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More than 30 years of
ESMAP engagementKEY
ACHIEVEMENTS

Turkey doubled its electricity generation capacity to 31,000MW since the early 2000s

ESMAP assisted Turkey through its energy reform process, helping to develop energy supply security legislation and regulation, establish regulatory agencies, and price reform

ESMAP continues to support Turkey with municipal-level energy efficiency planning

Listening to Client Needs: ESMAP Support to Turkey's Energy Transition 2007-15

Few countries can parallel Turkey's efforts to restructure its energy sector over the past 15 years. Moving from a state-owned, vertically-integrated model, Turkey has entirely privatized electricity distribution; passed groundbreaking electricity market, renewable energy, and energy efficiency legislation; established new regulatory bodies; and carried out price reform.

In the process, Turkey has added 31,000 MW in electricity generation capacity without long-term power purchase agreements or sovereign guarantees, more than doubling its capacity since the early 2000s. The country has transitioned to a well-functioning electricity market, with adequate supply to meet the country's growing needs.

During this period, the World Bank's Energy Sector Management Assistance Program ([ESMAP](#)) has provided technical assistance supporting the overall reform program. Along the way, the World Bank and ESMAP

have acted as trusted partners of Turkish counterparts, helping in a multi-faceted process that has moved Turkey from a country facing structural energy challenges and supply gaps to a global model for other countries.

"Over the last 15 years, the outcomes were very positive because we worked together," says Budak Dilli, former General Director of Energy Affairs at Turkey's Ministry of Energy and Natural Resources. "World Bank experts were told what we needed, they listened, and they offered solutions."

ESMAP's engagement with Turkey began in 1983, with the publication of an "Issues and Options" paper—a comprehensive assessment of the current state and future potential of the country's energy sector. The focus then was on building a secure energy supply by developing enough coal and hydropower potential to replace costly imported fossil fuels. Also important at the time was developing the capacity of the country's state-owned enterprises to manage rapidly

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growing energy systems.

Early 2000s: Launch of Reform and Renewable Energy Law

By the turn of the millennium, Turkey had mostly moved past these challenges. However, an economic crisis in 2000-01 demonstrated the vulnerabilities of an energy sector that was centralized, run by public monopolies, and lacking a strong regulatory framework.

Turkey launched its energy market reform in 2001, in response to this crisis. Laws were passed that provided for complete restructuring of the sector, including opening the electricity market to private distributors and traders, open access to the electricity grid, and the establishment of the Energy Market Regulatory Authority.

In 2004, the World Bank extended a \$202 million loan to Turkey to develop privately owned and operated power generation from renewable sources. The loan sought to foster institutional capacity, new regulations, and financing mechanisms that would allow for this renewable energy expansion.

The loan facilitated renewable investments and initiated studies for a better regulatory framework. In May 2005, Turkey passed a Renewable Energy Law that specified a minimum price and established a mechanism for priority dispatch of power from renewable sources. The aim of the law was to ensure that renewable energy sources would be developed and used in a planned, economic and regulated manner. The country now had a regulatory mechanism that would guide future renewable development.

