FUNCTIONS AND VIABILITY OF TURKISH WHOLESALE ELECTRICITY TRADING AND CONTRACTING COMPANY (TETAŞ) IN THE SHORT, MID AND THE LONG TERM

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ABSTRACT

FUNCTIONS AND VIABILITY OF TURKISH WHOLESALE ELECTRICITY TRADING AND CONTRACTING COMPANY (TETAŞ) IN THE SHORT, MID AND THE LONG TERM.

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This thesis analyses the necessity for the establishment, main functions and the viability of the Turkish Wholesale Electricity Trading and Contracting Company, TETAŞ in the short, mean and the long term. In order to understand the necessity for the establishment of TETAŞ, Turkish Energy Policies such as the state-led energy policies and the competition based market orientation are put under scrutiny.

The thesis also discusses whether Turkish Government has carried out a comprehensive, deterministic and effective “Liberalization Policy” in the electricity sector by looking at the present situation and the principles outlined in Laws No: 4628, 5654 and 5686 and the Strategy Paper.

The dissertation then examines the life span of TETAŞ by looking at the impacts of the strategy paper, liberalization procedure of the overall electricity market and newly enacted laws such as Law No: 5654 and 5686 in the short, mean and the long term. In addition, TETAŞ is examined whether it is a

"monopoly" or not in Turkish Electricity wholesale market by calculating the supply concentration of TETAŞ using the Herfindahl Hirschman Index.

Despite the studies on the establishment of the liberal market such as the envisagement of Law No: 4628 and the strategy paper, this thesis study envisages that it is still not possible to talk about a liberal electricity market. In addition, it is also concluded that the statements outlined in Laws No: 5654 and 5686 hinder the overall liberalization efforts since these laws are postponing the liberalization of electricity sector and making the life span of TETAŞ longer.

As a result, liberalization efforts on the electricity market are unsuccessful in the mean term and TETAŞ seems to hold its dominance position in the wholesale market as a state-owned wholesale trading company in the long run.

Key Words: Turkish Energy Policies, Turkish Electricity Market, Wholesale trading, Turkish Electricity Market Design and Analysis, Turkish Electricity Wholesale Trading and Contracting Company (TETAŞ).

ÖZ

KISA, ORTA VE UZUN VADEDE TÜRKİYE ELEKTRİK TİCARET ANONİM ŞİRKETİNİN (TETAŞ) FONKSİYONLARI, VARLIK NEDENİ, SÜREKLİLİĞİ VE AKIBETİ

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Bu tezde, Türkiye Elektrik Ticaret ve Taahhüt Anonim Şirketinin (TETAŞ) kurulmasının önemi, şirketin temel fonksiyonları ve kısa, orta ve uzun vadede şirketin varlığı ve akıbeti analiz edilmektedir. TETAŞ'ın kurulmasının önemini anlamak amacıyla, devlet kontrollü enerji politikaları ile rekabete dayalı piyasa oluşumu dikkatle incelenmiştir.

Ayrıca bu tez kapsamında, Türkiye Cumhuriyeti hükümetinin elektrik sektöründe kapsamlı, kararlı ve etkin bir "Liberal Politika" izleyip izlemediği 4628, 5654 ve 5686 nolu kanunlara ve Strateji belgesindeki hükümlere bakılarak tartışılmıştır.

Tezde aynı zamanda TETAŞ'ın kısa, orta ve uzun vadede ömrü, strateji belgesi, elektrik piyasasının liberalleşme süreci, 5654 ve 5686 nolu kanunların etkileri göz önüne alınarak dikkatle incelenmiştir. Bunun yanında TETAŞ'ın Türk elektrik toptansatış piyasasında "tekel" olup olmadığı

“Herfindahl Hirschman Index” metodolojisi kullanılarak arz yoğunluğunun hesaplanması yöntemiyle dikkatle incelenmiştir.

Strateji belgesi ve 4628 nolu kanundaki liberal piyasa oluşumuna yönelik yapılan çalışmalara rağmen, bu tez çalışması halen liberal bir elektrik piyasasından bahsedilemeyeciğini öngörmektedir. Bunlara ek olarak, 5654 ve 5686 nolu kanunların liberal elektrik piyasa oluşumunu geciktirdiği ve TETAŞ’ın ömrünü uzattığı için, liberalleşme çabalarını engellediği sonucuna varılmaktadır. Tüm bu edinimler ışığında, TETAŞ toptansatış piyasasındaki hakim yerini uzun vadede koruyacak gibi görünmektedir.

Tüm bu gerçeklere bakıldığında, elektrik piyasasındaki liberalleşme çabalarının orta vadede başarısız olmuştur ve TETAŞ, devlete bağlı bir toptansatış ve ticaret şirketi olarak piyasa gücünüde elinde bulundurarak uzun vadede Türk elektrik piyasasında yer alacaktır.

Anahtar Kelimeler: Türk Enerji Politikaları, Türk Elektrik Piyasası, Toptan satış ticareti, Türkiye Enerji Piyasası Tasarımı ve Analizi, Türkiye Elektrik Ticareti Anonim Şirketi (TETAŞ).

To my family, my sweet nephew Bartu, my grandmother Nimet and my dear fiancé Elif with love

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Introduction

Energy has always been important for the countries' economic and social life. It is important since it has been one of the major inputs for the industrial development and somewhat turned out to be a prerequisite for sustainable development. Increasing concern about the adverse socio-economic and environmental impacts of current energy use patterns, in many cases coupled with staggering levels of fossil fuel import dependence, call for substantial changes in the energy technology and energy supply system. Technology adoption and diffusion models both at the micro-economic and macro-economic level can provide valuable insights for a better understanding of the actual and required transitions in the energy converting capital stock, the related fuel consumption patterns, the underlying investment decisions.

Energy is also vital for social development that it fairly facilitates life through heating, lighting and transportation while it contributes to education and scientific studies. The ability of attaining the energy resources, sustaining the energy flow and managing them, seem vital given that the long-term goals are mostly accomplished via the possession and intelligence-based management of the energy reserves. Thus, leading countries have undertaken the leading role and even waged great wars for exploiting the energy resources, particularly primary or fossil resources that are coal, oil and natural gas.

The humanity has witnessed many wars in the last quarter of this century, which were implicitly involved in the energy issues. Therefore, the strategic aspect of energy finds room in the states' agenda. Indeed, any bottleneck in the production of primary energy resources or unexpected hikes in the energy prices immediately reverberate within the national economies. In this sense, *power and energy*, emanated from either states or non-states actors, or both, turn out to be a crucial determining factor for the exploitation of these resources.

Given that the energy concept has been playing a great role in economy, policy and military, and also has been shaping and determining the distribution of wealth, the unequal distribution of the energy sources in the world geography and the struggle to utilize these sources in maximum terms make one contemplate about the degrees of power. As there are noticeable differences among the national economies, the degrees of power on the management of the energy resources formulate the levels of dependence and somewhat improve the conditions in favor of the developed countries. As energy has become a commodity of trade, the power struggle has also been deepened and new participants such as society, corporations and regional firms have come onto the stage.

Turkey stands at a very strategic location for energy trade, at the crossroads of Europe, the Middle East and Central Asia. For the last two decades, Turkey has been one of the fastest growing energy markets in the world, with an average annual growth rate of 9 per cent. Despite the decrease by one per cent in 2001 due to the economic crisis, this trend is estimated to continue till 2020 at an average increase of 8 per cent per year.[1] Official projections indicate that rapid growth in electricity consumption would continue over the next fifteen years. Still, the Government anticipates the need for significant increases in power generating capacity as well as the necessity of upgrading transmission and distribution systems, requiring an average $4.5 to $5.5 billion investment a year in the energy sector during

2004-2010. This makes it the third largest area of investment in the global market after China and India. Until only a few decades ago, the Turkish Government was playing an active role in the Turkish economy. Although the energy policy is still largely centrally-driven and governed by the Ministry of Energy and Natural Resources (MENR), it is presently being transformed into a liberalized market so as to attract foreign investment and to restructure its market in parallel with the energy policy of the EU. In this context, Turkey has begun to pursue new rules and policies to liberalize its energy market to meet its increasing demand through diminishing the government intervention. It has ratified the international Energy Charter Treaty, international arbitration tribunals and introduced laws that will break up the Government's monopoly in the energy sector and set up a regulatory body to supervise the market activities.

Starting from the 1980s, the energy policies have become very much related to the economic, social, security, environmental policies as well as the national interests. The increasing financial vulnerability of many states has driven them to allow the Multinational Corporations, which offer worldwide investment opportunities. The neo-liberal wave of the 1980s rendered "deregulation" in major energy sub-sectors with a rising volume of liberalization of the public entities. Turkey also felt that trend with the eminent "January 24 Decisions" in 1980, which called for the liberalization in the public sector, the liberalization of the State Economic Enterprises (SEEs) and the creation of a competition based energy market. There have been numerous State Economic Enterprises in the energy sector, which the public investments had the vast portion. The so-called reason behind the liberalization has been to reduce the state into a smaller size, so that it could deal with only the principle duties, such as defense, justice, security and health. Another reason was the inefficiency of the State Economic Enterprises, state-owned companies and corruptions that had occurred within the public entities. Yet, the counter argument to the neo-liberal economic policies that advocates the extensive role of the state would not come late.

According to this argument, the role of the state in the economy had been considerable during the import substitution period until the 1980s and the state could have been capable to deal with the problems within the state enterprises.

Subsequent legislations that allow the liberalization of these entities, many of which were natural monopolies, were passed in the Turkish Parliament throughout the 1980s and this process accelerated in the 1990s. This caused a major shift in Turkish economic policies and eventually had an effect on the energy sector. The model for deregulation in the energy sector was mainly inspired from the EU Electricity Directives and this was promoted by the international finance institutions such as the International Monetary Fund (IMF) and the World Bank. Thus, the idea of "financial development" in other words "to become rich" prevailed. It can be argued that the neo-liberal economic thought began to affect Turkey's energy policies via the channels of liberalization since the 1980s. The early 2000s also witnessed the establishment of an independent regulatory body Energy Market Regulatory Authority (EMRA) in Turkey that has a responsibility for the establishment of the competition based energy market. Besides, the energy policies started to go into a transformation stage, as the state was to relinquish its superior managing duty on the energy issues.

It will not be forgotten that Turkey is strategically positioned at the crossroads of Europe, Asia and the Middle East. More important than its location as the bridge between East and West, Turkey's complex mix of modern industry and commerce continues to attract a diverse set of foreign companies ranging from mining to high technology to energy.

Nowadays several state economic enterprises and private sector companies in the energy sector continue to dominate the electricity and energy activities in Turkey; firms and consumers face with very high electricity and natural gas prices, which affect the competitiveness of the economy. With the general objective of improving the functioning of the sector and reducing costly

Government transfers, the Turkish energy sector has become the primary target of the liberalization program. Under the recently enacted laws such as Law No: 4628 and 4646, the electricity and natural gas markets are being progressively liberalized and transformed to be more efficient.

Electricity Market Law No: 4628 was enacted on 20 February 2001. The law set up a path toward a competition based market structure in the electricity generation and distribution facilities. One of the basic implementations of the law is that the state-owned Turkish Electricity Generation and Transmission Company (TEAŞ) were vertically unbundled into three companies; namely, Electricity Generation Company (EÜAŞ), Turkish Electricity Transmission Company (TEİAŞ), and Turkish Wholesale Electricity Trading and Contracting Company (TETAŞ). The generation plants of the state-owned Turkish Electricity Generation and Transmission Company (TEAŞ) were transferred to the newly established state-owned company; Electricity Generation Company (EÜAŞ). Moreover, the assets and operation duty of the transmission system were given to Turkish Electricity Transmission Company (TEİAŞ) while the duty and responsibility for carrying out wholesale trading activities were assigned to newly established state-owned company; Turkish Wholesale Electricity Trading and Contracting Company (TETAŞ). Subsequently, the Law No: 4628 intended that the electricity generation plants of EÜAŞ and the distribution regions of TEDAŞ would be liberalized. Finally, TEDAŞ and TETAŞ would carry out the transmission and wholesale facilities, respectively. This legal basis led to an important change that escorted the replacement of “Sale of Property” with the “Transfer of Operating Rights” (TOOR).[2]

The vertical unbundled model of the Turkish Electricity sector is given in Figure-1.

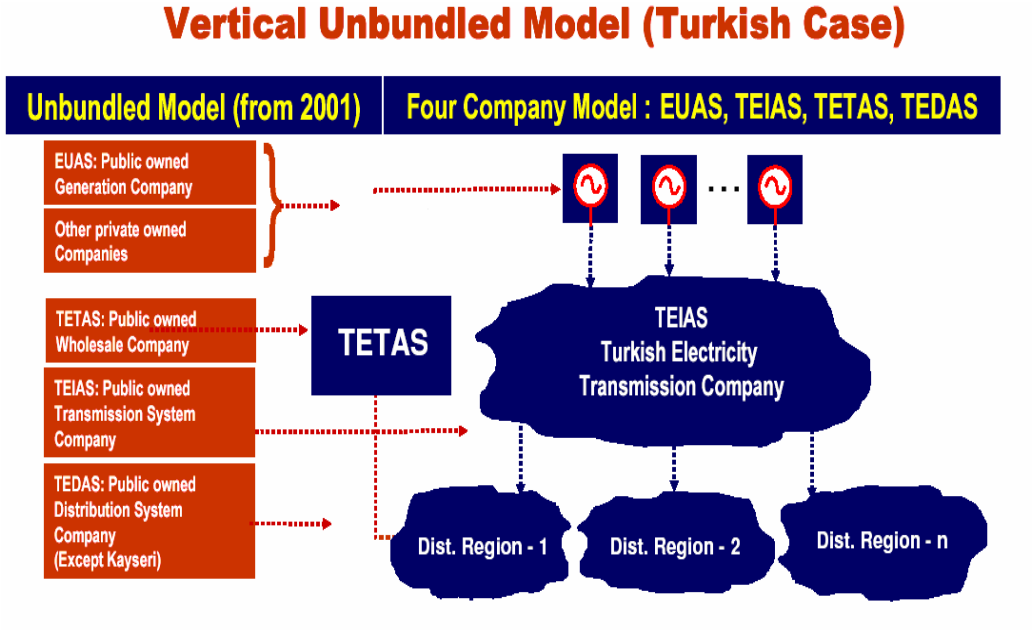

Figure 1 The Vertical Unbundled Model of the Electricity Sector

Law No: 4628 set the stage for an independent institution, the Energy Market Regulatory Authority (EMRA), which supervises the electricity, oil and natural gas markets, including setting tariffs, granting licenses, and assuring competition for market participation. EMRA also introduced the concept of “eligible customer” and ensure the freedom for eligible customers to choose their suppliers.

A major institutional change in the energy sector was the establishment of the Energy Market Regulatory Authority (EMRA) in 2001. Policy issues related to energy markets are the responsibility of the Energy Market Regulatory Authority (EMRA), whereas issues related to energy policy and planning are under the Ministry of Energy and Natural Resources (MENR). The Under secretariat of the State Planning Organization (DPT) evaluates Turkey's general energy needs, while the Privatization Administration (PA) is responsible for transferring the operation rights of the State Economic Enterprises involving energy activities, and their preparation for liberalization.

The fact that several public institutions are engaged in energy activities, causes inefficient coordination within the sector, and makes it difficult to solve problems.

According to the new market structure, TETAŞ is one of the most important state-owned energy companies. Main duty of TETAŞ is to set the wholesale electricity prices in the market by making use of the large generating capacity of the state-owned hydroelectric power plants.

In principle, it is envisaged in the Law No: 4628 that the mission of TETAŞ is to be completely ceased when the generation plants governed and owned by EÜAŞ are all liberalized except 20 hydroelectric plants including the natural monopoly-type large-capacity hydroelectric plants such as Keban, Karakaya, Atatürk and the nuclear plant if it is deemed necessary to be built. Hence, TETAŞ was thought as a company to be in action only within the transition period from the state-owned model to fully liberalized model in the short term. Thus, TETAŞ was planned to have a certain-term of life that would span until the establishment of a fully competition based market structure. However, difficulties encountered during the implementation period for the Law No: 4628 have revealed that the establishment of a fully liberalized market will take much longer time and effort than anticipated, hence, the lifetime of TETAŞ seems to be much longer than as envisaged by the Law No: 4628.

Thus, it is necessary to discuss whether Turkey has carried out a comprehensive and effective “Liberalization Policy” in electricity sector by looking at the present situation and principles outlined in Laws No: 3096, 4628 and the Strategy Paper dated March 17, 2004, which ought to render a strong political will and capability, and envisage the accomplishment of a sustainable competition based electricity market in the long term.

Hence, the major aim of the present research in this thesis is to study the needs for the establishment, main functions and the role of the Turkish Wholesale Electricity Trading and Contracting Company, TETAŞ, in the Turkish Electricity Market. The dissertation includes a study on further functions of TETAŞ in terms of its viability, future and lifetime in the short, medium and long term by looking at the effects of the strategy paper, liberalization procedure of the overall electricity market and newly enacted laws such as Law No: 5654 and 5686. Moreover, TETAŞ is examined in terms of the question, whether it can be regarded as having “market power” or not. If the answer to this question comes out to be “yes”, then, the ways of handling the market power of TETAŞ and its dominant position in the market are questioned in the Turkish wholesale market.

While focusing on these issues, the attention firstly is focused on the evolution of Turkey’s energy policies, with taking the general economic aspects and major transformations into consideration. In this sense, a clear summary of the energy policies of Turkey is presented. Then, the electricity market reforms and the present structure of electricity sector is explained. Finally, and the most importantly, functions, missions and life span of TETAŞ is examined by looking at the effects of the strategy paper, liberalization procedure of the overall electricity market and newly enacted laws such as Law No: 5654 and 5686.

In the scope of this thesis, “Privatization” and “Liberalization” terms are accepted to be absolutely different. The intended objective for the Turkish electricity sector is not privatization but the liberalization. Because the privatization is accepted to sell off the ownership to the third parties such as domestic and foreign companies but the liberalization is accepted to transfer of operation rights to the investors, yet still the ownership is under the control of the state.

The literature for this thesis mostly comprise of the sources attained through the libraries of Middle East Technical University, Bilkent University and the research materials in the case of energy and electricity concepts dealing with TETAŞ, the Strategy Paper dated March 17, 2004, Law No: 4628, Law No: 5654 and 5686 and secondary legislation based on the law, issued by EMRA.

1.2 Outline of the Thesis

Introduction for this thesis is given in Chapter 1 in which the general information of the energy concept, in terms of liberal and neo-liberal point of view in the world is conducted. Moreover, Turkish energy policies, summarized energy sector activities and the objectives for this dissertation are stated.

In Chapter 2, State-led energy policies and the competition based market orientation are put under scrutiny. A detailed perspective is examined about the energy overview of the Turkey. A few comments about the historical background of the Turkish energy sector and particularly the electricity sector is explained. Chapter 2 also concentrates on the key energy sub-sectors in Turkey by underlining Turkey's energy situation with using appropriate quantitative data. Then, the energy overview of Turkey is discussed with numerical data and the Government policy development is introduced. Recent data of primary energy consumption, production and energy demand of Turkey are illustrated by tables and figures. Moreover, since domestic energy policies can solidly be associated with foreign relations in energy and since Turkey mostly relies on the importation of primary energy resources, electricity demand and supply in Turkey gain a vital importance. Thus, electricity demand and supply problem is examined with the help of quantitative and qualitative data. Then, Turkey's energy policies especially the Electricity Market regulations since the early 1980s are emphasized. Indeed, the Law No: 3096 and Law No: 4628 and their impacts on the sector are the most important subject matters in this chapter since these laws envisaged the liberalization in Turkish energy sector, which had an explicit influence in Turkish energy and implicitly the electricity sector. Furthermore, a set of policies carried out by the policy-makers and the recent enactment of

the laws in these sub-sectors are analyzed in order to highlight the basic vulnerabilities within the envisagement of these laws. In this sense, brief overviews of Turkish Electricity Sector and the constitutional amendments through the new laws, which deal with the creation of a competitive energy market, and the basic instruments for the liberalization are the other subject matters in this chapter. Then, the present structure of the Turkish Energy sector particularly the Turkish Electricity Sector is concentrated on in a detailed manner.

In addition, the reformist attempts in the Turkish electricity market since late 1980s and key challenges in front of the Turkish energy sector are summarized by looking at the Electricity Market Reforms so far in a detailed manner, so that a new institutional framework was introduced to regulate and oversee the new market structure. The cornerstone of the Electricity Liberalization procedure, which is known as the “Law No: 4628” is introduced in detailed. Thus, Turkey is so effective place on the game board of energy politics become the important subject matters in this chapter. Furthermore, the concept of “Liberalization procedure” is underpinned in order to illuminate the crucial factors behind the transformation in Turkish energy and electricity sector. Moreover, the key role of the governmental corporations is introduced such as Energy Market Regulatory Authority (EMRA) and Ministry of Energy and Natural Resources (MENR) in terms of their boarding and aims.

Chapter 3 is reserved for a case study, namely the need for a state-owned Wholesale Trading and Contracting company; TETAŞ, its function and viability and the life-span analysis of TETAŞ with respect to short, mean and the long term. TETAŞ is a state-owned company that fulfills the requirements described in the Law No: 4628. In this chapter, the necessity for the establishment of the Turkish Wholesale Electricity Sales Company (TETAŞ) is explained. Secondly, detailed analysis of portfolio of TETAŞ is put under scrutiny. Then, the main functions of TETAŞ are examined again in a detailed manner. In this retro respect, importance of existing energy trading

contracts in the market implementation which is one of the main functions of TETAŞ and the participants in the market are explained. Moreover, one of most important study for the liberalization of the market namely “The Strategy Paper” of High Planning Council, dated March 17, 2004 is examined and the impacts of the Strategy Paper on the TETAŞ are commented in the later part of the chapter. In addition to this analysis, some provisions stated in the Law No: 4628, 5686 and 5654 are examined in terms of the life span of TETAŞ. Finally, the strategies are discussed in order to handle the monopolistic structure and the dominance of the TETAŞ in the Turkish wholesale electricity market. To do that, dominant position, market power and monopoly terms are discussed in terms of the Turkish wholesale market. In addition, TETAŞ is discussed whether it is a monopoly by calculating the supply concentration of TETAŞ using the Herfindahl Hirschman Index. Then, some offers to handle the dominant position of TETAŞ are given. Finally and the most importantly, future and life time of TETAŞ in the long term, the short term and mean term analysis are examined in detailed with respect to Law No: 4628, 5686 and 5654 envisaged by the Government, the Strategy Paper dated March 17, 2004, the liberalization efforts for the distribution assets and generation plants and government policies.

Finally in Chapter 4, conclusions are drawn according to the ideas built up in Chapter 3. Some concluding remarks and precautions needed to be successful in the liberalization efforts are also stated. At the end of Chapter 4, appendices are also presented for further reading and understanding.

CHAPTER 2

A GENERAL OVERVIEW OF THE TURKISH ELECTRICITY MARKET

2.1. The Energy Overview of Turkey and the Government Policy Developments on Electricity Sector

There have been mainly two contentious approaches in Turkish energy market structure since the early 1980s: “The liberalization in the sector through a competition based structure” and “The approach that aims to conserve the extensive and continuous role of the state in energy management and investments.” The debate between the two approaches has been continuing for the last two decades, yet, neo-liberal economic policies seemed to offset and even prevailed over the counter approach.

The main rationale behind the liberalization in Turkish energy market structure has been the desire to realize the long-run economical profits to be gained from competition based market structures for the electricity, gas and oil sectors. When looked at this stance, the defenders claim that only a viable competitive market environment can maintain the stability in realizing the necessary investment for energy infrastructure, while at the same time, keeping the prices at a reasonable level and hence, provide the expected long-run economical profit. Moreover, this model is capable of alleviating the clumsiness of the state and ends discussions on whether the state should continue making investments in the energy sector and eventually directing the state to allocate the scarce resources to more demanding social fields, such as health, education, justice and defense in a more effective manner.

This discourse advocates that state should “take its hands off” from economy, so that the economical stability can be enhanced, augmented with foreign direct investment (FDI) and liberalizations.

