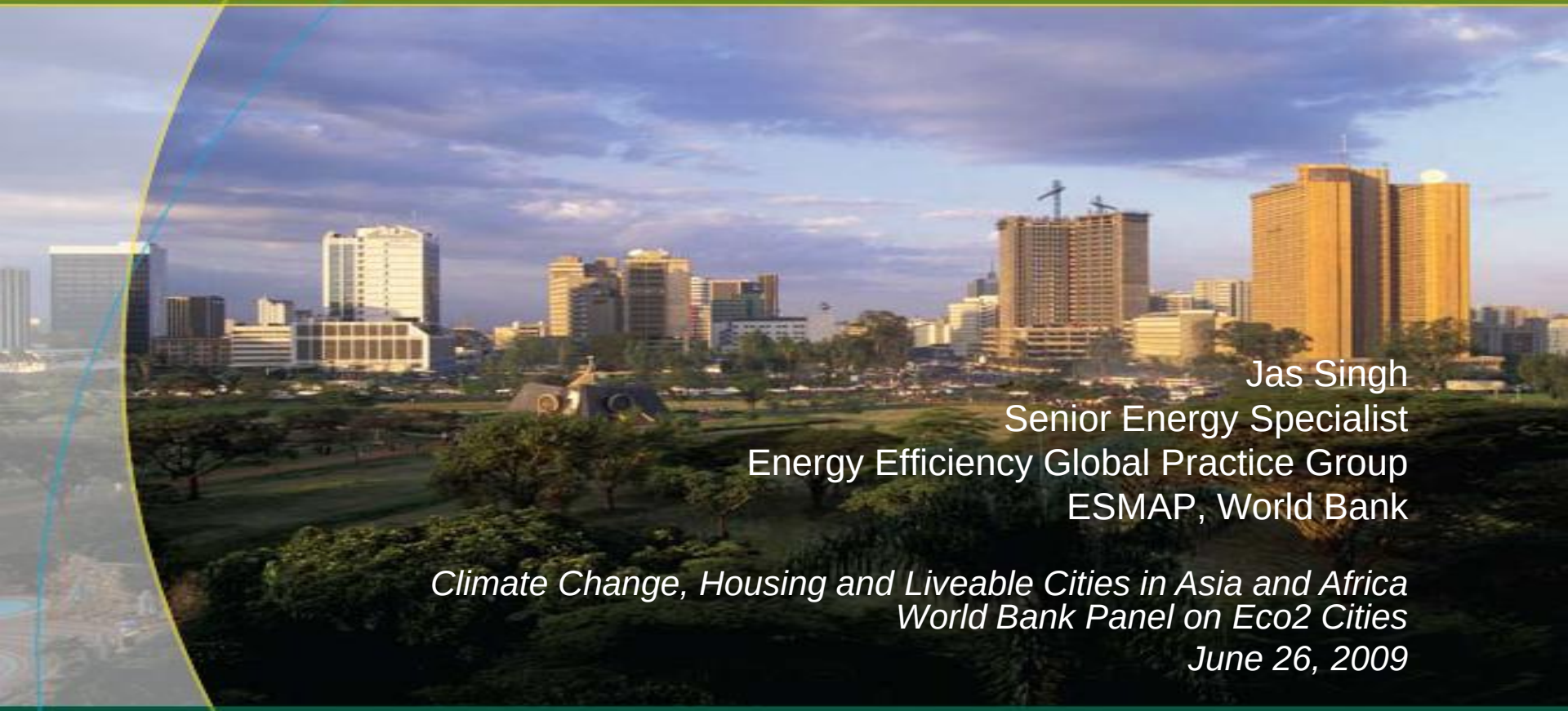
ESMAP's Energy Efficient Cities Initiative



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Climate Change, Housing and Liveable Cities in Asia and Africa
World Bank Panel on Eco2 Cities
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Helping Cities Meet Their Energy Challenges of the New Century

