Clean Energy in the Paradigm of Energy Security: The Development of U.S.-China Energy Cooperation


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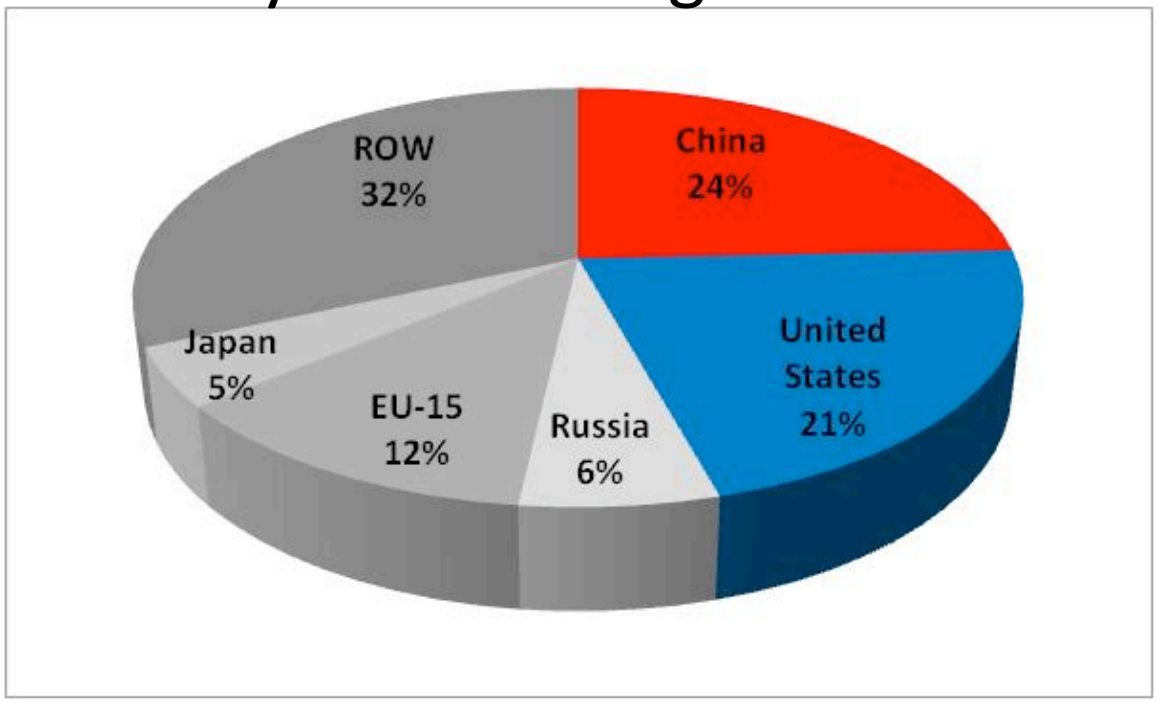
Climate, Energy and US-China Relations

- US and China are strategically interdependent, and face similar challenges in
  - maintaining energy security
  - combating climate change
  - ensuring economic growth and prosperity
- We are entering a challenging time in US-China relations
  - Climate and energy cooperation may be one key area where we can advance
- US-China cooperation on climate change can broaden and deepen areas of long-term, mutually beneficial cooperation and build strategic trust
- China and the United States are positioned to lead the global transformation to a sustainable, low carbon global economy
  - Are currently leaders in renewable energy

The Global Climate Challenge

- As the world's top two energy consumers and carbon emitters, the United States and China play a decisive role in our ability to address global climate change



CO2 Emissions from Fossil Fuels and Cement (2007)

E*nergy*: IEA, 2007 (1990-2005); BP, 2008 (2005-2007 trend); *venting and flaring*: EDGAR 4.0 (EIA, 2007; CDIAC, 2007); cement: EDGAR 4.0 (USGS, 2007), USGS (2008)

Renewable Energy Cooperation

- In a carbon-constrained world, the U.S. and China will have no alternative but to become far more active partners in developing low-carbon economies, expanding the role for renewable energy technologies
- Both countries are also motivated by a set of related goals, namely job creation, energy security, and pollution reduction, making renewables development an optimal strategy
- As major technology exporters, they are also poised to jointly lead the way in fostering greater worldwide use of clean energy
- Given the size of their energy markets, any substantial progress the two countries make in advancing renewables will necessarily advance technological understanding, accelerate deployment to reduce costs further, and bring immediate benefits to the global community

Barriers to Renewables Deployment in the US & China

Transmission Issues

- Integration into existing grids
- Resource Variability: balancing intermittent generation within a service area
- Critical Corridors

Siting Barriers

- Public acceptance
- Environmental impacts
- Competing land use needs

Rising Costs

- Materials inputs
- Materials supply constraints

Turbine Reliability

- Gearbox / Drive train
- Blades
- Undersized test facilities
- Low capacity factors & poor siting

Policy Framework

- Consistent, supportive policies
- Policies that promote local economic development and jobs

These are all topics ripe for US-China Cooperation

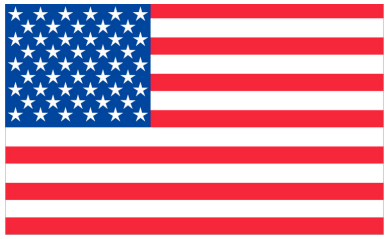
Outlook for Renewables in the US & China