Defenders of the “Extensive and continuous role of the state”, on the other hand, endeavor to position the priority of the state investments and a balanced public entrepreneurship in the energy sector. Therefore, the defenders refuse to accept a fully liberalized program for energy sector. They rather stand firm with the absolute superior role of the state vis-à-vis the penetration of the private capital. Thus, the crux of this argument is that it speculates the abandonment of state control and excessive liberalizations through the neo-liberal economic approach. They eventually oppose the claim that liberalization in the energy sector will bring higher public satisfaction and welfare, since this sort of transformation will rather bring out excess profit margins for private companies and abrogate the common rules and duties of the state. Therefore, they keep a strict suspicious stance against the neo-liberal economic wave as this will enormously credit the individual interest and drive the public interest to diminish progressively. However this state control based ideology was implicitly over because of the liberalization progress taken place in Turkey. Finally, with the diverse energy sources, Turkey has eventually understood the reality that Turkey should open its doors to the public sector.

Turkey has been taking steps to strengthen its role as an energy bridge between the major oil producing areas of the Caspian Sea and the Middle East and their European markets. Yet, the Country’s limited energy maneuver capability can hardly meet the rapidly increasing domestic demand, and is highly dependent on imported oil and gas. Even though the geographical proximity of Turkey to “rich areas” holds significance, it barely advances a mature basis for sustainable of energy flow and political stability in Turkey’s close neighborhood. Another prominent aspect is that there has hardly been a comprehensive energy strategy in Turkey’s economic and

political agenda. This reality brings us to focus on the evolution of the market structure from state-owned to competition based model in Turkey at first glance, so that the internal crux of Turkey's energy steps can be illuminated.

Figure A-1 in Appendix-A illustrates the crucial increase in total electrical energy consumption between the years 1997 and 2006 and it is predicted to be increasing the years between 2007 and 2013. Figure A-2 in Appendix-A then shows the actual primary energy production in Turkey between 2005 and 2006 and the production are predicted to increase in the following years. These figures state clearly the fact and points out a strong option through an "inward-looking implementation", which comprises the assessment of indigenous energy production. Figure A-3 in Appendix-A definitely emphasizes the global energy trend in the next quarter century by looking at the previous row data. The dependence on oil, natural gas and coal is predicted to prevail in the next decades, though the demand of natural gas seems relatively exceed that of coal in the beginning of 2010 by looking at the Figure A-3.

The Turkish electricity market is one of the fastest growing power markets in the world. The reasons behind this growth can be explained with long-term ignorance in electrification in the past, i.e. low per capita electricity consumption, young and rapidly growing population, rapid urbanization and strong economic growth. By 2006, the electricity consumption in Turkey per capita is 2, 357 kWh. [1] By looking at the Table 1, by 2007, the total installed capacity of Turkey has risen to 41.692 MW. 66.5 per cent (27.726 MW) of the installed capacity is thermal and the rest (13.966 MW) is hydroelectricity and renewable resources. In power generation the share of natural gas has been increased remarkably to a level of 60 per cent in 2007.

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[1] *(5, 232 kWh in Spain, 4, 985 kWh in Italy and 4, 575 kWh in Greece).*

Table 1 Distribution of the Installed Capacity w.r.t the Energy Resources (MW)

YEARS	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
LIGNITE	8235	8235	8235	8235	8537	8537	8537	8537	8537	8537
COAL	555	555	555	555	555	555	555	555	555	555
IMPORT COAL	1788	1788	1788	1923	1923	1923	1923	1923	1923	1923
NATURAL GAS	13916	14176	14268	14268	14268	14268	14268	14268	14268	14268
GEOTHERMAL	30	30	82	82	82	82	82	82	82	82
FUEL OIL	2470	2282	2011	1748	1748	1748	1748	1748	1748	1748
GAS OIL	214	214	214	214	214	214	214	214	214	214
OTHERS	446	446	446	446	446	446	446	446	446	446
THERMALS TOTAL	27653	27726	27599	27472	27774	27774	27774	27774	27774	27774
BIOGAS+WASTE	15	30	30	30	30	30	30	30	30	30
HYDROELECTRIC	13036	13678	14596	16340	16698	17020	17020	17020	17020	17020
WIND	51	258	348	348	348	348	348	348	348	348
TOTAL	**40755**	**41692**	**42574**	**44190**	**44851**	**45172**	**45172**	**45172**	**45172**	**45172**

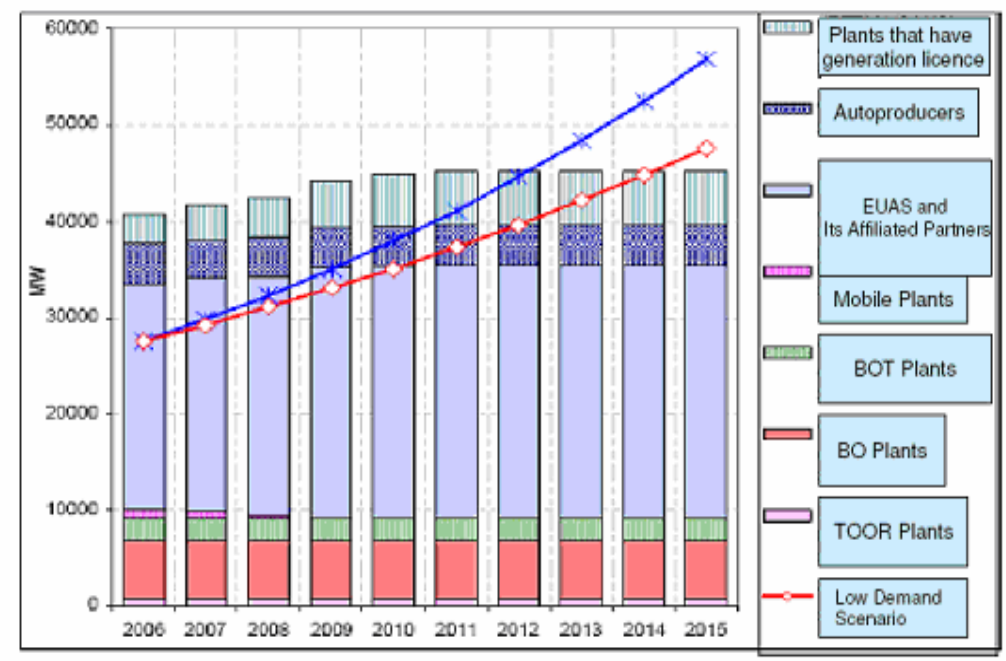


Figure 2 Distribution of the Installed Capacity w.r.t Companies
Source: Accessible at www.euas.gov.tr

The needs are increasing with the globalize world causes tremendous consumption. Additions to installed capacity have come in bursts, as Figure 2 indicates. The evolution of the technological composition represented by the percentage shares of installed capacity for the different energy sources used is illustrated in Figure 3.

About renewable energy sources, a draft law has been prepared including a series of effective incentives in the field of renewable energy sources. It is argued that Turkey has a significant potential of wind, geothermal and solar energy sources. The efforts for exploring the potential reserves are continuing. About nuclear energy, Government has declared its intention for building up nuclear power plants and now it has revived the prospect of developing a nuclear power plant under state control.

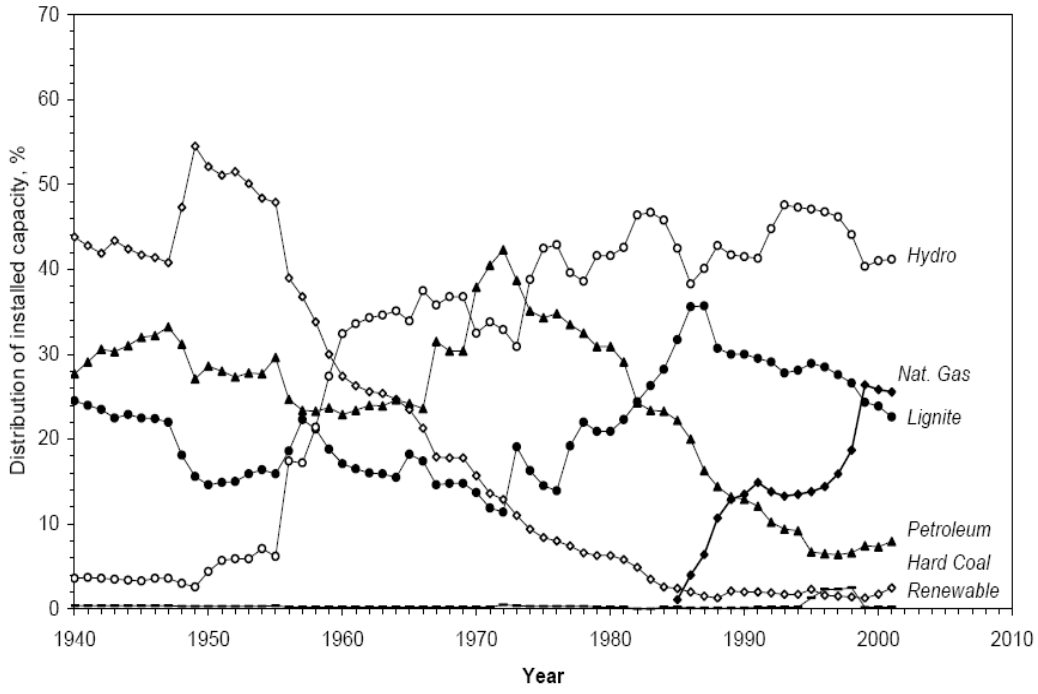


Figure 3 Distribution of installed capacity by energy source [3]

Turkey ranks among the fastest growing energy markets in the world, the total primary energy supply (TPES) growth rate is nearly 7% per year and

total final consumption (TFC) growth has been around 6% per year over the last three decades. The Government envisages acceleration in demand growth in the coming years, with an annual average TFC growth rate of 6.4% during 2000-2010. Turkey's need for energy import also exhibits an increasing trend. Domestic production could meet approximately 32% of the demand in 2007 (Table 2), and the Government expects this percentage to fall to 27% by 2010. In 2007, oil shares 61% of the total net energy imports, followed by gas (23%), and coal (15%). Foreign direct investment needs in the sub sector are estimated at about $ 4.5-5.5 billion per year until 2010.[4]

Table 2 Turkey's energy balances (Million tones of equivalent) [5]

	1973	**1990**	**1998**	**1999**	**2005**	**2010**	**2020**
Total production	**15.65**	**25.48**	**29.32**	**27.66**	**31.71**	**40.87**	**61.22**
Coal[a]	5.28	11.72	13.94	13.28	18.79	26.14	32.36
Oil	3.69	3.90	3.39	3.09	1.81	1.13	0.49
Gas	..	0.19	0.51	0.67	0.19	0.17	0.14
Comb. renewable & wastes[b]	6.41	7.21	6.98	6.72	5.33	4.42	3.93
Nuclear	..	..	..	..	..	..	7.30
Hydroelectric	0.22	1.99	3.63	2.98	3.09	5.34	10.00
Geothermal	0.05	0.43	0.66	0.69	2.12	2.62	4.73
Solar/wind/other[c]	..	0.03	0.21	0.24	0.38	1.05	2.27
Total net imports[d]	**9.02**	**28.48**	**45.61**	**46.03**	**83.45**	**113.00**	**220.98**
Coal[a]							
Exports	..	..	..	..	..	..	..
Imports	0.01	4.56	8.75	7.79	7.29	13.55	75.21
Net imports	0.01	4.56	8.75	7.79	7.29	13.55	75.21
Oil							
Exports	0.86	2.03	2.37	2.77	..	..	..
Imports	9.96	23.40	30.29	30.17	41.99	50.04	71.41.
Bunkers	0.09	0.36	0.63	0.59	..	..	..
Net imports	9.01	21.02	27.29	26.82	41.99	50.04	71.41

Table 2 Continued

	1973	1990	1998	1999	2005	2010	2020
Gas							
Exports	..	..	..	..	..	..	..
Imports	..	2.96	9.31	11.25	33.87	49.41	74.36
Net imports	..	2.96	9.31	11.25	33.87	49.41	74.36
Electricity							
Exports	..	0.08	0.03	0.03	..	..	..
Imports	..	0.02	0.28	0.20	0.30	..	..
Net imports	..	–0.06	0.26	0.18	0.30	..	..
Total stock changes	**0.27**	**-0.95**	**-0.12**	**0.49**	**..**	**..**	**..**
Total supply (TPES)	**24.51**	**52.99**	**74.71**	**74.28**	**115.16**	**153.87**	**282.19**
Coal[a]	5.24	16.38	22.93	21.60	26.08	39.70	107.57
Oil	12.60	23.90	30.35	30.14	43.80	51.16	71.89
Gas	..	3.11	11.74	11.74	34.06	49.58	74.50
Comb. renewables & wastes[b]	6.41	7.21	6.98	6.72	5.33	4.42	3.93
Nuclear	..	..	..	..	..	..	7.30
Hydroelectric	0.22	1.99	3.63	2.98	3.09	5.34	10.00
Geothermal	0.05	0.43	0.66	0.69	2.12	2.62	4.73
Solar/wind/other[c]	..	0.03	0.21	0.24	0.38	1.05	2.27
Electricity trade[e]	..	-0.06	0.26	0.18	0.30	..	..
Shares (%)							
Coal	21.4	30.9	30.7	29.1	22.7	25.8	38.1
Oil	51.4	45.1	40.6	40.6	38.0	33.2	25.5
Gas	..	5.9	13.0	15.8	29.6	32.2	26.4
Comb. renewables & wastes	26.1	13.6	9.3	9.0	4.6	2.9	1.4
Nuclear	..	..	..	..	..	..	2.6
Hydroelectric	0.9	3.8	4.9	4.0	2.7	3.5	3.5
Geothermal	0.2	0.8	0.9	0.9	1.8	1.7	1.7
Solar/wind/other	..	0.1	0.3	0.3	0.3	0.7	0.8
Electricity trade	..	-0.1	0.3	0.2	0.3	..	..

.. Not available.
a Includes lignite and peat.
b Comprises solid biomass and animal products, gas/liquids from biomass, industrial waste, and municipal waste.
c Other: tide, wave, and ambient heat used in heat pumps, etc.
d Total net imports include combustible renewables and waste.
e Total supply of electricity represents net trade. A negative number indicates that exports are greater than imports.

The lack of adequate investment seems to lead to power shortages in the system in the mean and long term. Increasing the Country's electricity generating capacity continues to be a top priority for the Government, which seems to turn out to be the private sector's responsibility for new investment and restructuring of the sub sector in the near future.

At a glance, policy of the Turkish Government for the energy resources is quite clear. All laws up to date are directed to establish a liberal market structure. Turkey's energy sector improved as fast as it relates to the distribution of gas; safety and security equipment and services; and building materials. On 17 December 2004, the EU and Turkey agreed with Turkey to begin accession the Turkish Government initiations in fall 2005 and market liberalization procedure is still continuing now in 2007. Turkey has begun to adopt a number of European Union directives, regulations and laws to bring it more in line with the EU, which may impact foreign companies as Turkey establishes closer relations with Europe.

The Turkish Government estimates that the generation companies in Turkey will produce over 160,000 billion kWh and Turkey will import over 500 million kWh; export over 2,152 million kWh of electricity. In 2010, total demand is predicted to be over 240,000 billion kWh. It is estimated that 44 percent of this demand is predicted to be met by natural gas-fired power plants, 27 percent of it by coal-fired power plants, 24 percent by hydroelectric, 3 percent by oil fired and 2 percent by wind power.[6] The Turkish Government estimates that Turkey needs an additional power generation capacity of 54,000 MW until 2020. Ministry of Energy and Natural Resources (MENR) announced that Turkey would have nuclear power plants built at the total capacity of 4,500 – 6,000 MW to meet the demand.

The Energy Market Regulatory Agency (EMRA) grants licenses to private sector investors, which would like to install power plants as an independent power producer or auto producer. Most of these investors are interested in purchasing natural gas-fired power plants as cogeneration, simple or

combined cycle types. The Turkish Government has submitted a draft renewable energy law to the Turkish Parliament for approval. Once this law passed, retail companies would be forced to buy 8 percent of their total electricity procurement from renewable energy generation companies. Prices to be paid to the renewable energy suppliers will be higher than the average prices. These regulations will boost the renewable energy market in Turkey.

Renewable energy will play an important role as Turkey's preparations for accession to the European Union is underway. TETAŞ seems to provide purchasing guarantees to renewable energy companies.

Major opportunities may come out as a result of planned liberalization of electricity distribution grids and existing power plants owned by the State. The Privatization Administration should have finished these liberalizations especially for the distribution regions and generation portfolio of the EÜAŞ in 2007. However, the liberalization of the distribution regions and generation portfolio of the EÜAŞ has not been finished yet by the Government.

The government officials estimate that the demand for electricity in 2010 is predicted to be approximately 265.000 GWh and the total capacity needs to be increased to 45.000 MW.[7] As Turkey has been a “net importer” of primary energy resources, most of which are devoted to the electricity generation since the late 1980s, the electricity sector needs vital investments by looking at the high and the low demand scenarios presented in the Figure 4, 5, 6 and Table 3, 4, 5 respectively.

Table 3 Peak and Energy Demand in Turkey between 1996 and 2006

YEARS	PEAK DEMAND (MW)	INCR (%)	ENERGY DEMAND (GWh)	INCR (%)
1996	15231	7,5	94789	10,8
1997	16926	11,1	105517	11,3
1998	17799	5,2	114023	8,1
1999	18938	6,4	118485	3,9
2000	19390	2,4	128276	8,3
2001	19612	1,1	126871	-1,1
2002	21006	7,1	132553	4,5
2003	21729	3,4	141151	6,5
2004	23485	8,1	150018	6,3
2005	25174	7,2	160806	7,2
2006	27500	9,23	171430	6,6

Table 4 Approximate Low Demand Scenario*

YEARS	PEAK DEMAND		ENERGY DEMAND	
	MW	INCR (%)	GWh	INCR (%)
2006	27500	-	171430	-
2007	29233	6.3	182230	6.3
2008	31074	6.3	193711	6.3
2009	33032	6.3	205914	6.3
2010	35113	6.3	218887	6.3
2011	37325	6.3	232677	6.3
2012	39676	6.3	247335	6.3
2013	42176	6.3	262918	6.3
2014	44833	6.3	279481	6.3
2015	47658	6.3	297089	6.3

(*) Source: Accessible at www.euas.gov.tr

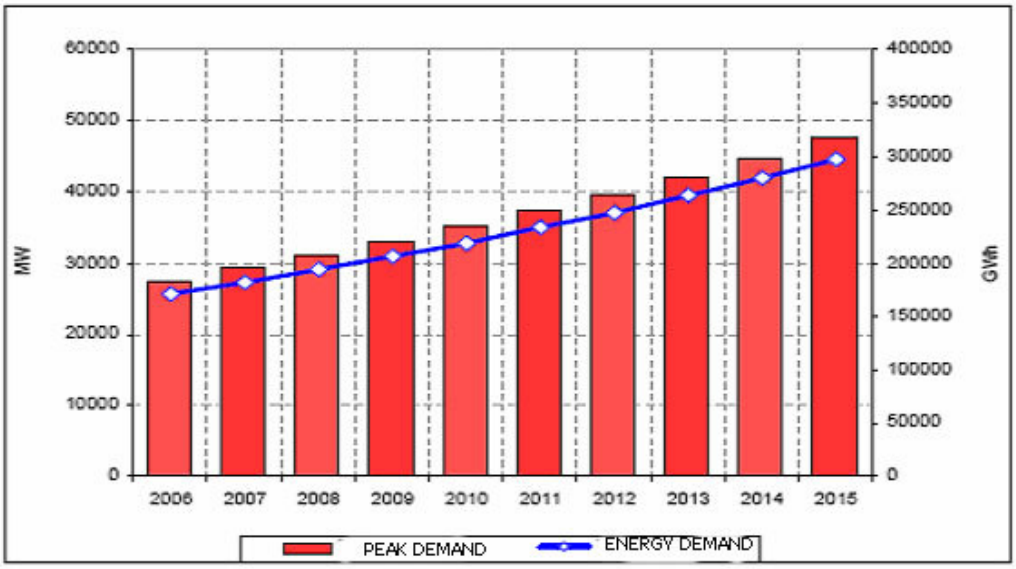


Figure 4 Turkish Energy Demand Projections Low Scenario

Source: Accessible at www.euas.gov.tr

Table 5 Approximate High Demand Scenario

YEARS	PEAK DEMAND		ENERGY DEMAND	
	MW	INCR (%)	GWh	INCR (%)
2006	27500	-	171430	-
2007	29810	8.4	185830	8.4
2008	32314	8.4	201440	8.4
2009	35028	8.4	218361	8.4
2010	37971	8.4	236703	8.4
2011	41160	8.4	256586	8.4
2012	44618	8.4	278139	8.4
2013	48366	8.4	301503	8.4
2014	52428	8.4	326829	8.4
2015	56832	8.4	354283	8.4

Source: Accessible at www.euas.gov.tr

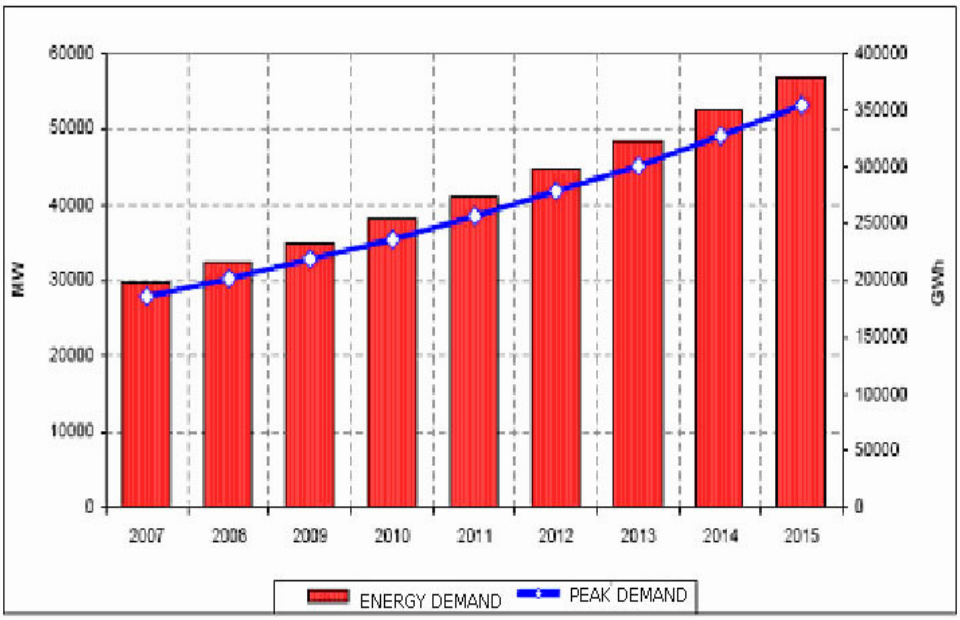


Figure 5 Turkish Energy Demand Projections High Scenario

Source: Accessible at www.euas.gov.tr

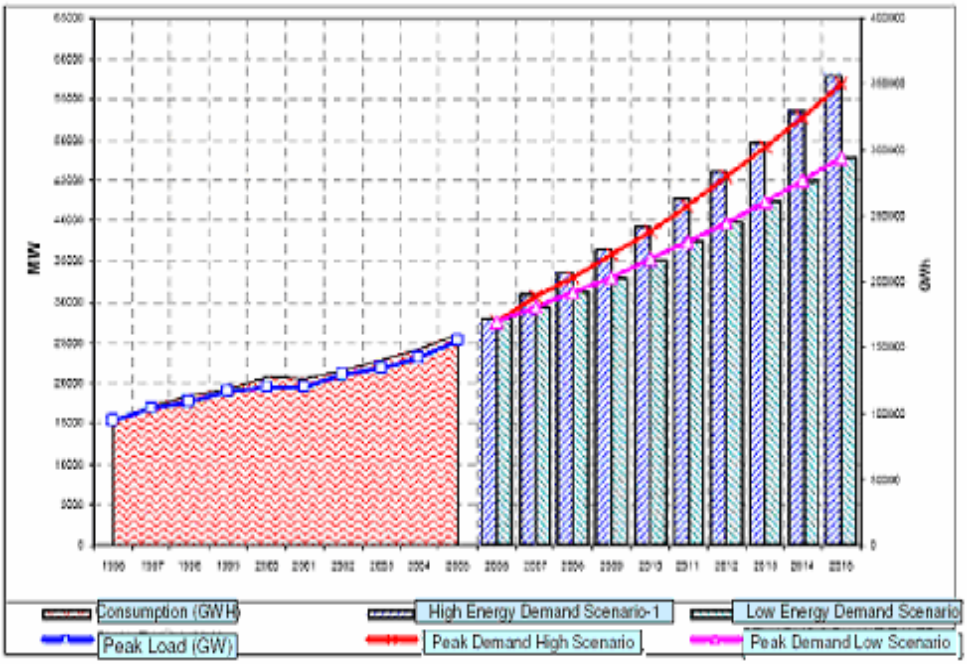


Figure 6 Turkish Electricity System Peak Power and Demand Projection

Source: Accessible at www.euas.gov.tr

Under the light of the figures and tables above by looking at both the high and the low scenarios, it can be expressed that Turkey will be confronted by a significant unmet energy need in the near future starting from 2009. The response to the question of "how to satisfy these needs in what preconditions" has remained within the studies of major energy sub-sectors. A set of policies undertaken by the policy-makers, legal amendments in Turkish energy sector, and the role of the transnational actors in shaping Turkey's energy policies will be the crucial answers to these questions in the future.

