EUROPEANISATION OF THE TURKISH ENERGY SECTOR: A CASE STUDY ON THE ELECTRICITY MARKET

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Approval of the Graduate School of Social Sciences

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ABSTRACT

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This thesis analyses Europeanisation process of the Turkish energy sector by comparing and contrasting the current situation of the sector with the European standards and by using the Turkish electricity market as a case study. In order to do this, it first focuses on the meaning of Europeanisation in energy sector and reveals the fundamentals of it by moving from several European energy strategy documents and 15 Turkey progress reports. The three pillars of Europeanisation in the energy sector are identified as security, competitiveness and sustainability. These three pillars are decomposed into seven principles as diversification of sources and routes, integration with the others, having storage capacities, liberalisation, green energy production and energy efficiency. Compatibility of the Turkish electricity market with the European standards is analysed and exemplified in accordance with the three pillars-seven principles structure upon which Europeanisation depends.

Keywords: Turkey, European Union, Europeanisation, Electricity Market

ÖZ

TÜRK ENERJİ SEKTÖRÜNÜN AVRUPALILAŞMASI: ELEKTRİK PİYASASI ÜZERİNE ÖRNEK BİR İNCELEME

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Bu çalışma, Türk enerji sektörünün Avrupalılaşmasını, sektörün mevcut durumunu Avrupa standartları ile karşılaştırarak ve elektrik piyasasını örnek bir inceleme olarak kullanarak analiz etmektedir. Bunu yapmak için önce, Avrupalılaşmanın enerji sektöründeki anlamına odaklanmakta ve çeşitli Avrupa enerji stratejisi belgeleri ile 15 Türkiye ilerleme raporundan yararlanarak Avrupalılaşmanın temellerini açığa çıkarmaktadır. Enerji sektöründeki Avrupalılaşmanın üç sütunu güvenlik, rekabetçilik ve sürdürülebilirlik olarak belirlenmektedir. Bu üç sütun, kaynak ve güzergah çeşitlendirmesi, komşularla bütünleşme, yeterli depolama sığasına sahip olma, serbestleşme, yeşil enerji üretimi ve enerji verimliliği olmak üzere yedi ilkeye ayrıştırılmaktadır. Türk elektrik piyasasının Avrupa standartlarıyla uyumluluğu, Avrupalılaşmanın dayandığı üç sütun-yedi ilke yapısına uygun şekilde incelenmekte ve örneklendirilmektedir.

Anahtar Kelimeler: Türkiye, Avrupa Birliği, Avrupalılaşma, Elektrik Piyasası

To My Beloved Parents

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LIST OF ABBREVIATIONS

ABB	Ministry for European Union Affairs
BOTAS	Petroleum Pipeline Corporation
CCS	Carbon Capture and Storage
CEER	Council of European Energy Regulators
DEKTMK	World Energy Council Turkish National Committee
DPT	State Planning Organisation
DSI	State Water Affairs
EC	European Council
EDC	Electricity Distribution Company
EEC	European Economic Community
ENTSO-e	European Network of Transmission System Operators for Electricity
EPDK	Energy Market Regulatory Authority
ETKB	Ministry of Energy and Natural Resources
EU	European Union
EUAS	Electricity Generation Company
GW	Gigawatt
GWh	Gigawatt-hour
IMF	International Monetary Fund
kW	Kilowatt

LNG	Liquefied Natural Gas
MFA	Ministry of Foreign Affairs
MW	Megawatt
MTEP	Million-Ton Equivalent of Petroleum
OECD	Organisation for Economic Cooperation and Development
SET	Strategic Energy Technology
SOMTES	Soma Thermal Power Plant Company
TAEK	Turkish Atomic Energy Authority
TANAP	Trans-Anatolian Pipeline
TEDAS	Turkish Electricity Distribution Company
TEIAS	Turkish Electricity Transmission Company
TEK	Turkish Electricity Institution
TKI	Turkish Coal Corporation
TPAO	Turkish Petroleum Corporation
TUSIAD	Turkish Industry and Business Association
USA	United States of America
USSR	Union of Soviet Socialist Republics