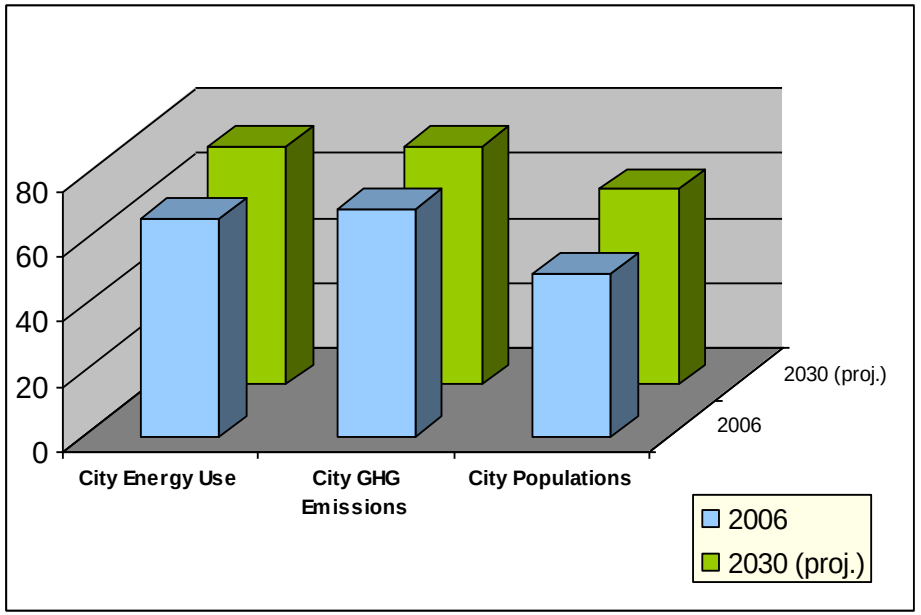
What is the Problem?

- Cities are engines for socioeconomic development
- Escalating energy demand puts pressures on costs, service quality, access and the environment across all sectors:
  - *Power/heating*
  - *Water/wastewater*
  - *Transport*
  - *Public lighting*
  - *Buildings/public housing*
  - *Solid waste*
- Constrained city budgets and technical/institutional capabilities
- Priority on delivering key services and expanding access
- Growing interest in sustainable energy/“eco-cities,” but on-the-ground results have been limited

Facts and Figures

By 2030:

- Almost ¾ of energy use and GHG will come from cities
- 81% of urban energy demand increases will come from non-OECD cities
- Developing countries will triple their built-up urban area



	2006	2030 (proj.)
City Energy Use	67%	73%
City GHG Emissions	70%	76%
City Populations	50%	60%

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Why Energy Efficiency?

Energy Efficiency (EE) can:

- Offer practical solutions to meet city energy needs without sacrificing socioeconomic development priorities
- Lower a city's fuel imports and energy costs while freeing up resources for service improvement/expansion
- Offer win-win-win solutions – it is good for the government, private sector and environment
- Provide other socioeconomic benefits (e.g., improved competitiveness, job creation, quality of life)

Barriers to EE in Cities

Policy / Regulatory	Public End Users	Equipment/ Service Providers	Financiers
▪ Low energy prices ▪ Rigid procurement and budgeting policies ▪ Limitations on public financing ▪ Inadequate planning and design methods ▪ Limited autonomy vis-à-vis national/ state bodies ▪ Informal settlements ▪ Election cycles	▪ Limited incentives ▪ No discretionary upgrade budgets ▪ Lack of financing ▪ Unclear ownership of cost/energy savings ▪ Weak linkages across sectors ▪ Lack of awareness and expertise ▪ Behavioral biases	▪ High project development costs ▪ High transaction costs for public sector ▪ Limited technical and risk management skills ▪ Public sector repayment concerns ▪ Limited equity	▪ High perceived risks ▪ New technologies ▪ Small sizes/high transaction costs ▪ Behavioral biases

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Municipal Control of Energy Use

Sector Cluster Category	Subcategory	City Government Potential Leverage
Industry	Manufacture	Indirect, relatively weak
	Construction	Indirect, relatively weak
Transport	Private motor vehicles	Indirect, relatively weak
	Commercial motor vehicles	Indirect, relatively weak
	Public transit system	Direct, strong
	Government motor vehicles	Direct, strong
Municipal Services	Water supply & wastewater treatment	Direct, strong
	Solid waste management	Direct, strong
	Public lighting (street, traffic, parks)	Direct, strong
Buildings	Government buildings	Direct, strong
	Commercial buildings (non-public)	Indirect, strong in new construction
	Residential buildings	Indirect, strong in new construction

Where Should a City Start?