2.2. Electricity Demand in Turkey & the Electricity Market

Electricity demand in Turkey has been growing at a remarkable average rate of 6.5 % over the last 10 years, inducing annual investments in the generation, transmission and distribution infrastructure in the order of US$ 4.5-5.5 billion. Installed generation capacity today is represented by some 368 power plants and is estimated to be around 40.755 GW in 2006 as shown in Table 7. By 2007 it is predicted to be around nearly 41.692 GW.

The current data with regards to the electricity generation and installed capacity by fuel in Turkey are as follows;

Table 6 Electricity Generation by Fuel (GWh)

	2003	**2004**	**2005**	**2006**	**2007**
Natural Gas	52.497	63.536	70.645	77.415	81.684
Hydroelectric	33.684	35.330	40.951	43.698	45.910
Coal	32.149	32.253	41.556	47.505	50.653
Other	11.070	9.462	8.760	8.269	7.298
Total	**129.400**	**140.581**	**161.912**	**175.945**	**185.545**

Source: Accessible at www.euas.gov.tr

Table 7 Installed Capacities by Fuel (MW)

	2002	2003	2004	2005	2006	2007
Natural Gas	9.472	11.510	11.986	12.809	13.916	14.175
Hydroelectric	12.241	12.579	12.626	12.882	13.036	13.676
Coal	7.293	8.239	8.807	8.266	8.890	8.890
Other	2.840	3.260	3.342	3.595	4.913	4.951
Total	**31.846**	**35.587**	**37.761**	**38.800**	**40.755**	**41.692**

Source: Accessible at www.teias.gov.tr

The electricity generation rests on hydroelectric power and fossil-fuelled thermal power generation. The rise of hydroelectric power started with the evaluation of technically and economically feasible hydroelectric power potentials. Figure 7 shows the distribution of the electricity generation by different energy resources including the predictions till 2020.

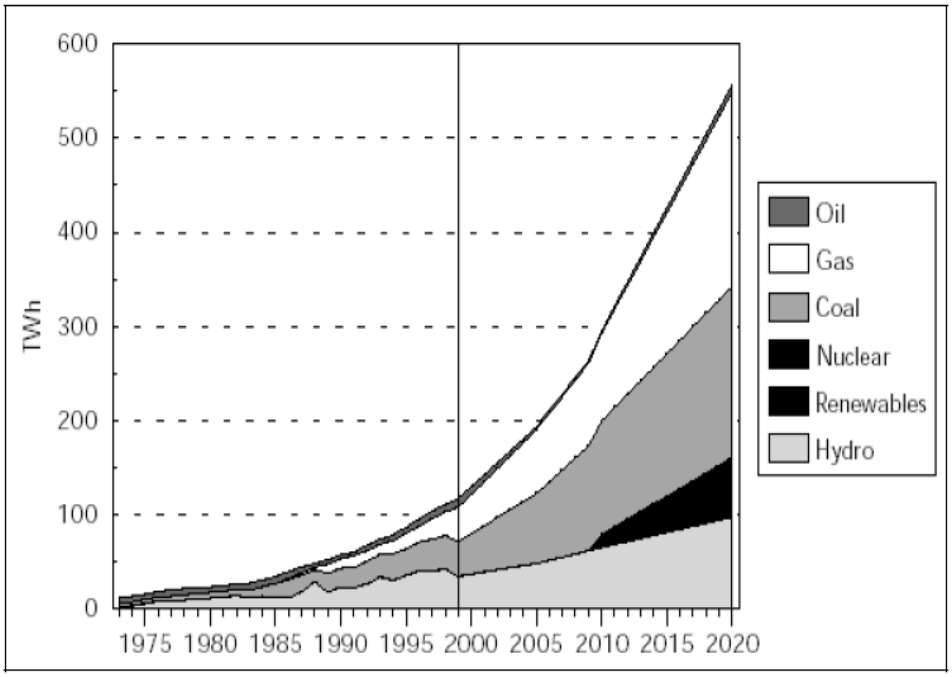


Figure 7 Electricity generation by energy input source, 1973-1999, with projections until 2020. [8]

Figure 8 clearly illustrates the vital importance and urgent need for the investments in the Turkish electricity sector in the near future.

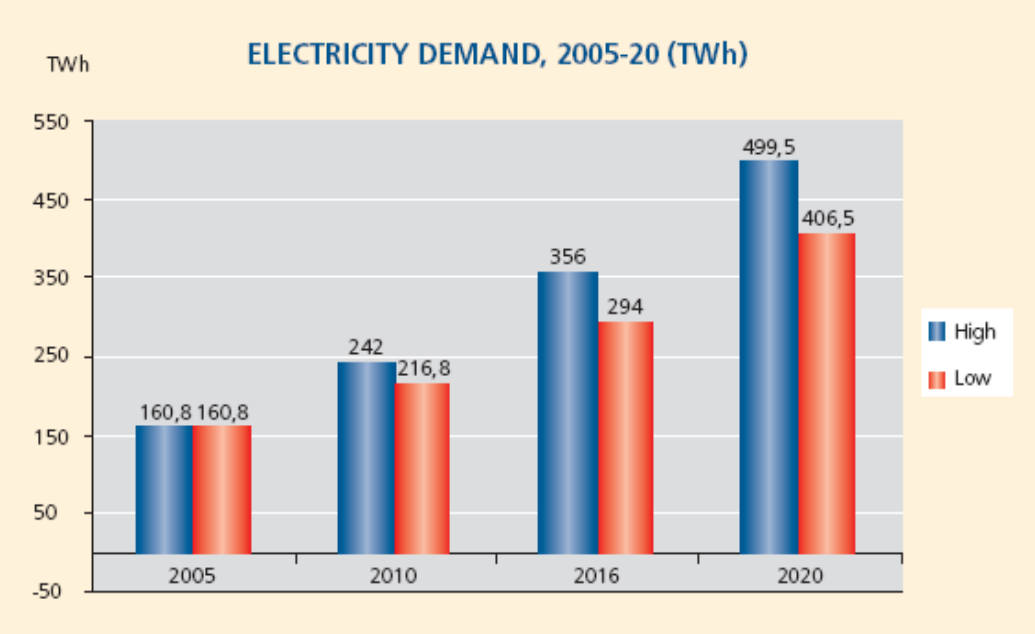


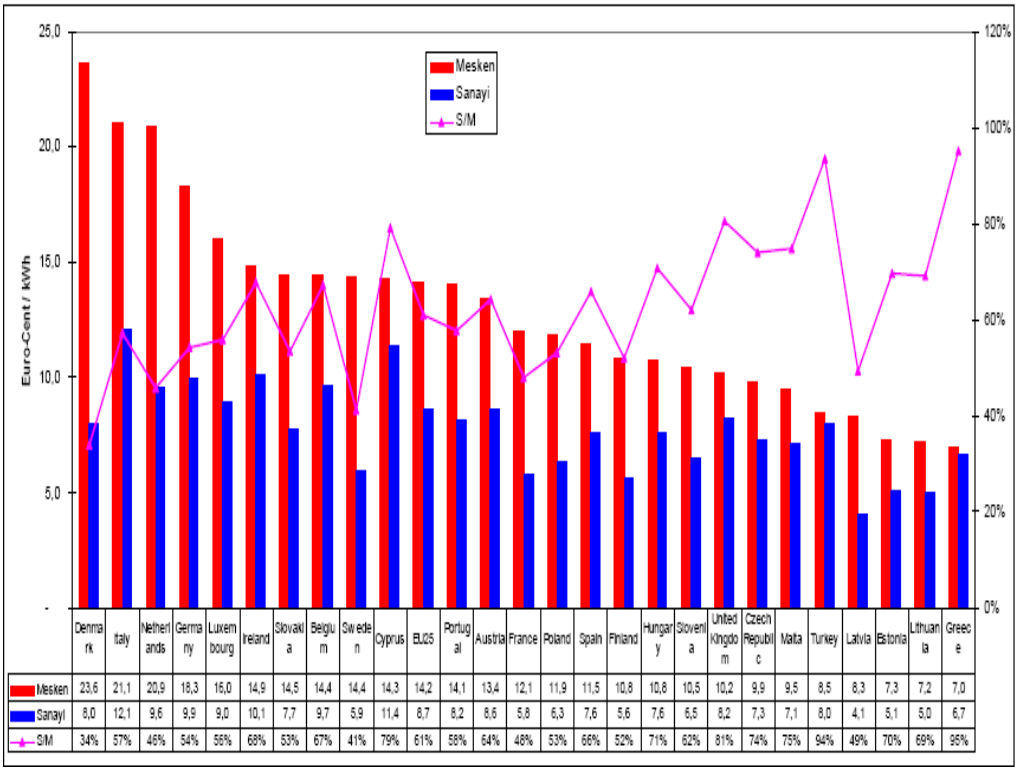
Figure 8 Electricity Demand Projections

Source: Accessible at (www.epdk.gov.tr)

Although it is estimated that there is no need for new capacity until 2006-2007, the projections of the Government say that it is predicted to be a significant need for capacity increase by the end of 2009. As a result, new investments will be needed to deal with the growth in demand. However, due to the uncertainty concerning the present state and future of the Turkish electricity market, investors hesitate in making large energy investments in the sector.

In addition to the legal changes since the early 1980s, it will be convenient to emphasize the ways of how electricity is generated in Turkey. Indeed, electricity already makes up 13.4 per cent of overall consumption and is growing at an annual 9.8 per cent by 2007[9], and this somewhat makes electricity the most important and contentious aspect of Turkish energy.[10]

Another important aspect of the Turkish electricity market is that both the domestic and the industry prices increase in a similar manner. As seen in Figure 9, the residential and the industry prices are nearly the same which is deemed as undesirable by foreign consultants.



	Denmark	Italy	Netherlands	Germany	Luxembourg	Ireland	Slovakia	Belgium	Sweden	Cyprus	EU25	Portugal	Austria	France	Poland	Spain	Finland	Hungary	Slovenia	United Kingdom	Czech Republic	Malta	Turkey	Latvia	Estonia	Lithuania	Greece
Mesken	23,6	21,1	20,9	18,3	16,0	14,9	14,5	14,4	14,4	14,3	14,2	14,1	13,4	12,1	11,9	11,5	10,8	10,8	10,5	10,2	9,9	9,5	8,5	8,3	7,3	7,2	7,0
Sanayi	8,0	12,1	9,6	9,9	9,0	10,1	7,7	9,7	5,9	11,4	8,7	8,2	8,6	5,8	6,3	7,6	5,6	7,6	6,5	8,2	7,3	7,1	8,0	4,1	5,1	5,0	6,7
S/M	34%	57%	46%	54%	56%	68%	53%	67%	41%	79%	61%	58%	64%	48%	53%	66%	52%	71%	62%	81%	74%	75%	94%	49%	70%	69%	95%

Figure 9 Residential-Sector Electricity Prices Comparison (2006)

As explained above and under the light of the reality that Turkey imports a high percentage of its energy resources from the foreign countries, Turkey seems to face with difficulties both in an economical point of view and the energy demand point of view in the near future.

2.3. The Electricity Market Reforms

In principle the main objective of energy policies is to supply uninterrupted, reliable, affordable and environmental-friendly energy. However, verbal explanations have not been enough to accomplish these objectives. As political will is the foremost deterministic force in realizing these goals, the resistance and bargaining capability against the other external powers and influences also have to be taken into consideration. Global finance institutions such as the International Monetary Fund, the World Bank; also the regional organizations such as the European Union and the Organization of Economic Cooperation and Development (OECD) can be considered as the external powers which influences the Government policies. Thus, the Turkish Government enacted several laws along with the legal basis of the liberalization efforts through this crucial interaction since 1983.[11]

The electricity sector was considered as the pioneering one in order to supply an uninterrupted energy input to the industry. Despite the increasing role of the private sector in recent years, there are some chronic problems in the sector that prevent the well functioning of the market.

In retrospect, the Turkish Parliament passed constitutional amendments, which were “seeking for significant improvements in trade and investment” in 1984. The government enacted Law No: 3096, which opened the electricity sector to private companies including private investors in this year. Until the enactment of Law No: 3096, the services in the electricity sector were only carried out by the Turkish Electricity Agency (TEK). This law authorized enterprises other than the Turkish Electricity Authority for the Generation, Transmission, Distribution and Trading of Electricity, which allows private firms build, generate, distribute and trade electricity. Thus, the investors would be granted the right to build and operate the power plants. In this sense, the implementation of this legislation for financing major energy

projects brought about four basic models: “Build-Operate-Transfer” (BOT), “Build-Own-Operate” (BO), “Transfer of Operating Rights” (TOOR) and “Auto-Production Model”. These models would ensure the liberalization of major electricity power plants and the state would eventually be withdrawn from the “costly way of energy supply with huge subsidies”. This would further mean that the natural monopolistic character of the electricity sector would be converted to a new model by unbundling TEK. As a conclusion, it can be said that the monopolistic structure of Turkish Electricity Authority (TEK) was changed with the enactment of Law No: 3096 in 1984.

A major reform in law 3096 is that a new investment model known as the ‘Build Operate Transfer’ (BOT) model which is based on the principle of granting private investors to build and operate electricity generation, transmission and distribution systems for a certain period of operation time, such as 20 years, and then transfer the ownership of the plants to the State at the end of this period.

Another important reform that has been realized in 1993, based on the principles of outlined in Law No: 3096 is that the Turkish Electricity Authority is vertically unbundled into two functional companies, namely, Turkish Electricity Generation and Transmission Company (TEAŞ) and the Turkish Electricity Distribution Company (TEDAŞ), the former is being responsible for generation and transmission infrastructure, while the latter being responsible for the operation and planning of the distribution system. The main purpose of all of those reforms is to establish a competitive electricity market structure.

The Government’s overall macroeconomic stabilization program involves special emphasis on strengthening the private sector participation in the Turkish economy. The liberalization program was further accelerated with the Law No: 4646, introduced on 23 November 1994.[12] Within the directions outlined in these legislations, electricity would no more be perceived as a public service and would become a commodity to be traded for “profit.

A further step in enhancing private participation to energy sector has taken place in 1994, i.e. ten years later, with the BO (Build Operate) Law, which grants the ownership right to the investors. Typically, under a BO, BOT or TOOR (A Concession Agreement made on an existing plant or infrastructure with private investors to renovate and operate for a certain period of time) contracts, the state guarantees to purchase a certain amount of the production at a tariff determined in the Agreement, so that investors can recover their fixed costs. Moreover, Transfer of Operating Rights' (TOOR) model has also been used by the Government to transfer the operation rights of the generation plants and distribution assets. BOT along with BO have achieved partial success in attracting private investment in generation and have left significant contingent liabilities for the Treasury through the guarantees given to the private investors. Despite of all these liberalization efforts, in 2000 some 75% of the overall installed generation capacity in the electricity sector was still owned by the government.

The "Letter of Development Policy" for economic reform in 2000 was clearly emphasizing the intension of the Turkish Government in establishing a competitive and liberal electricity market. The letter, which was sent to the World Bank before the new Electricity Law is put in action in 2001, put several objectives for liberalization. These can be listed as "the financial deterioration of Turkish Electricity Generation and Transmission Company (TEAŞ)", high purchasing price of electricity from "the newly established BOT Projects" and the poor level of bill collection for the electricity sold to the Turkish Electricity Distribution Company (TEDAŞ).[13] The letter also pointed that government would decide to address these problems through a comprehensive framework based on establishing a competitive market for electricity, which transfers the task of supplying and trading electricity with the associated market risks, to the private sector.

Moreover, the volume of supplementary investments for the energy infrastructure by the public sector have been significantly reduced; the

choices for the primary sources for electricity generation have been shifted and also the percentage share of the natural gas for electricity generation has relatively been increased to a high level with respect to the other fuel alternatives[14]; and finally, the legal framework of the market has significantly been altered by the new legislations leading to the liberalization of the public enterprises and establishing a competitive electricity market. In essence, the liberalization in Turkey has been contemplated as a prerequisite for the liberalization of the electricity sector via a competitive market structure.

The fast economic growth in Turkey has been augmented by a similar growth in demand for energy. Huge investments have to be realized to meet this rapidly growing demand. Therefore, the Government felt the need for encouraging private investors through paving the way for them with a new law based on liberalization principles. Therefore, as a candidate country of the EU, the Turkish Government has prepared Law No: 4628, which is also known as Electricity Market Law (Law No: 4628), in line with the EU Electricity Directives. In this context, the Turkish Government is committed to realize an ambitious liberalization program through the Electricity Market Law No: 4628, in the electricity generation and distribution sectors, which is a crucial step for the liberalization of the market. The Law was enacted on 3 March 2001 by the recommendations of IMF and World Bank, which envisages the opening of the electricity market to private participations. The main aim of this law was to restructure and deregulate the generation and wholesale trading activities in electricity sector within the directions of the EU Directives to attract domestic and foreign resources to the sector. With similar objectives, Natural Gas Market Law No: 4646 was enacted in parallel with the Electricity Market Law in the same year. These laws aim to prevent public enterprises from involving in market activities except the transmission of electricity until the realization of liberalization.

The main objectives of Law No: 4628 are to enhance the development of a financially sound, stable and transparent electricity market, with a competitive character in line with private law provisions, and to provide for an autonomous regulation and supervision.

Law No: 4628 deregulates the generation and wholesale trading activities, while regulates the transmission, distribution, and retailing services. The Law envisages to keep a high percentage of the wholesale trading under the state control until the generation and distribution sectors are fully liberalized. The transmission assets and activities on the other hand, are planned to be owned and carried out by a state-owned company, named: TEİAŞ.

The Law outlines the principles of liberalization to be followed for the generation and distribution sectors, and tariffs. The Law aims to establish a competitive environment, where the market participants trade freely the electrical commodities in that market through bilateral agreements without any need for Treasury guarantees. A preparatory period of 18 months starting as of 3 March 2001 was specified to complete the necessary secondary legislations to be supplemented to the Law. The major objective of the liberalization efforts is to create a competition based market based on bilateral agreements among the market participants matched by a balancing and settlement mechanism.

The law includes the following key issues for liberalization;

- An independent regulatory body, called; Energy Market Regulatory Authority (EMRA), governed by the Board,
- Granting licenses to market participants,
- An energy market to be based on bilateral contracts among market participants,

- Eligible customer concept, which grants the right of choosing their suppliers to those customers whose annual consumptions exceed a certain level,
- Divestiture of the existing generation and distribution systems,
- Granting non-discriminatory access right to all market participants for the transmission and distribution facilities,
- Eliminating of all types of cross-subsidies in the electricity tariffs,
- Unbundling of the Turkish Generation and Transmission Company (TEAŞ) into three independent companies; the Turkish Electricity Transmission Company (TEİAŞ), the Electricity Generation Company (EÜAŞ) and the Turkish Wholesale Electricity Trading and Contracting Company (TETAŞ), a state-owned wholesale trading company.

TEDAŞ and Affiliated Partners are still in charge of the electricity distribution. TEDAŞ and Affiliated Partners are still to be under public ownership in order to guarantee the reliability of supply to the customers. TEDAŞ and Affiliated Partners are now subject to further restructuring and liberalization procedure in order to adopt their structures to the new competitive-based market conditions. After this procedure, TEDAŞ and Affiliated Partners are expected to serve to a more diversified customer spectrum with increased number of suppliers. 20 Distribution regions with 20 companies and a private distribution company Kayseri Elektrik A.Ş. (KCETAS) are ready for liberalization.

EÜAŞ and Affiliated Partnerships are responsible for the generation activities on behalf of the state-owned thermal and hydroelectric plants. The overall portfolio of EÜAŞ and Affiliated Partnerships accounts 48 per cent of the total electric generation capacity. The rest is provided by the Build Operate

Transfer (BOT), Build Operate (BO), generation companies and auto producers. Generation companies' portfolios are shown in Table 8.

Table 8 Generation Companies Portfolios (24/05/2007)

COMPANIES	THERMAL PEAK (MW)	THERMAL GENERATION (MWH)	HYDRO PEAK (MW)	HYDRO GENERATION (MWH)	WIND GENERATION (MWH)	TOTAL PEAK (MW)
EÜAŞ PLANTS	8719,9	122358	11313,8	78613	-	20033,7
EÜAŞ AFFILIATED PARTNERS	3834	32863	-	-	-	3834,0
TOOR PLANTS	620	8350	30	-	-	650,0
AUTOPRODUCERS	3273,9	45886	1107,5	4144	-	4381,4
GENERATION COMPANIES PLANTS	2492,4	41217	329	1785	112,3 (MW)/ 37(MWH)	2933,7
BOT PLANTS	1449,6	30725	1754,6	14065	20,7(MW)/ 11(MWH)	3224,9
BO PLANTS	6101,8	129891	-	-	-	6101,8
MOBILE PLANTS	296,6	42	-	-	-	296,6
TOTAL	**26788,2**	**411332**	**14534,9**	**98607**	**133 (MW)/ 48 (MWH)**	**41456,1**

Source: Accessible at www.euas.gov.tr (with reserved BOT & Autoproducers Plants)

Private sector companies may participate in all sectors of the market, except transmission, by obtaining licenses from EMRA. Liberalization of the generation sector is also on the agenda of the Law No: 4628 and according to the Strategy Paper dated March 17, 2004 issued by the High Planning Council (HPC) which explains the time table for the liberalization procedure for the generating and distribution companies, it is envisaged that it should have been finished till the end of 2007.

Turkish electricity Transmission Company (TEİAŞ) is the sole operator for the transmission system. TEİAŞ owns and operates the transmission system assets and also acts as a system and market operator. TEİAŞ will remain as the sole transmission system operator (TSO) and the state will be the asset owner in the long-run.

Law No: 4628 envisages competition based electricity trading through bilateral contracts among the market participants supported by a complementing balancing and settlement mechanism. The Law envisages cost-based tariffs calculated with respect to methodologies derived according to the Electricity Market Tariffs Regulation and the related communiqués, and are submitted to EMRA for approval.

Turkish Wholesale Electricity Trading and Contracting Company (TETAŞ) is in charge of wholesale trading of almost 60% of total generation. TETAŞ prepares and submits tariff proposals to EMRA for approval. TETAŞ took over all the public sector purchasing contracts of the previous regime, in other words TETAŞ has taken over all purchasing obligations arising from the contracts. TETAŞ may sell electricity to new consumers or sign any new Power Purchase Agreements (PPAs) as the obligations stated in the Law No: 4628 and its role is intended to diminish over time, once the cost burden is mitigated and all the state-owned generation plants is liberalized.

The types of contracts which are Build-Operate-Transfer (BOT), Transfers-Of-Operating-Rights (TOOR), and Build-Operate (BO) are for 20 years and are subject to power purchase agreements on predetermined quantities with the Treasury's guarantee. The system has led to the accumulation of significant contingent liabilities, and implicit subsidization of an inefficient sector. Moreover, in order to eliminate the lack of coordination within the sector, the benefits from low cost generation from the hydroelectric power plants by EÜAŞ and its affiliated partners were used to offset the cost burden. The current structure of the electricity, based on these vesting contracts, with purchasing guarantees and high prices, have been an unfavorable impact on the market for many years, and in the absence of further measures, it will hamper the liberalization procedure and delay the consequent reduction of energy prices.

With respect to Board Decision No: 1070, dated January 25, 2007, consumers with annual consumption above 3 GWH are considered as

"eligible customers". According to the Law No: 4628, those customers are granted to choose their suppliers through an Electricity Sales Agreement (ESA) with conditions completely determined by their wills with respect to principles of competition. According to Electricity Market Tariffs Regulation and the related communiqués, tariffs must be calculated on the basis of real costs which are directly related to the characteristics of the regular market operations such as fuel and operation costs, network losses, illicit utilization.