CHAPTER 1

INTRODUCTION

This thesis is going to examine the transformation of the Turkish energy sector continuing hand in hand with the accession process of the Republic of Turkey to the European Union (EU). Turkey and Europe are two major actors at the very heart of the Eurasian landmass; their long war-dominated common history has apparently been evolving to a more stable and peaceful type of relation in the framework of membership process of Turkey. In this, Turkey's "Europeanisation" via the accession period to the European Union has been the most prominent motive behind indeed. At the accession negotiations, there are 33 separate chapters and almost every aspect of the Turkey-European Union relations is being examined during the accession talks. Among them, energy issue holds a privileged place and is a separate chapter on its own. Because there are some criteria before Turkey to be met in energy sector, as there are for the other numerous issues, Turkey has to transform her energy market in accordance with the European standards.

Another motive behind this study is the unique position of energy topics in terms of the Turkish-European relations. This point is a well-analysed subject in the International Relations literature. At the general course of negotiations, the subjects about foreign security policy and energy are seen as of high importance (Oguzlu, 2012). This situation has two aspects. Firstly, Turkey exhibits extensive opportunities to Europe for energy security and the EU tends to exploit these opportunities as much and quick as possible. Secondly, energy strength of Turkey can be translated into political realm and Ankara can use it as a bargaining chip in negotiations

(Karbuz and Sanli, 2010). This can be a direct contribution to the Turkish foreign policy.

During the entire study, "European standards" will not be considered with a pre-defined luggage with it. This work neither takes Europeanisation as a positive notion, nor defends that Turkey should target the EU membership or should deepen the process. What the thesis is going to do is just defining the meaning of Europeanisation in terms of the energy sector clearly and analysing the Turkish energy market in the light of this notion by intensifying the focus on the Turkish electricity market which will also be exploited as a case study at this thesis.

The current level of Turkey-European relations largely depends upon accession negotiations and related aspects of it. For this reason, any progress or delay at the negotiations directly affect the relations. Energy issues worth studying for two reasons. First, even if the Turkey-European relations are taken apart from the membership process of Turkey, energy is a field of cooperation between the parties. Turkey, as a both transit country and net energy importer like the Union, there is a huge potential for cooperation in energy issues in areas like exploitation of the Caspian energy sources, free and secure flow of energy and preventing net energy exporters from using their energy cards as a mean of their foreign policies. Secondly, when the energy issues are taken into consideration within the framework of the membership negotiations of Turkey, any positive or negative development related to the energy chapter, has direct reflections on the membership process. If negotiations at the energy chapter are furthered and concluded, a remarkable shift in the Turkey's membership process will be materialised. Henceforth, analysing Europeanisation of the Turkish energy sector in the light of Europeanisation has value in international relations.

The main research question of the thesis will be "Is the Turkish energy sector compatible with the EU standards?". Nevertheless, while examining the Turkish energy sector within a European context, defining what Europeanisation does mean in the energy sector is also needed deeply. Therefore, the complementary research question has been formulated as "What is Europeanisation in the energy sector?".

The answer given to these questions will constitute the hypothesis for the study. This study argues that although Turkey gradually but successfully Europeanises its energy sector by applying three pillars, security, competitiveness and sustainability, there are certain problems particularly in terms of having enough storage facilities, green energy production and energy efficiency.

Theoretically, this thesis avoids from appealing to a certain International Relations theory, although the political realism and liberal perspective will constitute the bulk of the theoretical analyses in a combined way. Despite the fact that realism and liberalism are placed on one another's contrary, the very nature of the Turkish energy sector requires this approach. Europeanisation of the Turkish energy sector is a transformation and it takes time to proceed. Despite the fact that the current energy structure is more like a zero-sum game, Europeanisation process tends to convert it into a positive-sum one played among the members. Thus, both theoretical approaches are needed to be employed. For the former theory, realism, there are two fundamental reasons behind the selection. First of all, the contemporary energy structure presents pretty much a zero-sum game rather than a positive-sum one, as it has been said before. In this, the basis of the current energy structure plays a pivotal role; that is fossil-fuel dependent energy production. Because the fossil fuels have an ever-decreasing supply in the long term, one's gain becomes another's loss most of the time. Therefore, exploitation and sharing of energy sources cause more problems between countries as the world approaches to the end of fossil fuels age. The conflictual environment between the Nordic countries and Russia on the exploitation of the untapped arctic fossil fuel reserves is a suitable example for this. Another similar example is clashes between Turkey, the Turkish Republic of Northern Cyprus and the Southern Cyprus about the exploitation of the rich natural gas sources near the island of Cyprus.