- **Manufacturing**
  - China in particular has taken impressive strides to improve its manufacturing capability in wind turbines and solar photovoltaic (PV) systems, although the latter are almost exclusively being sold as exports
  - The United States has until recently been the world's top market for wind turbines, and a leading supplier of second-generation, thin-film PV materials
- **Deployment**
  - Much of the near-term growth in renewable power in both countries will be in wind installations, as well as some larger-scale solar generation
  - Due to its emphasis on PV manufacturing, China is favoring PV for central station plants, whereas the United States is expected to rely more on solar thermal technologies for central stations while using PV more for smaller and distributed applications (including MW-scale installations on commercial roofs)

Recent Headlines Highlighting Tensions

- 7/20/10
  - IEA pronounces China world's largest energy consumer
  - China rejects claims; calls IEA data unreliable
- 7/22/10
  - U.S. Senate pronounces climate bill dead
  - China announces plan to begin domestic carbon trading
- 8/15/10
  - China passes Japan to become second largest economy
- 9/4/10
  - U.S. unemployment worse than similar industrial nations
- 9/8/10
  - China named most attractive place to invest in renewable energy by Ernst & Young
- 9/9/10
  - United Steelworkers file Section 301 Petition against China's Green Technology Practices

Clean Energy Competition



- International trade
  - Chinese imports to the US
- US market access in China
  - Preference for Chinese manufacturers
  - Unfair subsidies

- International trade
  - Competing with US/EU manufacturers in other markets
- Market access in the US
  - Preference for US manufacturers
  - Concerns about technology performance

Perceived Challenges to Cooperation

- ***We are competing with China to become a renewable energy technology leader***
  - They lead in production, but not in R&D or deployment
- ***If US companies cooperate with Chinese companies they will steal our technology and intellectual property***
  - Are many US companies already benefiting from cooperation with Chinese partners
- ***They cannot learn anything from us***
  - Serious challenges even in wind deployment in China
    - Very low capacity factors as a result of poor siting practices, O&M and lack of technology testing and certification facilities
- ***We have nothing to learn from them***
  - China is the only country pursing GW-scale wind farm development
  - Similar transmission and integration issues as the US means they provide a valuable laboratory for learning

Implementation of Clean Energy Cooperation

- U.S.-China Strategic and Economic Dialogue
- Memorandum of Understanding to Enhance Cooperation on Climate Change, Energy and the Environment
- Climate Change Policy Dialogue
- Memorandum of Cooperation to Build Capacity to Address Climate Change
- U.S.-China Joint Commission on Commerce and Trade
- U.S.-China Clean Energy Research Centers
- U.S.-China Electric Vehicles Initiative
- U.S.-China Energy Efficiency Action Plan
- U.S.-China Renewable Energy Partnership
- 21st Century Coal Cooperation
- Shale Gas Resource Initiative
- U.S.-China Energy Cooperation Program (ECP)
- U.S.-China Energy Efficiency Forum
- U.S.-China Renewable Energy Forum
- U.S.-China Advanced Biofuels Forum

Consortia announced for U.S. side, along with $25 mill of USG funds.
Chinese consortium unknown;
mandate: R&D? &D? &D?

Bilateral Cooperation & Climate Negotiations

- China & the United States are central players in negotiating a multilateral climate change agreement
  - Copenhagen achieved a lot… but not enough
- Multilateral politics differ from bilateral politics
  - Particularly in the way China positions itself as an equal partner rather than as the voice of the developing world
- Bilateral agreements cannot replace a multilateral treaty
  - Limited in scope but less politically, commercially sensitive when key actors brought together
  - Bilateral cooperative actions can help achieve action in the near term
  - They hopefully will also improve the multilateral relationship though creating mutual understandings and building trust.

International Climate Negotiations

- US-China tensions often high, as in Copenhagen
- China sides with the G77 – lowest common denominator often sets the position
  - Most recent alliance with the BASIC countries; many are taking serious actions

– The first ever UNFCCC negotiation hosted by China showed that little has changed, and expectations for Cancun are low

Climate <-> Energy

- Climate policy related to clean energy and to energy security but often separated in US-China policy discussions
- China is increasingly combining the two domestically
  - Energy intensity target motivated by energy security
    - Aims to eliminate the wasteful use of energy
  - Energy intensity target has led to a carbon intensity target
    - Builds upon the systems in place
    - Will require a new system of GHG accounting
    - Additional climate policies to reduce emissions
  - Still major concerns over data quality; energy intensity target will likely not be achieved

Conclusions

- We face similar challenges
  - maintaining energy security
  - combating climate change
  - ensuring economic growth and prosperity

  →***This can create opportunities for cooperation, or grounds for competition***
- We are entering a challenging time in US-China relations

  →***Climate and energy cooperation may be one key area where we can advance – or further strain – the relationship***
- China and the United States are positioned to lead the global transformation to a sustainable, low carbon global economy

  →***We play a key role in advancing technological understanding, reducing costs, and bringing immediate benefits to the global community***

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