According to Electricity Market Tariffs Regulation and the related communiqués, tariffs proposed by the companies, are forwarded to EMRA for review and approval. Approved tariffs are then published in the Official Gazette and on the EMRA's website for transparency.

Therefore, the fundamental principles of neo-liberal economic approach such as “the separation of economics from politics” and the realization of economic problems through a “technical perspective” had already been adopted in the electricity sector. Hence, the electricity sector has a special importance among the structural reforms, which should aim the recognition of a comprehensive transformation in Turkish Electricity Sector. The transformations described above, have led the political perspectives to review the possibility of divesting the relations between the State Economic Enterprises (SEEs) and State towards liberalization.[15]

As a result of these reforms, The Energy Market Regulatory Authority (EMRA) and Privatization Administration (PA) have been established as the prevalent actors in the liberalization procedure for the Turkish Electricity Sector after the enactment of the electricity market law.

The Energy Market Regulatory Authority (EMRA), founded in 2001 with respect to the legal basis outlined in Law No: 4628, is an independent, regulatory body, with the duties assigned by the Law. The Authority is governed by a Board composed of nine members. EMRA was aimed to have an exclusive control on the market activities in electricity, gas and oil sectors

and activities. In the electricity sector, in principle, The Authority is responsible for preparing secondary legislation concerning market activities, granting licenses to market participants and ensuring the conformity of the market behavior with the provisions stated in legislations and applying sanctions to those market participants who violate the rules in the legislations. The Authority is also responsible for setting out the tariffs to be employed for electricity sale in retail level with regard to the market conditions. Furthermore, the Authority monitors the market performance and activities in order to ensure that the behavior of the market participants is conformable with the conditions included in their licenses. In addition, the Authority approves the tariffs of non-eligible customers and TETAŞ. In short, it can be said that the Authority is responsible for amendments and adjustments by the envisagement of the Law and ensures the compliance of the market behavior with the provisions of the Law. The Authority has also the role of first place (the second place is the State Council) for settling disputes arising from various conflicts concerning the market activities among the market participants.

The Ministry of Energy and Natural Resources (MENR) is responsible for the development of energy policies and programs in coordination with the relevant governmental institutions and companies in the sector. It is also responsible for the coordination, supervision, evaluation, implementation and management of international affairs, such as cross border energy transmission projects.

After the enactment of Law No: 4628, High Planning Council announced the Strategy Paper dated March 17, 2004, setting out the basic principles and a detailed action plan for the liberalization in the electricity sector. As for the liberalization strategy, priority shall be given to the distribution regions and generation portfolio of EÜAŞ which are the power plants under the control of EÜAŞ. The Paper has drawn a road map, pointing out important milestones for the liberalization. Liberalization of electricity should have begun with the

offer for liberalization of distribution systems in 2005 and it should be finished in 2011 by all means according to the Paper. Presently, this objective has not been achieved yet in terms of the distribution systems and the generation plants. The Liberalization Strategy explained in the Strategy Paper also envisages liberalization of state-owned generation plants after successful completion of liberalization of distribution network.

2.4. The Liberalization procedure for the Distribution Assets and Generation Plants and Its Benefit to the Turkish Electricity Market

The primary objective of the liberalization is to ensure the delivery of electricity in an adequate amount, continuously with high-quality, and at low-cost. According to Strategy Paper dated March 17, 2004, upon the completion of the necessary electricity sector reforms and the restructuring of state-owned electricity enterprises, the electricity generation plants will be liberalized following the liberalization of distribution assets. Timely and successful liberalization of electricity generation and distribution services are essential elements of market liberalization.

The primary benefits expected from electricity sector reform and liberalization may be listed as follows:

- Decreasing of costs of operation through carrying out effective and efficient operation services for the generation and distribution services;
- Increasing the supply quality and security;
- Reducing the technical losses and illicit utilization in distribution regions to the level in OECD countries and by carrying out an effective and efficient rehabilitation and expansion program for the distribution system infrastructure;

- Ensuring that this program is financed by the private sector without creating any liability on the public resources;
- Reflecting the benefits obtained from competition to customers.

As part of this progress, efforts are spent to minimize the cost of transition to liberal market model on the public institutions. The main principle is the implementation of cost–based tariff in the electricity sector, whereas the national tariff practice is operational during the first implementation period through establishment of a tariff balancing mechanism that stabilizes the price differences in non-eligible customer tariffs.

The distribution companies' tariffs are to be set through finalization of transition contracts between the distribution companies and the EÜAŞ and its affiliated partnerships, transition contracts between the distribution companies and TETAŞ, and transition contracts between the EÜAŞ's hydroelectric generation plants and TETAŞ.

In order to stabilize the prices in the retail market, during the first five-year transitional period, a "Tariff-Balancing Mechanism" has been developed and implemented for regions in the in those parts of the Country, where the income / customer is low and the ratio of loss and illicit utilization is high.

According to the Strategy Paper dated March 17, 2004, the liberalization of the distribution assets was expected to be finished by mid-2007. However, The Government then decided to realize the liberalization procedure for the distribution assets after the 2007 election. This will ensure that liberalization procedure will be postponed inevitably.

Regarding the technical and the financial characteristics, existing contracts, the current legal structure, and the operational problems arising from the geographical characteristics, the size of the regions are so adjusted that the total number of regions is 21 (with Kayseri). The regions and the associated companies are listed in Appendix B.

The liberalization procedure and the associated action plan for the distribution assets and the generation sector are given in Appendices C and D, respectively.

The realization of these procedures has a vital importance on liberalizing the Turkish Electricity Market in order to have a competitive electricity market characteristic.

2.5. Difficulties in front of the Turkish Electricity Market

The 2000's have been a period in which Turkey's public financial resources have generally showed a poor availability, with increasing deficits and public debt, and deterioration of the fiscal structure. There are still serious deficiencies in good governance, which lead to the loss of trust in private investors.

Another significant challenge in the market is the long-term agreements made with power generation plants realized on the principle of BOT and BO, with Treasury guarantees backing the payments of purchased energy. The prices of the energy purchased from the BOT power plants are comparatively higher than those purchased from EÜAŞ and its affiliated companies, due to the reason that term components in the tariffs are set to relatively high figures. These projects introduce a significant difficulty in front of market opening[2]. Current market opening is estimated at around 30 percent of the total Turkish electricity market, with a significant number of consumers either producing electricity for their own consumption, or buying from a supplier other than the incumbent distribution company operating in the same region. Turkey aims to achieve the ambitious target of complete market opening by 2011. However, because of the Government wrong decisions and unstable energy policies, it seems that the aim of full market opening will not be

[2] The percentage of the electricity sold in the competitive market through bilateral agreements to the overall electricity sold

achieved. Market opening ratios of the European countries including Turkey and their electricity market properties are given in the Table 9.

Table 9 Market Info of the European Countries

Country	Market Opening (Percent)	Eligibility Threshold	Type of Unbundling		Market Model	Balancing Prices Set
			Transmission	Distribution		
Austria	100	-	Legal	Legal	Bilateral	Market
Belgium	90	-	Legal	Legal	Bilateral	Regulated
Denmark	100	-	Legal	Legal	Hybrid	Market
Finland	100	-	Ownership	Accounting	Hybrid	Market
France	70	-	Legal	Management	Bilateral	Market
Germany	100	-	Legal	Accounting	Bilateral	Market
Greece	62	-	Legal	None	Bilateral	TSO
Ireland	56	1GWh	Legal	Management	Bilateral	Market
Italy	79	-	Ownership	Legal	Bilateral	TSO
Luxembourg	57	20GWh	Management	Management	Bilateral	-
Netherlands	100	-	Ownership	Legal	Bilateral	Market
Portugal	100	-	Ownership	Accounting	Bilateral	Regulated
Spain	100	-	Ownership	Legal	Pool	Market
Sweden	100	-	Ownership	Legal	Hybrid	Market
United Kingdom	100	-	Ownership	Legal	Bilateral	Market
Estonia	10	40GWh	Legal	Legal	Bilateral	TSO
Latvia	76	-	HH	Accounting	Bilateral	TSO
Lithuania	N/A	-	Legal	Legal	Bilateral	TSO
Poland	52	1GWh	Legal	Accounting	Bilateral	Market
Czech Republic	47	-	Legal	Accounting	Bilateral	Market
Slovakia	66	-	Legal	Management	Bilateral	Regulated
Hungary	67	-	Legal	Accounting	Bilateral	Regulated
Slovenia	75	-	Legal	Accounting	Bilateral	Market
Cyprus	35	350MWh	Management	None	Bilateral	TSO
Malta	0	-	N/A	Singe buyer	N/A	N/A
Turkey	31	3 GWh	Legal	Accounting	Bilateral	Market

Source: Commission of the European Communities (2006)

Another problem in the Turkish energy market is the strong influence of oil and gas prices on electricity prices due to the fact that a high percentage (% 43) of the electricity produced is obtained from the gas plants. The share of natural gas in electricity consumption tends to increase within the next five years. The dependency on the Russian natural gas for electricity generation

render an obligation of firm energy planning in order to assure Turkey's energy security. Although Turkey has sufficient domestic hydroelectric, coal and lignite potentials, these potentials are not efficiently utilized and security of supply is threatened by relying on imported fuels, mostly natural gas, which is highly sensitive to the world prices. Although the aim is to establish a liberal electricity market by assigning roles to the private sector market participants, during the planning and restructuring procedure, their contributions and opinions are usually neglected. Admittedly, if a country does not search for alternative fuels such as coal or at least does not diversify primary resources, it might ultimately encounter bottlenecks and difficulties in terms of both economic and strategic points.

There are also significant technical problems in the market. High loss and illicit utilization rates in the electricity distribution are the other crucial problems that have to be addressed by the authorities. It is estimated that an amount more than 20% of electricity supplied to the grid is lost as resistive dissipation or illegal consumption.[16] To use efficient energy and reduce the tariffs, necessary precautions for decreasing the loss and theft rates need to be taken.

Another important problem which led the liberalization procedure into uncertainty is the ambiguity of the border-line separating the relevant state-owned institutions in terms of their authorities and responsibilities. It is seen that there was a clash of authorities and interests among these institutions. The authorities like Ministry of Energy and Natural Resources, State Planning Organization, TEAŞ and TEDAŞ were playing the primary roles in the policy-making, planning, investment, operating and setting tariffs until the enactment of Law No: 4628. The uncertainty in the restructuring procedure has created serious problems in reaching consensus among these authorities. However, with the introduction of the Law No: 4628, there emerged new authorities like EMRA, an independent regulatory authority. Besides, new state enterprises such as EÜAŞ, TETAŞ, and TEİAŞ are

established as the new market participants and playing the primary roles in planning, investing, operating the infrastructure and setting tariffs. In the long-term, these state enterprises are expected to have limited functions in the market, except TEİAŞ in order to have a fully liberalized competition based market structure. That's why EÜAŞ and its affiliated partners and the distribution regions related to the TEDAŞ and its affiliated partners have to be liberalized in the mean-term so that the mission of TETAŞ in the market will be finished in the mean term.

Moreover, it can be assumed that the liberalization procedure for the electricity sector is carried out in favor of the social interests. The repercussions of the procedure that comes out in the long-term may sometimes be worse than anticipated, if the necessary precautions are not taken during the transition period. The main principles for the liberalization of the electricity sector are to ensure;

- the development of a financially sound and transparent electricity market operating in a competitive environment under provisions of civil law,
- the delivery of sufficient, good quality, low cost and environment-friendly electricity to consumers,
- the autonomous regulation and supervision of this market.

Nonetheless, the recent experiences in the EU countries have shown that a competitive electricity market might not always lead to higher efficiency and low prices. The liberalization effort in the EU has transformed a fragmented electrical sector dominated by a small number of regional state utilities into a European market ruled by an oligopoly of powerful liberalized energy corporations. These led to several distortions in the EU electricity market that, small number of powerful electricity suppliers protected by their high price policies preventing competition.[17]

Consequently, despite the reduction in the wholesale prices, non-eligible consumers could not benefit from this reduction. Moreover, transmission and distribution systems generally had high sink costs, for the reasons of creating a competitive market, can sometimes hardly been met in a liberal electricity market.[18] Considering these facts, Turkey has to take every kind of precautions in order not face with these difficulties during the liberalization procedure.

The rulers should also take the Country's institutional structure and legal status into consideration that an unregulated electricity market may lead to consumer discrimination and market failure. For Turkish Electricity Sector, on the other hand, the regulatory authority (EMRA) is supposed to fulfill effective regulation and more involvement of the government seems vital to protect the rights of all consumers. Turkish policy-makers also have to be aware of the financial differences between the countries.

Given that the liberalization in the electricity sector among the EU countries initially stepped at 30-35 percent in market opening, even this rate was only 8 percent in France, due to the dominancy of the nuclear plants as the main energy source[19], it would not be too wise to envisage a full liberalization procedure in Turkish Electricity Sector, if the transition period activities are not examined carefully and practiced well. So, before fast transition into competition-based market, some transition period precautions are needed and the decisions must be applied in a deterministic manner without letting the governments ruin these decisions.[20] Transformations realized during the transition periods however, should not have the nature that they implement some permanent changes on the structure hindering or prohibiting to pass to a fully liberalized competitive market structure.[21]

To conclude, in order to realize a successful liberalization procedure, experiences in various EU countries in establishing a fully competitive electricity market, such as the United Kingdom and the Scandinavian countries should be carefully examined.

CHAPTER 3

THE NEED FOR A STATE-OWNED WHOLESALE TRADING COMPANY: TETAŞ- ITS FUNCTION AND VIABILITY

3.1. The Need for the Turkish Wholesale Electricity Trading and Contracting Company: TETAŞ

Within the directives outlined in the Law No: 4628, the state-owned electricity generation and transmission company, TEAŞ has been unbundled into three functional companies, namely Electricity Generation Company (EÜAŞ), Turkish Wholesale Electricity Trading and Contracting Company (TETAŞ) and Turkish Electricity Transmission Company (TEİAŞ). Law No: 4628 envisages keeping a high percentage of the wholesale trading under the state control until the generation and distribution assets are fully liberalized. This envisagement is provided by a state-owned company, namely Turkish Wholesale Electricity Trading and Contracting Company (TETAŞ).

The main objective in establishing TETAŞ was to take over the existing Power Purchase Agreements between the BOT, BO plants and the public sector, to purchase the electricity generated by the state-owned plants and to provide electricity to the state-owned distribution companies owned by TEDAŞ during the transition period from the previously state-owned model to the liberal market model. In other words, TETAŞ was established to carry out the wholesale electricity trading activity on the behalf of the public interest, in the Turkish electricity market for a certain period of time. Beginning from the enactment of the Electricity Market Law No: 4628, TETAŞ was entitled to be

responsible for the existing wholesale electricity trading agreements on the behalf of TEAŞ and TEDAŞ. Indeed, dealing with the long-term treasury-guaranteed Power Purchase Agreements (PPAs) and the associated stranded costs are the primary reasons for the establishment of TETAŞ which enabled TETAŞ to become the most dominating wholesale electricity trading company in the Turkish electricity wholesale market.

Therefore, in principle, it is envisaged in the Law No: 4628 that the main objective in establishing TETAŞ is to be completely ceased when the generation plants governed and owned by EÜAŞ are fully liberalized. Hence, TETAŞ was regarded as a company to function only within a certain transition period from the state-owned model to the fully liberalized model. Thus, TETAŞ was planned to have a limited life-span, that would extend until the establishment of a fully competition based market structure and its role is intended to diminish over time, once the stranded costs are resolved. However, the difficulties encountered during the implementation period as regards Law No: 4628 have revealed that the establishment of a fully liberalized market will take a much longer time period and require more effort than anticipated; hence, the TETAŞ seems to survive much longer than envisaged by Law No: 4628.

3.2. Portfolio of TETAŞ

Turkish Wholesale Electricity Trading and Contracting Company, which has been established in terms of its present Articles of Association, is an economic state enterprise. It has a juristic personality, is independent in its activities and its liability is limited with its capital. Reserving the provisions of Law No: 4628 (Electricity Market Law), associated Decree Law and of the present Articles of Association, TETAŞ is subject to provisions of the Private Law.

The establishment is not subject to the provisions of the General Accounting Law and the State Tender Law and auditing of the Turkish Council of State.

Energy trading portfolio of TETAŞ with partners and amounts are listed in Table 10.

Table 10 Portfolio of TETAŞ

Tetaş Energy Purchase / Sell Portfolio Year 2006					
Purchased Energy			Sold Energy		
Source	**GWh**	**%**	**To**	**GWh**	**%**
State-Owned Plants (EÜAŞ + Affiliated Partners+ Plants transferred to Privatization Administration)	70, 463.6	54.67	**TEDAŞ + Affiliated Partners**	113, 354.7	90.38
BO(5 Plants)	40,678.0	31.56	**Kayseri**	2, 046.6	1.63
BOT (23 Plants)	13, 592.8	10.55	**Direct Customers. (*)**	5, 801.7	4.63
TOOR (3 Plants)	3, 554.9	2.76	**Nahçıvan**	403.4	0.32
Türkmenistan	534.6	0.41	**IRAQ**	75.5	0.06
PMUM	65.9	0.05	**PMUM**	3, 741.1	2.98
TOTAL	**128, 889.8**	**100.00**	**TOTAL**	**125, 423.0**	**100.00**

Companies presently selling electricity to TETAŞ within the framework of Build Operate, Build Operate Transfer and Transfer of Operating Rights contracts are a total of 31 plants as seen in Table 10. A more detailed technical analysis of the portfolio companies of TETAŞ such as the distribution and the generation portfolio companies is given in Appendix E.

3.3. The Main Objectives of TETAŞ

TETAŞ is perceived as a public company that is assigned for resolving the stranded costs arising from the contracts under the previous regime.

Similar to the other private wholesale companies, TETAŞ is obliged to have wholesale trading license to be granted by EMRA.

According to the Law No: 4628, the main duties of the Turkish Wholesale Electricity Trading and Contracting Company (TETAŞ) are:

1. Operating in the market in a non-discriminatory manner,
2. Conducting the existing energy purchasing agreements made by TEAŞ and TEDAŞ with BO and BOT companies,
3. Importing and/or exporting electricity to or from countries that fulfill the condition of international interconnection in accordance with the Ministry's policy determined according to the Law No: 3154 on the Establishment and Duties of Ministry of Energy and Natural Resources,
4. Signing energy agreements within the scope of Provisional Article 4 and Provisional Article 8 of 4628,
5. Implementing new agreements and conduction the existing agreements that is taken over, if necessary,
6. Engaging the energy purchasing agreements primarily with Electricity Generation Company (EÜAŞ), unless a more economical supply resource becomes available,
7. Making new energy purchasing agreements with the other parties, in case of a supply shortage, provided that the term of such contracts do not exceed one year and are approved by the Board,
8. Dealing with the existing supply contracts for the eligible customers directly connected to the transmission system, until these customers prefer to assign suppliers other than TETAŞ,
9. Submission of offers and bids to the balancing and settlement market,
10. Preparing the wholesale tariffs and implementing the approved tariffs.

3.4. The STRATEGY PAPER and its Impact on TETAŞ

The primary objective of the liberalization is to ensure the delivery of electricity continuously in an adequate amount and quality at low-cost. In this context, after the enactment of Law No: 4628, High Planning Council of the Turkish Government has announced the Strategy Paper dated March 17, 2004, setting out the basic principles and a detailed action plan for the liberalization in the electricity sector. As for the liberalization strategy, priority shall be given to the formation and liberalization of the distribution sector and then to liberalization of the power plants possessed by EÜAŞ. The reason for initiating the liberalization procedure from the distribution sector, not from the generation sector is that the distribution companies, holding retail licenses and operating in a liberal market, have to create confidence in investors regarding the liberalization procedure of the generation sector. The Paper has drawn a road map, pointing out the important milestones for the liberalization procedure. Liberalization of the electricity market should have begun with the offer for liberalization of distribution sector in 2005 and expected to be finished by 2006. However, due to political reasons, the Government has decided to continue the liberalization procedure for the distribution assets after the election has been settled down.

The liberalization strategy explained in the Strategy Paper plans to realize the liberalization of state-owned generation plants after the liberalization procedure for distribution sector has been completed. However, any delay in the liberalization of the distribution sector will directly be reflected to the liberalization of the generation plants, and hence the overall procedure will be postponed inevitably.

According to the Strategy Paper, liberalization of the electricity sector will be realized within the lines described as follows;

- The liberalization procedure will be performed by the Privatization Administration (PA) within the framework of the provisions of Law No: 4046.

- The liberalization procedure will not be solely focused on the maximization of the income.

- Effort will be spend in order to ensure that liberalization does not lead to permanent increases in electricity prices.

- The participation of financially strong and viable companies which are able to realize the objectives and principles of the program will be encouraged.

- Preliminary investments for the rehabilitation of power plants and upgrading of distribution infrastructure as well as operational and maintenance activities will be performed independently from the liberalization procedure.

According to the Paper, generation plants will be bundled into several portfolio groups composed of different types of assets for liberalization to enhance competition. Seventeen hydropower plants possessed by EÜAŞ, with a total capacity of 7055 MW, remained in government ownership (EÜAŞ) and sell its electricity to TETAŞ.

Thermal power plants and hydroelectrical power plants in the portfolio of EÜAŞ to be liberalized are shown in Table 11 and Table 12 respectively.

Table 11 EÜAŞ Thermal Power Plants

PLANTS	CAPACITY(MW)	PRODUCTION(MWH)	PLANT PEAK(MW)
ANBARLI-A	630.0	4834	215
ANBARLI-B	832.8	15251	685
ANB-B CEV.	518.1	8293	365
BURSA	957.0	14330	649
BURSA ÇEV.	475.0	6966	310
CATES-B	300.0	6435	275
ORHANELİ	210.0	4160	190
SEYİTÖMER	600.0	9985	420
TUTES-A	65.0	0	0
TUTES-B	300.0	6070	255
ALİAĞA	120.0	0	0
ALİAĞA-CEV.	60.0	0	0
ÇAN	320.0	3608	151
DENİZLİ-JEOTERMAL	15.0	255	12
ELBİSTAN-A	1355.0	17370	750
ELBİSTAN-B	1440.0	16283	820
ENGİL	15.0	0	0
KANGAL	457.0	8518	350
HOPA	50.0	0	0
TOTAL	**8719.9**	**122358**	**5447.0**

Table 12 EÜAŞ Hydroelectrical Power Plants

PLANTS	CAPACITY(MW)	PRODUCTION(MWH)	PEAK(MW)	ADD-ON CAPACITY(MW)
ADIGÜZEL	62.0	0	0.0	0.0
DEMİRKÖPRÜ	69.0	0	0.0	0.0
KEMER	48.0	0	0.0	0.0
K.ÖREN-1	32.0	312	13.0	13.0
K.ÖREN-II	47.2	434	18.0	18.0
KEPEZ I+II	32.4	276	12.0	12.0
MANAVGAT	48.0	384	16.0	16.0
ATATÜRK	2405.0	19110	1580.0	1580.0
BATMAN	198.0	2096	194.0	129.0
DİCLE	110.0	0	0.0	0.0
KARAKAYA	1800.0	17149	1450.0	1190.0
KARKAMIŞ	189.0	1038	64.0	43.0
KEBAN	1330.0	13764	980.0	960.0
KRALKIZI	94.5	958	100.0	100.0
MENZELET	124.0	350	58.0	58.0
MERCAN	19.1	285	12.0	12.0
ÖZLÜCE	170.0	2454	165.0	163.0

Table 12 Continued

Ş.URFA	51.8	0	0.0	0.0
ASLANTAŞ	138.0	757	40.0	36.0
ÇATALAN	168.9	1119	108.0	108.0
BERKE	510.0	268	135.0	0.0
KADINCIK-I	70.0	1144	72.0	40.0
KADINCIK-II	56.0	382	48.0	0.0
SEYHAN-1	60.2	841	35.0	35.0
SEYHAN-2	7.0	2	2.0	0.0
SIR	283.5	157	78.0	0.0
YÜREGİR	6.0	45	2.0	2.0
ALMUS	27.0	169	16.0	0.0
ALTINKAYA	702.6	0	0.0	0.0
ATAKÖY	5.5	40	2.0	1.4
ÇAMLIGÖZE	32.0	431	30.0	30.0
DERBENT	56.4	147	27.0	2.0
DOGANKENT	74.5	1615	68.0	66.0
H.UĞURLU	500.0	3180	330.0	220.0
KILIÇKAYA	120.0	1560	120.0	120.0
KÖKLÜCE	90.0	0	0.0	0.0
KÜRTÜN	85.0	1602	70.0	70.0
S.UĞURLU	69.0	872	65.0	46.0
BORÇKA	300.6	0	0.0	0.0
ÇILDIR	15.4	75	3.5	3.0
İKİZDERE	18.6	411	17.2	17.2
KUZGUN	20.9	0	0.0	0.0
MURATLI	115.0	2617	117.0	114.0
TERCAN	15.0	328	14.1	14.1
TORTUM	26.2	571	24.0	24.0
BEYKÖY	16.8	69	11.0	9.0
GEZENDE	159.4	0	0.0	0.0
GÖKÇEKAYA	278.4	256	86.0	0.0
HİRFANLI	128.0	452	30.0	30.0
KAPULUKAYA	54.0	366	18.0	18.0
KESİKKÖPRÜ	76.0	293	40.0	0.0
SARIYAR	160.0	154	40.0	0.0
YENİCE	37.9	80	12.0	12.0
TOTAL	**11314**	**78613**		**5311.7**

As part of this program, the necessary steps required for creating confidence in the international investors and their domestic partners shall be taken, while efforts are to be made to minimize the cost of transforming the market model to a liberal structure.