At this very point, the second reason for choosing the realism arises: geopolitical concerns related to the energy issues. In terms of geopolitics of energy, there are two sub-reasons. The first sub-reason is that geopolitics gains importance in terms of diversification of suppliers and routes which are two basic principles in

Europeanisation. For example, Ukraine's geopolitical location has had an indispensable position in the Europe's energy security thanks to the high-capacity pipelines going through Ukraine's territory. In order to utilise the lenses of geopolitics accordingly, realist theory has been preferred to incorporate. The latter sub-reason is existence and appearance of chokepoints in the current energy system. This is a complementary pillar of the former. The security and continuity is crucial for the smooth-functioning of the entire economic and political realm. For example, any instability at the Turkish straits or Ceyhan terminal may severely hit the European and Turkish economies. Thus, energy issues, although they seem as if they were the same with economic relations at the first glance, are deeply included in the security policies and realism explains the securitisation of the energy issues.

The latter theory selected, liberalism, is much better to understand the meaning of transformation. The main logic behind the Europeanisation is converting the energy game into a positive-sum one among the members. The reason behind this is about the nature of a Europeanised energy market which is expected to be interconnected with its allies, be fed by a mixture of diversified supplies including renewable sources and to have enough storage facilities in cases of emergency. Thus, solidarity among members can be realised and be reflected on the other fields of international politics. Because all members can benefit from solidarity, energy issues can be transformed into a win-win situation as parallel to the Europeanisation transformation. Although these two theoretical approaches have been selected, they will not be highlighted for every single case; instead, they will be kept in mind as tools for analyses during the whole research.

Methodologically, two methods will be used in an interlinked way. The first method will be traditional literature review. Among what the other scholars and practitioners have written on the topic before this thesis, there are a lot of pieces worth to benefit from. Therefore, a detailed scan will be conducted on the existing literature to pick the usable pieces up. These pieces will constitute the secondary sources most of the time at the thesis. Yet, primary sources are also needed. This need particularly appears when it comes to the objective of producing a clear-cut

definition for the Europeanisation notion. In order to fully understand what Europe wants in the energy sector, primary sources will be used. Sources like reports or policy briefs are going to be analysed to derive the constituents of the notion. Besides, while examining the Turkish electricity market, some statistical data prepared by the both Turkish authorities and the international institutions will be added to the progress reports between 1998 and 2012 published by the European authorities to the mixture of primary sources to enrich it. Thus, the thesis is going to include both secondary and primary sources widely without overlooking any of them.

There are numerous articles dealing with similar topics throughout the literature, lots of high quality studies dealing with Europeanisation notion, energy security of Europe or of Turkey, Turkey's accession process to the EU or with diversification of routes and sources, greening of the energy sector and liberalisation of energy markets can be found in the literature. Nevertheless, a study dealing with Europeanisation in energy sector by depending upon its three pillars and taking the Turkish electricity market as a case study exemplifying a continuing transformation cannot be found easily. This thesis targets to fill this gap in the literature. The originality that this thesis exhibits is placing Turkish energy structure in the context of Europeanisation by defining it in a holistic way and in a concrete framework.

Geographically Turkey, which mainly refers to Anatolia and some immediate localities around it, and Europe are neighbouring regions and this proximity on the concrete realm has had some undeniable reflections to the abstract realm as it is the same in terms the mutual identities of the parties and the current course of the relationships in between. A series of long centuries were spent in wars; sometimes due to the inclusion of Turks in intra-Europe clashes somehow and sometimes direct Turkish-European clashes for a variety of reasons. Apart from the cooperation against non-Europeans, Turks were also regarded as an element of the balance of power for intra-European wars for many times like Germans did in the First World War against some other European powers. In the most general understanding, flow of history seems to place Turks as an "other" in the European eyes permanently.

