

WIND ENERGY POLICIES IN TURKEY

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ABSTRACT

Energy is a strategic parameter, which demonstrates the development of a country. In Turkey, energy and energy politics are mainly based on the supply due to the inadequate fossil fuel resources. In the beginning of the 21st century, due to the increase in the price of fossil fuels and environmental burdens, many countries showed renewed interest in alternative energy resources. Climate change and environmental problems caused by greenhouse gas emissions showed the importance of renewable energy resources and especially wind energy. The major reason for the interest in wind energy technologies out of many renewable energy resources is the bulk availability of this resource without any cost.

In Turkey, the major solution to the dependency on foreign energy resources is: domestic production, development, and operation of renewable energy resources. However, in order to make these investments, suitable conditions and strategies must be generated. In order to accelerate the wind energy investments in Turkey: (i) the problems related to the interconnectivity of the wind power systems to the grid must be solved (ii) the guaranteed purchase price of the wind energy must be updated (iii) and the construction/operation of wind power plants must be subsidised by government initiatives.

In this study, the politics related to wind energy is extensively reviewed and the possible suggestions/solutions related to the acceleration of wind energy production and investments in Turkey are given.

Keywords: Energy Policy, Power Supply Security, Renewable Energy, Wind Energy

1. INTRODUCTION

Energy is a strategic parameter, which demonstrates development of a country. In Turkey, energy and energy politics are mainly based on supply due to inadequate amount of local fossil fuel resources. At the beginning of the 21st century, due to increase in fossil fuel prices and environmental burdens, many countries showed renewed interest in alternative energy resources. Climate change and environmental problems caused by greenhouse gas emissions showed the importance of renewable energy resources, especially wind energy. Major reason for the interest in wind energy technologies out of many renewable energy resources can be related to the bulk availability of this resource without any cost.

In Turkey, it is especially important to reach development targets, increase social welfare, and make industrial sector competitive at international level. In order to reach these targets energy demand has been increasing steadily in the last couple of decades and it is believed that this demand will keep on

increasing in the near future. In 2008, the annual energy demand was 106 million tonnes of petroleum equivalent and in 2010, this amount rise to 126 Mtoe and it is predicated that by 2020 this would reach up to 222 Mtoe. These values indicate a 6% annual increase in the energy demand.

Turkey has one of the biggest wind energy potentials in Europe. Technical wind energy potential of Turkey is around 83000 MW. This is almost two folds of current energy demand and 8000 MW of this potential is classified as highly efficient and 40000 MW is efficient [1, 2]. The installed capacity of Turkey was 44758 MW by the end of 2009 and 791.55 MW of this capacity is provided by wind energy. In 2009 electricity produced from primary sources was 194813 GWh in Turkey, and 1495.4 GWh of this energy was produced from wind energy, Table 1. Turkish Wind Energy Association announced that as of May 2010 installed wind energy potential of Turkey is 1030 MW. Therefore, in the first 5 months of 2010 installed wind capacity of Turkey increased approximately 25%. Based on the Electric Energy Market and Supply Security Strategy document of Higher Planning Council, which was published on 18 May 2009, it is planned to increase the wind energy capacity of Turkey to 20000 MW by 2023 [3].

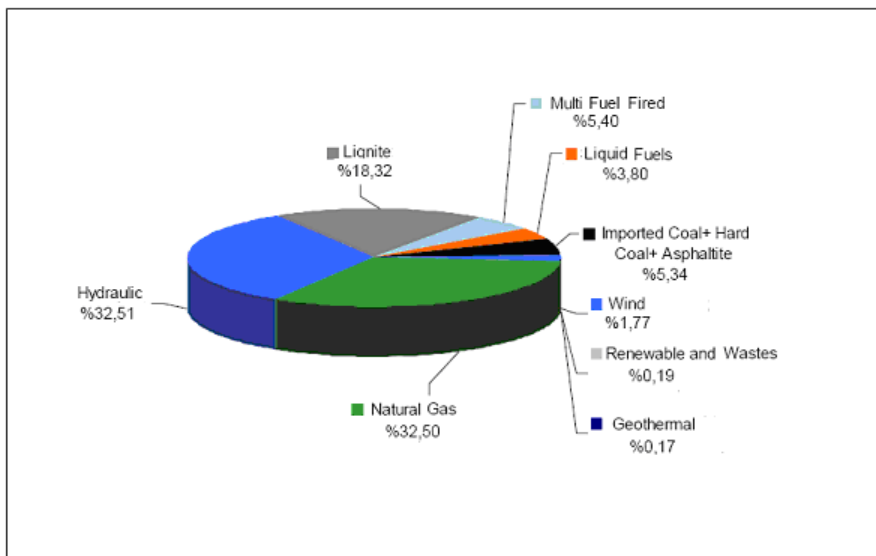


Figure.1. Share of the Resources in Turkey's Installed Capacity [3].

