ESMAP Energy Efficient Cities Initiative
Program Document

Problem Statement

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 fuel growth and expand basic service infrastructure. This demand for energy has enormous implications for cities, particularly their operating budgets, competitiveness, service quality and cost, quality of life and local and global environmental impacts. The International Energy Agency (IEA) clearly recognizes the importance of energy use in cities and, in their latest World Energy Outlook 2008 report, devotes an entire chapter to energy use in cities. Some of their key findings include:

- Cities consume about two-thirds of the world's energy use and account for more than 70 percent of global greenhouse gas (GHG) emissions, but represent only half the population.
- By 2030, cities are expected to account for some 73 percent of global energy demand, while accounting for 73 percent of CO_2 emissions and 60 percent of the world's population. Of this growth, 81 percent will come from non-OECD cities.

The escalating demand of energy use for basic urban services, combined with an increasing gap between the rich and the poor, have resulted in serious pressures on service quality across all urban sectors – water/wastewater, power/heating, housing, city lighting, buildings and transport. City officials, often operating under constrained budgets and limited technical expertise, typically put a high priority on providing key services and expanding access, which has led to an under appreciation of long-term financial and environmental sustainability.

Energy is widely viewed as the lifeblood of cities, powering public services, hospitals and schools while moving people within the city and beyond. 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 energy efficiency (EE) measures and planning can lower a city's dependence on imported fuels and its energy costs while freeing up resources that can improve or extend city services. Improving a city's design and planning functions can have dramatic implications on future energy needs.

There is now growing interest in EE within city contexts, as well as "eco-cities." Energy efficiency can offer practical solutions to budget-constrained cities to meet their energy needs without sacrificing their socioeconomic development priorities. This is because EE measures are generally cost-effective; that is, the higher upfront investment for the more efficient equipment or system is offset by lower recurring energy costs. Eco-cities represent a broader concept that integrates a portfolio of environmental initiatives and best practices, including sustainable energy use, into local economic development and planning. Broader eco-city designs are also often cost-effective but may have longer investment horizons (i.e., payback periods beyond 5-10 years), which can easily be justified given that city systems last much longer. Some measures may have higher incremental costs but could have other socioeconomic benefits, such as higher local investment, job creation, improved

competitiveness and enhanced quality of life (e.g., reduced commuting times, improved air quality and health, more green and community space).

In spite of this increased interest, results in the field have been more difficult to achieve. It has been challenging to operationalize sustainable energy measures and scale-up sustainable energy investments and impacts, even when financing is available. Often city managers/ mayors are not equipped with adequate data and tools to prioritize their investment and policy actions. While major barriers to implementing sustainable energy measures are common to many cities, surmounting them often requires locally-adapted approaches. There is much need to assist cities to assess sustainable energy options, support knowledge sharing among cities, and encourage and scale-up local initiatives through pilots and investment programs.

Program Objective

The objective of the Energy Efficient Cities Initiative (EECI) is to help mainstream and scale-up sustainable energy actions (such as EE) and climate change mitigation considerations in the urban context. A flexible, cross-cutting and programmatic approach will be used in order to target multiple sectors at the sub-sovereign level. This work would cut across the ESMAP core functions - think tank, global knowledge clearinghouse, and operational leveraging (under Bank urban sector investment lending).

Program Development

In order to meet the above-mentioned objective, a comprehensive program has been developed to include upstream, operational and evaluation support while disseminating tools, experiences, and results to city clients and other interested organizations. There are also a number of parallel efforts underway[1] all of which would also contribute to the EECI. A critical aspect of the EECI would be to build upon the existent work of the Bank and others through broad consultation with partners and stakeholders, and leverage sustainable energy investments in cities through existing and (possibly) new Bank financing instruments. The ESMAP team would also liaise with the Bank's Urban Anchor, World Bank Institute (WBI), Carbon Finance, International Finance Corporation (IFC) and other internal partners to coordinate other parallel efforts in support of sustainable energy programs within cities. Other key principles considered when developing the EECI program structure included:

a) the program must be demand-driven, so ESMAP can respond to what cities actually need to take action;
b) given the complex nature and the broad scope of work, forging strong and strategic partnerships with internal and external groups will be very important;
c) program components should be well integrated, where each component can feed into and benefit from one another;
d) the program should encourage the testing of new ideas and innovative approaches while still maintaining a strong focus on results; and
e) the program should have a parallel outreach/public relations campaign, to build momentum, attract new partners and create demand.