Specific events like above-mentioned Crimean War or 1571 Battle of Lepanto created some breaking points but the general image did not change radically (Kumrular, 2008). Not only in military terms, but also in economic terms Turkey and Europe have always had intense interactions. Because the Ottoman Empire controlled the classical trade routes for centuries, Europeans had no other choice for a long time but to trade with Ottomans. Yet, in addition to the routes-based trade, Ottoman Anatolia and European continent had supplementary economic structures; Europe and Turkey could import from one another what they needed. When the trade structures of parties are examined, it can be said that this structure did not change much.

Positive interactions being limited just to military and economic realms mainly started to include political and cultural realms after the Ottoman Empire evolved to the Republic of Turkey at the interwar period. Proclamation of the Republic has symbolic meanings in terms of a series of very radical shifts both in domestic and foreign political realms. It marks a watershed in the relations and a serious transformation from conflictual neighbourhood to good neighbourhood. The new Turkish elite took the office at the beginning of 1920s, saw modernisation of Turkey as necessary and took the necessary measures, implemented the required policies. Despite the fact that the transformation of the domestic political arena was presented as a complement of the transformation in the foreign policy often, cultural and civilisational modernisation were emphasised for its own sake as well. From this respect, Turkey's membership process to the European Economic Community (EEC, which has later become the European Union) created a lucky path for Europeanisation of Turkey both at the domestic and foreign policy levels simultaneously.

Turkey made her first application to join to the EEC in the year of 1959 at the times of Democrat Party in office. In return to Turkish application to join, the EEC offered an association agreement to Ankara in order to prepare Turkey to the accession. The association agreement, which is called as Ankara Agreement, was signed on 12 September 1963 with great enthusiasm by Turkey (ABB, 2011). The

agreement entered into force on December 1, 1964 and targeted full membership of Turkey by offering three different but adjunct phases. The treaty is regarded as the most fundamental document related to the Turkey-European Union relations today. On November 3, 1970 the Additional Protocol was signed between parties which aimed harmonisation of the Turkish legislation with that of Europe and economic integration by letting free flow of goods, capital, real persons and services. After the treaty entered into force, EEC members abolished all tariffs and quotas against Turkey (except some regulations about fabrics) and as a consequence of this, the total share of EEC countries rose to 42% in 1972 from 29% in 1963; it was 37,1% for EU-27 countries in 2009 (ABB, 2011). Although the shares in the mutual foreign trade fluctuate in a narrow margin, one reality does not change: the Turkish and European economies are pretty much bound to each other.

In 1987, Turkey applied for full membership to the European Community (EC) for the first time by regarding herself as a European country and with the confidence sourcing from the successful conduct of the Ankara Agreement for more than 20 years, despite all hardships emerging from the very nature of the Cold War. Nevertheless, the Turkish application was handled under the Treaty of Rome instead of Ankara Agreement which prolonged the process significantly. About Turkey's application, the European Commission prepared an opinion paper where proposing to make Turkish application wait for a more favourable atmosphere instead of overextending the capabilities of the Community just before the completion of single market (ABB, 2011). The Commission, on the other hand, advised to complete the Customs Union with Turkey nonetheless until 1995 as envisaged before. With the Customs Union entered into force, Turkey and European Union abolished all tariffs and quotas in manufactured goods and processed foods reciprocally. Within the framework of Customs Union, Turkey continues to harmonise her legislation with that of the EU. This includes effective implementation of some normative principles such as abolishing state monopolies in the economy, liberalisation of some sectors and privatisation of some state economic enterprises. Among the sectors which were planned to be liberalised and privatised, energy sector held a very distinguished place

due to its incredible volume respective to the other sectors in the Turkish economy. Furthermore, as addition to its enormous depth, energy sector also deserves attention because it is a separate chapter at the progress reports. These two constitute the main motives behind this study which mainly targets to examine the change in the Turkish energy sector in the process of liberalisation and privatisation within the framework of Europeanisation.

