

# ESMAP's Energy Efficient Cities Initiative



## Helping Cities Meet Their Energy Challenges of the New Century

### **By 2030:**

- 4.9 billion people (60% of the world's population) will inhabit cities
- Cities will consume 73% of the world's energy
- Cities will emit 73% of the world's greenhouse gases
- 81% of urban energy growth will come from developing countries
- Urban built up areas in developing countries will triple

## WORKING TOGETHER ACROSS ALL SECTORS—

### **Buildings, Housing, Power/Heating, Public Lighting, Transport, Water/Wastewater**

Energy efficiency improvements in the urban context should take a holistic approach of both supply- and demand-side measures. When thinking about water utilities, for example, significant city resources are spent trying to stem financial losses in the provision of this basic service. Often times, the major issues are water leakages and overuse of energy due to outdated, malfunctioning, or mismatched equipment. A first step may be to identify and repair leaks that can save both water and energy. But, much more could be done. On the supply side, further efficiency gains can be made by downsizing (and right-sizing) pumping stations and through system redesign and optimization. Similarly, efforts on the demand-side, such as promoting low-flow taps and water conservation, can yield further savings.

Public buildings tend to be older and use more inefficient equipment. Buildings can consume about 40% of a city's energy and, thus, have significant potential for energy savings with a wide range of options. Cities can often start with relatively low-cost and modulated measures, such as improvements in building envelope measures (e.g., windows, insulation), electrical appliances, and office equipment. For building complexes, such as city halls, schools, and hospitals, a more comprehensive approach would maximize cost effectiveness and potential savings. New buildings, could adopt energy-efficient design standards that would reduce the life-cycle cost of buildings and serve as an example to the private sector.



In Fortaleza, Brazil, the local utility implemented measures to improve the distribution of water, while reducing operational costs and environmental impacts. With an investment of only US\$1.1 million to install an automatic control system and other simple measures, the company has saved US\$2.5 million, or 88 GWh, over 4 years. More importantly, the utility was able to establish an additional 88,000 new connections without increasing their overall energy use.



In South Africa, Durban conducted a pilot project to “green” two of its municipal buildings through multiple low-cost measures, resulting in annual energy savings of 15%, or 400,000 kWh, a reduction in CO<sub>2</sub> emissions of 340 tonnes, and generated a return on investment in only 5 months. The city is now reviewing plans to retrofit many more buildings.



## THE CHALLENGE— Cities must garner political will and access appropriate financing

Cities face major barriers to implementing sustainable energy measures. Even where there is a desire to improve their efficiency levels, cities often lack the requisite information, supportive national-level policies, access to financing and other support. City managers and mayors are often not equipped with adequate information or resources to identify and prioritize energy actions and are left with more questions than answers: How will energy efficiency solutions meet my immediate city priorities? How can I build broad support among constituents and city staff for energy efficiency programs? What are the best policy, investment and technology options? Which cities have initiated similar efforts? How did they do it and what were the results? How can this be financed? How can we involve the local private sector? City leaders need help removing barriers and building capacity to acquire, adapt, and diffuse energy efficiency strategies and technologies.



### BARRIERS TO ENERGY EFFICIENCY

POLICY / REGULATORY	SERVICE PROVIDERS	PUBLIC END USERS	FINANCIERS
<ul style="list-style-type: none"> <li>• Low energy prices</li> <li>• Rigid procurement and budgeting policies</li> <li>• Inadequate planning and design methods</li> <li>• Limitations on public financing</li> </ul>	<ul style="list-style-type: none"> <li>• New contractual mechanisms</li> <li>• Limited technical and risk management skills</li> <li>• High project development costs</li> <li>• Limited equity</li> <li>• Public repayment concerns</li> </ul>	<ul style="list-style-type: none"> <li>• Limited incentives</li> <li>• No discretionary upgrade budgets</li> <li>• Unclear ownership of energy/cost savings</li> <li>• Lack of awareness</li> </ul>	<ul style="list-style-type: none"> <li>• New technologies</li> <li>• Small sizes/high transaction costs</li> <li>• High perceived risks</li> <li>• Behavioral biases</li> </ul>

## **THE OPPORTUNITY— Energy efficiency saves money and helps the environment**

Cities are an important engine for economic growth and socioeconomic development. Rapid urbanization in recent decades has led to ever-expanding cities, creating massive requirements for energy to promote growth and expand basic service infrastructure. Energy is widely viewed as the lifeblood of cities, powering public services, hospitals, and schools while moving people within the city and beyond. Against this backdrop, many cities struggle to meet the growing energy demand.