The main principle in the liberalization procedure will be the development and implementation of cost–based tariffs, while the national tariff has been

continued for the first five-year period of implementation. A tariff balancing mechanism is established and implemented during the first five-year period of implementation in order the non-eligible customers particularly in the southern eastern region of the Country not to be influenced from high prices due to excessive loss and illicit utilization in this region.

The Strategy Paper aims to establish a competitive market structure by taking into account the existing public liabilities and not leading to additional State guarantees.

According to the Paper, TETAŞ will play an important role in realizing the objectives for the liberalized market structure. Paper assigns TETAŞ the following responsibilities by means of bilateral contracts:

A. TETAŞ will purchase electricity from hydroelectric power plants in the portfolio of EÜAŞ,

B. TETAŞ will carry out the present obligations and duties due to the contracts made by its predecessor.

C. TETAŞ will provide electricity to the Distribution Companies on the basis of a wholesale tariff calculated in terms of weighted average of the marginal costs of energy purchased from the BOT, BO and EÜAŞ plants before and after the liberalization procedure, until the portfolio of EÜAŞ has all been liberalized.

The energy purchased by TETAŞ through the existing contracts and EÜAŞ' s portfolio, will be allocated to the Distribution Companies through purchase agreements to be signed between TETAŞ and distribution companies.

Although the present duration of the transition period contracts is five years, within the context of the duties[3] assigned in the Strategy Paper, duration of the transition period contracts and hence the overall life-span of TETAŞ will significantly be increased. In case of not being able to realize the liberalization program for the distribution networks on time, the transition period contracts assigned to TETAŞ will be extended. In case that the liberalization of the generation power plants can not be realized on time, then further increase in the life-span of TETAŞ is expected, thus TETAŞ seems to be in the wholesale market with its huge market power for a rather long period of time not shorter than twelve years.

In 10/05/2006, an amendment is made in Law No: 4628, by the Provisional Article No: 10 in order to assign the thermal portfolio of EÜAŞ directly to the TEDAŞ and its affiliated partners. The main objective of this amendment is to try to stabilize the high prices of energy purchased from the BO, BOT plants by mixing this energy with the cheap hydroelectrical energy obtained from EÜAŞ, thus achieving a reasonable wholesale tariff determined by TETAŞ that would not disturb the eligible customers.

Although the portfolio of TETAŞ has significantly decreased by the above approach, the wholesale electricity tariff of TETAŞ has somehow decreased as shown in Table 13. Detailed analysis of the eligible customer electricity wholesale tariff is shown in Appendix F.

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[3] The generation of the hydroelectric power plants that are under the possession of EÜAŞ shall continue to be sold to TETAŞ as long as it is deemed necessary to achieve an average TETAŞ sales price that reflects the expected market price.

These transition contracts will be set at regulated prices and will last for a maximum of 5 years, except for TETAŞ contracts. As they run out such contracts will be replaced by market priced bilateral contracts and thus, will ensure a smooth transition to liberal market.

Table 13 Tetaş Electricity Wholesale Tariff

YEARS	2005	2006	2007
Average Electricity Wholesale Tariff	10,4 Ykr/kWh	9, 92 Ykr/kWh	9, 69 Ykr/kWh

Moreover, due to the political intervention of the Government, the wholesale tariffs of TETAŞ have been reduced effectively to a rather cheap level compared to the market prices.

At present, TETAŞ is the most dominant wholesale trader in the electricity market holding about 60% of the overall annual wholesale portfolio. Hence, a reduction in TETAŞ's tariff whether it is raised from the real situation or it is made due to political concerns, has a significant influence in the market environment and the investment climate. Thus, parties considering investment in the generation sector are highly frightened by these types of manipulations. Such a low price hinders the development of the generation sector towards a competitive market structure and destroys the liberalization procedure. Hence, it can be clearly stated that modifications made by the Strategy Paper in the liberalization procedure have resulted in a situation that the life span of TETAŞ has significantly been increased and the power of manipulation of the wholesale prices with the directions of political concerns has remained in the Government for a rather long period of time. Thus, it can be concluded that the modifications made by the Strategy Paper have created mostly detrimental consequences that delays, if not cancels, the liberalization procedure.

Current status of the electricity sector and the energy flow diagram after the strategy paper and the amendments made in Law No: 4628 are shown in Figure 10.

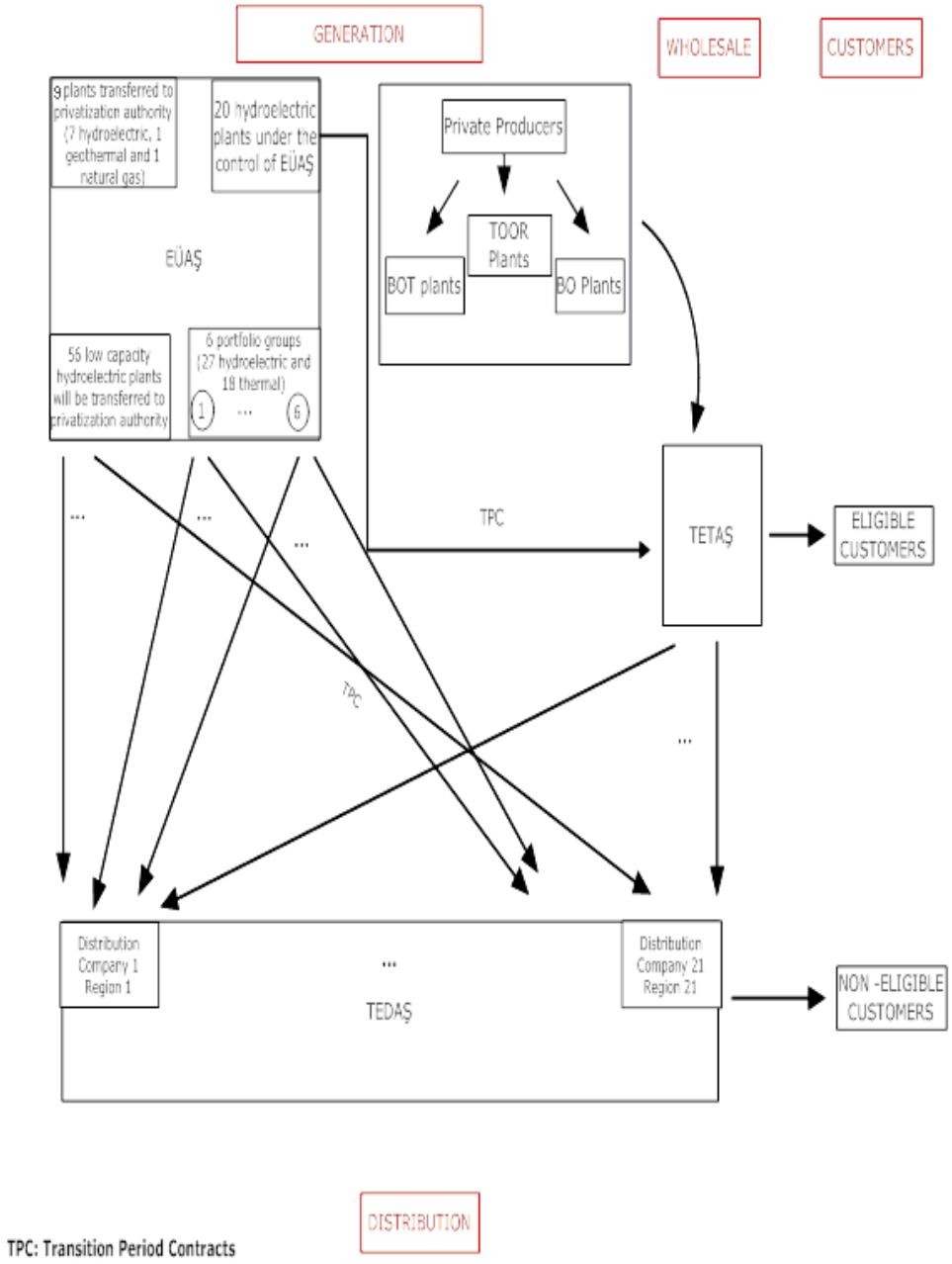

Figure 10 Current Status of the Electricity Sector

3.5. The Liberalization Procedure of the Generation Portfolio and Its Impacts on TETAŞ

According to the principles stated in the Strategy Paper dated March 17, 2004, liberalization of the generation sector is regarded as a task that would be carried out after the liberalization of the distribution sector. Hence, it can safely be stated that liberalization of EÜAŞ' s portfolio is an important task that can be realized in a date not later than two to four years.

One of the most important objectives of the liberalization of the electricity market is to liberalize the distribution assets first, then the generation portfolio of EÜAŞ after which there would be no need for the state-owned wholesale company "TETAŞ".

According to the targets that were pointed out by the Strategy Paper, dated March 17, 2004, Ministry of Energy Resources (MENR), Under secretariat of Treasury, State Planning Organization and Energy Market Regulatory Authority (EMRA) initiated the liberalization procedure of the generation portfolio of EÜAŞ in 2003. Firstly, all hydroelectric power plants constructed, commissioned or to be commissioned by General Directorate of State Hydraulic Works(DSİ) were transferred to EÜAŞ in March 2004 and then the total of 20 hydroelectric plants including the natural monopoly-type large-capacity hydroelectric plants such as Keban, Karakaya and Atatürk were decided to be retained in the control of EÜAŞ. These 20 hydroelectric plants are given in the Table 14.

Moreover, 56 low-capacity hydroelectric plants, whose installed capacities are between 15 MW and 51 MW and annual generations are rather low compared to the others, were decided to be liberalized. Although EÜAŞ offered Ministry of Energy Resources and Privatization Administration to add these plants within the portfolio of the 21 distribution company with respect to

their geographical situation, Ministry of Energy Resources rejected this suggestion. Ministry of Energy Resources then announced that these low-capacity hydroelectric plants would be liberalized. However, the liberalization type of these plants have not been decided yet whether they will be liberalized one by one or as a group in the associated distribution region. Privatization Administration will decide the liberalization procedure of these plants in the near future. 56 low-capacity hydroelectric plants are given in the Table 15 and Table 16 respectively.

In addition to these efforts, 7 hydroelectric plants whose installed capacity are lower than 22 MW, a thermal (natural gas) plant with 15 MW installed capacity and a geothermal plant with 15 MW installed plant capacity were transferred to the Privatization Administration in order to be liberalized in December 2006. These plants are given in the Table 17.

Table 14 Hydroelectric Plants under the control of EÜAŞ

	NAME	FUEL TYPE	RIVER	PLACE	LOAD FACTOR	RATED POWER(MW)	ANNUAL GENERATION (MWH)
1	ATATÜRK	Hydroelectric	Fırat	ŞANLIURFA	33,7%	2,405	7,100,000
2	KARAKAYA	Hydroelectric	Fırat	DİYARBAKIR	43,1%	1,800	6,800,000
3	DİCLE	Hydroelectric	Dicle	DİYARBAKIR	23,7%	110	228,000
4	BATMAN	Hydroelectric	Dicle	DİYARBAKIR	27,8%	198	483,000
5	KEBAN	Hydroelectric	Fırat	ELAZIĞ	50%	1,330	5,820,000
6	BORÇKA	Hydroelectric	Çoruh	ARTVİN	39,5%	300	1,039,000
7	MURATLI	Hydroelectric	Çoruh	ARTVİN	44,1%	115	444,000
8	SIR	Hydroelectric	Manavgat	K.MARAŞ	29,2%	283,5	725,000
9	BERKE	Hydroelectric	Seyhan	OSMANİYE	20,6%	510	920,000
10	KADINCIK 1	Hydroelectric	Sini Lake	MERSİN	32,6%	70	200,000
11	SEYHAN 1	Hydroelectric	Seyhan	ADANA	23,2%	60	121,700
12	SEYHAN 2	Hydroelectric	Seyhan	ADANA	12,5%	7,5	8,180
13	YÜREĞİR	Hydroelectric	Seyhan	ADANA	9,1%	6	4,800
14	KADINCIK 2	Hydroelectric	Arit Lake	MERSİN	38,5%	56	189,000
15	MANAVGAT	Hydroelectric	Derme Lake	ANTALYA	26,2%	48	110,000
16	KARACAÖREN2	Hydroelectric	Göksu Sulama Channel	BURDUR	22,1%	46,4	90,000
17	KEPEZ 1	Hydroelectric	Kırkgöz Isale Channel	ANTALYA	25,9%	26,4	60,000
18	KEPEZ 2	Hydroelectric	Kırkgöz Isale Channel	ANTALYA	8,6%	6	4,500
19	KRALKIZI	Hydroelectric	Dicle	DIYARBAKIR	13,4%	94,5	111,000
20	URFA-TÜNEL	Hydroelectric	Fırat	URFA	28,3%	50	124,000
	TOTAL					**7,522**	**24,582,180**

Table 15 Low-Capacity Hydroelectric Plants

TEDAŞ REG.	No	PLANT NAME	PLACE		ASSOCIATED COMPANY	RATED POWER (MW)	ANNUAL GENERATION (MWH)
			CITY	COUNTY			
1	1	ÇAĞÇAĞ	MARDİN	NÜSAYBİN	ZÜMRÜT	14,400	35,000
	2	BOTAN	SİİRT	MERKEZ	SAHİN YİLMAZ	1,584	6,000
	3	ULUDERE	ŞIRNAK	ULUDERE	MEZRE	640	1,500
	4	ADİLCEVAZ	BİTLİS	ADİLCEVAZ	YILDIZ TERMİK	393,6	1,000
	5	AHLAT	BİTLİS	AHLAT	ZÜMRÜT	201	1,000
	6	ENGİL	VAN	EDREMİT	ÖZENİR	4,596	14,000
	7	ERCİŞ	VAN	ERCİŞ	EMBİ	800	1,000,
2	8	HOŞAP	VAN	GÜRPİNAR	ÖZENİR	3,500	13,700
	9	KOÇKÖPRÜ	VAN	ERCİS	ŞAHİN YİLMAZ	8,800	20,000
	10	MALAZGİRT	MUŞ	MALAZGİRT	ŞAHİN YİLMAZ	1,216	2,250
	11	OTLUCA	HAKKARİ	MERKEZ	ÖZENİR	1,260	1500
	12	VARTO - SÖNMEZ	MUŞ	VARTO	ZÜMRÜT	264	1,000
	13	ARPAÇAY - TELEK	KARS	ARPAÇAY	DENİZCAN	62,4	300
	14	BAYBURT	BAYBURT	MERKEZ	UZMANLAR	396	1,500
3	15	DEREİÇİ	KARS	MERKEZ	MET	400	400
	16	GİRLEVİK	ERZİNCAN	MERKEZ	ÖZENİR	3,040	17,000
	17	KİTİ	IĞDIR	MERKEZ	DEMİSTAŞ	2,760	12,500
	18	ESENDAL	ARTVİN	YUSUFELİ	MİRAÇ	300	1,000
4	19	IŞIKLAR - VİSERA	TRABZON	AKÇAABAT	HGG	1,040	4,500
5	20	ÇEMİŞGEZEK	TUNCELİ	ÇEMİŞGEZEK	EMBİ	0,116	740
	21	ERKENEK	MALATYA	DOGANŞEHİR	EMBİ	0,32	1,600
	22	DERME	MALATYA	MERKEZ		4,5	8,000
	23	KERNEK	MALATYA	MERKEZ	ESENLİK	0,832	1,500
6	24	KOYULHİSAR	SİVAS	KOYULHİSAR		0,2	600
7	25	ANAMUR	İÇEL	ANAMUR	MET	0,84	3,300
	26	BOZYAZİ	İÇEL	BOZYAZİ	MET	0,424	1,500
	27	DEGİRMENDERE	ADANA	KADİRLİ	İN-TUR	0,5	1,500
	28	KARAÇAY	ADANA	MERKEZ	MET	0,4	1,180
	29	KUZUCULU	HATAY	DÖRTYOL	GES	0,272	1,000
	30	SİLİFKE	İÇEL	SİLİFKE	MET	0,4	2,350
	31	MUT - DERİNÇAY	İÇEL	MUT	MET	0,880	600
	32	ZEYNE	İÇEL	GULNAR	REM	0,3258	2,500
8	33	BOZKİR	KONYA	BOZKİR	MET	0,752	500
	34	DERE	KONYA	MERAM	MET	0,6	1,250
	35	ERMENEK	KARAMAN	ERMENEK	İN-TUR	1,12	1,250
	36	GOKSU	KARAMAN	HADİM	CENAY	10,8	70,000
	37	İVRİZ	KONYA	EREGLİ	UNİTEKNİK	1,040	700
	38	ÇAMARDİ	NİGDE	ÇAMARDİ	MEZRE	0,0688	800
9	39	KAYADİBİ	BARTİN	MERKEZ	TRANSTEK	0,464	2,500

Table 16 Low-Capacity Hydroelectric Plants continued

TEDAŞ REG.	No	PLANT NAME	PLACE		ASSOCIATED COMPANY	RATED POWER (MW)	ANNUAL GENERATION (MWH)
			CITY	COUNTY			
10	40	TURUNÇOVA -FİNİKE	ANTALYA	FİNİKE	YAMANLAR	0,552	1,000
	41	KOVADA-1	ISPARTA	EGIRDIR	DEREBOGAZI	0,0825	3,000
	42	KOVADA-2	ISPARTA	EGIRDIR	DEREBOGAZI	0,512	20,000
12	43	İNEGOL - CERRAH	BURSA	INEGOL	MET	0,272	850
	44	IZNIK- DEREKOY	BURSA	IZNIK	BERKAY	0,240	800
	45	M.KEMALPAŞA-SUUÇTU	BURSA	M,KEMALPASA	TRANS INŞ.	0,472	1,000
15	46	HARAKLI - HENDEK	SAKARYA	HENDEK	AKIN SOGUT	0,264	1,000
	47	PAZARKOY-AKYAZI	SAKARYA	AKYAZI	AS-EM	0,1776	800
16	48	BOZÖYUK	BILECIK	BOZUYUK	MET	0,360	1,200
	49	KAYAKOY	KUTAHYA	EMET	MET	0,0256	7,100
18	50	PINARBASI	KAYSERI	PINARBASI	AS-EM	0,992	850
	51	SIZIR	KAYSERI	GEMEREK	KCETAŞ	0,0678	50,000
	52	BUNYAN	KAYSERİ	BUNYAN	KCETAŞ	0,0136	4,000
20	53	BESNI	ADIYAMAN	BESNI	TEKYOL	0,272	600
	54	CEYHAN	K.MARAŞ	MERKEZ	MET	0,036	18,000
21	55	DURUCASU	AMASYA	TAŞOVA	MET	0,8	1,900
	56	LADIK BUYUKKIZOGLU	SAMSUN	LADIK	LADIK KAYM.	0,4	1,500

Table 17 Plants Transferred to Privatization Administration

Plants	Country	County	Type	Installed Capacity (MW)	Annual Generation (Gwh)	Liable Generation (Gwh)
Tercan Hydroelectric	Erzincan	Tercan	Hydroelectric	15	48	18
Kuzgun Hydroelectric	Erzurum	Ilıca	Hydroelectric	20,9	36	10
Mercan Hydroelectric	Tunceli	Ovacık	Hydroelectric	19,2	78	40
İkizdere Hydroelectric	Rize	İkizdere	Hydroelectric	18,6	110	100
Çıldır HES	Kars	Arpaçay	Hydroelectric	15,36	48	20
Beyköy Hydroelectric	Eskişehir	Sarıcakaya	Hydroelectric	16,8	87	60
Ataköy Hydroelectric	Tokat	Almus	Hydroelectric	5,525	8	8
Denizli Geothermal	Denizli	Sarayköy	Geothermal	15	104	64
Van Engil Natural Gas	Van	Engil	Natural Gas	15	-	-

Development of a valid sound liberalization program for Turkey's natural monopoly-type large-capacity hydroelectric plants such as Keban, Karakaya and Atatürk does not seem to be easy. Because these plants do not only generate electricity but also serve for watering purposes and for other important activities such as regulation of national frequency. It seems that these plants with the total of 20 hydroelectric plants that are under the possession of EÜAŞ will continue to reside on the Government side (EÜAŞ) and continue supplying energy to TETAŞ for a rather long period of time even after the liberalization program has been completed. It is quite likely that these plants together with the nuclear plants to be installed in the mean term will constitute a new portfolio, which may be called; **"Government-owned Portfolio"** that will perhaps be never liberalized.

After the studies on the natural monopoly type large hydroelectric plants and low-capacity hydroelectric plants, Ministry of Energy Resources, Under secretariat of Treasury, State Planning Organization and Energy Market Regulatory Authority (EMRA) gave priority to the liberalization procedure of the remaining generation portfolio of EÜAŞ. During the decision phase of liberalization procedure, the idea of "mixed-fuel portfolio groups" prevailed. The generation portfolio to be liberalized were identified and grouped on the basis of following criteria:

- Formation of market power should be prevented, i.e. none of the portfolio company will be monopoly in the market,
- Fuel variation should be balanced in all of the portfolio groups,
- The ratio of the hydroelectric vs. thermal energy should be balanced in all of the portfolio groups,
- Average load factor should be balanced in all of the portfolio groups,
- Installed capacities of the portfolio groups should be identical to each other,

- Geographic situation of the plants should be given priority while forming the groups,
- Financial viability should be provided so that average generation cost should be identical in all of the portfolio groups so that none of the portfolio company will hold the dominant position in the market when the liberal market is completely established.

Under these criteria, Ministry of Energy Resources and EÜAŞ determined the liberalization procedure of the remaining generation portfolio of EÜAŞ in September 2006. The idea of forming six portfolios consisting of generating plants with various fuel types (mixed-fuel portfolio) bundled together was accepted. In all these 6 portfolio groups, the ratio of the hydroelectric vs. thermal energy is between 22,1% and 26,7% so that the balance between the groups is achieved in order to handle formation of the dominant position in the market. The properties of the "Portfolio Groups" are given in the Table 18.

Table 18 Properties of the portfolio Groups

Properties of the portfolio Groups	
Total Rated Power of the Thermal Plants in the Portfolio groups	11,769 MW
Total Rated Power of Hydroelectric Plants in the Portfolio groups	3,677 MW
Total Rated Power of the Portfolio groups	15,446 MW
Total Annual Generation of the Portfolio Groups	49,000 GWh

These six portfolio companies which are composed of 18 thermal (Lignite, coal, natural gas, fuel oil and gas oil) and 27 hydroelectrical plants are given in the Table 19, 20, 21, 22, 23 and 24 respectively.

