

# 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 76% 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, Power/Heating, Public Lighting, Solid Waste, 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 Often times, the major issues are water leakages and overuse of energy due to outdated, malfunctioning, or mismatched equipment.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. Water utilities can implement an energy monitoring and targeting system to quantitatively manage system-wide energy use, reduce waste and cost, and identify key energy-efficiency investment needs. 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 employ inefficient equipment and operations and maintenance practices. 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 to improve building envelope (e.g., white roofs, sun shading, weather stripping), electrical appliances, and office equipment. Comprehensive energy efficiency renovations would maximize cost effectiveness and potential savings. New buildings, could adopt energy efficient design standards that would reduce the life cycle cost of buildings.



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 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” 2 of its municipal buildings through multiple low-cost measures, resulting in annual energy savings of 15%, or 400,000 kWh, a 340-tonne reduction in CO<sub>2</sub> emissions, and a payback period of 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. In addition, city managers and mayors are often not equipped with adequate 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 implement 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>• Public financing limitations</li> <li>• Limited autonomy of national/state bodies</li> <li>• Informal settlements</li> <li>• Election cycles</li> </ul>	<ul style="list-style-type: none"> <li>• High transaction costs for public sector</li> <li>• Weak technical and risk management skills</li> <li>• High project development costs</li> <li>• Limited equity</li> <li>• Public repayment concerns</li> <li>• New contractual mechanisms (ESCOs)</li> </ul>	<ul style="list-style-type: none"> <li>• Few incentives</li> <li>• No discretionary upgrade budgets or financing</li> <li>• Unclear ownership of energy/cost savings</li> <li>• Limited awareness and expertise</li> <li>• Weak linkages across sectors</li> <li>• Behavioral biases</li> </ul>	<ul style="list-style-type: none"> <li>• New technologies</li> <li>• Small sizes/high transaction costs</li> <li>• High real and perceived risks</li> <li>• Weak energy efficiency loan appraisal skills</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 energy requirements 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 or cooled, and commerce would come to a grinding halt. Reducing energy use through efficiency measures and improved urban planning can lessen a city's dependence on imported fuels and reduce energy costs, freeing up resources for improved city services and socioeconomic benefits, such as shorter commuting times, improved air quality and health, and increased 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 energy efficiency 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, and 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 is building upon existing work through broad consultation and leveraging 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.

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

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

- **Diagnose Inefficient Energy Use and Offer Solutions.** 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. EECI is also helping mainstream good municipal energy management practices and is collaborating with the International Benchmark Network for Water and Sanitation Utilities (IBNET) to scale up energy monitoring and targeting in water and sanitation utilities.
- **Offer Technical Assistance 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 targeted technical assistance to cities to incorporate energy efficiency measures (e.g., buildings, transport systems, water networks, procurement policies) into their programs and development planning.
- **Share Good Practices and Reward Innovation.** EECI has established an online database to share good practices from all city sectors around the world and will present annual awards to recognize the most innovative and high impact efforts of individual cities. Further, targeted publications on global good practices in public procurement, building codes, sustainable transport, and other areas will also be developed and disseminated.
- **Mobilize Partners and Financing.** EECI will also work with many global partner institutions, enabling cities to access the various skills and comparative advantages of diverse organizations in a coordinated and holistic manner. Additionally, EECI will liaise with the World Bank operational units, IFC-World Bank Subnational Finance, World Bank Infrastructure Recovery and Assets Platform (INFRA), Global Environment Facility, Clean Technology Fund, carbon finance, and other sources to mobilize loans, guarantees, and other financing as required.



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**The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by the World Bank that assists low- and middle-income countries to increase know how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth.**

**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) or write to us at:**



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