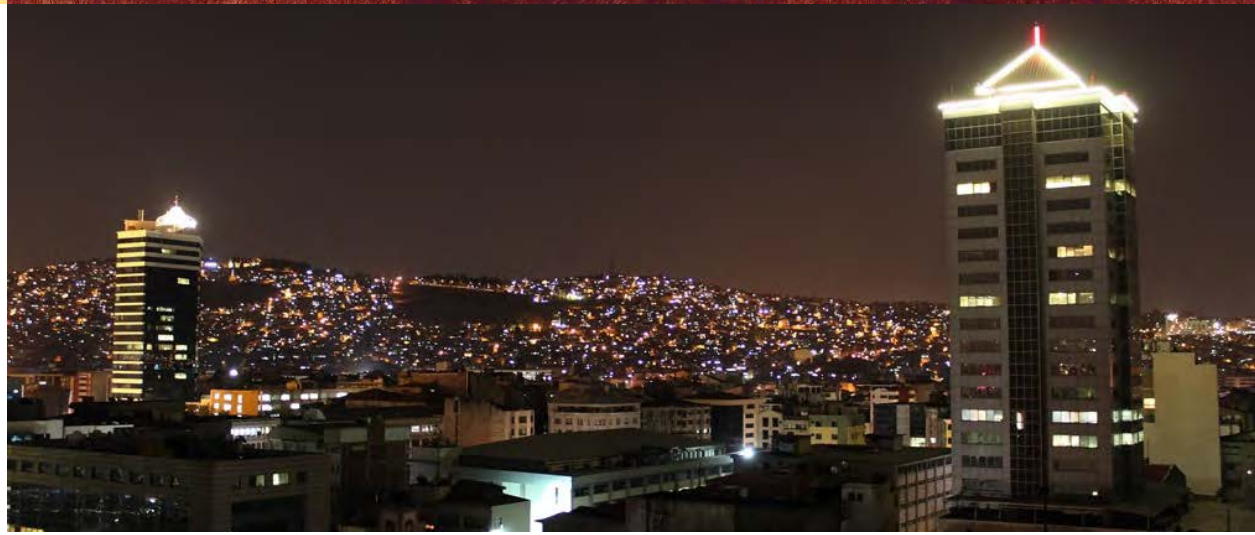
Late 2000s: Threat to Supply Security

The value of ESMAP assistance would be proved two years later. Turkey’s planners extrapolated from the then-current seven percent annual growth in energy demand, and realized that very soon, the country would not be able to meet its electricity needs due to a lack of investment in generation. The government asked the World Bank to help review its electricity supply model and see what other countries had done in similar situation.

In 2007, the World Bank, with ESMAP support, brought in experts from all over Europe and Brazil to conduct a supply and demand analysis of Turkey’s electricity sector. They recommended a number of mechanisms to increase generation capacity, including electricity auctions and certificate schemes for

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generators. ESMAP also helped to organize training for TEİAŞ staff, the national electricity transmission company, on auctions and certificates, as well as measures such as day-ahead electricity markets to help stabilize the system.

These activities helped introduce supply security legislation and regulations, and provided the basis for the government to define how the national electricity supply would be monitored and governed.

The looming supply shortage brought into question the entire reform process, with some parties calling for a return to a centralized system. However, Ministry of Energy planners remained firm in their commitment to continue with liberalization. According to Mr. Dilli, the expert advice and knowledge sharing supported by ESMAP played a key role in maintaining that commitment, particularly at a time when reforms could easily have been reversed.

“By bringing in experts and transferring their experience to us, [ESMAP] really helped us to design the new market and design the transitional measures. It is easy to make mistakes in a reform process. It can ruin or delay everything if you don’t sequence things correctly,” he says.

These ESMAP activities also helped catalyze an increase in World Bank energy lending to Turkey, providing the analytical underpinnings for three loans totaling \$1.15 billion between 2009 and 2011. This loan program contributed to a number of critical outcomes for Turkey’s continuing reform program, including establishment of a day-ahead electricity market and financial recovery for the power sector.

In the end, the supply shortage was avoided. New capacity was developed, and demand dropped from seven percent a year to roughly four percent a year as a result of the global economic slowdown.

The reform program thrived. In 2007, the private sector share of the country’s electricity generation capacity stood at 19 percent. By 2014, that share had grown to 55 percent and continues to increase.

Continuing Support: Hydropower, Energy Efficiency

In recent years, as Turkey’s energy sector has matured and changed, ESMAP support has changed with it. Partially as a result of the success of the reform program, these activities are targeted toward specific challenges rather than assistance to the entire sector.

Rather than a scarcity of supply, Turkey now faces an abundance of players in the electricity generation arena. This has led to some instances of uncontrolled development, particularly in hydropower. The rapid increase in privately funded small- and medium-sized plants has helped Turkey develop a more reliable energy base, but has also had unforeseen impacts on fragile environments. Although Turkey has strong Environmental Impact Assessment regulations in place for individual hydropower projects, it had no mechanism to gauge the overall effects of a combination of projects.

In early 2013, ESMAP supported the preparation of a study on Cumulative Environmental Impact Assessments of hydropower in Turkey. The result of an 18-month process that involved consultations with a wide range of government authorities and non-governmental organizations, the study presented guidelines for conducting such an assessment. Since then, the Ministry of Environment and Urbanization has started to incorporate cumulative impact assessments for new hydropower projects.

Another targeted program of assistance has been work in the southeastern city of Gaziantep—to increase the energy efficiency



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.

of municipal services in one of the country's fastest growing urban centers. In 2011, ESMAP piloted its Tool for Rapid Assessment of City Energy ([TRACE](#)) in Gaziantep to help city planners chart their energy efficiency investments.

The TRACE assessment concluded that Gaziantep's water, urban transport, and public lighting sectors should be priorities for investment. For example, the study found that improving the energy performance of the public water system and implementing a leakage detection program could save the city \$14 million in energy costs per year. The TRACE pilot informed the preparation of a master plan for the city, along with major energy efficiency initiatives. It also paved the way for similar assessments in other Turkish cities under a World Bank-financed sustainable cities project focused on planning long-term infrastructure investments.

The success of Turkey's energy reform program was on display in Istanbul in mid-2014, when ESMAP sponsored a South-South knowledge exchange on open access to transmission and distribution grids. The event gathered participants from Azerbaijan, Brazil, China, India, Indonesia, Tunisia, Turkey, and Vietnam.

ESMAP's engagement with Turkey—ongoing for more than 30 years—and its support to energy reforms continues. A landmark will be reached in 2015, when ESMAP publishes Turkey's Energy Transition: Milestones and Challenges—a comprehensive look at the country's reform program over the past 15 years and future challenges.

