition nearly the size of the UK's entire power grid). In 2006, an astounding 102 GWe of capacity was added, again primarily in the form of coal-burning power plants. Though Chinese per capita electricity consumption remains low (about 20 percent of average per capita consumption in the world's advanced economies), the scale and pace of the power sector's build-out is extraordinary. In aggregate terms, China is expected to overtake the United States as the world's largest emitter of carbon dioxide within the next two years.

To understand China's current energy situation – as well as the context for future Chinese participation in carbon mitigation efforts – one must recognize three key features of the Chinese system. First, especially at the national level, China's energy-related governmental bureaucracy is highly fragmented and poorly coordinated. Responsibility for energy pricing, for the approval of infrastructure projects, for the oversight of state energy companies, and for long-term energy policy is spread across many agencies, most of them seriously understaffed, and some of which – given their very recent emergence on the scene – are notably weak in relation both to other agencies and to the players they

are supposed to be regulating. In much of the Chinese power sector – except for the nuclear area – precious little evidence exists for coherent, top-down policy making or even a clear overall policy agenda.

Second, under these conditions it is the state energy companies – the national oil corporations and the national power generating groups – that are among the most coherent entities. These are the organizations that are most capable of defining their own interests and that are most likely to act, making decisions that their ostensible state regulators and overseers can barely keep up with and sometimes do not even monitor. At the same time, and reflecting China's increasingly deep integration with the global economy, these corporate entities are hardly simple organizations themselves. Listed on both domestic and foreign stock exchanges, the state energy corporations encompass complicated groupings of stakeholders, including state-appointed senior executives, domestic and foreign corporate board members, major financiers from the global investment banking community, and international institutional investors. Textbook examples of shareholder-driven corporate governance they are not, but neither are they simple puppets of the state – in no small part because the state itself is so fragmented and lacks a clear voice on energy policy. In essence, the central government in Beijing today has neither a coherent national energy strategy nor much capacity to monitor, support, or impede the actions of state-owned energy companies – actions that are often misunderstood by outsiders as merely echoing government policy.

Third, and most important, the remarkably rapid growth of energy consumption in China has been possible because a host of infrastructural issues are being resolved very quickly by individuals and organizations operating well below the level of national energy corporations. Key decisions about China's physical and technological infrastructure – decisions with profound consequences for its long-term energy development – are being made almost daily by actors at the grass roots level. Boundaries at this level between regulators, investors, and commercial operators are hazy at best, and some decision makers simultaneously occupy several of these categories. Despite such admittedly chaotic conditions, generating capacity has consistently been added. It has been added, though, on an ad hoc basis, in a wide-variety of forms (ranging from large-scale municipal power plants to smaller scale off-grid generation by industrial consumers), utilizing a wide-array of technologies, and often in tension with existing regulatory strictures.

To attribute China's aggregate energy demand growth – or even the actions of the state-owned energy companies – to central government agendas or geopolitical strategy is thus mistaken. What many outsiders take to be the deliberate result of Chinese national “energy strategy” is in fact better understood as an agglomeration of ad hoc decisions by local governments, local power producers, and local industrial concerns, few if any of whom have the national interest in mind, and most of whom are rushing to fill a void left by the absence of national-level energy strategy. Amidst surging energy demand and frenetic local decision-making, agencies and individuals in the central government are scrambling simply to keep abreast of developments on the ground. China's astonishingly

rapid energy development may well be spinning the heads of outsiders, but it is vexing, perplexing, and even overwhelming Chinese governmental insiders too.

In light of these conditions, how can China become part of the solution to – rather than just the newest major driver of – the challenge of global climate change? First, we should recognize that the Chinese government’s capacity to achieve targets for reducing hydrocarbon consumption or pollutant releases, or Kyoto-like limits on greenhouse gas emissions, is in practice limited today, and will likely be so for the next five to ten years. Neither louder demands for compliance by outsiders nor escalating penalties for non-compliance are likely to yield the desired results.

Second, and equally important, China’s national leadership will likely be prepared to enter into such agreements over the longer term, but on a primarily aspirational basis. The term “aspirational” on the one hand relates to the Chinese central leadership’s desire to come to terms with many of the same issues facing policy makers in the United States. Chinese leaders are feeling the combined pressures of increasing reliance on foreign sources of energy, increasing demands from citizens in many regions for better environmental management, and growing concerns about the perceived direct effects of global warming on China today (namely, the prolonged water shortages and rapid desertification patterns afflicting the nation’s North and West). As a result, certain policy makers have become focused on building central regulatory capacity to address a wide variety of energy-related externalities, including – though not primarily – climate change.