Table 19 Generation Portfolio Group-1

		PLANT	FUEL-TYPE	RIVER	PLACE	RATED POWER (MW)	ANNUAL GENERATION (MWH)	TOTAL
HYDRO	1	Kesikköprü	Hydroelectric	Kızılırmak	ANKARA	76	164,269	
	2	Adıgüzel	Hydroelectric	B. Menderes	DENİZLİ	62	94,250	
	3	Kapulukaya	Hydroelectric	Kızılırmak	KIRIKKALE	54	169,588	
	4	Menzelet	Hydroelectric	Ceyhan	KAHRAMANMARAŞ	124	575,009	
	5	Hirfanlı	Hydroelectric	Kızılırmak	KIRŞEHİR	128	257,241	
	6	Aslantaş	Hydroelectric	Ceyhan	OSMANiYE	138	672,848	
			HYDROELECTRIC TOTAL			**582**	**1,933,205**	**%23,3**
THERMAL	1	Seyitömer	Lignite		KÜTAHYA	577	3,755,000	
	2	Soma	Lignite		MANiSA	1,034	6,124,000	
	3	Çatalağzı	Coal		ZONGULDAK	300	1,900,000	
			THERMAL TOTAL			**1,911**	**11,779,000**	**%76,7**
			PORTFOLIO TOTAL			**2,493**	**13,712,205**	**%100**

Table 20 Generation Portfolio Group-2

		PLANT	FUEL-TYPE	RIVER	PLACE	RATED POWER (MW)	ANNUAL GENERATION (MWH)	TOTAL
HYDDRO	1	Yenice	Hydroelectric	Sakarya	ANKARA	38	90,397	
	2	Gökçekaya	Hydroelectric	Sakarya	ESKİŞEHİR	278	475,102	
	3	Sarıyar	Hydroelectric	Sakarya	ANKARA	160	346,835	
			HYDROELECTRIC TOTAL			**476**	**912,334**	**%22,4**
THERMAL	1	Kemerköy	Lignite		MUĞLA	540	2,900,000	
	2	Yeniköy	Lignite		MUĞLA	360	2,100,000	
	3	Yatağan	Lignite		MUĞLA	600	3,453,000	
		Aliağa	Gas Oil		İZMİR	150	1,000,000	
			THERMAL TOTAL			**1,650**	**9,453,000**	**%77,6**
			PORTFOLIO TOTAL			**2,126**	**10,365,334**	**%100**

Table 21 Generation Portfolio Group-3

		PLANT	FUEL-TYPE	RIVER	PLACE	RATED POWER (MW)	ANNUAL GENERATION (MWH)	TOTAL
HYDRO	1	Derbent	Hydroelectric	Kızılırmak	SAMSUN	56	251,033	
	2	Altınkaya	Hydroelectric	Kızılırmak	SAMSUN	703	1,065,455	
	3	Karkamış	Hydroelectric	Fırat	GAZİANTEP	189	245,292	
			HYDROELECTRIC TOTAL			**948**	**1,561,780**	**%26,7**
THERMAL	1	Afşin Elbistan B	Lignite		K.MARAŞ	1,440	7,200,000	
	2	Afşin Elbistan A	Lignite		K.MARAŞ	1,120	7,046,000	
	3	Hopa	Fuel Oil		ARTVİN	40	320,000	
			THERMAL TOTAL			**2,600**	**14,566,000**	**%73,3**
			PORTFOLIO TOTAL			**3,548**	**16,127,780**	**%100**

Table 22 Generation Portfolio Group-4

		PLANT	FUEL-TYPE	RIVER	PLACE	RATED POWER (MW)	ANNUAL GENERATION (MWH)	TOTAL
HYDRO	1	Hasan Uğurlu	Hydroelectric	Yeşilırmak	SAMSUN	500	1,146,588	
	2	Suat Uğurlu	Hydroelectric	Yeşilırmak	SAMSUN	69	293,277	
	3	Karacaören 1	Hydroelectric	Aksu	BURDUR	32	109,754	
			HYDROELECTRIC TOTAL			**601**	**1,549,619**	**%24,2**
THERML	1	Ambarlı Natural Gas	Natural Gas		İSTANBUL	1,251	8,400,000	
	2	Ambarlı Fuel Oil	Fuel Oil		İSTANBUL	630	3,580,000	
			THERMAL TOTAL			**1,881**	**11,980,000**	**%75,8**
			PORTFOLIO TOTAL			**2,482**	**13,529,619**	**%100**

Table 23 Generation Portfolio Group-5

		PLANT	FUEL-TYPE	RIVER	PLACE	RATED POWER (MW)	ANNUAL GENERATION (MWH)	TOTAL
HYDRO	1	Özlüce	Hydroelectric	Peri Suyu	ELAZIĞ	170	372,094	
	2	Çatalan	Hydroelectric	Seyhan	ADANA	169	534,819	
	3	Köklüce	Hydroelectric	Yeşilırmak	TOKAT	90	408,739	
	4	Kemer	Hydroelectric	B.Menderes	AYDIN	48	93,210	
	5	Almus	Hydroelectric	Yeşilırmak	TOKAT	27	85,116	
			HYDROELECTRIC TOTAL			**504**	**1,493,978**	**%22,1**
THERMAL	1	Bursa Doğal Gaz	Natural Gas		BURSA	1,382	8,800,000	
	2	Kangal	Lignite		SİVAS	390	2,376,000	
			THERMAL TOTAL			**1,772**	**11,176,000**	**%77,9**
			PORTFOLIO TOTAL			**2,276**	**12,669,978**	**%100**

Table 24 Generation Portfolio Group-6

		PLANT	FUEL-TYPE	RIVER	PLACE	RATED POWER (MW)	ANNUAL GENERATION (MWH)	TOTAL
HYDRO	1	Çamlıgöze	Hydroelectric	Yeşilırmak	SİVAS	32	49,811	
	2	Kürtün	Hydroelectric	Harşit Çayı	GÜMÜŞHANE	85	198,000	
	3	Demirköprü	Hydroelectric	Harşit Çayı	MANİSA	69	99,973	
	4	Doğankent	Hydroelectric	Harşit Çayı	GİRESUN	75	256,150	
	5	Tortum	Hydroelectric	Tortum	ERZURUM	26	102,150	
	6	Kılıçkaya	Hydroelectric	Harşit Çayı	SİVAS	120	308,492	
	7	Gezende	Hydroelectric	Göksu Emenek	İÇEL	159	450,897	
			HYDROELECTRIC TOTAL			**566**	**1,465,473**	**%22,4**
THERMAL	1	Orhaneli	Lignite		BURSA	210	1,305,000	
	2	Tunçbilek	Lignite		KÜTAHYA	345	1,898,000	
	3	Çan	Lignite		ÇANAKKALE	320	1,872,000	
	4	Hamitabat	Natural Gas		KIRKLARELİ	1,080	7,185,000	
			THERMAL TOTAL			**1,95**	**12,260,000**	**%77,6**
			PORTFOLIO TOTAL			**2,521**	**13,725,473**	**%100**

After the formation of the portfolio groups and the formation of both hydroelectric plants that are decided to be retained under the control of EÜAŞ and low-capacity hydroelectric plants that are to be liberalized,

- The transition contracts between EÜAŞ and TETAŞ have been signed for a period of 5 years.
- 120 transition contracts have been signed in 21 June 2006 between portfolio generation groups and 20 distribution companies for a period of 5 years.
- 20 transition contracts have been signed in 21 June 2006 between TEDAŞ and TETAŞ for a period of 5 years.

Until 1 September 2011, these transition contracts are going to be valid. Then, the portfolio generation groups will be transferred to Privatization Administration by means of the liberalization scope.

Medium and long-term strategic plans of Ministry of Energy and Natural Resources (MENR) involving the liberalization of the generating facilities owned by EÜAŞ excluding those regarded as natural monopoly type large hydroelectric plants was decided as six portfolios of generation companies consisting of generating plants with various fuel types (mixed-fuel portfolio) bundled together as explained above. The liberalization procedure of these portfolio groups will be carried out by Privatization Administration, a government administration directly affiliated to the Prime Minister responsible for realizing the liberalization program of the Government.

According to the procedure, only the operation right of the plants in these portfolios is to be liberalized. EMRA is predicted to grant license to these companies for a certain period of operation, such as 15 years and then the shares of these companies will be liberalized. By looking at the previous experiences, it can be claimed that the liberalization procedure for these

portfolios will most likely be carried out on the basis of the transfer of operation right (TOOR) of the **"overall portfolio"**, neither on the basis of individual plants in a portfolio, nor on a certain percent of the shares of a portfolio or plant. Hence; it seems that the ownership rights on these portfolios shall always be retained in EÜAŞ, and the Operation Rights (TOOR) transferred to the companies is predicted to expire at the end of the operation period.

The present liberalization program with six portfolios of mixed fuel plants does not fully seem to be suitable for encouraging the investors and for the enhancing the competition in the market. Formation of portfolios with different fuel types, i.e. hydroelectric, coal, gas, fuel oil, etc. emerge need for different types of professional engineering experience and fuel management, repair and maintenance practices, different types of equipment and hardware stock and repair shop, or in short, different types of professional background and knowledge. It is not difficult to say that formation of mixed fuel portfolios will result in;

(a) Inefficiencies, both in fuel management and operation, that will eventually influence the tariffs, and hence the customers,

(b) Poor repair and maintenance practices due to lack of professional experience in that particular type of fuel and plant,

(c) Difficulties in following the tariffs of the portfolios, whether they reflect the real prices or not,

(d) Difficulties in estimating the prices of portfolios for liberalization.

Thus, it can be said that formation of single fuel liberalization type in a specific region should have been preferred in order to encourage the investors to invest in a field which they already have professional experience in.

Within the single-fuel type model, especially the hydroelectric power plants will earn more income when they sell their output at market price level. In order to prevent this unfair situation, the government should have established *a levy* on these types of plants with cheap marginal costs, so that the other plants with higher marginal costs will be supported and hence the competitive market structure will not be spoiled. This would enhance the investor's confidence in the model and encourage them to make investment and enter in the market.

Remembering the statement in the Law 4628 stating that **"cross subsidy is not allowed"**, the levy collected from those hydroelectric portfolios with relatively cheaper prices should be devoted again back to restoration program for market prices, i.e. again back to TETAŞ as income, in order to relieve the rise in the wholesale tariffs of the remaining portfolios of TETAŞ.

Discussions made between the representatives of Ministry of Energy and Natural Resources (MENR) and BO and BOT investors for releasing the long term purchasing contracts, between 2002 and 2003, came to an end with negative outcome, hence the contracts could not have been terminated. Furthermore, the present status of BO plants has been reinforced by the amendment made on the Law No: 4628 by the Law No: 5539 enacted in 01/07/2009, in order to emphasize the validity and duration of the contracts. In terms of these facts, it can be said that life-span of TETAŞ will be extended at least to a period determined by the validity of these BO and BOT agreements.

The portfolio of TETAŞ will decrease as a result of the liberalization program. As a consequence, it seems that 20 hydroelectric plants that are under the control of EÜAŞ including the natural monopoly type large-capacity hydroelectric power plants and nuclear plants if it is deemed necessary to be built, remain in the portfolio of the TETAŞ in the long term. Although TETAŞ will become smaller in terms of its budget as its portfolio decreases, the idea

of disappearance of TETAŞ is no more valid and the life span of TETAŞ has been extended in the long run.

3.6. The Law No: 5654, "Installation and Operation of Nuclear Plants and Energy Purchasing" and its Impacts on TETAŞ

The year 2009 will be a year in which the Turkish Electricity Generation System is expected to confront a very serious deficiency in supply and demand. The main reason for this deficiency is the lack of investments in the generation sector within the period 2005-2009. This lack of investments has created serious difficulties in the establishment of the liberalized market model. Although, the Government continually denied the imbalance in the supply-demand profile and the obvious need for new investments in the generation sector, it has eventually realized situation, that some urgent, radical measures are needed for promoting the investments in order to restore the imbalance.

Government's point of view on this issue may shortly be outlined as follows:

(a) Applications for making investment in coal-fired plants based on the domestic coal reserves in Afsin-Elbistan Area must urgently be promoted,

(b) Foreign investment in nuclear plants must urgently be attracted by a Law in which the necessary incentives are to be outlined,

(c) Both of the nuclear and the coal-fired power plant projects must be supported by some kind of long-term purchasing agreements to the firms,

(d) The purchasing agreements however, must be arranged in such a way that the people and media against the liberalization program of the Government will not be able to make political

discussions claiming that Article 2 stated in the Electricity Market Law[4] is violated, i.e. again long-term purchasing obligations are imposed on the state-owned wholesale trading company TETAŞ.

(e) For that purpose, some kind of long-term purchasing obligation with a certain price profile shall be implemented to those retail (i.e. the retail branch of the existing state-owned distribution companies) and wholesale companies acting in the market, and in case that the total electricity generation could not be fully absorbed by these retail and wholesale companies, the remaining part shall be transferred to TETAŞ,

Because of the concerns of the Government stated above, the Law No: 5654, "Installation and Operation of Nuclear Plants and Energy Purchasing", dated: May 08, 2007[5] was submitted to the Parliament.

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[4] **Article 2 in EML dated 03.03.2001;**

Turkish Electricity Trading and Contracting Co. Inc. (TETAŞ) takes over the existing energy sale and purchase agreements from TEAŞ and TEDAS signed within the framework of existing contracts. It may sign energy purchase and sales agreements within the scope of Provisional Article 4 and Provisional Article 8, implements and terminates the agreements it took over and/or signed. On the condition to be limited to the energy sales commitments assumed by the Turkish Electricity Trading and Contracting Co. Inc. (TETAŞ) against TEDAS and distribution companies within the framework of the transfer of operating rights agreements transferred until 31 October 2001, the Turkish Electricity Trading and Contracting Co. Inc. purchases electricity from Electricity Generation Co. Inc. unless a more economical supply resource is available and in case the electricity supply shortage continues, may sign energy purchase agreements, provided that the term of such contracts do not exceed one year and are approved by the Board.

[5] **Law No: 5654 on Installation and Operation of Nuclear Plants, dated: May 08, 2007, Article 4,**

Companies with licenses for retail and wholesale activities make bilateral agreements to purchase the electrical energy generated by the plant for fifteen years of operation period. Conditions concerning the purchasing obligation are inserted in the licenses of these companies.

The amount of electrical energy, remaining as the difference between the generated and sold electricity, if any, is purchased by TETAŞ through bilateral agreements.

Law No: 5654 on Installation and Operation of Nuclear Plants, dated: May 08, 2007, Article 6,

Company granted with the rights stated in this law, may establish a partnership relation with a public economic enterprise on the principle of the public economic enterprise participating in the shares of the Company subject to the Law no. 233, on Public Economic Enterprises dated 08.06.1984.

As a conclusion it can be said that the Government seems;

(a) to have decided to grant the long-term purchasing guarantees to generation companies, as in the years 1994-1997 on the basis of BO contracts,

(b) ready to accept a wide range of commercial alternatives for participation on the principle of Public Economic Enterprises (EÜAŞ in this case).

Articles 4, 6 and Provisional Article 2 of Law No: 5654 on "Installation and Operation of Nuclear Plants and Energy Purchasing" are clear indications of these observations.

In May 24, 2007, The President of the Turkish Republic has put a veto on Articles 5, 6, and 7 of Law No: 5654 on "Installation and Operation of Nuclear Plants and Energy Purchasing", dated May 08, 2007, with the justification that the statement in Article 6 - ***"Private companies may participate in the shares of the company to be established in a percent that they determine" -*** is an indication that the participation procedure in the statement is ***"Privatization"***. As stated in Article 47 in the Turkish Constitution, however, the principles and methods of the privatization procedure must be arranged by law. In addition, the statement grants the right of deciding on the

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Public economic enterprises may install power plants as stated in this Law. For that purpose, the Council of Ministers may decide to establish an economic enterprise for installing power plants, and/or operating, being to be operated by a third party, and selling the generated power subject to private law, without being subject to the Law no. 233, on Public Economic Enterprises dated 08.06.1984. Private companies may participate in the shares of the company to be established in a percent that they determine.

Law No: 5654 on Installation and Operation of Nuclear Plants, dated: May 08, 2007, Provisional Article 2.

Electricity generated by those coal-fired plants with a rating above 1000 MW installed by those Companies granted by EÜAŞ by a tender for the right of using domestic coal reserves is purchased by the retail and wholesale companies subject to the Article 4 in this Law, provided that the plants are put in service by the end of 2014.

percentage of shares in participation to a company, while according to Article 47 in the Turkish Constitution, this right resides solely in the Government.

As a result of the President's veto, it now became clear that the legal basis for Public Private Partnership (PPP) does not exist, unless a new legislative framework has been prepared and passed through the Turkish Parliament according to the principles stated in the veto, i.e. regarding Article 47 in the Turkish Constitution that the principles and methods of privatization procedure must be arranged by law. It seems, however, that the new Government will exhibit an effort similar to that of the present Government in order to be able to enact Law No: 5654 "Installation and Operation of Nuclear Plants and Energy Purchasing". Urgency of the situation on the other hand, puts a severe time limitations in front of the new Government for the enactment of the Law.

Parties with commercial interests in taking a role in the Public Private Partnership (PPP) Projects are expected to emphasize the urgency of finding a solution for the supply-demand gap in 2009 and the importance of purchasing guarantees to be imposed on TETAŞ in order to promote the investments for the reliability and stability of the Turkish electrical power system. However, these wills of the companies put strong pressure on the Government and the Government can not resist these pressures. Hence, the problem of the imbalance between supply-demand will be solved if Law No: 5654 "Installation and Operation of Nuclear Plants and Energy Purchasing" is accepted in the second time but the establishment of the liberalization efforts will be hindered due to the increase in the life-span of TETAŞ in the long term.

Retail and wholesale companies acting in the market as competitors and their potential successors to be assigned after the liberalization procedure are expected to be standing severely and strongly against the purchasing guarantees to be imposed on TETAŞ within the context of Public Private Partnership (PPP) projects, due to the obvious reason that most of these

companies are presently trying to obtain their own generation facilities by taking over hydroelectric and coal-fired power plant projects at the project or installation phase.

To conclude, Law No: 5654 envisages bilateral contracts and Electricity Sales Agreements (ESAs) under the long-term purchasing guarantees to be imposed on TETAŞ. Moreover, the bilateral contracts and ESAs will be valid for the coal type plants which have a capacity above 1000 MW, such as Afşin Coal Plant. In addition, the partnership of the Government with these plants was presented in the Law. The idea of "the partnership of the Government" will be a big handicap for the liberalization procedure, if the President of the Turkish Republic accepts the law in the second run. It will not only ruin what the Governments have done so far for the establishment of the liberalization in the Turkish electricity market but also extend the life-span of TETAŞ for a long period of time.

3.7. The Law No: 5686, "The Geo-Thermal Resources and Natural Mineral Water Law" and its Impacts on TETAŞ

In June 2007, The Government enacted Law No: 5686 **"The Geo-Thermal Resources and Natural Mineral Water Law"**. The law includes a Provisional Statement 10 with an objective quite similar to that in the Law No: 5654. The Provisional Statement 10 states that; **"the electricity generated by those plants whose coal reserves are granted by EÜAŞ, with at least 1000 MW rating, installed not later than 2014 shall be bought by retail and wholesale branches of the distribution companies for 15 years time period. Conditions concerning the electricity purchasing liabilities are written in the licenses of these companies. The excess amount resulting from these transactions, if any, is purchased by TETAŞ."**

As a conclusion, it seems that the supply-demand imbalance problem will be solved in the medium-term by the enactment of this law, but the life span of TETAŞ will significantly be increased in the long run, thus these kinds of laws are hindering the establishment of the liberalization of Turkish electricity market.

3.8. Evaluation of the Dominant Position of TETAŞ in the Turkish Wholesale Electricity Market

A single provider is said to be monopoly if it serves for the entire market demand. Even though there are several concepts of monopoly such as cross-monopoly and natural monopoly, they possess a common thread in that rivalry in a particular market cannot be sustained and perhaps is even inefficient. One idea of monopoly is that in some situations competition causes self-destruction of the market structure, resulting in a single firm supplying the entire market demand. This idea has led to the cost-based definition of monopoly, which states that a firm is a natural monopoly, if it is able to serve the entire market demand at a lower cost than any combination of two or more smaller, more specialized firms.[22]

If the monopoly firm serves the whole market, then economies of scale are sufficient for the firm to be a *monopoly*, although other cost characteristics may also result in a single-product firm being considered a natural monopoly. Economies of scale imply that the firm's average cost declines as the firm increases output. Even if the firm is not a monopoly, it may not always be subject to a significant competitive pressure. In this situation, the firm is said to have *market power* because the firm becomes able to receive a profit above its cost of equity by limiting its output to be given to the market.

Measurement of the market power is directly related to the supply concentration in the market. That's why it is apt to state that supply concentration is a measure for Market Power. "Supply Concentration" is the situation that a large percentage of the generating/trading capacity is owned and/or operated by a single investor.

Main effect of the supply concentration is the increase of Market Power. Supply concentration may be reduced by;

- increasing the volume of divestiture from the company with supply concentration, i.e. by transferring plants to purchasers by specifying the price of long-term power sale from this plant to the regulated utility,
- limiting the percentage of ownership of the generating/trading capacity in the market,

Regulators employ several tools for detecting the market power, such as the Herfindahl-Hirschman Index (HHI) and the Lerner Index. The HHI is an index of the number of firms in the market and their market shares. The formula of Herfindahl-Hirschman Index and the calculation of the market power in the Turkish electricity wholesale market are given in the Formula 1 and Table 25, 26, 27, 28, 29 and Table 30 respectively.

$$HHI = \sum_{i=1}^{n} \phi_i^2$$

Formula 1 Herfindahl-Hirschman Index Formula

In the formula, n represents the number of market participants; Φi represents the percentage market share of the i^{th} participant.

It is very important to calculate the supply concentration in order to measure the market power, if any, in order to handle the difficulties in the Turkish electricity wholesale market. To do that, Herfindahl-Hirschman Index Formula

is to be used. Table 25 shows the total wholesale trading with system imbalance between September 2006 and June 2007.

Table 25 Total Wholesale Trading with System Imbalance (Sept. 2006- June 2007)

No	Date	Wholesale Trading (MWh)	System Imbalance (MWh)	TOTAL Wholesale Trading (MWh)
1	September 06	9.966.065	2.327.678	12.293.743
2	October 06	9.452.125	2.207.002	11.659.127
3	November 06	11.115.949	1.845.059	12.961.008
4	December 06	11.844.951	2.061.324	13.906.275
5	January 07	11.242.157	2.358.057	13.600.214
6	February 07	10.682.384	1.885.315	12.567.699
7	March 07	11.315.857	2.255.971	13.571.828
8	April 07	10.347.533	2.596.649	12.944.182
9	May 07	10.628.958	2.458.567	13.087.525
10	June 07	10.898.206	2.615.145	13.513.351

Table 26 indicates the market share and the wholesale trading activities of TETAŞ in the Turkish electricity market.

Table 26 Wholesale Trading activities and the market share of TETAŞ (Sept. 2006- June 2007)

No	Energy Flow	Date	Bilateral Contracts (MWh)	TOTAL Wholesale Trading (MWh)	TETAŞ Wholesale Market Share (TETAŞ/TOTAL)
1	TETAŞ→Wholesale Market	September 06	5.329.532	12.293.743	53,47679 %
2	TETAŞ→Wholesale Market	October 06	5.315.952	11.659.127	56,24081 %
3	TETAŞ→Wholesale Market	November 06	6.357.338	12.961.008	57,19114 %
4	TETAŞ→Wholesale Market	December 06	6.893.745	13.906.275	58,19986 %
5	TETAŞ→Wholesale Market	January 07	6.630.686	13.600.214	58,98055 %
6	TETAŞ→Wholesale Market	February 07	6.442.959	12.567.699	60,31387 %
7	TETAŞ→Wholesale Market	March 07	7.041.007	13.571.828	62,22248 %
8	TETAŞ→Wholesale Market	April 07	6.559.491	12.944.182	63,39183 %
9	TETAŞ→Wholesale Market	May 07	7.013.663	13.087.525	65,98636 %
10	TETAŞ→Wholesale Market	June 07	6.563.253	13.513.351	60,22324 %
	TETAŞ Average Wholesale Market Share				**59,62269 %**

Likewise, Table 27 indicates the market share and the wholesale trading activities of EÜAŞ in the Turkish electricity market.

