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IMPACT

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SIGNIFICANT POTENTIAL SAVINGS IDENTIFIED BY TRACE

Potable Water
US$ 14 million / yr

Public Transportation
US$ 12 million / yr

Reducing Private Vehicle Use
US$ 11 million / yr

Municipal Building Improvements
US$ 7.5 million / yr

Street Lights
US$ 6 million / yr

ESMAP Tool Helps Turkish City Make Economic Growth Sustainable

The city of Gaziantep in southeastern Turkey is one of the fastest growing urban areas in the world. An important trade link serving as Turkey's gateway to the Middle East, the city has seen its population increase ten-fold to an estimated 1.35 million over the last 40 years.

Gaziantep's rapid expansion has placed significant pressure on its land and environment. And with a population anticipated to reach 3 million over the next 20 years, municipal planners face the challenge of ensuring its existing and new infrastructure can sustain the city's explosive growth.

In recent years, the Gaziantep Metropolitan Municipality (GMM) has taken a number of steps to tackle energy efficiency challenges and, as such, was a natural venue for one of the first global pilots of the Tool for Rapid Assessment of City Energy (TRACE) in 2011.

TRACE was developed by the World Bank's Energy Sector Management Assistance Program (ESMAP) in 2010 as a means to help city planners target and prioritize energy efficiency interventions.

The TRACE deployment in Gaziantep placed the city at the forefront of Turkey's ambitious "greening" agenda and directly informed the creation of a Sustainable Cities investment program in the World Bank's US$ 4.4 billion 2012-2015 Country Partnership Strategy with Turkey.

Stephen Karam, a Sector Leader with the World Bank's Europe and Central Asia (ECA) Sustainable Development Department, said the TRACE tool offered an excellent entry point for a dialogue with GMM planners about how best to identify and implement energy efficiency improvements.

ESMAP

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Stephen Karam
Sector Leader
World Bank Europe and Central Asia Sustainable Development Department

"When you talk to mayors about climate change or low carbon growth, their eyes tend to glaze over. Even though they are interested in the global public good, these initiatives don't necessarily yield local benefits," Mr. Karam said. "However, talking about energy efficiency is different, because it affects a city's bottom line—and nowhere more so than in Turkey."

TRACE examines energy efficiency in six municipal sectors—transport, buildings, water, public lighting, solid waste, and power/heating—and is usually conducted over a three-month period. Experts collect data, make onsite assessments, interview local decision-makers, and prepare a comprehensive report recommending interventions to improve energy efficiency.

Preparation of the TRACE deployment in Gaziantep was carried out jointly by the GMM and representatives of the Iller Bank, which since 2003 has partnered with the World Bank in financing environment sector investments in Turkish cities through the Municipal Services Project.

To carry out the TRACE pilot, World Bank and Iller Bank staff, along with planners from the GMM, fanned out across Gaziantep to conduct an analysis of the city's key municipal sectors.

The final TRACE study found there to be high per capita electricity use; high city-wide water consumption; and disproportionately high electricity consumption by municipal water pumps. It also found high and growing ownership and use of private motor vehicles; high city-wide electricity use for public lighting; and very high consumption of electricity in municipal buildings.

However, in other sectors, TRACE found Gaziantep's energy efficiency performance to be strong. The city's wastewater treatment system not only runs efficiently but benefits from a series of innovations—such as co-generating methane gas from sludge to produce heat and electricity—that virtually eliminate the plant's energy costs. Likewise, the city's solid waste management system is innovative and generally effective, and the widespread use of solar heaters is helping consumers save money.

The final TRACE assessment concluded that Gaziantep's water, urban transport, and public lighting sectors were priorities for further investigation and listed five areas—in order of priority—where significant energy savings were possible:

1. **Potable Water |** Gaziantep's water system was designed for 300,000 people and now serves more than 1.3 million. In 2010, some 40 percent of the potable water produced in Gaziantep was lost in the system due to technical losses. TRACE found that although the water system has

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already benefited from a series of innovations, a two-pronged approach of improving the energy performance of existing technology and reducing water losses through a more extensive leakage detection program could bring energy savings of nearly US$ 14 million a year.

2. **Public Transportation** | TRACE identified a wide range of measures to improve the performance—and therefore energy efficiency—of Gaziantep's public transport network. Extending the city's light rail system, expanding the bus network, and implementing bus fleet maintenance programs are among the steps that could bring annual energy savings of more than US$ 12 million in the public transportation sector.

3. **Private Vehicles** | Reducing the number of private vehicles on the road can lower emissions and improve air quality. TRACE found that optimizing traffic flows would allow private vehicles to spend less time in traffic, which in turn would reduce fuel consumption and pollution. Optimizing traffic patterns would also make public transportation more efficient and thus more appealing to commuters currently traveling to work by car. TRACE found that by significantly reducing the number of cars on the road, Gaziantep could enjoy energy savings of nearly US$ 11 million a year.

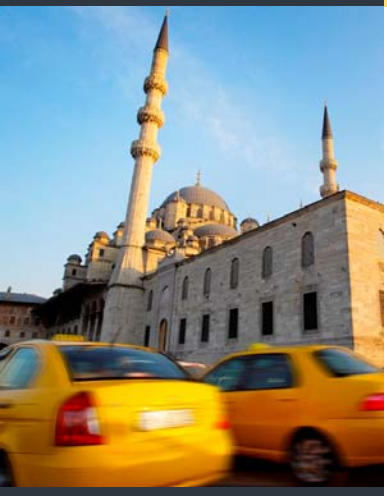
4. **Municipal Buildings** | Buildings are among the biggest energy consumers in any city, and in Gaziantep they consume around 20 percent of all electricity produced. In order to set a good example for other buildings in the city, TRACE recommended local authorities develop an audit and retrofit program for the offices they own. By mandating energy efficiency guidelines for buildings and taking advantage of innovative financing—such as energy service company (ESCO) arrangements that place minimum burdens on public budgets—TRACE found the GMM could realize some US$ 7.5 million in energy savings per year.