Without energy, water cannot flow to houses, offices cannot be heated and cooled, and commerce would come to a grinding halt. Reducing energy use through efficiency measures and improved urban planning can reduce a city's dependence on imported fuels and reduce energy costs, freeing up resources for improved city services and socioeconomic benefits, such as reduced commuting times, improved air quality and health, and more green and community space.

### **Energy Efficiency . . .**

- Saves cities money
- Lowers energy bills and operating costs
- Improves competitiveness
- Creates local jobs
- Improves the quality of municipal services
- Strengthens local energy security
- Reduces local air pollution and greenhouse gas emissions



## RESPONDING TO THE CHALLENGE— Energy Efficient Cities Initiative, a unique approach

In October 2008, the Energy Sector Management Assistance Program (ESMAP) invited representatives from a dozen cities and several partner organizations for a Roundtable Discussion about ongoing initiatives, barriers, and opportunities to further scale-up impacts.<sup>1</sup> Based on these discussions, ESMAP launched the **Energy Efficient Cities Initiative (EECI)** to help cities around the world meet their energy challenges in partnership with other organizations.

The **Energy Efficient Cities Initiative** is a flexible, cross-cutting, demand-driven program that identifies innovative ways to improve energy efficiency in the delivery of city services and reduce the costs and environmental impacts of energy use. EECI will build upon existent work through broad consultation and leverage sustainable energy investments in cities through existing, and possibly new, financing instruments. Given the complex nature and the broad scope of this work, forging strong and strategic partnerships is critical for EECI to successfully respond to the needs of cities.



Cities require locally tailored approaches, assistance evaluating sustainable energy policies and investment options, and support financing, implementing, and monitoring these programs. EECI can:

- **Analyze Energy Use in Your City.** EECI is developing tools to review a city's existing systems for overall performance, identify sectors where the most improvements can be made, and provide a list of policy recommendations, practical actions, and investment options to save energy and lower costs.
- **Offer Small Grants to Test New Approaches.** EECI has partnered with Cities Alliance, a World Bank-managed program dealing with city development strategies and slum upgrading, to provide small grants to cities to test new ways to deliver new energy efficiency measures and document results.
- **Share Good Practices and Reward Innovation.** EECI will establish an online database to share good practices from all city sectors around the world and present annual awards to recognize the most innovative and high impact efforts of individual cities.
- **Mobilize Partners and Financing.** EECI will also work with many global partner institutions, allowing cities to access the various skills and comparative advantages of different organizations in a more coordinated and holistic manner. Additionally, EECI will liaise with the World Bank Group operational units to mobilize loan funds, Global Environment Facility grants, Clean Technology Fund resources, carbon finance, and other financing as required.

1. The proceedings from this event can be downloaded at: <http://www.esmap.org/news/featured.asp?id=59>.

**ESMAP is a global knowledge and technical assistance partnership administered by the World Bank and assists low- and middle-income countries to acquire know-how and increase institutional capability to secure clean, reliable, and affordable energy services for sustainable economic development.**

**We welcome the opportunity to hear what your city has done to meet these energy challenges at: [esmap@worldbank.org](mailto:esmap@worldbank.org).**

To learn more about **Energy Efficient Cities Initiative**, please visit our website at: [www.esmap.org](http://www.esmap.org).



Energy Sector Management Assistance Program  
The World Bank  
1818 H Street, NW  
Washington, DC 20433 USA  
email: [esmap@worldbank.org](mailto:esmap@worldbank.org)  
web: [www.esmap.org](http://www.esmap.org)