



TRACE

Tool for Rapid Assessment of City Energy



Helping Cities Realize Energy
Efficiency Opportunities





Cities face the difficult challenge of maintaining economic competitiveness, and improving and expanding municipal services in the face of limited budgets. Energy efficiency (EE) can help cities relieve some of the budgetary pressure by reducing energy costs, thus freeing resources for municipal services. EE can also help improve the quality of services, such as improved lighting, transport, and building maintenance. The **Tool for Rapid Assessment of City Energy (TRACE)** is a decision-support system designed to help cities quickly identify and harness EE opportunities. It targets underperforming sectors, evaluates improvement and cost-saving potential, and helps prioritize actions

for EE interventions. TRACE focuses on the municipal sectors with the highest energy use: passenger transport, municipal buildings, water and wastewater, public lighting, power and heat, and solid waste.



TRACE was developed by the Energy Sector Management Assistance Program (ESMAP), a global technical assistance program administered by the World Bank, and was designed to involve city decision-makers in the deployment process. TRACE starts by collecting benchmark data, continues with a two-week on-location assessment with technical experts and decision-makers, and concludes with a final report to city authorities with specific recommendations on EE opportunities tailored to the city's needs.



TRACE Modules

TRACE consists of three modules: **energy benchmarking**, which compares the target city with peer cities globally; **sector prioritization**, which ranks sectors according to their EE potential; and **intervention selection**, which functions as a “playbook” of global best EE practices that the city can consult for actual implementation design.

1| Energy Benchmarking

This module has a database of 28 key performance indicators collected from 93 cities around the world. Examples include citywide indicators (such as energy consumption per unit of the city’s GDP) and sector-specific variables (such as electricity consumption per light pole). City authorities can compare their city’s performance against peer cities on any of the key performance indicators. They can also choose the comparison cities based on population size, climate conditions, human development index, and any other criteria.

2| Sector Prioritization

This module uses three functions—potential for improvement, sector energy spending, and city authority control—to prioritize sectors. The “potential for improvement” indicates the scope of EE improvement that the city may realize if it were to match the average of better-performing comparator cities. The “sector energy spending” captures the total amount of money that the city spends in the sector on energy. The “city authority control” allows the user to specify the degree of influence the city authority has in the sector.

3| Intervention Selection

TRACE contains a set of 60 EE interventions that combines a blend of both high-level strategic programs and specific activities that the city can pursue. These recommendations are supported by a database of 191 global case studies that link to additional resources and software tools that can help the city implement EE measures. Each recommendation is rated on three attributes: (i) energy savings potential, (ii) initial implementation cost, and (iii) speed of implementation. These are used to help the city prioritize activities in an action plan.

In order to synthesize recommendations appropriate for a city, TRACE enables the user to match city capability to the capabilities required to implement each recommendation. City officials can then select a set of recommendations deemed socially and economically viable. A detailed analysis is available for each recommendation to help users quantify the potential energy savings for each EE action.



TRACE IN ACTION

As of June 2013, TRACE has been deployed in 25 cities in Africa, Asia, Eastern Europe, and Latin America.

- * In **Turkey**, TRACE helped define the Sustainable Cities pillar in the World Bank's Country Partnership Strategy for Turkey for 2012-15. Since then, the TRACE findings have informed the World Bank's US\$300 million programmatic lending to cities in Turkey.
- * In **Brazil**, TRACE was implemented in Rio de Janeiro and Belo Horizonte. In the latter, the findings have been incorporated in the city's strategy and the "traffic optimization" recommendation has been implemented. In Rio de Janeiro, the World Bank's Presidential Cities Task Force is preparing specific investments in the public lighting and buildings sectors, which were identified by TRACE as having the largest EE potential.
- * In **Vietnam**, the World Bank used TRACE to create city-level case studies, the results of which were subsequently used to create Sustainable Urban Energy Program Guidelines for cities across the East Asia and Pacific region.
- * In **Romania**, a World Bank team is deploying TRACE in seven fast-growing cities as part of the Romania Regional Development Program funded by the European Union. TRACE is being used to identify the specific investments to be funded under the program.
- * In **Kenya**, TRACE is being used to identify EE investments and prepare Nairobi's EE action plan.

Getting Started with TRACE

TRACE can be downloaded from <http://esmap.org/TRACE>. ESMAP provides **training** to cities or implementing agencies that are planning to use TRACE. The training can be conducted in person or via video link. A TRACE **e-learning** course was created in partnership with the World Bank Institute. The course is available at <http://einstitute.worldbank.org/ei/course/trace-how-use-tool-rapid-assessment-city-energy>. The course is available for free with online registration. Additionally, ESMAP offers **facilitated online courses** for free to those planning to use TRACE. These are offered at a specified time to users around the world.

ESMAP

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

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For more information about TRACE or ESMAP's Energy Efficient Cities Initiative, please visit us at www.esmap.org or write to us at:



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