5. **Street Lighting** | The public lighting system in Gaziantep has two major problems: many streets are poorly lit or not lit at all, and the system is highly energy intensive. While extending the network to provide better lighting would lead to higher energy bills, TRACE identified a range of improvements to offset the extra costs. These include new technologies that significantly increase bulb efficiency and lifespan, and a program using strategic timers and dimmers tailored to an area's specific needs. The total energy savings from improvements to Gaziantep's Street Lighting System could potentially net some US$ 6 million a year.

Mr. Fuat Ozcorekci, Secretary General of the GMM, describes his city's experience in implementing one of the first TRACE pilots as "an excellent learning opportunity that helped benchmark our performance against other cities and identify priority areas."

The TRACE deployment in Gaziantep has paved the way for its use in up to eight other cities under a World Bank-financed Turkey Sustainable Cities Project (SCP) now being prepared by the World Bank and the Turkish government. The SCP will assist participating metropolitan municipalities in planning long-term infrastructure investments on the basis of environmental, financial, and social baseline data and established performance targets. Following its participation in the successful Gaziantep pilot project, Iller Bank has established a new Energy Efficiency Technical Unit that aims to deploy TRACE in helping SCP participants prioritize their energy efficiency investment needs.

Mr. Karam said that addressing energy efficiency issues through TRACE has helped ensure that Gaziantep will become more economically competitive, as well as a regional center of innovation, providing best practices for other cities in Turkey—and beyond.



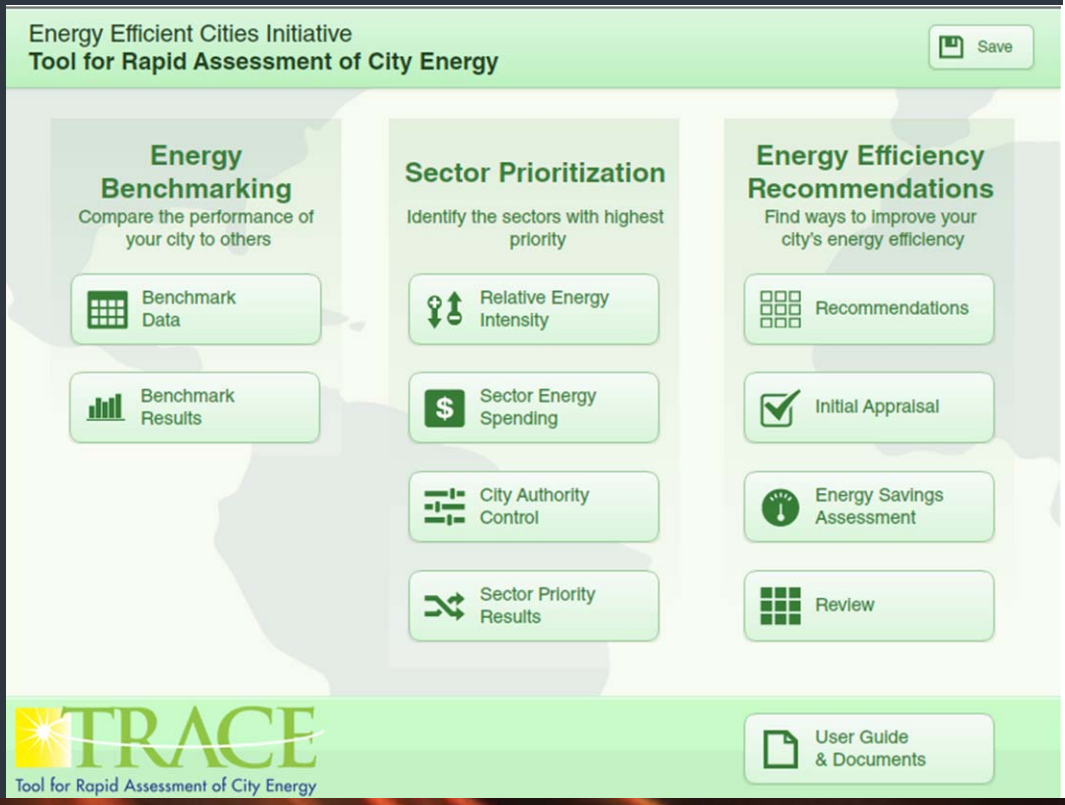
TRACE has also informed World Bank policy dialogue and lending outside Turkey under the Sustainable Development Department's Sustainable Cities Initiative (SCI) in Europe and Central Asia—the most energy-intensive region in the world. In Skopje, Macedonia, findings from a TRACE deployment fed into the national Green Growth Agenda and informed World Bank investments in municipal infrastructure. In Tbilisi, Georgia, TRACE contributed to the development of priority energy efficiency improvements that can be supported under the Georgia Municipal Development Fund. Other TRACE studies prepared under the ECA SCI include Banja Luka, Belgrade, Pristina, and Sarajevo.

Since its creation the TRACE tool has been deployed in 23 cities around the world. The tool is currently being deployed in Rio de Janeiro as the Brazilian city implements energy efficiency measures ahead of the 2014 FIFA World Cup and the 2016 Summer Olympics, as well as in other cities including Accra, Addis Ababa, Nairobi, and Colombo.

ESMAP MISSION

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. ESMAP is funded by Australia, Austria, Denmark, Finland, France, Germany, Iceland, Lithuania, the Netherlands, Norway, Sweden, and the United Kingdom, as well as the World Bank.

TRACE | HOW IT WORKS



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