



China-US Clean Energy Initiatives

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For the past year, working groups, composed of American and Chinese experts in energy, finance, law and public policy, have analyzed our countries' common energy challenges, identified opportunities for cooperation and developed the following list of priority initiatives:

1. Utilize Policy Tools to Eliminate Barriers and Accelerate Clean Energy Adoption

Situation: Despite our well-recognized common interests in accelerating deployment of clean energy technologies and creating jobs by increasing trade, a number of policy barriers exist that prevent common interests and good intentions from being translated into action. Key issues to address include:

- Minimize or eliminate tariffs and non-tariff barriers on clean energy goods and services
- Eliminate export controls for clean energy technology, software and services
- Establish joint Intellectual Property licensing entity to facilitate technology exchange
- Institute ongoing and sustainable financing mechanisms for clean energy, including direct financing, loans and loan guarantees
- Implement innovative energy rate structures to help manage demand
- Share best practices on incentives to accelerate clean energy deployment_

2. Establish a Joint Energy Efficiency Center

Situation: The US and China have the potential to improve energy efficiency significantly, especially in the commercial and industrial sectors. But both countries suffer from a shortage of qualified, certified energy auditors who can identify opportunities for energy savings and build business plans to justify the necessary investment to banks and other lenders.

- Establish articulation agreements between universities and technical colleges specializing in energy technologies to jointly create curricula, certifications, and degree programs
 - Expand exchange programs for researchers, scholars, and students
 - Coordinate joint research and development of innovative technologies to maximize impact and minimize duplication
- Establish “train the trainers” program to greatly increase qualified (and certified) energy audit experts, who can analyze factories and commercial buildings to identify efficiency improvements
- Establish finance training programs to improve skills in developing business/investment cases and to improve lending community's ability to evaluate efficiency investments from ESCOs, factory and commercial building owners

3. Share knowledge and technologies needed to create Smart Grid (including transmission and distribution networks).

Situation: The smart grid offers the opportunity to improve the efficiency, reliability and flexibility of both countries' electrical systems by adding intelligence to the network, optimizing transmission and integrating distributed generation and storage technologies.

- Address urban distribution issues common to, for example, Beijing and New York
- Install Smart Meter systems
- Develop and deploy distributed “smart” storage systems to wind, solar and off-peak generation can be utilized during peak periods, instead of building “peaking” plants
- Share knowledge and technology necessary to integrate variable and distributed resources, such as wind and solar, into grid
- Deploy “system of systems” software that can provide the necessary intelligence to provide real-time management of complex sub-systems
- Share knowledge on ultra high voltage transmission technologies to reduce line loss and provide cost-effective means to bring power generated in remote areas to urban population centers
- Develop standards for smart appliances that can be tied to the smart grid
- Share knowledge about issues surrounding recharging of electrical vehicles
- Develop demand side management tools, including technology and behavioral solutions

4. Coordinated Development of Advanced Coal Projects, including Carbon Capture and Sequestration

Situation: China and the US are the world's largest consumers of coal, which provides 80% and 50%, respectively, of each country's electrical generation. By working together to develop and deploy advanced coal technologies on a parallel basis, and sharing information on what components and practices work best, both countries can accelerate the development of cleaner coal plants and drive down their cost.

- Create coordinated program, involving multiple projects in both countries, to accelerate deployment and refinement of advanced coal technologies, at a reduced cost to each country:
 - Design and construct four demonstration scale advanced near-zero pollution/emission coal-fired power plants and two coal power plant retrofit projects. (Each country would build two advanced plants and execute one retrofit project). Utilize multiple combustion technologies, environmental control systems, operating procedures, types of coal to benchmark most promising technologies and operating practices
- Conduct joint research & development of advanced coal technologies as well as capture and sequestration of carbon

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- Test various capture and sequestration technologies, including use of CO₂ to create sustainable bio-fuels
 - “Twice the benefit at half the cost”

5. Increase Efficiency, Lower Manufacturing Cost of Solar Photovoltaic and Hot Water Systems; Set ambitious goals for solar deployment by 2020.

Situation: China and the US are world leaders in solar technology and manufacturing. By combining forces, the two countries can work together to increase efficiency of both photovoltaic and hot water solar technology and lower manufacturing costs so that solar becomes more competitive with thermal generating resources.

- Set ambitious goals for the adoption of solar for both China and the United States
- Conduct joint research and development aimed at improving efficiency and lowering manufacturing costs
- Develop Utility scale (1+MW) plants in each country
- Develop commercial scale (50+KW) projects in each country and share information on how best to integrate these resources into the grid
- Share information on the effectiveness of policy initiatives which will accelerate deployment of solar technology
 - Financing
 - Elimination of tariffs
 - Exemption from export controls
 - Incentives such as feed-in tariffs, accelerated depreciation
- Joint development of technologies and procedures to facilitate integration of solar into the grid
- Construct parallel commercial-scale concentrating solar projects to evaluate best technologies and develop optimal operating practices

6. Power Rollout of Electric Vehicles

Situation: The US and China are the world's largest automobile markets and both countries have the potential to cut dependence on imported petroleum, reduce pollution and CO₂ emissions and create jobs by rapidly transforming vehicles so that they are powered by electricity rather than gasoline and diesel.

- Aggressively roll out recharging infrastructure for one or more cities in each country to accommodate PHEVs and EVs. Set ambitious goal of at least 100,000 vehicles for each city by 2015.
- “Coopetition”—recognize that we can both cooperate and compete for market share. Establish common standards to facilitate broad adoption and maximum opportunities for trade
- Conduct joint battery technology R&D
- Share knowledge of how to utilize smart grid technology to assure that vehicles are recharged when there is spare capacity in the grid and carbon emissions will

be minimized

- Establish necessary policies: incentives, local permitting, etc. appropriate for each country. Share knowledge on effectiveness of such policies.

7. Develop Bio-Energy Fuels and Sustainable Transportation Technologies for the Aviation and Maritime industries

Situation: *Unlike automobiles, airplanes and ships cannot rely on batteries to power them, so there is a need to develop sustainable biofuels that can reduce net carbon emissions and increase energy efficiency.*

- Focus on commercial aviation and maritime, including port operations
- Testing and evaluation of sustainable bio-fuels feedstocks
- Development of sustainable bio-fuels manufacturing and distribution capability
- Development of policies which ensure that biofuels will be available on reasonable commercial basis for transportation modes that have no practical alternative to liquid fuel (aviation, maritime).
- Improved efficiency of both countries' air traffic control systems
- Sharing of best practices

8. Create *Strategic Energy Zones (SEZs)* to facilitate innovation in applying new policies, rate structures, tax incentives, etc. so that it will be easier to implement other priorities in the joint clean energy program.

Situation: *China accelerated its economic development by creating Special Economic Zones, which encouraged innovation and concentrated investment. Building on that model, create zones in each country where new ideas, technologies and policies can be pilot tested without having to change national policies, which is usually more complicated and time consuming.*

- Focus investment and activity in geographic or virtual zones
- Create “Paired Zones” e.g. San Francisco and Beijing, Seattle and Chongqing. Build on existing relationships, ecoPartnerships, sister cities and sister states/provinces
- Serve as models for broader deployment of policies and technologies in both countries that are sustainable and replicable
- Establish focused and intense exchange programs to build trust, share best practices.
- Create model sustainable communities, appropriate to the conditions of each country