Energy Efficient Cities Initiative
– Leveraging Local and International Financing for Energy Efficient Urban Operation and Development

Feng Liu
Energy Sector Management Assistance Program
Energy Sector Management Assistance Program

• Established in 1983.

• A global technical assistance partnership administered by the World Bank and sponsored by official donors.

• Focusing on energy service for poverty reduction, energy security through supply diversification and energy efficiency, and energy sustainability for climate change mitigation and adaptation.

• Leveraging World Bank lending, developing innovative policies and solutions, and disseminating knowledge and best practices.
Financing Energy Efficient Cities:

**Large Impacts**

By 2030:

- 3/4 of global energy use and GHG emissions will come from cities
- 81% of urban energy demand increases will come from cities in developing countries
- Tripling of urban built-up areas in developing countries (compared with 2000)

**Major Constraints**

Investment in EE is limited by:

- Priorities on delivering key urban services and access – How to mainstream EE in cities?
- Budgets, incentives, technical and institutional capabilities – What is causing the blockage?
- Insufficient on-the-ground results – Where are the next Curitibas and Rizhaos?
ESMAP Response to Urban Energy Challenges

• Energy Efficient Cities Initiative

• Parallel Activities:
  – Adoption of Building Energy Efficiency Standard and Associated Carbon Financing Methodology
  – Public Procurement of Energy Efficiency Services
  – Energy Efficiency in Water and Sanitation Utilities
Energy Efficient Cities Initiative

EECI Components

- Rapid analytical framework (RAF) for EE retrofits in cities and energy planning tools
- Small grants program through Cities Alliance
- Urban EE good practice awards and database
- Development of WB regional urban lending operations
- Outreach, knowledge exchange, and dissemination
## Energy Efficiency in Cities: Local Leverage

<table>
<thead>
<tr>
<th>Sector Category</th>
<th>Subcategory</th>
<th>City Government Leverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Manufacture</td>
<td>Indirect, weak</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Indirect, week</td>
</tr>
<tr>
<td>Transport</td>
<td>Private/commercial motor vehicles</td>
<td>Indirect, weak</td>
</tr>
<tr>
<td></td>
<td>Government motor vehicles</td>
<td>Direct, strong</td>
</tr>
<tr>
<td></td>
<td>Public transit systems</td>
<td>Direct, strong</td>
</tr>
<tr>
<td>Municipal Services</td>
<td>Water supply and sanitation</td>
<td>Direct, strong</td>
</tr>
<tr>
<td></td>
<td>Solid waste management</td>
<td>Direct, strong</td>
</tr>
<tr>
<td></td>
<td>Public lighting</td>
<td>Direct, strong</td>
</tr>
<tr>
<td>Buildings</td>
<td>Public buildings</td>
<td>Direct, strong</td>
</tr>
<tr>
<td></td>
<td>Commercial buildings (non-public)</td>
<td>Indirect, strong in new constructions</td>
</tr>
<tr>
<td></td>
<td>Residential buildings</td>
<td>Indirect, strong in new constructions</td>
</tr>
</tbody>
</table>
## Financing EE Cities: Role of International Assistance

<table>
<thead>
<tr>
<th>Sector</th>
<th>Short Payback (under 5 yrs)</th>
<th>Medium Payback (5-10 yrs)</th>
<th>Long Payback (over 10 yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Services</td>
<td>• Pump retrofits</td>
<td>• System rehabilitation</td>
<td>• Modern waste management facility</td>
</tr>
<tr>
<td>Buildings</td>
<td>• Utility DSM programs</td>
<td>• Selected retrofit measures</td>
<td>• Building EE code compliance</td>
</tr>
<tr>
<td>Transport</td>
<td>• Traffic management</td>
<td>• Mass transit improvements</td>
<td>• Transit oriented urban development</td>
</tr>
<tr>
<td>Local Financing (Gov/Pri/Com)</td>
<td>MDB and Bilateral Financing</td>
<td></td>
<td>Climate mitigation funds</td>
</tr>
<tr>
<td></td>
<td>Barrier removal and incentives: GEF and CF</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Leveraging Urban Lending to Support Energy Efficient Cities

- Eco2 Cities Framework for investing in urban development in East Asia and Pacific Region

- Municipal services lending platform in South Asia Region
Leveraging Carbon Financing for Building Energy Efficiency

Building challenges in developing countries:

• Large technical potential … much of it in future years

• Lack of standards is the least problem

• Compliance is abysmal in general

• It takes many years (and growth) to develop compliance capacity

• National/local governments have to commit for the long haul
Leveraging Carbon Financing for Building Energy Efficiency

Building blocks for a successful program

• Start with a realistic mandatory building energy standard
• Multi-year substantive engagements with national and local governments and industry to build compliance capacity
• The potential role of carbon finance
  – Focus on adoption of energy-efficient built-in technologies
  – Support rigorous compliance enforcement

ESMAP and WB Carbon Finance are developing

• Operational guidelines (available in September 2009)
• CF methodology for new buildings (draft in November 2009)
Expanding Public Procurement of Energy Efficiency Services

Main Hurdles:

• Preparation of technical information, audit, baseline
• Scope of RFP (defining the project, goods vs. services, etc.)
• Evaluation of dissimilar bids
• Budgeting (savings retention, payment of ESCO)
• Contract and financing terms (duration, payments, M&V)
Expanding Public Procurement of Energy Efficiency Services

Overcoming the Hurdles:

- Numerous solutions that require local adaptation
- The key is designing appropriate business and procurement models. This will require
  - Upfront surveys of potential bidders to determine available services and potential risks and identify training, risk sharing, and financing requirements;
  - Determine host facility procurement restrictions and preferences; and
  - Select/Develop key contract clauses to meet host AND service provider needs and capabilities.
- As experiences gained and processes more widely accepted, develop and disseminate standard documents.

† ESMAP study report available in July 2009
Improving Energy Efficiency of Water & Sanitation Utilities

• **Huge water losses**: 50 billion m³ worldwide, 70% in developing countries, and 70% technical losses.

• **Widespread inefficiency**: 30-40% of energy used in municipal water supply operations globally is wasted due to poorly managed pumping and filtration systems.

• **Key issues**:  
  – Lack of senior management knowledge of the energy situation  
  – Lack of management know-how  
  – Lack of metering  
  – Lack of financing for investments in part because of the above
Improving Energy Efficiency of Water & Sanitation Utilities

• Energy Monitoring and Target Setting (Energy M&T), the Brazilian Experience:
  – Large electricity savings achievable: up to 50% reduction
  – Synergies between energy and water: co-benefit in water loss reduction and possibility of micro-hydropower turbines
  – Improved service and increased access

• ESMAP is collaborating with IBNET to
  – Broaden IBNET benchmarking database to include energy efficiency and energy costs indicators
  – Provide grants and technical support to disseminate Energy M&T practice
THANK YOU !