

# Turkey's Energy Policies: Suggestions for a Change

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## ABSTRACT

*This paper begins by underlining Turkey's excessive external dependence on energy. Issues surrounding the creation of new power generation capacities are then reviewed, including the potential use of renewable energy sources and the importance of energy saving and efficiency. The government's plans regarding the restructuring of Turkey's energy sector, and the potential addition of nuclear energy, are also critiqued and discussed. The Commentary ends with policy suggestions for Turkey's energy sector, emphasizing the need for policies based on inclusive, public debate; an updated inventory of Turkey's energy sources; guidelines that the Energy Market Regulatory Authority should follow; and the importance of considering environmental issues and basing Turkey's energy future on local and renewable sources.*

Turkey is highly dependent on external energy sources. According to Ministry of Energy and Natural Resources (MENR) data, Turkey's dependency rose from 51.9% in 1990 to 75% in 2007, and reached 72.8% in 2008. The State Institute of Statistics reveals that Turkey's import figures for energy related raw materials (i.e. crude petroleum, petroleum products, natural gas and coal) which climbed to \$48,252 billion USD in 2008, comprised nearly one fourth of total imports that same year. The burden decreased in 2009 due to a decline in petroleum and gas prices. Still in 2009, Turkey paid \$29,870 billion USD for imports of raw energy materials, and their share in total imports was 21.2 percent.

Turkey's dependency in electricity production is also high. MENR figures reveal that imported natural gas has a 48.2% share in power generation; when imported coal and petroleum products are also added, Turkey's energy dependency rises to 58.60 percent.

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renewable domestic energy sources potential.

### **Power Shortages**

Since 1980, power generation, along with many other public utilities, has been forced into the open market. With the passage of Electricity Market and Natural Gas Market laws and the formation of the Energy Marketing Regulatory Authority (EMRA) in 2001, the responsibility for developing Turkey's energy resources was granted to the private sector.

The capacity built by the private sector since 2003 totals up to 7,042 MW, a sum which comprises 15.73% of Turkey's capacity of 4,476,670 MW at the end of 2009. Within the capacity built by the private sector, natural gas generating power plants have the highest share with 56.95%, followed by hydro with 16.16% and wind with 11.25%.

As of March 2010, the total licenses issued by the EMRA for power generation and energy infrastructure total up to 3,272,085 MW. Although hydro projects again rank first with a 41.96% share, imported hard coal and natural gas follow close behind with 22.81 and 15.53 percent shares, respectively. Given that the annual working hours of thermal power plants are about 2.3-2.8 times greater than hydro plants, with their longer work cycle, power generation on thermal power will be far more than renewable sources. Especially when considered against the background of new power plants that work on imported coal and natural gas, imported fossil fuels will continue to be dominant in Turkey's energy sector.

There are a number of power plants under planning and construction phase; those that have received licenses and are slated for construction would be able to provide up to 73.09% of the country's existing capacity. However, their pace of construction is very slow. An EMRA analysis points out that about two thirds of all investments are at the 0-10 percent completion stage; in other words, many have not even broken ground. The share of investments with a realization rate over one third is only 17 percent.

Is it possible to decrease these high rates of dependency on external sources? Yes. The second question is: "how?" The reply would be to develop and implement strategies, roadmaps and action plans based on public planning, public control and power generation that aim to utilize Turkey's significant new and

## The Government's Plans

The Turkish government has published two important energy strategy documents in the last couple of months. The first one is "Electricity Energy Market and Supply Security Strategy," dated May 21, 2009. This was followed by "Ministry of Energy and Natural Resources (MENR) Strategic Plan" dated March 2010. These two important documents define the government's preferences and approaches to energy policies. The main target of both documents is "to develop market structure and applications." The tools that would be used for reaching this target are listed as: "improvement of the existing market, building capacity mechanisms and capacity/energy procurement through contests, activating transitional contracts, enhancing market openness, developing tariffs and pricing, and the separation of market activities."

Another main driving force of these strategy documents is to accelerate and finalize the privatization of all public assets in the energy sector. The government is moving at a fast pace toward privatization. Four regional electricity distribution companies have been privatized already, and three are in the transfer stage. One is being blocked by Supreme Court. There will be new tenders for four more distribution companies in July, and the Privatization Authority has plans for selling the remaining four in the coming months, so that it could finish the privatization of all distribution companies before the end of the year. The government also plans to sell all publicly owned power generation plants, starting with the small hydro power plants, followed by the gas and coal operated plants. The bids are currently being collected for fifty-two small hydro plants in nineteen packages which total up to 141.1 MW.

It is bitter to note that the government, which claims that they are ending public/state participation/ownership in electricity distribution companies, has opened the doors to publicly owned companies from the Czech Republic and Austria. More publicly owned and public-private foreign companies are expected to be active in Turkey's energy sector as privatization process continues.

The resource utilization targets stated in the Strategy Paper sound very interesting but are quite arguable. The report claims that the government plans to utilize all domestic lignite and hard coal potential. A quick glance at the licenses issued by the EMRA reveals that the capacity figure of imported hard coal based power plants exceeds 7,400 MW, and that this figure will rise to 16,000 MW when the planned projects come online. However, Turkey's licensed domestic lignite

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based power plants are at a capacity of merely 1,749 MW and this figure makes it questionable how the target of 12,000 MW based on local lignite will be utilized.