Table-1 Turkey Electricity Generation by Primary Sources [3]

| SOURCES | GWh |
|--|-----------|
| Natural Gas | 96.094,7 |
| Lignite | 39.089,5 |
| Hydraulic | 35.958,4 |
| Imported Coal + Hard Coal + Asphaltite | 16.595,6 |
| Liquid Fuels | |
| ➤ Fuel-Oil | 4.439,8 |
| ➤ LPG | 0,4 |
| ➤ Naphtha | 17,6 |
| ➤ Diesel Fuelled | 345,8 |
| Wind | 1.495,4 |
| Geothermal | 435,7 |
| Renewable and Wastes | 340,1 |
| TOTAL | 194.813,0 |

2. CURRENT LEGISLATION RELATED TO WIND ENERGY

In order to decrease dependence on foreign energy sources, investment on local and renewable energy resources must be encouraged. In Turkey, various projects are ongoing to facilitate the current potential for sustainable energy security, economic efficiency, and environmental protection. In order to liberate the energy sector, Electric Market, Natural Gas Market, and Petroleum Market legislations were passed. In order to control the public and private sector investments an independent authority, Energy Market Regulatory Authority (EPDK), was established. EPDK produces various plans for the liberation of energy market in Turkey. These plans also set the ground for the utilisation of renewable energy sources.

In order to decrease Turkey's dependence on foreign energy resources the first step was the preparation of legislation No. 5346, which is related to the utilisation of renewable energy sources. Based on this legislation various roadmaps were prepared to utilise solar, wind, geothermal and other renewable energy sources of Turkey. These studies made it possible to provide 2.72 GWh of annual energy demand and future endeavours. Of course, the studies did not end up at that point, and in 2006 the renewed legislation No. 2872 "Environment Legislation" covered carbon footprint, government incentives, and environmental protection. Shortly after, in 2007, legislation No. 5627 "Energy Efficiency" stated that industrial organisations improving energy efficiency would get tax reductions up to 20%.

In 2007, another government incentive was passed from the parliament, which provides a 10 year purchase guarantee to the companies with accepted wind energy production plants. Based on the "Feed-in-tariff" conditions investors got the chance to produce long term agenda with a 10 year purchase guarantee [4].

The incentives carried out based on Turkey's Electric Market Licence Legislation are as follows:

- The purchase price is equivalent to the last years Turkey's average wholesale price provided by EPDK. This price cannot be lower than 5 eurocent per kWh and cannot be higher than 5.5 eurocent per kWh.
- The fixed term tariff is for plants, which will be placed into operation before 31/12/2011 and for a term of 10 years.
- TEDAS and licensed distributors would provide priority to renewable energy producers for grid connection.
- In developed projects, government land will be allocated to the investors, except the forbidden zones.
- For plants that will be put into operation before 2011, 85% of the rent, elevation right, and operational right costs would be subsidized.

However, there are still legal problems related to the adjustment of the market price of renewable energy sources. The aim of this legislation is to provide a safety net for producers to invest in renewable energy sources. As stated above, Turkish government guarantees to purchase renewable energy sources from 5.5 eurocents per kWh. However, in Germany, guaranteed purchased price is 9 eurocents and in France it is 9.86 eurocents. Therefore, the guaranteed purchase price in Turkey is very low compared to its European counterparts. A new legislation providing a guaranteed purchase price of 8 eurocents was drawn back from the parliament by the ministry of economy before ruling. Currently, a new legislation has been prepared [5].

The most important problem related to wind energy investments is the legal gap to determine the organisation, which is going to make the related investments to substation routing and additional transmission lines. Based on a council decision from EPDK, it was decided to take the wind energy licence applications in 1 November 2007, and at that date the wind energy capacity was 78151 MW based on the applications. These applications were made without considering the constraints on substation routing and transmission lines. In order to solve this problem, EPDK made a public announcement in 24 March 2009 and based on this revision, the capacity decreased to 28000 MW. Later on, EPDK announced that investments can be made based on private companies' technical

evaluation but not on TEIAS's regulations, and the whole auction was ruled out. There is still ambiguity on how the process is going to work. In addition, there is still uncertainty on whose going to make the investments related to the additional transmission lines [6].

3. CONCLUSION

In Turkey, the major solution to the dependency on foreign energy resources is domestic production, development and operation of renewable energy resources. However, in order to make these investments, suitable conditions and strategies must be generated. In order to accelerate the wind energy investments in Turkey: (i) problems related to the interconnectivity of the wind power systems to the grid must be solved (ii) guaranteed purchase price of wind energy must be updated (iii) construction/operation of wind power plants must be subsidised by government initiatives (iv) and investments related to the utilisation of local wind energy technologies must be encouraged.

The legal uncertainty related to transmission line routing and additional distribution line investments should be solved immediately, since they put setback on foreign investors. The guaranteed purchase should be increased to the level of European countries. Grid connection locations and capacities of wind power production plants must be determined when licenses are given. Current connections should be planned based on the future expansions of the grid, if not, big problems can rise in the future [6]. Advanced and efficient technologies must be used in the wind energy sector. Energy saving projects must be started as soon as possible and new project should be supported economically [7]. Wind prediction models should be produced and universities/institutes should be encouraged to prepare these models on scientific ground. R&D projects should be carried out to solve the problems related to the connection of wind energy systems to the grid. Finally, problems related to financing renewable and wind energy projects must be solved.

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