ENERGY POLICY OF TURKEY

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ABSTRACT

This study indicates all the above mentioned concepts, such as; Turkish energy production and consumption, energy policies and efficiency, and underlies the necessary precautions to be taken. About 22% of energy generated in Turkey is lost because of inefficient distribution and relay systems, and Turkey is in a bottleneck of energy, since the decisions of the past have not been realized. The first step to change the current energy situation is the stability and firmness in her decisions that were made previously.

The solar energy potential is large and projects aiming at the utilization of solar energy such as, photovoltaic, active–passive heating and solar power plants should be encouraged. Usage of wind, hydroelectric and geothermal energy could be increased by legal regulations prepared for more efficient Build-Own-Operate and Build-Operate-Transfer models.

Key words: energy policy, efficiency, conservation, renewable energy resources

INTRODUCTION

The need for energy increases with elevated life standards each day. Provision of clean, cheap and long-lasting energy should be the main goal of the energy policy of any country since increasing life standards, growing world population and rapid developments in technology rises the need for energy each day, however, the provision of such energy will be harder due to the limited energy reservoirs present around the world. The environmental pollution resulting from the usage of energy is another serious problem. Due to these difficulties related to the energy issue, the world is seeking for alternative energy sources.

In 1980, the population of our country was 44 million and it is 68 million in the year 2000. On the other hand our primary energy consumption was 32 MTEP in 1980, it was 74 MTEP in 1998. Beside this, primary energy sources production in 1998 was 28.9 MTEP. The final energy consumption pear year is presented in Table 1[1]. The growth of economy and industry, the increase in population, urbanization, and the spread of technology led to remarkable increase in the Turkey’s primary energy and electric consumption. Turkey is a country who has not completed its industrialization, and is still in the process of development and a rapid rise in energy consumption is expected all along this process of development. It is also estimated that energy demand in the year 2020 will be 65% higher than that of today and it will be 250% higher than that of today in the year 2050. In 1998, consumption of electric energy per individual was 1386 kWh which constitutes about the 1/5 of the OECD average. It is expected for the year 2010 that existing electrical power will increase about three folds and in 2020 it will be about 5 folds of today’s values [2].

The energy consumption by houses and utilities was 15 MTEP in 1990 and it reached to 18.8 MTEP in 1998 as seen in Table 2. In residence and utilities sectors, wood, animal and biomass, plant waste materials, which are considered in new and renewable energy resource group, comprise the 37.2% while geothermal energy comprises the 0.8% and solar energy comprises just 0.4% of
the total energy consumption of year. In the same period, the percentage of electric consumption reached to 17.7% while its previous percentage was 10%. On the other hand the natural gas reached from 0.3% to 12.9%. The energy consumption in 1998 was smaller compared with that of 1997 because of the good weather conditions. The share of industry in energy consumption was 27% in 1990 and it has risen to 29% at the end of 1998. The share of industry, in end-use consumption, increased from 35% to 38%. These values indicate that, industrialization is continuing in our country, in particular; energy intensive industry is in progress. Although petrol is the main fuel in industry, percentage of oil consumption dropped. During 1990-98 the share of the natural gas used in this sector increased rapidly from 5% to 10.6%. The percentage of energy consumption in transport sector, given by the statistics, dropped by a percentage of 19% because of the illegal energy consumption (Table 2) [1]. The imported energy increased because of rapid rise in energy demand and slow production of energy. Due to the limited energy sources, Turkey is very much dependent on imported oil and natural gas. 60% of the consumed energy is imported and this is the main factor for high energy prizes [1].

THE ENERGY POLICY AND PROGRAMME

The Governments who have acted up to now, emphasized the importance of energy in different times and have summarized the existing energy condition and have declared their energy politics for many times. The existing energy state and policies have been stated as below in “8th Development and Energy Policy for 5 Years” which has been accepted in July, 2000, under the title of ‘ENERGY’:

* Energy consumption which will underpin the social and economic development, will damage the environment at minimum rates, will be cheap, is targeted.
* A more particular planning approach is needed in electric utilities.
* Energy and electric sectors must be planned by proper selection of projects, investments and the policy decisions.
* In spite of these necessities, in our country, concrete structuring of the sector has failed for long years, and investments could not have been managed effectively.
* The main reason for the shortage of energy, that emerged during the late years of the 7th and the early years of the 8th Development and Energy Policy for 5 Years, is the investment plan applications during the past 10-year period. This is due to the plant projects, depending on their type, which require 3-8 years of time for their construction, these durations could get longer together with the time necessary for project planning and development.
* For the 6th Development and Energy Policy for 5 Years, about $12 billion of investments have been planned however, just $ 8-billion of investments have been realized. Those numbers are expected to be $18 billion and $11 billion for the 7th Development Plan Period which means that, for the last two plan terms, only 60 - 70% of the investments have been realized. For this outcome, the main
reason is that the expected investments from non-governmental organizations had not been carried out.
* Although the studies that will enable non-governmental organizations to compete, had been thought to be completed in 1996, studies have not been finished, yet.
* Electric consumption, in the past 40 years, has grown rapidly, with 1% rate per year, and this increase has decreased to 8.5% in average for the last 20 years. In spite of the decreasing growing rate of energy consumption, country’s electric demand will continue to rise until the saturation of consumption is reached.
* Studies on these issues show us that, electric consumption, which was 118.5 billion kWh in 1999, will be as high as 195 billion kWh and 285 billion kWh by the years 2005 and 2010, respectively.
* In order to meet this demand, it is important to draw the native or foreign capitals to the electric sector.
* Similar problems emerged in natural gas sector as those in the electric sector.
* New plant projects (B.O. and B.O.T. models) could not work as expected.
* Projects aiming to diminish the losses in electric delivery systems and in city networks could not lead to any beneficial result.
* Although saving energy is possible, policy, methods and precautions to utilize this potential could not be carried out effectively.
* Primary energy production, which was 26.3 MTEP in 1995, remained just at 28.1 MTEP level in 2000. Therefore, the rate at which the energy demand is met by our own production has dropped.
* As the shares of natural gas and hydro energy is increasing in primary energy production, petrol products’ share and the share of energy which is not commercial has declined.
* Despite the precautions taken, prevention of the losses in energy delivery systems and relay systems, which is around 20%, was not achieved [1,7].

The energy policy of Turkey was determined by the MENR and The Ministry of Environment as described below: [1]
* It should provide the essential economic growth,
* It should support and lead social development,
* It should be safe, economic, and efficient.

Considering the above facts, the MENR aims to encourage investments in energy areas to utilize the local resources to produce energy. B.O.T., B.O. projects are targetted to meet middle- and long-term energy demand.

Short term policies and precautions could be summarized as the followings:
* Appraising the country’s own resources,
* Increasing the speed of investigation of new energy sources,
* For energy import, finding new countries and resources,

Encouraging private sector’s investments and privatization by creating a more competitive environment in electric sector to bring out an increased production rate and transparency,
* Carrying out “energy conservation programme” to minimize the energy losses at every stage of energy production, its delivery, and consumption and to increase productivity and to prevent prodigality,
* Usage and encouragement of renewable energy sources to meet energy needs as soon as possible,
* Consideration of human health and environment, while covering the energy needs,
* Besides the hydro projects, consideration of thermic plants which utilizes other types of fuel and preparing necessary arrangements to use the nuclear energy for the construction of nuclear power plants and utilization of nuclear technology, inorder to diminish the all clean energy technology programming the research and development studies in energy field [1].

SUMMARY OF SOME ACTIVITIES RELATED WITH THE ABOVE POLICIES

Energy Conservation Co-ordination Comission, which was founded by the MENR, is performing studies to inform the public and students about energy conservation. Energy conservation studies are being continued by The UETM which works under EIE. If these precautions are taken effectively, it would be possible to save about $3 billion (14 MTEP) per year [1]. Studies of foundation of a new energy conservation center are being continued by UETM and JICA.

In order to increase energy productivity, Energy Conservation Regulations have been published in 11/11/1995. According to those regulations, industrial organizations whose energy consumption is equal to or over 2000 TEP per year have to appoint an energy manager to their factories. Energy managers are given certificates by EIE/UETM. Thus, a new programme is going to be started for small and middle scale enterprise [1,3].

New insolation standard is being considered as a must by the Ministry of Public Works and meeting this standards will result in an increase of energy productivity around 50%, each year, in 2.5% of the planned building stocks [1].