The Chinese central government's very publicly announced goal to increase national energy efficiency by 20 percent from 2006-2011 is a clear example of this aspirational bent. Key actors within the central government have grown increasingly aware of China's energy vulnerabilities and the urgent need for more sustainable utilization of energy resources. Against some opposition from within their own system, they fought hard to include the efficiency targets in the 2006-2011 five-year plan. Public commitments to such targets, by putting the government's reputation on the line (vis-a-vis its own citizens, let alone outsiders), suggest a certain determination to depart from "business as usual" – probably a necessary, but by no means sufficient condition for change to occur. Of course, given that the first of the five year efficiency targets were not met in 2006, the question of governmental capacity still remains open.

In a second "aspirational" sense, China's central government will likely over time seek to join global accords on carbon mitigation if doing so becomes accepted practice among the world's advanced industrial nations. Chinese governmental legitimacy has increasingly come to rely on the ability of the state to persuade citizens that it is modernizing China, effectively bringing to China the laws, institutions, and practices of advanced industrial societies. While the issue of democratization is still sensitive, the government has increasingly encouraged citizens to judge it in terms of its delivery of rule of law, private ownership, a better environment, etc. – terms all measured against the established standards of advanced industrial societies. For at least ten years, the Chinese government has urged its citizenry to take up the cause of "putting China on the global track" and "getting China onto the global standard." As a result, we have witnessed

China doing things we would not have anticipated previously – joining the World Trade Organization on fairly strict terms, building rules of intellectual property rights protection, expanding the rights of private entrepreneurs, and moving toward a more modern system of currency management. In each of these areas, change has been incremental, regulations have often been slow to emerge, and enforcement has tended to lag even further behind. Yet, in each of these cases, positive change has taken place over time, often at considerable cost to key societal constituencies, and often well beyond the expectations of domestic and foreign observers. The point is that “getting onto the global standard” – a standard defined by the world’s advanced societies – carries great importance in China, both for the legitimacy of the government and the individual citizen’s sense of the status of the nation.

How, though, can China’s highly decentralized system of energy sector governance be directed to meet the aspirational goals of citizen and state alike. In one sense, this is not a system capable of responding deftly to either domestic or international mandates, particularly when such mandates call for dramatic near-term change. Indeed, the response by subordinate officials to dictat from above is more likely to come in the form of distorted information reporting than actual changes of behavior. In another sense, though, this is a system in which players are emerging at every level who have a stake – whether political or commercial – in achieving more sustainable energy outcomes. That some central agencies have been able to work into the policy agenda stricter energy efficiency targets, that citizens in China’s more advanced cities like Shanghai are demanding and getting better air quality enforcement, and that some domestic energy

companies are positioning themselves for an environmentally-constrained market are just some indicators of this. Although these players are not coordinated, and they at times represent competing interests themselves, they are frequently looking outside, particularly to the advanced industrial economies, for guidance and models to emulate. Moreover, they are doing so in the context of a system that is highly integrated into the global economy, to the point that foreign commercial entities are often deeply involved in domestic decision making, particularly with respect to the strategies of China's domestic energy companies.

Perhaps most important of all, for all its faults, the Chinese system is highly experimental, flexible, and – as evidenced by developments over the past two decades – capable of great change. Those entities that are seeking more sustainable energy solutions in many cases actually have the ability to pursue experimental projects, often on a large scale and often involving foreign players. For example, several municipalities, including Beijing, have taken advantage of aspects of the new national Renewable Energy Law to establish cleaner, more efficient, large-scale biomass-fueled power plants. The specific terms of such projects – who pays for them, who designs and controls them, and so on – are always subject to ambiguity, negotiation, and ad hoc interpretation. This is, after all, a nation with an institutional tolerance for “systems within systems” and a wide array of quasi-legal, gray area activities. Experiments on the sustainable energy front are certainly possible, and in some cases are beginning to happen. Those most likely to succeed will not be national in scale, but localized, replicable, and able to propagate to other localities. These experiments, particularly since they so frequently involve foreign

participants, are also likely to be consistent with trends in advanced economies. China's economic and commercial development is now so dependent on global integration that it will not permit itself – and, indeed, in purely commercial terms, cannot permit itself – to become an outlier in terms of the technological and institutional underpinnings of its energy system. In this respect, the commercial ambitions that make China's energy sector so difficult to regulate also contain the seeds, over the long run, for successful Chinese participation in global carbon mitigation efforts.

Mr. Chairman, thank you again for inviting my testimony. I greatly appreciate the effort of this committee to shape our nation's response to the risks of global climate change, and to do so with a full understanding of the likely responses from major developing countries such as China.