[1] These include an ongoing review of procurement practices for EE performance contracting, an analytical toolkit for EE in the transport sector, a review of best practices for EE building code programs and review of EE options in municipal water utilities in Sub-Saharan Africa. Other parallel efforts may be identified during this period to further these goals.

As a first step, ESMAP launched an Energy Efficient Cities Practitioners Roundtable, which was designed to conduct a stocktaking exercise of what cities and partners are already doing and what major gaps remain. The Roundtable was held on October 20-21, 2008 at the World Bank Washington, D.C. Offices with over 50 participants, about one-third from developing country cities. The proceedings of the workshop, along with an article and video, can be found on ESMAP's website (www.esmap.org).

The Roundtable, which included representatives from 10 cities, 8 partner organizations (internal and external), and Bank (regional and anchor) staff, provided participants an opportunity to present their ongoing initiatives and discussed barriers and opportunities to further their work on EE programs. Some main take-away points included:

- Developing countries cities are sensitive to being pushed to do more for climate change, which they perceive as a problem primarily caused by developed countries and is thus a lower priority for them than the many more urgent socioeconomic issues they face daily (e.g., crime/violence, basic service delivery, economic growth/job creation, massive urbanization, slums, traffic).
- All city representatives saw energy as a very important issue. They noted that energy spans all basic city services and should be considered as part of city expansion plans. Reducing energy use can reduce costs of many municipal services (e.g., water, power, heating, public lighting, etc.), reduce city outflows for fuel payments, improve local competitiveness and attract new investment/jobs, ease existing infrastructure bottlenecks like traffic, and reduce local air pollution, among other benefits.
- A main constraint to implementing EE measures has been its multidisciplinary nature. Since no one agency was accountable for efficient energy use, it often fell through the cracks of responsibility. Most city representatives suggested this could be addressed through a strong push from the mayor's office; however, they also noted there was often a lack of political will (and corresponding lack of public advocacy) on EE issues.
- Ways of addressing the lack of high-level commitment was more varied. Some suggestions included:
    - Engage politicians at the *national level*. The World Bank and others could advise national governments to consider increased mandates and incentives to cities on EE and other environmental issues.
    - Develop an *EE framework for cities* to help city officials articulate how energy/ environmental issues can affect citizens' immediate needs and local benefits of EE programs (e.g., from lower service costs to reduced vulnerability). By helping mayors to frame the issues in a way their citizens and other constituents can understand, it would be easier to achieve a "mass consciousness" for EE and build political consensus for actions.
    - Initiate small, *pilot actions on EE* to help "trigger" new thinking about the opportunities that EE can offer a city. Such pilots could bring together different agencies and stakeholders around a fairly simple program and demonstrate the energy and other co-benefits to a range of city officials with different technical disciplines. Such triggers could then allow new types of thinking about other energy-related planning moving ahead.
    - Consider efforts to *support the technical advocates*, to assist them to influence the politicians about opportunities and actions. Many technical staff are already aware of the issues, many have worked with international organizations and received

training, etc. but they are not decision-makers. Efforts to support them in dealing with political decision-makers could be one way to help influence change.

- During the breakout session, four groups discussed major city issues, the energy dimensions, possible solutions and how the international community could help them. Some suggested actions included:
  - Increased policy dialogue at the national and city levels to gain commitment for EE policies and resources
  - Policy advice on urban EE issues and options
  - International recognition for local EE initiatives
  - Dissemination of city energy benchmarking and best practices
  - Small grants for pilot EE measures
  - Consultant lists and resources to hire them to assist with integrated city/land use planning
  - Promote EE within long-term city development strategies and sustainable transport systems
  - Improve access to concessional or reasonable financing, with streamlined procedures, including the possibility of sub-sovereign financing
  - Improved know-how and development of monitoring and evaluation systems for city EE programs

Proposed Program of Activities

Based on the feedback from the Roundtable, along with discussions with many regional Bank staff and partners, ESMAP's Energy Efficiency Global Practice Group proposes to undertake the following actions over the next five years:

a) Development of Analytical Framework for Energy Efficient Cities. Based on the positive feedback received from the Roundtable, ESMAP will develop its rapid assessment framework (RAF), which will be designed to identify and address retrofitting of existing city systems, into a full tool and field test it in at least two cities. Development of the RAF would involve: (i) conducting a comprehensive review of analytical tools and databases to identify synergies; (ii) developing the tool for at least six sectors (transport, buildings, water, public lighting, power/ heating, solid waste); (iii) collecting baseline data for at least 20-30 cities (with reasonable geographic and GDP distribution); (iv) creating of a virtual panel of experts, both inside and outside the Bank, to critically review the tool; (v) refining and field testing RAF in at least two cities; (vi) refining the tool again, based on field tests; and (vii) preparing a report summarizing approach and field experiences. Unlike other tools, this would evaluate systems based on cost, energy use and GHG profiles and be able to help better quantify economic and environmental co-benefits. Each time the tool is used, it would feed the data into a database, which can eventually help establish some benchmarks for other cities to reference.