### **An Enhanced Role for Renewables**

The Strategy Paper refers to a rise in the share of renewable sources in Turkey's electricity production to 30% by 2023. This is not a challenging figure, as hydro power alone managed to meet one quarter of total demand in 2003, 2005 and 2006, and even reached 30.6 percent in 2004. If it were possible to utilize all of Turkey's potential hydro power by 2023, as stated in the Paper, then it would be possible to generate 140 billion kWh, which would easily meet one third of total demand in 2023. Noting that the Strategy Paper aims to have 20,000 MW of wind power in operation by 2023, then Turkey will have about 60 billion kWh of wind power for electricity. Combined with Turkey's hydro power, these two renewables would be able to meet 41-46 percent of Turkey's 431-487 billion kWh electricity demand by 2023. If the potential coming from geothermal, biofuels and solar energy were added to the capacities that would be generated from hydro and wind, the share of renewable energies would certainly be higher than the 30 percent target of the Strategy Paper. The target for electricity power generation *should* be 30% natural gas, 25% domestic lignite, 5% imported coal, 25-30% hydro and 10-15% other renewables.

The MENR's Strategic Plan covers a shorter period (2010-2014), and repeats the targets of the Strategy Paper. However, it has a target of a 5% share for nuclear power by 2023. This target is also very arguable. Based on the recent agreement made with Russia, MENR's very optimistic time schedule is to conclude all the regulations and arrangements which are prerequisite to construction of the nuclear plant by 2012, start construction immediately after that, and finish construction by 2019. The plan depends on being able to conclude commissioning and start-up in one year for the first unit of 1,200 MW, render the capacities of the following three units in the succeeding three years, and have full capacity in operation by the end of 2023. This time schedule will be very difficult to attain. Even if we assume that it is realized, then with 8,000 annual working hours, the 4,800 MW capacity nuclear power plants would have a 38.4 billion kWh capacity, which would constitute a 7.8-8.9% share in total power generation. This share is reasonably higher than the government's projections and would result in a fall in the share of renewable energies.

### **Energy Saving and Efficiency Improvements**

To date, Turkey has basically followed a policy that is based on meeting energy needs through creating a new source of energy supply. This policy ignores the fact

that losses due to electricity stealing and technical losses have reached the alarming rate of about 15 percent. Moreover, the possibilities for energy saving that could potentially reach a rate of more than 50% in some sectors have also been ignored. To meet the need for energy, new, large-scale investments have been made, but at the same time, technical and commercial losses have continued and therefore, foreign-source dependency has reached a critical magnitude.

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The policy from now on should emphasize that the investments should be made primarily for energy saving, and if the savings from these investments are not enough, only after that should new energy generation plants be built.

### Policy Suggestions

The angle between the policies that have been under implementation for the last thirty years, the social needs of the Turkish people, and the capacity to meet those needs are increasing day by day. The privatization policies being followed in essence function to satisfy the benefits of capital to get maximum profit. However, the fact that energy is a public and social service should be a basic principle that should be considered in all works done in this field. To benefit from energy is a human right. Thus, high quality energy should be provided to all consumers at a low cost, and in a sustainable, continuous manner.

Energy power generation should be based on local, new and renewable sources. Energy planning should aim at protecting national and public interests, and increasing social interests.

Turkey's energy sector needs a centralized structure for the coordination of regulation, planning, and controlling activities because it has strategic importance and it requires a rational use of resources. The implementation of this structure should take Turkey's real conditions into account.

In determining the policies of the energy sector, a National Energy Platform should be formed, where all segments of the society (universities, chambers, professional organizations, public organizations, trade unions, consumer associations, etc.) are represented. By means of the National Energy Platform, strategic plans for all the energy sectors (i.e. petroleum, natural gas, coal, hydro, wind, geothermal, solar, etc.) should be prepared. Based on these sub-sector plans, a National Energy Strategy must be prepared. This Strategy should be supported

with roadmaps and action plans. Within the MENR, a National Energy Strategy Center which would coordinate and cooperate with the National Energy Platform should be formed.

A realistic and updated inventory of Turkey's energy should be prepared. Privatization policies based on a rejection of public planning, public power generation or use of local sources should be abandoned. The public sector should be given the right to make investments for power generation.

The EMRA, while issuing licenses, should rely on the Energy Demand and Investment Forecasts that are prepared by considering national and public interests, and social benefit. The EMRA should not give licenses to any new generation projects based on imported coal. Natural gas fired projects should be consistent with the aims and policies that propose reducing the share of natural gas in electrical power production.

Policies that aim to downsize and privatize public energy companies have not been successful. BOTAS and TPAO should be combined with Turkish Petroleum and Natural Gas Corporation. The combined entity could carry out petroleum and natural gas surveys, and oversee production, transmission, refining, distribution and sales activities on a national and international scale in a vertical, integrated structure. Similarly, the Turkish Electricity Corporation should be formed again in order to provide the country with an integrated body for public electricity generation, transmission, and distribution activities.

In all energy investments and especially in power generation, the principle should be to minimize the negative effects on the environment. The EMRA should not give a license to any investment that does not certify that it is appropriate from an environmental standpoint. Any licenses that cannot meet this condition should be cancelled.

The legislation that would support power generation based on renewable sources must be renewed in the light of a macro strategy that aims to base Turkey's energy policies solidly on local, new and renewable sources. In addition, the local manufacture of equipment for power generation should be supported.