As easily derived from the short history of the relations given above, removal of high politics issues from the bilateral agenda, contributed much to softening of the relations in between. Parties, Turkey and European actors, had chance to concentrate more on low politics issues and the question of how to cooperate. Especially, Turkey's regarding full membership to the EU as a major goal in her foreign policy eased relations. In the general course of the Turco-European relations, energy related topics create a concrete, meaningful and rational base for further relations. In terms of common interests, what European energy market needs can almost perfectly be met by Turkey. Both Turkey's unique geographical position and its full-fledged integration with the Western capitalist economic system make cooperation much easier than cooperating with other possible regional actors. Ultimately, Europeanisation of Turkey is a political choice being made by decision-makers; whether to accelerate the process or to halt it altogether is in the hands of elected governments. Nevertheless, classical republican Turkish foreign policy favours intense relations with Europe; existence of a separate ministry for European Affairs is the best proof for this. By moving from this point, the thesis does not claim that Europeanisation is beneficial for Turkey, nor says it should be stopped. The only endeavour of this thesis is to understand, define and reflect what the Europeanisation means for an energy sector and examining the Turkish energy sector in the light of this.

As said before, the focus will be intensified upon one of the key branches of the energy sector, electricity. Although oil and natural gas markets are as much important in the conventional energy structure as electricity is, focusing on electricity presents some suitable chances to understand the oil and gas markets as an addition

to the electricity market without devoting a whole study to them. Thus, by focusing on the electricity sector, the effects of Europeanisation will be observed in the three sectors more easily. In this to happen, the most influential factor is the fact that electricity is a secondary form of energy as different from the sources like oil, gas, or coal; this makes electricity different *inter alia*. While studying energy purely, this creates a fundamental difference. Yet, the technical details about energy are not completely important in terms of Europeanisation of the Turkish energy market because, the term, Europeanisation, is a pretty much political and economic concept rather than a technical one.

The thesis is going to consist of three main chapters and a conclusion part after them, in addition to the introduction part. The second chapter is going to be about the Europeanisation and the definition of it directly. The third chapter is going to give a brief history of electricity in Turkey and the evolution of electricity generation in Turkey. The fourth chapter is going to examine the Turkish electricity sector within the framework of Europeanisation. Finally at the conclusion part, some concluding remarks about the thesis are going to be given.

The second chapter will take the Europeanisation notion into consideration and will try to examine the term as a whole. The main goal is not to create a definition for Europeanisation being applicable just to Turkey but to any energy market related to Europe. While doing this, Europeanisation will be defined by utilising some original documents produced by the European organs. Progress reports about Turkey, publications of European Environmental Agency, European Commission's reports on environment and energy issues and publications of the European Agency for Energy Security are the main sources in specifying what Europeanisation does mean. Some main concepts, norms or policy advices will be collected throughout the publications mentioned. Thus, a general framework will be identified for Europeanisation notion.

Among the original documents mentioned above, progress reports have the utmost significance. The progress reports about the Turkish accession process to the Union are unique because, they are studies being produced solely for Turkey and

they include almost all aspects of the relations from health to fishery, including energy. In this respect, 15 progress reports from the year of 1998 to 2012 will be used. The progress reports will not be used only for defining what Europeanisation means but also for measuring how further Turkey succeeded Europeanising her energy market. In defining Europeanisation of an energy market, two more fundamental documents (and their supplementary documents) will be used. The first one is "Energy 2020: A Strategy for Competitive, Sustainable and Secure Energy" published by the European Commission and the second is "Energy Roadmap 2050" report, again of the Commission. At the first glance, using documents of the European Commission will exhibit a path-dependent approach to the European way of dealing with the energy issues; yet, because this also presents a coherent way, some similar approaches are employed in the literature (Maltby, 2013; Rowlands, 2005).

Roughly speaking, Europeanisation does seem to have three main pillars. These three pillars appear as *security*, *competitiveness* and *sustainability* when the documents are analysed. A wide chapter will be devoted to the in-depth analysis of these three pillars. After the chapter dealing with the Europeanisation notion itself, the third chapter is going to take the evolution of the Turkish electricity generation without looking at it from the lenses of Europeanisation. The chapter will start from the electricity generation endeavours at the Ottoman era and will continue with the examination of the electricity generation at the republican era. Like in every measurement, a standard of criteria will be needed. To measure Europeanisation, as said before, every pillar of Europeanisation is going to be accepted as a criterion which constitutes a kind of "Europeanisation rubber." Choosing electricity as a case study gains importance at this very point. One of the pillars of Europeanisation is sustainability. If another branch of the energy sector had been chosen instead of the electricity, which gains importance since it has many inseparable links with the other branches, it would simply be meaningless to examine the sustainability of a finite source such as oil, gas or coal for example.