   In parallel, ESMAP would work with select academic institutions and other partners to review city planning methodologies and tools that explicitly incorporate EE into their decision-making in order to recommend planning approaches to Bank Task Team Leaders (TTLs) and city officials. Unlike the RAF, which would be designed for retrofits, this would target city expansion/new

town planning for new built space and infrastructure systems. ESMAP would support research through the Bank's Urban Research Symposium on Cities and Climate Change in Marseille, France and other appropriate fora and participate in relevant international events, such as the Carbon Expo 2009 in Barcelona, to present ESMAP work, seek feedback, and identify new prospective partners.

Possible partners: Eco2, Global City Indicators Facility, IEA, Bank operational units, Academic institutions (TBD)

b) Small Grants Program. In order to encourage more initiatives from cities on energy efficiency, ESMAP would make available funds for small grants for cities to test new and innovative pilots without extensive upfront analytical requirements. (This could help serve as a "trigger" as discussed during the Roundtable.) ESMAP, possibly together with Cities Alliance, could issue calls for proposals 2-4 times per year to make available small grants (US$25-35k) for sector-specific projects. These grants could also be provided to incorporate EE measures into city development strategies and slum upgrading, schemes as appropriate. ESMAP would develop minimum requirements and evaluation criteria and could involve regional urban staff as appropriate to assist with evaluation. This would also allow regional staff to see what cities are doing so they can discuss possible scale-up programs with Bank lending. Each city that receives a grant would be required to provide a simple case study for the ESMAP website (see Good Practice Awards below).

Possible partners: Cities Alliance, Bank operational units, Clinton Climate Initiative (CCI)

c) Good Practice Awards. Many cities pointed to the need for appropriate fora to share experiences, ideas, lessons learned, etc. with other cities on their EE initiatives. The problem is that typical ESMAP reports, which are usually prepared by consultants at high cost, can become dated quickly, can be superficial and may only present a few cases. Some Roundtable participants pointed to the need for some international recognition in order to get stronger local and national support for their programs. ESMAP would seek to combine these two ideas by inviting cities to submit proposals periodically (e.g., quarterly) for an *ESMAP World Energy Efficient City Innovation Award* (with an award ceremony coinciding with the Bank's Energy Week, ESMAP Consultative Group meetings or other appropriate events). ESMAP would create a standard proposal form, which would require full economic and technical data, and place all project summaries on ESMAP's website by sector for other cities to see and review applications with regional urban staff. ESMAP would supplement this with the small grant reports and any other good case studies identified through other channels. Eventually, ESMAP would have a robust list of projects which could be sorted by sector and/or region. This portfolio would be reviewed periodically to identify emerging institutional models and instruments to scale-up financing and implementation of EE improvements (e.g., standard offers, multi-facility retrofit packaging, revolving funds) for further dissemination through BBLs, regional workshops and other channels.

Possible partners: WBI, Bank operational units, CCI

d) Project Development Support. Given the need to mainstream EE in the Bank's urban lending and the general lack of energy/EE expertise within urban sector units, support for EE innovations in the identification and preparation of urban projects is justified. Further, the internal incentive structures and budget realities are such that urban TTLs may prefer to take a sectoral approach when a more integrated approach may ultimately be more advantageous for the client city and urban TTLs may not be able to practically tap into ESMAP block grants from their regional energy units. There is also a need for ESMAP to test its RAF and planning approaches, enhance ESMAP staff urban operational capabilities, etc., through such support.

Therefore, ESMAP would develop and launch a project development support facility for urban and other non-block grant sector units, where TTLs working on city operations from around the Bank could apply for ESMAP assistance. The team will develop clear criteria for support and may consider one or more periodic calls for proposals to ensure some level of competition and cross-section of city clients. The East Asia & Pacific Urban Unit has already requested ESMAP support for an Eco-city project in Tianjin, China, which would be an excellent first candidate. ESMAP would set aside some funds and staff time, supporting perhaps 3-5 urban lending projects for up to US$300k per fiscal year in cash and staff time.

