Electric Power Systems in Turkey

Overview

Turkey’s demand for electricity grows at a rate of 8% per year. In 2007, Turkey produced 190 billion kWh of electricity from the existing installed capacity of 41,000 MW. In case of low demand, Turkey will require 400 billion kWh and in case of high demand, 500 billion kWh electricity production a year in 2020. This means Turkey will have to increase the total installed capacity over two times of the existing capacity. Minister of Energy and Natural Resources Dr. Hilmi Guler announced that Turkey requires an investment of $128 billion through 2020 in the energy sector. Of that, $105 billion is estimated to be in electric power generation, transmission and distribution sectors. The Turkish Government expects the majority of this investment to originate from the private sector.

The Turkish Government passed the Renewable Energy Law No. 5346, which entered into force on May 18, 2005. This law requires retail companies to buy 8 percent of their total electricity procurement from renewable energy generation companies. In addition, Energy Market Regulatory Agency (EMRA) has license fee exemption for renewable energy investors and The Turkish Electricity Trading Company, TETAS provides buying guarantees to renewable energy companies. Renewable energy will play an important role as Turkey’s preparations for accession to the European Union is underway.

Turkish private sector is showing great interest on the renewable energy type of power generation. Companies are seeking technologies, equipment, financing and partners to implement hydroelectric, wind, geothermal, solar and biomass power plant projects. The private sector plans to invest 2000-3000 MW wind power projects over the next 3-5 years in Turkey. The Ministry of Energy and Natural Resources (MENR) has developed the wind energy atlas of Turkey including information on the transmission lines and substation availability in those locations. This study showed Turkey has at least 48,000 MW of wind energy potential. Recently, EMRA collected license applications for wind power, the private sector made an incredible amount of applications. Certainly, EMRA will be very selective in awarding the licenses. Most of these companies will require wind turbines and towers and will also be seeking for potential partners and financing.

Recently, Turkish Government increased the wholesale electricity prices. Companies can sell their electricity at much higher prices through Market Accounting Conciliation Center (PMUM) set at TEIAS . Generation companies submit their price and amount of electricity that they would like to
supply to the grid through submitting their bids to PMUM one day before. The following day TETAS buys the electricity by starting with the lowest bid. Currently, as there is great demand for electricity, wholesale prices are approximately at 8-9 cents per kWh levels and prices are not expected to decrease for years to come until excess capacity is in the marketplace. The new law passed recently at the Turkish Parliament brings more incentives to renewable energy generation and guarantees to have the wholesale price of at least 5.5 Euro cents per kWh for the next 10 years as well as having buying guarantees. However, at a given region, wind energy can supply up to 5-15% of the total electricity distributed. Renewable energy companies can obtain higher prices for the voluntary carbon credits received from companies, which are in the countries that are a signatory to the Kyoto agreement.

Turkey’s hydroelectric power generation potential is 36,700 MW. Only 36% of this potential is being utilized so far. An installed capacity of over 13,000 MW hydroelectric power plants currently exists in Turkey. An additional 10,000 MW is under construction. When these projects are completed, 45% of Turkey’s hydroelectric potential will be in use.

In recent years, State Hydraulic Works (DSI) has started tendering new projects on water usage contract basis, which requires the private sector to obtain license from the Energy Market Regulatory Agency (EMRA) and invest for the building of the dams and hydroelectric power plants on certain locations designated by DSI. The Turkish Private Sector with their foreign partners will require financing for building these new hydroelectric power plants. Investors are then free to sell its electricity to the grid or large users. In the following years, DSI plans to tender out 627 new projects at the total installed capacity of 11,000 MW.

Turkey is in the first rank in Europe and 7th rank in the world in the geothermal energy resources. Only two projects are underway so far in geothermal power generation while the large potential remains unexplored. Minerals Research Exploration Institute (MTAE) of Turkey will soon announce the geothermal atlas of Turkey. EMRA would then collect license applications for such locations.

Turkey is fast moving into the liberalization of the electricity trading market. EMRA issues licenses for power generation or wholesale trading companies, which can sell its electricity generated anywhere in Turkey to any large client in any place in Turkey by paying a certain trading fee. EMRA has received license applications for over 30,000 MW, half of which is for hydroelectric power plant projects.

Many Turkish companies are seeking for potential foreign partners to participate in the upcoming power sector privatizations. Turkish Government will tender the privatization of its three electricity distribution grids located in Ankara, Bursa and Istanbul’s Anatolian side by the second half of 2008. For the purpose of privatization, the countrywide Turkish electricity grid has been divided into 21 regions. EMRA estimates that the winners will need to make a total investment of $2.2 billion until 2020 for the upgrading of the electricity distribution grids. Many Turkish companies are seeking for potential U.S. investors or O&M service companies to be able to bid for these privatizations. The Privatization Administration (PA) will collect bids for the privatization of 9 power plants on 22 February 2008. PA plans to privatize most of the power plants and electricity distribution grids by the end of 2009.
Turkish Parliament passed a nuclear energy law at the end of 2007, which provides electricity buying guarantee of Turkish Electricity Trading Company (TETAS) for 15 years. MENR will issue the nuclear energy regulations outlining the tendering procedures which will either allow full investment to be made by the private sector or by public private partnership or otherwise by the government. To diversify the energy resources, Turkish Government predicts Turkey should have a nuclear energy power generation capacity of 15,000 MW by 2025.

Turkish Government plans to license nuclear power plant investments at the total capacity of 5000 MW by the year 2012. For this purpose, MENR and Turkish Atomic Energy Agency (TAEK) have been studying the potential sites for the construction of nuclear power plants. The first investment will be made in Akkuyu and studies are continuing for Sinop site.

Turkey has approximately 46,000 km of electricity transmission lines and approximately 840,000 km electricity distribution lines. However, these lines need to be expanded to accommodate new power generation facilities including nuclear power plants to be built. In 2008 budget, Turkish Electricity Trading Company (TEDAS) is estimated to make an investment of USD 450 million. Turkey has electricity transmission line connections between Bulgaria, Georgia, Syria, Iran and Iraq. Turkey is trading some electricity between these countries. Another electricity transmission line is being built between Turkey and Greece to connect Turkey to the South European Grid. A Turkish company is exporting electricity to Northern Iraq.

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