- Retrofit existing public facilities
  - *Energy system retrofits in public buildings and services*
  - *Promote distributed generation and load reduction options*
- Implement policies and programs in non-public facilities
  - *"Green" buildings*
  - *Electrical equipment and appliances*
  - *Industrial process improvements*
  - *Promote "green" transport*
- Integrate energy considerations in land use planning and development
  - *Spatial densification*
  - *Integrated urban planning, city design*
  - *Coordinated utility planning*

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Typical Public EE Interventions

Policy

- ✓ ***Pricing*** (energy, waste, congestion)
- ✓ EE product ***procurement***
- ✓ Setting EE ***targets*** in public facilities
- ✓ Promote energy savings ***performance contracts*** (ESPCs)

Procedural

- ✓ Changes in ***budgeting*** to allow retention of energy/water cost savings
- ✓ Designation of ***energy managers*** and periodic ***energy audits***
- ✓ Improved ***planning***, ***recycling*** and ***O&M*** practices

Information

- ✓ ***Standard bidding documents*** and templates
- ✓ ***Guidelines*** for buildings/facility management, ***benchmarking/good practices***
- ✓ Public EE ***case studies***, newsletters, ***training***, ***demonstrations***

Incentives

- ✓ ***Funding*** for energy audits and project implementation
- ✓ ***Awards*** and competition among agencies, cities
- ✓ Publishing ***agency performance***, ranking and rating of agencies

Illustrative Economics of Municipal EE

Sector	Short-Term Payback (under 5 years)	Medium-Term Payback (5-10 years)	Long-Term Payback (10+ years)
Public Buildings	▪ Equipment retrofits ▪ Labeling building energy use ▪ ESCO contracting ▪ Solar water heating	▪ Building envelop measures ▪ Green roofs ▪ Training in good building O&M practices	▪ Building codes ▪ Certification of building materials ▪ Building integrated PV ▪ Equipment standards
Public Lighting	▪ Lighting retrofits (HPSV) ▪ Control systems & sensors	▪ Retrofits using LEDs ▪ Lighting system redesign	▪ Street & traffic lighting standards
Water/ Wastewater	▪ Pumping retrofits, incl. VSDs ▪ Leak reduction ▪ Load management ▪ ESCO contracting	▪ System redesign & optimization ▪ Wastewater methane recovery for power generation ▪ Water DSM (low-flow outlets)	
Transport	▪ Improve traffic circulation planning ▪ Differential fuel taxation/pricing ▪ Congestion/Parking fees ▪ Promote non-motorized transport	▪ Alternative fuels for buses/ taxis ▪ BRT systems ▪ Fuel efficiency vehicle standards ▪ Promote fuel-efficient vehicles through fiscal incentives	▪ Modal shifts ▪ Vehicle I&M programs ▪ Changes in land-use patterns to promote urban densification

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Commercial financing

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Commercial financing

Public financing

Climate change funds

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What is ESMAP?

- The Energy Sector Management Assistance Program (ESMAP) is a multi-donor trust fund, administered by the World Bank established in 1983
- ESMAP provides policy advice and TA on sustainable energy development developing countries
- ESMAP suggests innovative and strategic “cutting edge” solutions to governments, in the areas of both traditional and non-traditional energy use, complementing other donors and the private sector

What is ESMAP's EECI?

- Objective. Mainstream and scale-up urban energy efficiency programs
- EECI is designed to:
  - *Respond to city needs*
  - *Integrate parallel efforts*
  - *Focus on results*
  - *Foster global partnerships*
  - *Encourage innovation*
  - *Streamline dissemination*
- EECI includes:
  - *Analytical tools*
  - *Pilots/demonstrations*
  - *Program design*
  - *Investment operations*
  - *Awards recognition*
  - *Upstream assessments*
  - *Case studies*
  - *Policy papers*
  - *Monitoring & evaluation*
  - *Outreach*

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EECI Components

1. Rapid analytical framework (RAF) for EE in cities (retrofits) and planning tools
2. Small grants program through Cities Alliance
3. Urban EE good practice awards and database
4. Development of regional World Bank urban investment operations
5. Outreach and dissemination

List of Deliverables

EECI Outputs	Year
Development of draft RAF, review of planning tools	Year 2
Field testing of RAF and refinement of tool	Year 2
Technical paper on EE analyses in cities	Year 3
5-10 small grants (per year) to cities	Years 2-5
Issuance of awards to best practice cities	Years 2-5
Compendium of urban EE case studies	Years 3, 5
Development of 3-5 World Bank urban EE projects	Years 2-5
Dissemination of approaches, experiences, results	Years 2-5
Final report (results, lessons learned, next steps)	Year 5

Thank you!

For more information on EECI, please visit:
www.esmap.org

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