Support for projects will be flexible, but will focus on analysis of the energy dimension of the city and strategies to rationalize energy use. Use of ESMAP's analytic tools, best practices in EE policy/regulatory regulatory frameworks (such as introduction of lifecycle cost based procurement practices, use of ESCOs and financing schemes, building energy efficiency codes, etc.), EE training programs and institutional development, etc., would all be eligible under this component. Such support could also include not only Bank project preparation but also implementation, such as South Asia where municipal infrastructure funds already exist but potential EE interventions need some technical support in order to be investment ready. Several Roundtable participants also talked about the need for more flexible financing products, so this proposed activity would also explore options, within the context of a specific investment project to test new financing modalities (e.g., sector-wide development policy lending - DPL, sub-sovereign lending with IFC, learning and innovation loans - LILs).

Possible partners: Bank operational units, Global Environment Facility (GEF), Carbon Finance, Climate Investment Funds (CIF), CCI

e) Outreach and Dissemination. An essential aspect of the EECI will be to share ESMAP's ongoing experience and knowledge with other relevant Bank staff, international organizations and cities. Therefore, ESMAP will consider a variety of channels to publicize various aspects of the EECI as the need arises. These may include presentation of the EECI at the Bank's Energy Weeks, COP-14 (in Poznan), and other international conferences as appropriate, marketing of ESMAP's small grants and innovation awards through a variety of media outlets, dissemination of operational experiences and analytical work through conferences, BBLs, papers, operational guidance notes, ESMAP 4-pagers, reviews of urban strategy papers, etc., and other events as identified.

Possible partners: Bank operational units, WBI, Bank Urban Anchor, Local Governments for Sustainability (ICLEI), CCI, IEA, Cities Alliance

Integrated Program Design

The EECI has been designed to be fully integrated, so that outputs of one component can feed into another (see Figure 1, below). For example, all cities that receive grants will be required to submit case studies for the project database. Similarly, all grants would be shared with Bank regional TTLs for possible replication and scale-up through Bank lending. The analytical framework would also assist with upstream assessments to identify Bank lending opportunities. And, all emerging outputs and findings would be shared on an ongoing basis through various outreach mechanisms.

The program is also meant to help cities at all capacity levels. Cities could make use of the analytical tools and review case studies from the database in order to help identify initial actions. They could then make use of the small grants, if needed, to test some initial pilots. The Bank could then assist cities in scaling up successful pilots using a variety of financing mechanisms. Cities that have particularly innovative or successful programs can also be recognized through the innovation awards.

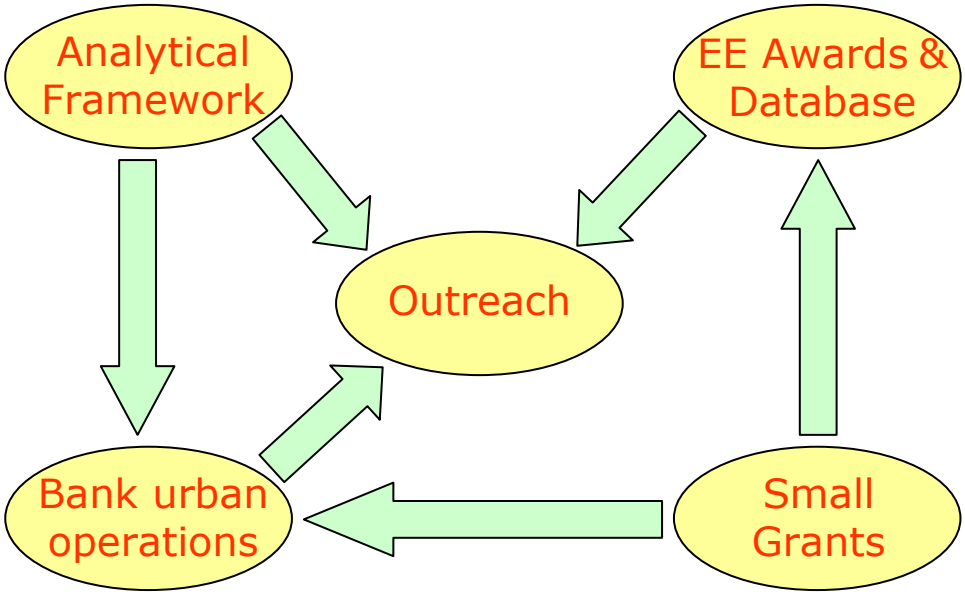
Deliverables

While the exact deliverables would be determined only once the detailed components are fully developed, and discussed with internal and outside practitioners, some indicative deliverables will likely include:

- Development of preliminary RAF and review of planning tools (Years 1-2);
- Field testing of RAF and refinement of tool (Years 2-4);
- Technical paper on analytical approaches for EE in cities (Year 3)
- 5-10 small grants per year to cities (Years 1-5)
- Issuance of awards to best practice cities (Years 2-5)
- Compendium of urban EE case studies, with emerging institutional and implementation models (Years 3 & 5)
- 3-5 urban EE projects or project components within Bank Project Appraisal Documents (PADs) (Years 2-4)
- Participation in 2-3 major international events to present program results (Years 1-5)
- Multiple BBLs and global and/or regional workshops to share results, experiences and lessons learned (Years 3-5)
- Final report, which includes impacts and results, lessons learned, etc., issues for broader scale-up (Year 5)

Attachment 1 includes a full logical framework for the program.

Figure 1. Integrated Program Design



Implementation Arrangements

This activity would be managed by ESMAP's Energy Efficiency Global Practice Group under ESMAP's core "Think Tank" function. For each component, ESMAP would develop partnership agreements with relevant internal and external groups in order to build upon various experiences and expertise. A virtual expert panel would also be established to review technical outputs, such as the RAF methodology. While ESMAP may rely more on partners for some activities, such as work with Cities Alliance for the small grants or the Bank's operational units for the project development support, ESMAP staff would maintain overall management of the funds and strategic direction. Various short- and long-term consultants will also be mobilized to carry out various aspects of the program.

Budget

A budget of about US$5 million is proposed for a five year program. A preliminary breakdown is provided in Table 1, below:

Table 1. Preliminary EECI Budget Requirements (In US$ '000)

Component	FY09	FY10	FY11	FY12	FY13	Total
Analytic Tools	250	250	200	200	150	1,050
Small Grants	150	300	300	300	300	1,350
EE Awards	100	150	200	150	250	850
Project Development	300	300	300	300	0	1,200
Outreach	50	100	150	150	100	550
Total	**850**	**1,100**	**1,150**	**1,100**	**800**	**5,000**

Monitoring and Evaluation Logical Framework for ESMAP Energy Efficient Cities Initiative

Outcome	Performance Indicator	Means of Verification	Risks/Assumptions
Analytical Framework Improved analytic approaches and planning tools to help cities understand more energy-efficient and sustainable energy pathways, and actions taken and investments made to realize them	1. Development of peer-reviewed analytic/ planning frameworks and benchmark database for city expansion and retrofitting 2. # of partners engaged in the initiative 3. # of cities interested in, receiving training on and using ESMAP analytic tools 4. # of additional actions taken, $ invested, and energy saved as a result of application of tools	ESMAP staff and project progress reports, trip reports, consultations with stakeholders and clients	Sudden downturn in energy prices or environmental concerns that push non-energy issues to the top of city priority lists Lack of political will, access to financing, local institutional abilities to take actions
Small Grants Program Accelerated innovation and trigger further interest in energy efficient measures	1. Granting mechanism and outreach plan established 2. # of cities received grant announcement and expressed interests 3. # of cities applying for and receiving small grants 4. $ leveraged and energy saved from small grants 5. # of grant-funded pilots later scaled up	ESMAP/Cities Alliance progress reports, city proposals and reporting, disbursement reports, post-grant surveys, website tracking data	Successful implementation of pilot programs by applicants Lack of political will, access to financing, local institutional abilities to scale-up pilots
Good Practice Awards Shared ideas, experiences, lessons learned among cities; internationally recognized good practices and project proponents/staff	1. # of good practice applications received from cities 2. # of awards given 3. # of hits/downloads on case study website 4. # of projects replicated	ESMAP progress reporting, proposal summaries, website tracking data, client follow-up surveys	Lack of political will, access to financing, local institutional abilities to replicate case studies
Project Development Support Expanded Bank investment and operations in energy efficient cities; examples set for other international finance institutions	1. # of Bank urban-related projects receiving ESMAP support 2. # of investment projects taken to the Board 3. $ leveraged by Bank and other sources in project 4. Estimated energy saved from investment operations 5. # of projects developed by the Bank and other MDBs that seek to replicate initial designs	ESMAP and regional reporting, project appraisal documents, consultations with Bank and other MDB regional staff	Limited emphasis of sustainable energy issues at the city level within Bank Country Assistance Strategies Ongoing Bank policy dialogue delays or threatens urban energy efficiency components within larger operations Insufficient demand from client cities to replicate early successes Constraints for Bank to develop suitable sub-sovereign lending instruments to facilitate replication and scale-up