Table 27 Wholesale Trading activities and the market share of EÜAŞ (Sept. 2006- June 2007)

No	Energy Flow	Date	Bilateral Contracts (MWh)	TOTAL Wholesale Trading (MWh)	EÜAŞ Wholesale Market Share (EÜAŞ/TOTAL)
1	EÜAŞ→Wholesale Market	September 06	6.054.508	12.293.743	60,751239 %
2	EÜAŞ→Wholesale Market	October 06	5.704.981	11.659.127	60,356597 %
3	EÜAŞ→Wholesale Market	November 06	6.362.774	12.961.008	57,240043 %
4	EÜAŞ→Wholesale Market	December 06	6.942.970	13.906.275	58,615439 %
5	EÜAŞ→Wholesale Market	January 07	6.341.365	13.600.214	56,407013 %
6	EÜAŞ→Wholesale Market	February 07	6.244.209	12.567.699	58,453328 %
7	EÜAŞ→Wholesale Market	March 07	6.444.678	13.571.828	56,952629 %
8	EÜAŞ→Wholesale Market	April 07	6.153.858	12.944.182	59,471741 %
9	EÜAŞ→Wholesale Market	May 07	6.047.452	13.087.525	56,896001 %
10	EÜAŞ→Wholesale Market	June 07	6.495.488	13.513.351	60,751239 %
	EÜAŞ Average Wholesale Market Share				**58,59 %**

Table 28 shows the market share and the wholesale trading of Private Wholesale Trading Companies (PWTC) in the Turkish electricity market.

Table 28 Wholesale Trading activities and the market share of PWTC (Sept. 2006- June 2007)

No	Energy Flow	Date	Bilateral Contracts (MWh)	TOTAL Wholesale Trading (MWh)	Private Wholesale Companies Market Share
1	• UNIT • MEGA • PARK • ELTEK • EKENERJİ • AKSA • ENERJİSA • AYEN • MARMARA • ŞAVK • ENİMEKS • ZORLU • SÖNMEZ • KARTET • T.ENERJİ→ Wholesale Market	September 06	229.025	12.293.743	2,298048 %
2		October 06	168.192	11.659.127	1,779409 %
3		November 06	152.836	12.961.008	1,374925 %
4		December 06	140.236	13.906.275	1,183931 %
5		January 07	153.078	13.600.214	1,361643 %
6		February 07	88.424	12.567.699	0,827755 %
7		March 07	136.225	13.571.828	1,203842 %
8		April 07	137.422	12.944.182	1,328065 %
9		May 07	153.654	13.087.525	1,445617 %
10		June 07	137.432	13.513.351	1,261052 %
	PWTC Average Wholesale Market Share				**1,406429 %**

Table 29 shows the market share of Private producers in the Turkish electricity market.

Table 29 The market share of BO, BOT and TOOR Plants (Sept. 2006- June 2007)

No	Energy Flow BO, BOT, TOOR → Wholesale Market	Private Producers Market Share
1	Private Producers (BO, BOT, TOOR) Average Wholesale Market Share	1,330572 %

According to the data given in the Table 25 through Table 29, the data needed to calculate the supply concentration of the Turkish electricity wholesale market with Herfindahl-Hirschman Index formula is obtained. Calculation of the HHII index is given in Table 30.

Table 30 Calculation of the Supply Concentration of the Turkish Electricity Wholesale Market

Herfindahl-Hirschman Index Formula	Companies (i's)	Market Shares (Φi's)	HHI CALCULATION
$HHI = \sum_{i=1}^{n} \phi_i^2$	TETAŞ	59,62269 %	0.691744
	EÜAŞ	58,59 %	
	PWTC	1,406429 %	
	Private Producers	1,330572 %	

In a fully monopolistic structure, Herfindahl-Hirschman Index (HHI) is equal to 1.0. In the Turkish case, HHI is equal to 0.691744 which is very close to 1.0. This situation indicates that supply concentration in Turkish electricity wholesale market is now a handicap in front of the establishment of the liberalized market structure. It is apt to state that EÜAŞ and TETAŞ are holding the dominant position in the market. Since EÜAŞ has not been liberalized yet and it is still belong to state, and since TETAŞ is a state-owned company, it is very clear that the state has the dominance on the Turkish electricity wholesale market. Moreover these state-owned companies

have the market power on the Turkish electricity wholesale market. In this kind of situation, it is very difficult to attract the attention of the investors to Turkish electricity market because of this monopolistic wholesale market structure.

Moreover, TETAŞ is used as an effective company by the Government to decrease the electricity prices. The government considers the state-owned wholesale trading company, TETAŞ, as an effective and a valuable tool for their political benefit in order to affect the public. As a result of this political interference in the electricity tariffs, the electricity prices is no more cost-based; on the contrary, the electricity prices have been turned out to be subsidy-based tariff which can be observed in the monopolistic models.

In order to handle such monopolies in the liberalized Turkish electricity market structure, remedies against the market power are stated in Law No: 4628.[6] However, these remedies have not been applied because of the political interferences to the market by the Government.

In many countries, electricity services have historically been supplied by vertically integrated enterprises dealing with generation, transmission, distribution and supply services. Such enterprises are managed as regulated

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[6] **Article 2.2, Section 2 in EML dated 03.03.2001;**

The total share a private sector generation company in the market through the generation facilities, which it operates together with its partnerships, cannot exceed the twenty percent of the Turkey total electricity energy installed capacity, which has been announced the preceding year.

Article 3.3, Section 2 in EML dated 03.03.2001;

In addition to regular distribution and retail trading activities, private sector distribution companies may be granted license for installing generation facilities within the region specified in their licenses,provided that their annual electrical energy generation does not exceed twenty percent of the total annual electricity energy supplied for consumption within their region in the preceding year.

vertical monopolies under public ownership. The performance of these regulated monopolies has varied widely across countries. Many developing countries have nevertheless faced common problems in the expansion of the energy sector, including low labor productivity, poor service quality, substantial energy losses (due to technical losses and illicit utilization), inadequate investment in power supply facilities, and cross-subsidized electricity prices to cover actual generation and transmission costs and support expansion investments in a constrained power system. Therefore, the design of reform programs in individual countries should reflect the particular socioeconomic circumstances of a country and its electricity sector. Many energy sector reform programs in developing countries, particularly in those where the energy sector is organized as vertical monopolies under public ownership as it was in Turkey, are focused on moving from this model to either a single buyer model (SBM) or directly to a competitive market model. Competitive market model is the model that the Turkish Government has chosen for the liberalization of Turkish electricity market since the enactment of the Law No: 4628 in 2001.

The competitive market is a market where it is intended to ensure competition, as is also mentioned in the Electricity Market Law No: 4628. However, in Turkey dealing with the long-term treasury-guaranteed PPAs and the associated stranded costs are the difficulties in front of the competitive market establishment.

Stranded costs are the outcomes of the high-cost, long term purchasing contracts i.e. long term “existing energy contracts”. As long term purchasing obligations lead to additional costs, regardless of what method is chosen for addressing the costs, this situation is seen as a difficulty in transition to the competitive market structure and the formation of the cost-based wholesale price. Since the existing contracts are mostly long-term, present holder of these contracts; TETAŞ, as a state-owned monopoly, holds the dominant position as the main wholesale energy trader in the wholesale market.

To illustrate the effects of long-term Power Purchase Agreements (PPA's) on Turkish electricity market and on TETAŞ, TEAŞ signed a PPA with Doğa Enerji A.Ş. in the scope of the BOT projects before the enactment of Law No: 4628, which expires in 2019. TETAŞ's payment obligations under the PPA are ultimately guaranteed by the Republic of Turkey. As may be seen from the example, TETAŞ has twenty-three of these kinds of PPAs commonly known as BOT contracts. In order for TETAŞ to extinguish from the market by all means at the end of the transition period, these financial burdens and liabilities should be expired; and there should be no companies in the portfolio of TETAŞ including the total of 20 hydroelectric plants involving the natural monopoly-type large-capacity hydroelectric plants such as Keban, Karakaya and Atatürk otherwise, the dominance of TETAŞ in the electricity wholesale market will continue until the end of 2019. However this situation does not seems to be realized. There is no way to cancel the existing long-term power purchase agreements and it seems that the hydroelectric plants under the possession of EÜAŞ are not easy to be liberalized for a long period of time. So this situation makes the lifespan of TETAŞ longer and this consequence will significantly spoil the liberalization procedure for the electricity market.

The dominant position of state-owned trading company, TETAŞ, also induces some concerns in the short term. One of the most important concerns is the provision for additional power generation capacity by private companies during the development of a competitive market. Independent Power Producers (IPPs) will feel the need to sign long-term contracts with the government in order to protect their investments, unless they are confident in the continued competitiveness of the electricity market and the liquidity of market contracts. These conditions are only plausible with the insurance of the distribution companies' creditworthiness and the provision of cost-based electricity tariffs. However, distribution companies in Turkey are facing financial difficulties mainly due to high technical losses and illicit utilization of the electricity. On the contrary, these induced concerns hinder medium and

long term efforts of the establishment of the competitive market structure since the long term purchase guarantees make TETAŞ life-span longer. Since TETAŞ holds its dominance position in the wholesale market, it does not seem possible to achieve fully liberalized market establishment in the near future.

3.8.1. Solution for Resolving the Market Dominancy of TETAŞ

Actual competitive market reform programs exhibit a variety of designs, particularly in terms of market structure, degree of private involvement and sequencing of reform stages. None of the model fits all participating countries and no matter which model is initially chosen, so electricity market restructuring is an ongoing and evolving procedure. Hence, the design of reform programs in individual countries should be adapted to the particular socioeconomic circumstances of a country and its electricity sector. Many energy sector reform programs in developing countries, particularly in those where the energy sector is organized as monopolies under public ownership are focused on moving from a monopoly to a competitive liberalized model.

When the competition-based liberalized market is established in Turkey, the commercial functions of TETAŞ are expected to be finalized. Hence, it can be stated that when the liberalized market is completely established, the dominancy of TETAŞ in the Turkish wholesale electricity market will naturally be expired. Thus, the establishment of the fully competitive Turkish electricity market structure has a vital importance to handle monopolies and the dominant positioned companies in the sector in the mean term.

CHAPTER 4

CONCLUSION

The Government of Turkey still does not have a long-term sustainable energy strategy and has not presented an accurate energy policy for the benefit of the country. Especially the Strategy Paper dated March 17, 2004, concerning the Electricity Market Reform and Liberalization, which defines the steps to be taken to ensure a smooth transition towards a fully competitive electricity market, is said to be unsuccessful. However, only a minority of the objectives explained in the strategy paper have been fulfilled. At the end of the year 2006, the distribution assets were planned to be liberalized, but it has not been liberalized yet because of the Government's wrong decisions. This delay affected the liberalization period of the generation portfolio of EÜAŞ. Moreover, the government has not enacted any laws or procedures regarding the liberalization of the portfolio groups that are possessed by EÜAŞ. These delays are one of the important difficulties impeding the liberalization procedure for the Turkish electricity market. Moreover, the liberalization procedure of the generation portfolio of EÜAŞ should have been started at the beginning of the year 2007. However, only minor preparation steps were applied. Portfolio groups have been decided and transition contracts have been signed between the portfolio groups and TEDAŞ. However, the liberalization procedure of the portfolio groups, hydroelectric power plants that are retained in EÜAŞ and other portfolio of EÜAŞ has not been decided yet. Because of these delays and wrong decisions of the Government, the Strategy Paper, is considered to be out of date. Combining all of these factors, it can be concluded that the state-owned trading company TETAŞ has to maintain its position until the end of the liberalization of distribution

assets and the generation portfolio of EÜAŞ excluding 20 hydroelectric plants retained under the possession of EÜAŞ involving the natural monopoly large-capacity hydroelectrical plants and nuclear plants. As a consequence, delays considering the time-table of the liberalization procedure which is stated in the strategy paper, cause an unexpected increase in life-span of TETAŞ. Hence, TETAŞ seems to be in the wholesale market with its huge market power for a rather long period of time.

As a result, it is apt to state that the new government after the election should prefer to establish a new legislative framework for outlining the basic principles and methods for the liberalization procedure of the state-owned generation plants in order to achieve the overall liberalization of the Turkish electricity market and the new Government must finish the liberalization procedure of the distribution regions as quickly as possible.

At the end of the liberalization procedure for the generation portfolio of EÜAŞ, assuming that the distribution systems are totally liberalized, TETAŞ's responsibilities as defined in Law No: 4628 will be fulfilled. However, it seems that 20 hydroelectric plants that are under the possession of EÜAŞ including the natural monopoly type large-capacity hydroelectric power plants will remain in the portfolio of the TETAŞ in the long term. These plants seem to continue supplying energy to TETAŞ for a rather long period of time even after the liberalization program has been completed. Natural monopoly type large-capacity hydroelectric power plants such as Keban, Karakaya and Atatürk are used for frequency regulation and watering purposes as indicated in the previous chapters. Because of these multi-purpose hydroelectric power plants, the liberalization procedure of the 20 hydroelectrical plants that are retained in EÜAŞ should be examined and scrutinized very carefully and very quickly in order to achieve the liberalization of the generation sector by all means. Although TETAŞ will become smaller in terms of its budget as its portfolio decreases after the liberalization of the generation plants, the idea of disappearance of TETAŞ seems difficult to be achieved in the long run.

After all generation plants and distribution regions are liberalized and the responsibility of TETAŞ on the eligible customer be fulfilled, the domestic and foreign companies will be eager to take part in the Turkish electricity wholesale market. Hence, the establishment of the competitive market has vital importance so that the prices will be equivalent to the market price and the establishment of the liberal electricity market will be achieved by all means.

However, the Government envisaged that the liberalization of public services still necessitates the state to invest in areas, such as base load projects like nuclear power plants and coal plants which is indeed against the idea of liberalization. The Government presented Law No: 5654, "Installation and Operation of Nuclear Plants and Energy Purchasing", dated May 2007, to the assembly and it was accepted by the deputies. Although the President of the Turkish Republic has put a veto on Articles 5, 6, and 7 of Law No: 5654, it is apt to state that the new Government will accept the same law as it is and send it to the approval of the new President of the Turkish Republic for the second time. Moreover, Law No: 5686 "The Geo-Thermal Resources and Natural Mineral Water Law", dated June 2007 was enacted by the Government.

Both of the laws offer new bilateral contracts, mean term power purchase agreements and state guarantees to be imposed on TETAŞ. These statements which are outlined in Laws No: 5654 and 5686 hinder the overall liberalization efforts. Moreover, power purchase agreements with state guarantees will be valid for the coal type plants which have a capacity above 1000 MW, such as Afşin Coal Plant. It is not the only wrong decision in both of the laws but also the partnership of the Government on the coal plants is offered. The idea of "the Partnership of the Government" will be a big handicap for the liberalization procedure. In addition, the excess capacity shall be sold to TETAŞ, if it is deemed necessary. These concepts are not only ruining what the Governments have done so far but also extending the

life-time of TETAŞ. Moreover, these envisagement are contradicting the facts stated in the Strategy Paper. The Strategy Paper aimed to establish a competitive market structure by taking into account the existing public liabilities and not leading to additional State guarantees. However, the Laws No: 5654 and 5686 present State guarantees and additional purchases by TETAŞ. All of these enacted laws are postponing the liberalization of the overall electricity sector. It is now very clear that the cornerstone of the electricity liberalization procedure, which is known as the Law No: 4628 and the objectives stated in Law No: 4628 which aims to achieve the establishment of the liberal electricity market, has been losing power.

The enactment of these Laws may reduce the imbalance between supply-demand in Turkish energy sector in the mean term but the establishment of the liberalization efforts will be hindered due to the increase in the life-span of TETAŞ in the long term.

As a result, the production portfolio of TETAŞ seems to consist of only nuclear plants and natural monopoly type large-capacity hydroelectric power plants. All kinds of regulations and alterations that increase the production portfolio and the operation period of TETAŞ such as Law No: 5654 and 5686 would jeopardize liberalization efforts.

Other important handicaps in front of the liberalization efforts are the supply concentration and market power concepts in Turkish electricity wholesale market. Herfindahl Hirschman Index calculations indicate that supply concentration in Turkish electricity wholesale market is now a handicap in front of the establishment of the liberalized market structure. EÜAŞ and TETAŞ are holding the dominant position in the wholesale market. Since EÜAŞ and TETAŞ are the state-owned companies, it is very clear that the state has the dominance on the Turkish electricity wholesale market. As a consequence of the supply concentration of the state-owned companies, these companies are said to have market power in the Turkish electricity wholesale market. In this kind of situation, it is very difficult to attract the

attention of the investors to Turkey because of this monopolistic wholesale market structure. Although most of the portfolio of EÜAŞ is to be liberalized in the mean term, TETAŞ seems to take part in the wholesale market for a long period of time. Since TETAŞ holds its dominance position in the wholesale market in the long run, it does not seem possible to achieve fully liberalized market establishment in the near future.

Hence, it can be stated that when the liberalized market is completely established, the dominancy of TETAŞ in the Turkish wholesale electricity market will naturally be expired. Thus, the establishment of the fully competitive Turkish electricity market structure has a vital importance to handle monopolies and the dominant positioned companies in the sector.

The implementation of cost-based electricity prices is one of the key issues for the development of a competitive electricity market in Turkey. Therefore, a well-designed electricity tariff strategy that considers the social, economic, and political issues of the Country is quite important. Determining subsidies and defining a phase-out plan for subsidies are among the critical issues for a transition phase in restructuring and are essential for introducing incremental steps in adjusting electricity prices. The development of a competitive electricity market depends on the success of this transition phase applications in Turkey. The market is facing the transitional challenges during the transition period and it is apt to state that it is very normal to have such difficulties. Handling of stranded costs is one of the problems that the market has faced so far. However, stranded benefit is the cure for this problem during the period. The existences of heavy contracts, such as the 20-year BO and BOT plants' contracts are one of the greatest handicap for the market. These kinds of long term agreements make TETAŞ life-span longer and hamper the liberal market establishment.

Hence, it should not be forgotten that Reformation is always a challenging issue and requires political commitment. In addition, reforms necessitate a comprehensive restructuring procedure, needs continuous effort and have to

be better implemented gradually. Moreover, the reforms such as liberalization can be achieved via public support. However, these are not enough for a success. There are inevitable conditions to be taken care of in order to manage the liberalization procedure. Firstly, a well-established market design and well-thought Government energy policy are very important. At the same time, both the investors and the customers should have a confidence in proper functioning of the market. This confidence will trigger the increase in demand and solve the problem of the need for the new investments. This will directly affect wholesale prices and these prices will encourage both domestic and foreign investors to invest in the Turkish electricity wholesale sector. That's why the disappearance of TETAŞ plays a vital role in the establishment of a liberalized market structure. However, it seems difficult to be realized in the long term.

As a result, electricity trading should not be done only by a public service, the state-owned company TETAŞ. If it is deemed necessary to have a state-owned company in the market because of the security reasons and the energy policy of the Government emanated from the establishment of the nuclear plants, then the supply concentration and associated market power of the state-owned company should be reduced so that the investors will take part in the wholesale market and the establishment of the competitive market will be achieved. If it is not the case, then the drawbacks of this kind of an administration mechanism inflict important damages on the sector. These can be enumerated as follows:

1. The government may consider the state-owned wholesale trading company, TETAŞ, as an effective and a valuable tool for their political benefit in order to affect the public. One of the important strategies to be used by such a company is to make the electricity prices stable before the elections so that the public may think that it is a success of the government. However, the truth is that the prices will

dramatically increase after the election and the citizens will pay more money.

2. As a result of this political interference in the electricity tariffs, the electricity prices will either be partially or no more cost-based; on the contrary, the electricity prices will turn out to be subsidy-based tariff which can be observed in the monopolistic models.

3. As a result of these policies, distribution and the generation companies start to lose money because they can not meet their production expenses. So the Treasury Ministry has to subsidize at the end of the year.

4. As a result of these facts, the majority of the people, who can be considered as the non-eligible customers who use less amount of electricity, will pay more money compared to the high-usage rate payers. This payment will be demanded by the government in terms of taxes so that the deficit of the budget will be subsidized by these taxes. Therefore, the industry and the legal entities which use high amount of electricity will gain unfair benefit. This is an unfair way of source transfer from the government to the industry.

5. Thus, especially the foreign investors and the domestic investors who want to invest money in the electricity market, may withdraw from taking part in the Turkish electricity market because of non-cost–based tariff as an outcome of the cross subsidies. Hence, the establishment of a competition-based market structure or, in other words, liberalization efforts will be hampered seriously and “Market Opening” will not reach a certain level.

6. Inevitably, these delays cause a state-based monopolistic structure so that the government has to invest money in order to balance the increasing demand and the load of the government will surely increase. So the investments needed for the governmental services such as health, internal and external security, justice, education and municipality services will decrease dramatically.

7. As a result, in the mean and the long term, the demand-supply balance will be corrupted and the need for investments will increase. So the foreign and the domestic investors will not meet these needs, so the establishment of the competition-based market structure will surely be unsuccessful. Thus, the emanation of the state-owned energy policy and monopolistic structure of the electricity market will gain power.

As a result of these facts, without any reformist movements, the liberalization efforts on the energy sector and particularly the electricity market will fail completely and TETAŞ will remain as a state-owned wholesale trading company in Turkish electricity market for a long period of time.

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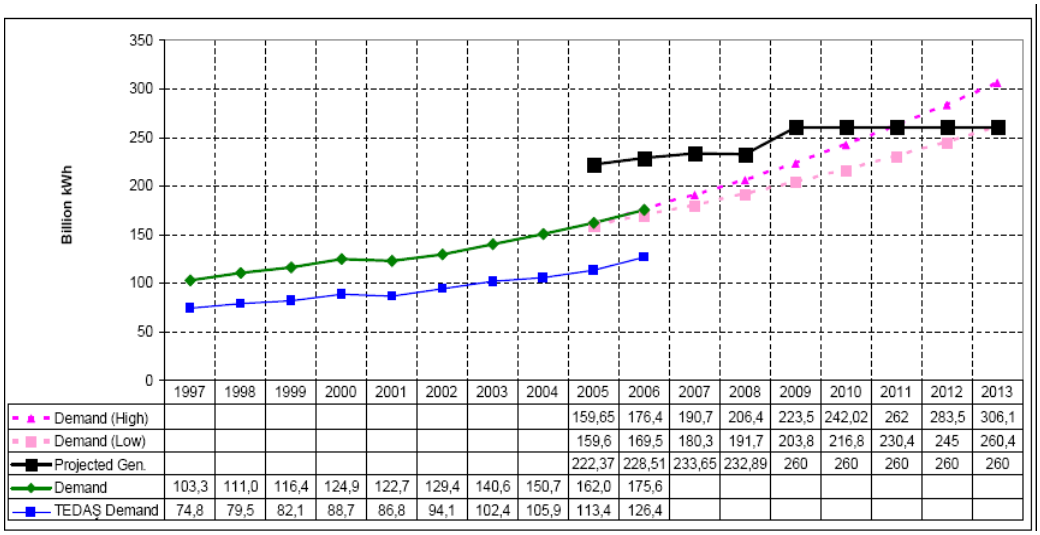
APPENDIX A



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Demand (High)									159,65	176,4	190,7	206,4	223,5	242,02	262	283,5	306,1
Demand (Low)									159,6	169,5	180,3	191,7	203,8	216,8	230,4	245	260,4
Projected Gen.									222,37	228,51	233,65	232,89	260	260	260	260	260
Demand	103,3	111,0	116,4	124,9	122,7	129,4	140,6	150,7	162,0	175,6							
TEDAŞ Demand	74,8	79,5	82,1	88,7	86,8	94,1	102,4	105,9	113,4	126,4							

Figure A-1 Turkey's Electrical Energy Consumption

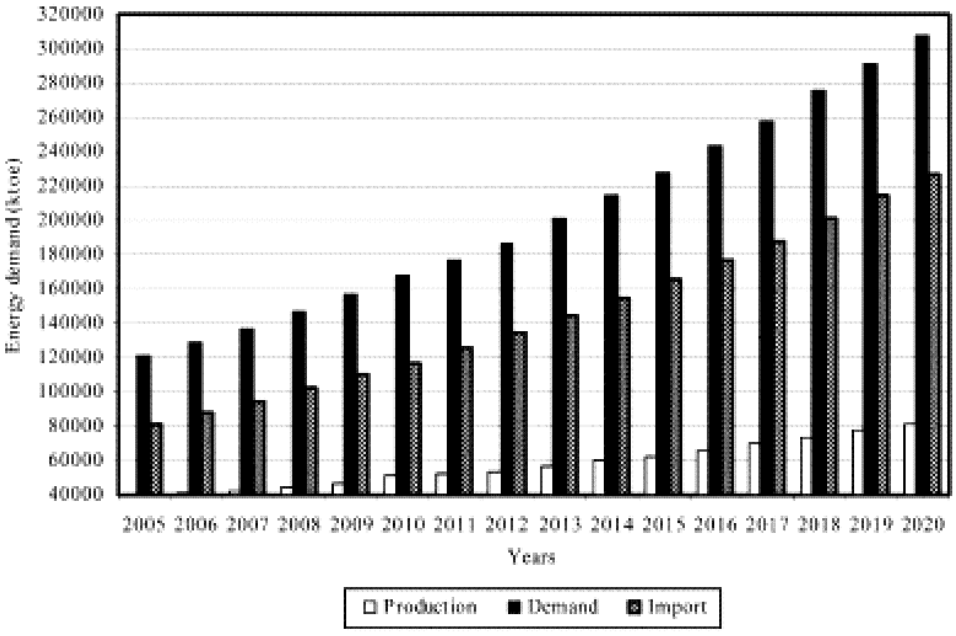


Figure A-2 Primary energy production, demand and import in Turkey during 2005–2020.