In the fourth chapter, the main focus will be put on the Turkish electricity market. This chapter is going to investigate the current situation of Turkish electricity market and place it accordingly in the framework of Europeanisation. Again in this chapter, three pillars of Europeanisation will be utilised in order to measure the compatibility of the Turkish electricity sector with the principles which the EU sets as policy framework. Electrical issues which constitute the basis of the chapter is built upon require a pretty high capacity in technical details; yet, this thesis does not aim to make investigation about the technical details. Therefore, all comments will be made by avoiding from going deep into the technical details as much as possible. While examining the electricity market, *Electricity Market Sector Reports* produced by the Energy Market Regulatory Authority (EPDK, in its Turkish acronym) will be used. Some other reports of EPDK, such as *Natural Gas Market Sector Reports*, will also be exploited as they are needed. Besides, some publications of Turkish Ministry of Energy and Natural Resources (ETKB, in its Turkish acronym), Privatisation Administration and some consultation companies for the investments are going to be used as well.

Lastly, in the concluding remarks chapter, consequences of the analyses will be commented on. All three pillars and seven principles will be taken into consideration separately and their situation in terms of Europeanisation of Turkey will be clarified. Problems, weaknesses and strengths of the Turkish electricity market on the way to Europe will be presented as an intense picture. Because this paper is not a policy brief, it will be avoided from to make policy recommendations. Nevertheless, some minor comments on what can be done to deepen the Europeanisation can be found in some parts as well.

CHAPTER 2

WHAT DOES EUROPEANISATION MEAN IN ENERGY SECTOR?

In this chapter, Europeanisation notion is going to be examined in depth by putting emphasis on the related aspects of it. The notion refers to a huge area including an immense amount of topics varying from industrial policy to social policy and from electoral law to minority rights. Europeanisation does not seem possible to detach from the values it is attached with. A very basic example is the European emphasis on democracy and human rights. Many principles included under the roof of Europeanisation notion are normative values although there are rationally put principles as well. For countries which do not want to engage with the normative values of Europe, Europeanisation may not seem a practical way of defending their interests.

Energy is a state-level issue due to both technical reasons and economic facts; this also brings the need for preservation of some national champions in energy business (Karbuz and Sanli, 2010). Starting from this point, this thesis will take the topic into consideration with a statist approach. As parallel to this state-centric approach, Europeanisation of a country can be taken as a process targeting to adjust state-level policies to an upper level set of pillars highlighted by the European Union, at its most basic meaning. Before every other aspect of Europeanisation, it should be recognised that the process itself is a political one. In other words, because Europeanisation process of a non-European actor goes on parallel to the relations and interactions with the European Union, intensity and depth of the relations are determined by the respective decision makers of the related parties. Only after that, Europeanisation process can advance in a country at the state level.

Another aspect of Europeanisation can be the creation of European citizenship, which can be called as *homo Europaeus*. It seems more plausible to regard people by referring to their ethnic/national identities rather than their European identity if people are prioritising their national states. From this perspective, Europeanisation can also be understood as a process of creating European citizens emphasising their common European identity much more than their primordial identities. Thus, the centuries-long dream of constructing a European homeland may come true. Some beliefs and values which are commonly shared by all peoples of the Union, can serve as a basis for Europeanisation. The particular importance of commonly shared beliefs and values appears at the policy-making process by influencing the decision-makers' priorities and preferences. Nevertheless, because this thesis is not going to deal with the social meanings and reflections of Europeanisation on the society, Europeanisation at the state level will be focal and the transformation of a country through societal or transnational agents will not be included.

As said before, Europeanisation refers to a set of pillars in a huge area with different topics in it; so, it can be applied to different topics as a process. For example, Europeanisation of energy policy of a country can be one of them and it is also the one which this thesis will try to apply to the Turkish electricity market. In order to understand how Europeanisation can be defined in terms of energy policy, two types of documents will be used. The first group of documents is going to consist of the documents prepared by organs of the European Union for own-use purposes within the Union. The second group of documents is going to consist from the documents prepared again by organs of the European Union, but for the use of a non-European country, Turkey. The former group will consist from 2 documents and the latter will include 15 progress reports prepared by the European Commission on Turkey's accession process between 1998 and 2012.

