Energy Efficiency Cooperation: U.S. and China Building Together

Jake Schmidt, Int’l Climate Policy Director
Michael Davidson, China Climate Fellow

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About the Natural Resources Defense Council (NRDC)

- NRDC’s purpose is to safeguard the Earth: its people, its plants and animals and the natural systems on which all life depends.
  - We use law, science and the support of 1.3 million members and online activists to protect the planet's wildlife and wild places and to ensure a safe and healthy environment for all living things.

- We have 5 offices in the U.S. and an office in Beijing, China
Overview

- China’s Energy Efficiency Goals
- Existing U.S.-China History of Cooperation
- Key Opportunities:
  - Buildings
  - Demand Side Management
  - Industry
  - Supply Chains
China’s Existing Commitments

Energy Intensity
- **Target:** 20% reduction from 2005 levels by 2010
- **Status:** 15.6% by end of 2009
- Top-1000 Enterprises program:
  - Reduce energy demand by 100 million tce by 2010
  - Currently exhausting all alternatives to achieve target

Carbon Intensity
- **Target:** 40-45% reduction from 2005 levels by 2020
- Inscribed in Copenhagen Accord

12th Five-Year Plan (2011-2015)
- **Energy Intensity Target:** 15-20% reduction likely
- **Carbon Intensity Target** also likely to be included
Energy Efficiency Potential - 2030

- Energy Efficiency
  2.4 Gt CO₂
- Clean Energy
  2.4 Gt CO₂

Sources: McKinsey analysis  China’s Green Revolution, 2009
U.S.-China EE Cooperation

- Cooperation goes back nearly 20 yrs

Recent cooperation includes:
- Building Efficiency MOU (July 2009)
- Energy Efficiency Action Plan (Nov 2009)
- Energy Efficiency Forum (May 2010)
  - Lawrence Berkeley National Lab–led consortium (NRDC is a U.S. partner)

California-Jiangsu Cooperation
- MOU on GHG reduction (Oct 2009)
Significant Building EE Potential

Cost-benefit estimates of CO₂ abatement (RMB/tCO₂)

- **Buildings**: Every tonne of CO₂ abated yields a net benefit of 461 RMB.
- **Transportation**: 41 RMB
- **Agriculture**: -236 RMB
- **Industry**: -287 RMB
- **Power**: -133 RMB

Can require large capital expenditures or result in low or negative ROI.

Every tonne of CO₂ abated has a net cost of 287 RMB.

Positive contribution to "Profit & Loss" statement.

Negative contribution to "Profit & Loss" statement.

Source: *From Gray to Green*, NRDC (2009)
China Building Efficiency Actions

- Agenda 21 Building (completed 2004)
- Current standards: 50% reduction for new buildings
- Energy retrofit target: 150 mil m² cold-climate residential by 2010
- Under development: energy rating and labeling for residential and commercial
- If meet 11th FYP’s targets: \(540\, \text{MtCO}_2\) reduction

Source: NRDC calculations based on LBNL, “Assessment of China’s Energy-Saving and Emission-Reduction Accomplishments and Opportunities During the 11th Five Year Plan” (2010).
Demand-Side Management

- Energy conservation
- Energy efficiency

- Efficiency Power Plant (EPP) – *virtual* power plant
  - Weighted average cost of an EPP¹ (15 fen/kWh)
  - Cost of new power source (35-40 fen/kWh)

- California-Jiangsu Model

- NRDC cooperates with energy efficiency centers in 6 provinces, State Grid DSM Center, Southern Grid

Industrial EE: Greening the Supply Chain

- NRDC worked with major apparel manufacturers to look at the energy use and pollution of their supply chain in China.

- Applying 10 key measures could save:
  - Energy (fuel) up to 31%
  - Electricity up to 3%

<table>
<thead>
<tr>
<th>Practice</th>
<th>Savings (kg coal/ton fabric)</th>
<th>% savings (rounded)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recover heat from hot rinse water</td>
<td>61.1-320</td>
<td>2-12%</td>
</tr>
<tr>
<td>Prescreen coal</td>
<td>79.5</td>
<td>3%</td>
</tr>
<tr>
<td>Maintain steam traps</td>
<td>72-128</td>
<td>1-5%</td>
</tr>
<tr>
<td>Recover heat from smokestack</td>
<td>65</td>
<td>1%</td>
</tr>
<tr>
<td>Energy savings from leak detection, preventive maintenance, improved cleaning</td>
<td>47-340</td>
<td>1.5-5%</td>
</tr>
</tbody>
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For more information, see: [www.nrdc.org/cleanbydesign](http://www.nrdc.org/cleanbydesign)
Low-Carbon Industry Parks

- China is building 12 “clean energy economic zones” throughout the country
  - Significant investments converting old industry facilities
  - Will be leaders in clean energy deployment & install state of the art EE/RE

- Suzhou Industrial Park (est. 1994)
  - Sino-Singapore cooperation
  - Eco Science Hub: Low-Carbon Demonstration (2010)
    - SIPAC-NRDC-Nanjing University

- Shanghai Industrial Park
  - Investing $750 million to convert old iron & steel plant into a clean energy center w/ as high EE as possible
Take Home Points

- Significant energy efficiency potential in China
  - China is aggressively moving to tap into this
  - But...
- U.S.-China cooperation is essential
Thank you!

- **Contact:**
  - Barbara Finamore, China Program Director (bfinamore@nrdc.org)
  - Jake Schmidt (jschmidt@nrdc.org)
  - Michael Davidson, China Climate Fellow (mdavidson@nrdc.org)

- Read our China blogs:
  - switchboard.nrdc.org/blogs/issues/greening_china/

- See our new reports on China:
  - http://china.nrdc.org/library/NRDC-Tianjin-side-event-reports

- China-U.S. Energy Efficiency Alliance:
  - www.chinauseealliance.org/
Additional Slides
China’s Efforts to Reduce Energy Use

- 11th Five-Year Plan
  - Reduce energy intensity by 20% between 2006 and 2010 (save 700 million tons of coal equivalent)
- Top-1000 program to save 100 million tce by 2010 (263 mt CO2 reduction)
- Government financial support: 7 billion RMB in 2007 (central/provincial)
- Officials' political career prospects dependent in part on their energy-saving performance
China’s Efforts to Reduce Energy Use (2)

- Distribute 150 million energy efficient light bulbs between 2008 and 2010
- Shut down 71 GW of small inefficient coal power plants between 2006 and mid-2010
- Implement efficiency dispatch rules – dispatch power plants based on coal consumption level
- Adopt energy labeling for refrigerator, air conditioner, washing machine, water heater, induction cooker, fluorescent lamp, motor, copier, computer monitor, etc.