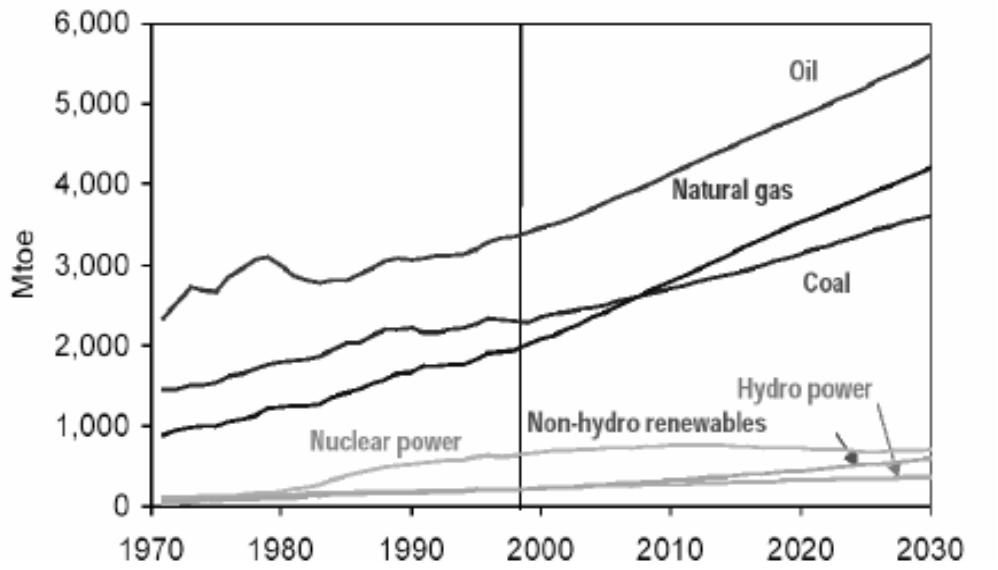


Figure A-3 Resources in Global Primary Energy Demand of Turkey (1970-2030)

[World Energy Outlook 2002, International Energy Agency (IEA). Available from the official website of IEA: http://www.iea.org accessed on 26 December 2006.]

APPENDIX B

Table B-1 Distribution Regions and Companies

COMPANY	DISTRIBUTION REGIONS	NET CONSUMPTION(MWH)
Akdeniz Electricity Distribution Inc.	Antalya, Burdur, Isparta İl sınırları	4.972,455
Aras Electricity Distribution Inc.	Erzurum, Ağrı, Ardahan, Bayburt, Erzincan, Iğdır,Kars	2.331,664
Çoruh Electricity Distribution Inc.	Trabzon, Artvin, Giresun, Gümüşhane, Rize	2.456,283
Dicle Electricity Distribution Inc.	Diyarbakır, Şanlıurfa, Mardin, Batman, Siirt Şırnak	4.564,139
Fırat Electricity Distribution Inc.	Elazığ, Bingöl, Malatya, Tunceli	2.466,025
Gediz Electricity Distribution Inc.	İzmir, Manisa	18.264,215
Göksu Electricity Distribution Inc.	Kahramanmaraş, Adıyaman	3.243,143
Çamlıbel Electricity Distribution Inc.	Sivas, Tokat, Yozgat	2.263,649
Menderes Electricity Distribution Inc.	Aydın, Denizli, Muğla	6.354,211
Osmangazi Electricity Distribution Inc.	Eskişehir, Afyon, Bilecik, Kütahya, Uşak	6.636,542
Toroslar Electricity Distribution Inc.	Adana, Gaziantep, Hatay, Mersin, Osmaniye, Kilis	14.758,086
Uludağ Electricity Distribution Inc.	Balıkesir, Bursa, Çanakkale, Yalova	16.551,847
Vangölü Electricity Distribution Inc.	Bitlis, Hakkari, Muş, Van	1.662.722
Yeşilırmak Electricity Distribution Inc.	Samsun, Amasya, Çorum, Ordu, Sinop	3.649,542
Başkent Electricity Distribution Inc.	Ankara,Kırıkkale,Zonguldak,Bartın, Karabük,Çankırı, Kastamonu.	11.254,887
Boğaziçi Electricity Distribution Inc.	İstanbul ili Rumeli Yakası.	18.348,751
İstanbul Anadolu Yakası Electricity Distribution Inc.	İstanbul ili Anadolu Yakası.	8.085,465
Meram Electricity Distribution Inc.	Kırşehir, Nevşehir, Niğde, Aksaray, Konya,Karaman.	5.701,883
Sakarya Electricity Distribution Inc.	Sakarya, Bolu, Düzce, Kocaeli.	8.923,492
Trakya Electricity Distribution Inc.	Edirne, Kırklareli, Tekirdağ	6.032,792
Kayseri Electricity Distribution Inc.(Private)	Kayseri	2.646,453
	TOTAL	169.513,736

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APPENDIX C

Table C-1The current situation of the Distribution Liberalization Plan

	DONE	IN PROGRESS	NOT STARTED
Action Plan for Distribution Liberalization			
The legal arrangements regarding the formation of the distribution regions will be completed.	√		
The legal arrangements regarding the formation of the distribution regions will be completed.	√		
The PA will sign consulting services contract for liberalization transactions.	√		
The performance standards and loss targets will be identified for each distribution region	√		
The accounting separation of the distribution regions will be completed	√		
The load profiles for the distribution regions will be prepared.	√		
The distribution companies will file their tariff applications			√
The transition contracts between TETAŞ and distribution companies or between Portfolio generation companies and distribution companies	√		
Separate licenses will be granted for each distribution region and tariff proposals submitted for each distribution company			√

APPENDIX D

Table D-1 The current situation of the Generation Liberalization Plan

	DONE	IN PROGRESS	NOT STARTED
Action Plan for Generation Liberalization			
The generation portion of all publicly owned hydroelectric plants shall be transferred to EÜAŞ.	√		
Portfolio generation groups will be identified and restructured as companies.	√		
The transition contracts between EÜAŞ and TETAŞ will be signed.	√		
The transition contracts between portfolio generation companies/ groups and distribution companies will be signed.	√		
The portfolio generation companies/groups will be transferred to liberalization scope.		√	
Provided Market Management System, to be prepared by TEİAS, is operational, the liberalization procedure will commence for portfolio generation companies/ groups.		√	

APPENDIX E

Table E-1 TETAŞ generation portfolio w.r.t. the BO, BOT &TOOR Plants

Plant(BOT)	Location	Company	Fuel	Contract	Rated
				(Years)	(MW)
Ahiköy-I Hydroelectric	Divriği / Sivas	Ahiköy Ener. San. ve Tic. A.Ş.	River	20	2,1
Ahiköy-Iı Hydroelectric	Divriği / Sivas	Ahiköy Ener. San. ve Tic. A.Ş.	River	20	2,5
Aksu-Çayköy	Çayköy/Eğirdir, Isparta	Aksu Enerji ve Tic.A.Ş.	River	50	15
Alaçatı Wind	Çeşme / Izmir	Ares. Alaçatı Wind.En.Snt San. ve Tic. A.Ş.	Wind	20	7,2
Berdan Hydroelectric	Tarsus/ İçel	Altek Elekt. Sant. Tes. İşlet. ve Tic. A.Ş.	River	15	
Bozcaada Wind	Bozcaada /Çanakkale	Bores.-Bozcaada Wind.En.Snt San. ve Tic.	Wind	20	10,2
Çal Hydroelectric	Çal / Denizli	Limak En.Ür.Dağ.San.Vetic.A.	River	20	2,2
Çamlıca I Hydroelectric	Kayseri	Ayen Enerji A.Ş.	River	15	84
Dınar Iı Hydroelectric	Dinar / Afyon	Metak Ener.Vetic.A.Ş.	River	15	3
Esenyurt N. Gas Plant	Esenyurt /Istanbul	Doğa Enerji Uretim San.ve Tic. Ltd. Şti.	Natural Gas	20	180
Fethiye Hydroelectric	Fethiye / Muğla	Fethiye Enerji ve Tic. A.Ş.	River	15	16,5
Dılovası N. Gas Plant	Gebze Dilovası /Kocaeli	Ova Elektrik A.Ş.	Natural Gas	20	253,4
Gırlevık II Mercan	Erzincan	İçtaş En.Ur.ve Tic. A.Ş.	River	20	11,6
Gönen Hydroelectric	Yenice, Balıkesir	Gönen Hydroelectric. Elekt. Üret. A.Ş.	River	20	10,6
Hasanlar Hydroelectric	Hasanlar Düzce/Bolu	Altek Elekt. Sant. Tes. İşlet. ve Tic. A.Ş.	River	20	9,4
Kısık Hydroelectric	Merkez /K. Maraş	Ayen Enerji A.Ş.	River	15	9,6
M. Ereglisi N. Gas	Marmara Ereğlisi	Trakya Elektrik Uretim ve Tic. A.Ş.	Natural Gas	20	478
M. Ereglisi N. Gas	Marrnara Ereğlisi	Uni-Mar Enerji Yatırımları A.Ş.	Natural Gas	20	478
Suçatı Hydroelectric	Suçatı Köyü/K.Maraş	Ere Elek. Ür. ve Dağ.San.ve Tic. A.Ş.	River	15	7
Sütçüler Hydroelectric	Sütçüler / Isparta	Sütçüler Ener.San. ve Tic. A.Ş.	River	20	2
Tohma-Medik	Malatya	Altek Elekt. Sant. Tes. İşlet. ve Tic. A.Ş.	River	20	12,5
TOTAL					**2266,8**

Plant(BO)	Fuel	Company	Year of	Rated Power	Generation/Year
Adapazarı	N. Gas	İntergen-Enka	2002	777	6.656.248.000,00
Gebze	N. Gas	Intergen-Enka	2002	1554	13.312.497.000,00
İzmir	N. Gas	Intergen-Enka	2002	1523	13.046.932.000,00
Ankara	N. Gas	Tractabel-Mimag	2004	770	6.346.803.000,00
İskenderun	İmport Coal	İsken (Siemens-Steag)	2004	1210	9.337.570.000,00
TOTAL				**5.834**	**48.700.050.000,00**
Plant((TOOR)	**Fuel**	**Company**	**Year of**	**Rated Power**	
Hazar 1-2	Hydroelectric	Bilgin Elektrik A.Ş	1996	29.8	
Çayırhan	Lignite	Park Termik A.Ş.	2001	620.0	
TOTAL				**649.8**	

Table E-2 TETAŞ detailed distribution portfolio

DISTRIBUTION REGION		TEDAS (64+1) REGION						
CUSTOMER GROUPS		ACTIVE ENERGY (TL/kWh)	PEAK TARIFF (TL/kWh)			POWER (TL/kW)	EXCESS POWER USAGE (TL/kW)	REACTIVE ENERGY (TL/kVARh)
			17.00-22.00	22.00-06.00	06.00-17.00			
A) TWO TERM TARIFF								
INDUSTRY	PRIORITY PROVINCES FOR DEVELOPMENT	91.392	134.554	56.976	86.822	5.905.000	8.857.000	45.696
	OTHER PROVINCES	97.776	150.317	56.976	92.890	6.316.000	9.474.000	48.888
INDUCTION AND ARC FURNACES		89.578	130.090	56.976	85.104	4.555.000	6.833.000	44.789
DRINKING AND USAGE WATER	PRIORITY PROVINCES FOR DEVELOPMENT	91.392	134.554	56.976	86.822	4.614.000	6.921.000	45.696
	OTHER PROVINCES	97.776	150.317	56.976	92.890	5.166.000	7.749.000	48.888
TREATMENT FACILITIES	PRIORITY PROVINCES FOR DEVELOPMENT	91.392	134.554	56.976	86.822	5.905.000	8.857.000	45.696
	OTHER PROVINCES	97.776	150.317	56.976	92.890	6.316.000	9.474.000	48.888
B) SINGLE TERM TARIFF								
INDUSTRY	PRIORITY PROVINCES FOR DEVELOPMENT	107.194	170.582	58.848	101.837			53.597
	OTHER PROVINCES	114.595	188.880	58.848	108.864			57.298
DRINKING AND USAGE WATER	PRIORITY PROVINCES FOR DEVELOPMENT	104.486	163.901	58.848	99.264			52.243
	OTHER PROVINCES	111.994	182.438	58.848	106.397			55.997
TREATMENT FACILITIES	PRIORITY PROVINCES FOR DEVELOPMENT	107.194	170.582	58.848	101.837			53.597
	OTHER PROVINCES	114.595	188.880	58.848	108.864			57.298

DISTRIBUTION REGION		BASKENT REGION						
CUSTOMER GROUPS		ACTIVE ENERGY (TL/kWh)	PEAK TARIFF (TL/kWh)			POWER (TL/kW)	EXCESS POWER USAGE (TL/kW)	REACTIVE ENERGY (TL/kVARh)
			17.00-22.00	22.00-06.00	06.00-17.00			
A) TWO TERM TARIFF								
INDUSTRY	PRIORITY PROVINCES FOR DEVELOPMENT	91.373	134.515	56.976	86.803	5.905.000	8.857.000	45.687
	OTHER PROVINCES	97.757	150.278	56.976	92.870	6.316.000	9.474.000	48.879
INDUCTION AND ARC FURNACES		89.558	130.022	56.976	85.094	4.555.000	6.833.000	44.779
DRINKING AND USAGE WATER	PRIORITY PROVINCES FOR DEVELOPMENT	91.373	134.515	56.976	86.803	4.614.000	6.921.000	45.687
	OTHER PROVINCES	97.757	150.278	56.976	92.870	5.166.000	7.749.000	48.879
TREATMENT FACILITIES	PRIORITY PROVINCES FOR DEVELOPMENT	91.373	134.515	56.976	86.803	5.905.000	8.857.000	45.687
	OTHER PROVINCES	97.757	150.278	56.976	92.870	6.316.000	9.474.000	48.879
B) SINGLE TERM TARIFF								
INDUSTRY	PRIORITY PROVINCES FOR DEVELOPMENT	107.174	170.544	58.848	101.818			53.587
	OTHER PROVINCES	114.576	188.832	58.848	108.845			57.288
DRINKING AND USAGE WATER	PRIORITY PROVINCES FOR DEVELOPMENT	104.467	163.853	58.848	99.245			52.234
	OTHER PROVINCES	111.974	182.400	58.848	106.378			55.987
TREATMENT FACILITIES	PRIORITY PROVINCES FOR DEVELOPMENT	107.174	170.544	58.848	101.818			53.587
	OTHER PROVINCES	114.576	188.832	58.848	108.845			57.288

DISTRIBUTION REGION		MERAM REGION						
CUSTOMER GROUPS		ACTIVE ENERGY (TL/kWh)	PEAK TARIFF (TL/kWh) 17.00-22.00	22.00-06.00	06.00-17.00	POWER (TL/kW)	EXCESS POWER USAGE (TL/kW)	REACTIVE ENERGY (TL/kVARh)
A) TWO TERM TARIFF								
INDUSTRY	PRIORITY PROVINCES FOR DEVELOPMENT	91.277	134.266	56.976	86.717	5.905.000	8.857.000	45.639
	OTHER PROVINCES	97.661	150.048	56.976	92.774	6.316.000	9.474.000	48.831
INDUCTION AND ARC FURNACES		89.462	129.802	56.976	84.998	4.555.000	6.833.000	44.731
DRINKING AND USAGE WATER	PRIORITY PROVINCES FOR DEVELOPMENT	91.277	134.266	56.976	86.717	4.614.000	6.921.000	45.639
	OTHER PROVINCES	97.661	150.048	56.976	92.774	5.166.000	7.749.000	48.831
TREATMENT FACILITIES	PRIORITY PROVINCES FOR DEVELOPMENT	91.277	134.266	56.976	86.717	5.905.000	8.857.000	45.639
	OTHER PROVINCES	97.661	150.048	56.976	92.774	6.316.000	9.474.000	48.831
B) SINGLE TERM TARIFF								
INDUSTRY	PRIORITY PROVINCES FOR DEVELOPMENT	107.078	170.314	58.848	101.722			53.539
	OTHER PROVINCES	114.480	188.582	58.848	108.758			57.240
DRINKING AND USAGE WATER	PRIORITY PROVINCES FOR DEVELOPMENT	104.371	163.632	58.848	99.149			52.186
	OTHER PROVINCES	111.878	182.170	58.848	106.282			55.939
TREATMENT FACILITIES	PRIORITY PROVINCES FOR DEVELOPMENT	107.078	170.314	58.848	101.722			53.539
	OTHER PROVINCES	114.480	188.582	58.848	108.758			57.240

DISTRIBUTION REGION	SAKARYA REGION						
CUSTOMER GROUPS	ACTIVE ENERGY (TL/kWh)	PEAK TARIFF (TL/kWh) 17.00-22.00	22.00-06.00	06.00-17.00	POWER (TL/kW)	EXCESS POWER USAGE (TL/kW)	REACTIVE ENERGY (TL/kVARh)
A) TWO TERM TARIFF							
INDUSTRY	97.670	150.067	56.976	92.784	6.316.000	9.474.000	48.835
INDUCTION AND ARC FURNACES	89.472	129.821	56.976	85.008	4.555.000	6.833.000	44.736
DRINKING AND USAGE WATER	97.670	150.067	56.976	92.784	6.316.000	9.474.000	48.835
TREATMENT FACILITIES	97.670	150.067	56.976	92.784	6.316.000	9.474.000	48.835
B) SINGLE TERM TARIFF							
INDUSTRY	114.490	188.611	58.848	108.768			57.245
DRINKING AND USAGE WATER	111.888	182.189	58.848	106.291			55.944
TREATMENT FACILITIES	114.490	188.611	58.848	108.768			57.245

DISTRIBUTION REGION	KARAELMAS REGION						
CUSTOMER GROUPS	ACTIVE ENERGY (TL/kWh)	PEAK TARIFF (TL/kWh)			POWER (TL/kW)	EXCESS POWER USAGE (TL/kW)	REACTIVE ENERGY (TL/kVARh)
		17.00-22.00	22.00-06.00	06.00-17.00			
A) TWO TERM TARIFF							
INDUSTRY	90.355	132.010	56.976	85.834	5.905.000	8.857.000	45.178
INDUCTION AND ARC FURNACES	88.541	127.517	56.976	84.125	4.555.000	6.833.000	44.271
DRINKING AND USAGE WATER	90.355	132.010	56.976	85.834	5.905.000	8.857.000	45.178
TREATMENT FACILITIES	90.355	132.010	56.976	85.834	5.905.000	8.857.000	45.178
B) SINGLE TERM TARIFF							
INDUSTRY	106.157	168.029	58.848	100.848			53.079
DRINKING AND USAGE WATER	103.450	161.347	58.848	98.275			51.725
TREATMENT FACILITIES	106.157	168.029	58.848	100.848			53.079

DISTRIBUTION REGION	KORFEZ REGION						
CUSTOMER GROUPS	ACTIVE ENERGY (TL/kWh)	PEAK TARIFF (TL/kWh)			POWER (TL/kW)	EXCESS POWER USAGE (TL/kW)	REACTIVE ENERGY (TL/kVARh)
		17.00-22.00	22.00-06.00	06.00-17.00			
A) TWO TERM TARIFF							
INDUSTRY	97.046	148.512	56.976	92.198	6.316.000	9.474.000	48.523
INDUCTION AND ARC FURNACES	88.848	128.285	56.976	84.413	4.555.000	6.833.000	44.424
DRINKING AND USAGE WATER	97.046	148.512	56.976	92.198	6.316.000	9.474.000	48.523
TREATMENT FACILITIES	97.046	148.512	56.976	92.198	6.316.000	9.474.000	48.523
B) SINGLE TERM TARIFF							
INDUSTRY	113.866	187.075	58.848	108.173			56.933
DRINKING AND USAGE WATER	111.264	180.634	58.848	105.706			55.632
TREATMENT FACILITIES	113.866	187.075	58.848	108.173			56.933

DISTRIBUTION REGION	BOGAZICI REGION						
CUSTOMER GROUPS	ACTIVE ENERGY (TL/kWh)	PEAK TARIFF (TL/kWh)			POWER (TL/kW)	EXCESS POWER USAGE (TL/kW)	REACTIVE ENERGY (TL/kVARh)
		17.00-22.00	22.00-06.00	06.00-17.00			
A) TWO TERM TARIFF							
INDUSTRY	95.222	144.019	56.976	90.461	6.316.000	9.474.000	47.611
INDUCTION AND ARC FURNACES	87.024	123.773	56.976	82.685	4.555.000	6.833.000	43.512
DRINKING AND USAGE WATER	95.222	144.019	56.976	90.461	6.316.000	9.474.000	47.611
TREATMENT FACILITIES	95.222	144.019	56.976	90.461	6.316.000	9.474.000	47.611
B) SINGLE TERM TARIFF							
INDUSTRY	112.042	182.573	58.848	106.435			56.021
DRINKING AND USAGE WATER	109.440	176.141	58.848	103.968			54.720
TREATMENT FACILITIES	112.042	182.573	58.848	106.435			56.021

DISTRIBUTION REGION	TRAKYA REGION						
CUSTOMER GROUPS	ACTIVE ENERGY (TL/kWh)	PEAK TARIFF (TL/kWh)			POWER (TL/kW)	EXCESS POWER USAGE (TL/kW)	REACTIVE ENERGY (TL/kVARh)
		17.00-22.00	22.00-06.00	06.00-17.00			
A) TWO TERM TARIFF							
INDUSTRY	96.365	146.842	56.976	91.546	6.316.000	9.474.000	48.183
INDUCTION AND ARC FURNACES	88.166	126.595	56.976	83.770	4.555.000	6.833.000	44.083
DRINKING AND USAGE WATER	96.365	146.842	56.976	91.546	6.316.000	9.474.000	48.183
TREATMENT FACILITIES	96.365	146.842	56.976	91.546	6.316.000	9.474.000	48.183
B) SINGLE TERM TARIFF							
INDUSTRY	113.184	185.376	58.848	107.530			56.592
DRINKING AND USAGE WATER	110.582	178.963	58.848	105.053			55.291
TREATMENT FACILITIES	113.184	185.376	58.848	107.530			56.592

Source: www.tetas.gov.tr

APPENDIX F

Table F-1 TETAŞ Wholesale Prices 2007

	TETAŞ 1 JANUARY 2007 ELECTRICITY WHOLESALE TARIFF			
20 DISTRIBUTION PLANTS ELECTRICITY WHOLESALE TARIFF:	9, 80 Ykr/kWh			
KAYSERİ ve CİVARI T.A.Ş ELECTRICITY WHOLESALE TARIFF	9, 80 Ykr/kWh			
2007 AVERAGE ELECTRICITY WHOLESALE TARIFF	9, 69 Ykr/kWh			

Table F-2 Eligible Customer Electricity Wholesale Tariff 2006

TURKISH WHOLESALE ELECTRICITY TRADING AND CONTRACTING COMPANY (TETAŞ)							
ELIGIBLE CUSTOMER ELECTRICITY WHOLESALE TARIFF							
			PEAK TARIFF			CAPACITY PRICE	OVER CAPACITY	REACTIVE ENERGY
		ACTIVE ENERGY		(YKr/kWh)				
			Peak	Night	Day			
INDUSTRY		(YKr/kWh)	17/22	22/06	06/17	(YKr/Month/kW)	(YKr/Month/kW)	(YKr/kVARh)
TWO-TERM TARIFF		9.12	14.74	4.86	8.66	607	911	4.56
SINGLE-TERM TARIFF		10.00	16.91	4.86	9.49			5.00

Source: www.epdk.gov.tr