The documents at the first group are strategy papers upon which the European energy policy is planned to be constructed. The first document tries to set

short-term targets for the European energy mix while the second aims to point a future direction for a pan-European strategy. The basic rationale behind the strategy papers is to cure Europe's weaknesses sourcing from energy related issues such as limited manoeuvre area in the field of global politics and sensitive economic growth to fluctuations in exogenous energy sources. The documents at the second group are directed to one country, Turkey. Among various chapters examining the different aspects of accession negotiations, energy chapters are meaningful in terms of the topics covered by this study. The related chapters of progress reports are valuable to understand what Europe expects from candidates in Europeanising their energy sector and to observe the transformation of the Turkish energy sector. Thus, two sources will be utilised while producing a definition for Europeanisation of the energy sector as what Europe does within the Union and as what Europe wants from candidates. By deriving necessary aspects from the respective documents, comparing and contrasting them, a coherent definition will be produced. In terms of the sources used, European Commission has a significant weight and as said before, this may present a path-dependent approach to a certain degree. On the other hand, this deficit is remedied with the fact that the European Commission is a strong agenda-setter not only for the members but also for the neighbourhood of the Union; this is the reason there are studies using the same method which this research uses (Rowlands, 2005).

2.1. Energy 2020: A Strategy for Competitive, Sustainable and Secure Energy

Energy 2020: A Strategy for Competitive, Sustainable and Secure Energy document was prepared by the European Commission as a communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions and also was published by the Commission. In other words, it is a document prepared for own-use purposes. The document proposes five actions for a new energy strategy. The proposed five ways are achieving an energy-efficient Europe, creating a pan-European energy market,

empowering consumers while emphasising the highest level of safety and security, maintaining the European leadership in energy technologies and strengthening external dimensions of the European strategy.

In terms of efficient use of energy, the strategy has two ultimate goals as achieving 20% energy conservation by 2020 and decoupling economic growth from energy use. The report explains why energy efficiency is vital for the strategy as:

> Energy efficiency is the most cost-effective way to reduce emissions, improve energy security and competitiveness, make energy consumption more affordable for consumers as well as create employment, including in export industries (EC, 2010a, pg.6).

The report regards effective compliance monitoring, adequate market surveillance, widespread usage of energy services and material efficiency as important and advises to give priority to building and transport sectors because they are the most potent ones. It is recommended to re-consider the huge public buildings stock for energy efficiency and to have ambitious goals for the public sector. Another focus of the energy efficiency chapter is to make energy efficiency investments, including electricity, profitable in itself. In sum, it can be said that four actions are proposed in Energy 2020 document for a more energy efficient Europe as

> ... tapping into the biggest energy-saving potential (buildings and transport), reinforcing industrial competitiveness by making industry more efficient, reinforcing efficiency in energy supply, preparing the National Energy Efficiency Action Plans (EC, 2010a, pg.7).

In terms of ensuring free movement of energy, there are two bases as creating an energy market and spreading it to beyond the national borders through pan-European integration infrastructure. The basic rationale behind is to have *more competitive prices for more sustainable supplies*. According to the document, electricity and natural gas markets are not fully integrated because of national barriers before the integration; there are some companies in many countries owing a

de facto monopoly (EC, 2010a). In terms of market structure, national champions should not be confused with the state-owned monopolies (Maltby, 2013). BOTAŞ, which is a state owned company for oil and gas transportation in Turkey, is a great example; it has a *de facto* monopoly in the Turkish market although the legal structure is suitable for competition. The document emphasises the need for legal background as "The legal framework must be properly enforced to give investors the confidence to invest in new production, transport and storage options for renewable sources." and underlines the necessary harmonisation between national policies and legal structures. The same point is very well emphasised in a study depending upon a questionnaire answered by European energy investors. The results of the questionnaire show that the private sector also seeks for a more applicable and harmonised pan-European legal structure for more inclusion (EC, 2010a).