Together with the environmental points and energy efficiency considerations, decisions in order to meet the European Energy Standards and its attachment were accepted by the Government [4]. TUBITAK has performed numerous projects in the field of energy. According to a report presented by MAM, the potential of energy which can be saved by the industry reaches 30% of the energy consumed by industry [3].

CONCLUSION AND DISCUSSION

Turkey is a nation who should be aware of the energy consumption because of the high rate of oil imports. Necessary legal regulations have to be made to prevent any energy loss during delivery and to prevent the usage of energy through illegal means. In 1996, although the energy production was about 94.9 TWh, the net consumption, after the above mentioned losses are deducted, was just 74.2 TWh.
in the same year. Experts claim that about 22% of energy generated in Turkey is lost because of inefficient distribution and relay systems [6]. The energy concept can not be discussed without considering the environmental effects. Utilization of 60% of thermic and 40% of hydraulic energy is appropriate for our country. It was decided that the shares of hydraulic and renewable energy will be 28% in 2020, but this fraction is lower than that of the developing energy technology could provide by that time and 99.9% of that share consists of the hydraulic energy [5].

Turkey has an average yearly sunshine duration of 2609 hours, however, solar energy is being used to heat water via water-heater-collectors. Projects aiming the utilization of solar energy such as, photovoltaic, active – passive heating of residential and buildings and solar power-plant fields should be encouraged to put to use this huge energy potential [1,5].

US plans to meet 10% of her total energy consumption with hydrogen in 2025. Turkey should be aware of the importance of this new energy source which is considered as the fuel of this millenium. The MENR declared that, Turkey should sign contracts with UNIDO to establish an International Center of Hydrogen Energy Technology Center in Istanbul, and the Council of Ministries also agreed with that decision. This is an important step which should be put to use in a very short time.

Usage of wind energy is also in demand due to its appropriateness for environment. Turkey is the bottom country in the world ranking for the utilization of wind energy with an amount of 9 MW per year. Applications made to the MENR aims to increase that amount up to 2300 MW per year. If this is achieved, Turkey could be the top three country for wind energy utilization all over the world following Germany and US.

In order to put to use the hydroelectric potential of the country, legal regulations, which are necessary for more efficient B.O.T. and B.O. models, should be made.

Turkey has 1/8 of the geothermal potential of the world. Even though it’s not efficient, geothermal energy is in use and reaches about 710MW. This amount could be 10 folds higher if the necessary precautions are taken.

Increasing the share of hydraulic and renewable energy resources in energy production from 28% to higher rates by the year 2020 by increasing the share of renewable energy resources.

Basic energy concepts should be a part of the curriculum at every level of education programmes including universities, in order to have a more sensitive generation about the energy issue.

The Governments should consider the importance of renewable energy sources more seriously for the provision of a more secure world for the next generation. It should not be forgotten that, Turkey is in a bottleneck of energy nowadays, since decisions made in the past were not realized. The first step to change the current energy situation is the stability in her decisions that were made previously.
Table 1. Disbursment of Enduse Energy Consumption by Sources

<table>
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*1000 tonnes
**Million M³
***GWh
****1000 TEP
Table 2. Disbursement of General & Enduse Energy Consumption by Sectors (1000 TEP)

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<th>Years &amp; Percentages</th>
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<th>%</th>
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<td>Residence &amp; Services</td>
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<td>33</td>
<td>19216</td>
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<td>100</td>
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<td>100</td>
<td>73257</td>
<td>100</td>
<td>74249</td>
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REFERENCES:

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ABBREVIATIONS:

ICHET : International Center of Hydrogen Energy Technology Center.
and Development Administration of Turkey.
TUBITAK : The Scientific and Technical Research Council of Turkey.
UETM : National Energy Conservation Center of Turkey.
JICA : Japan International Coordination Association.
MENR : The Turkish Ministry of Energy and Natural Resources.
OECD : Organization of Economic Co-operation and Development.
B.O. : Build-Own-Operate.
B.O.T. : Build-Operate-Transfer.
MAM : Marmara Scientific and Industrial Research Institute.
TAEK : Turkish Atomic Energy Authority.

UNITS:

KGPE : Equivalent of kg petroleum
MTEP : Equivalent of million tonnes petroleum
TW-h : Terra watt hour
MW : Mega watt