The strategy presented at the Energy 2020 report, recognises the material requirements like appropriate infrastructure in transport and communication sectors to deliver supplies accordingly in the market; among them, ultimate priority is given to the smart grids due to the technical reasons about renewable energy sources. The fact that an intention for solidarity will be null and void without enough technical capability is admitted in the document. At this very point, in spite of the continuing emphasis on solidarity among members, there are numerous pieces in the literature shedding light on the relation between energy and solidarity where the former one presents a zero-sum game while the latter is expected to present a positive-sum one (Pointvogl, 2009). According to Energy 2020 strategy:

> ...natural gas will continue to play a key role in the EU's energy mix in the coming years and gas can gain importance as the back-up fuel for variable electricity generation. This calls for diversified imports, both pipeline gas and Liquefied Natural Gas terminals, while domestic gas networks are required to be increasingly interconnected. (EC, 2010a, pg.10).

In sum, it can be said that four actions are proposed in Energy 2020 document for a more integrated Europe as: "timely and accurate implementation of the internal market legislation, establishing a blueprint of the European infrastructure for future,

streamlining market rules for infrastructure developments, providing financing framework" (EC, 2010a).

In terms of providing secure energy to consumers at affordable prices, the main goal is to create chance for consumers to benefit from a well functioning internal market providing them with a wider choice and lower prices. This is expressed as:

> The opening of markets can deliver the best prices, choice, innovation and service for consumers if it goes hand in hand with measures to guarantee trust, protect consumers and to help them play the active role expected of them by liberalisation." (EC, 2010a, pg.12).

The today's European internal energy market, particularly power market, has been achieved at the second half of 2000s (Balaguer, 2011). Because the energy input has the largest share in the total production cost, a considerable decrease in the energy prices is expected to increase competitiveness of the EU notably. In this to happen, price zones play a pivotal role. Some studies show that market actors seek for "large enough" price zones so that giant generators will not dominate the region and the distribution companies will not be forced to make massive investments in very large zones (Makkonen, 2012).

To decrease the energy prices, particularly in electricity sector, nuclear plants with high safety are taken into account as a possible solution for member and candidate countries, as long as the procedures meet non-proliferation criteria. The main task of a possible energy market is summarised as "Providing affordable but cost-reflective and reliable supplies to consumers is the main task of market" (EC, 2010a). This task is emphasised by almost all regulatory authorities in the member and candidate states, including that of Turkey, which is Energy Market Regulatory Authority (EPDK, in its Turkish acronym). In sum, it can be said that two main actions are offered as making energy policy more consumer-friendly and continuous improvement in safety and security.

In terms of realising a technological breakthrough, there is increasing need for clarity. Because both Energy 2020 strategy and Energy Roadmap 2050 tightly

depend upon new technological shifts, Europe feels sustaining its leadership in energy technologies compulsory; the price of being overthrown cannot be afforded (EC, 2010a). Expected technological developments include technologies like second-generation biofuels, smart grids, smart cities and intelligent networks, carbon capture and storage infrastructure, electro storage and electro mobility, next generation nuclear plants, renewable sources for heating or cooling. In this framework, because electricity storage and CCS seems unpredictable, connecting large areas such as continental Europe and the North Africa with each other via super-grids seems as technically the most feasible plan (Patt et al., 2011). All these constitute Strategic Energy Technology (SET) Plan which pretty much depends upon innovation. Nevertheless, there are some continuing debates within the Union on some key definitions like renewable sources; these debates are urgently needed to be finalised in order to intensify the focus on future (Rowlands, 2005). Besides, some analysis argues that even the expected penetration level of renewables may not help enough (Rasmussen, 2012). In sum, it can be said that three actions are planned for appropriate technological development as implementing SET plan swiftly, providing public finance for some projects if needed and ensuring long-term EU technological competitiveness.

In terms of external dimension of the European strategy, the Union is advised to exploit the scale of its internal market in creating a common voice against third parties (EC, 2010a). This is one of the most debated issues related to European energy policy. This also includes external dimensions of the European internal energy market (Maltby, 2013). Due to highly diverging national interests of individual member states, a common European energy policy is regarded as "still emerging" (Pointvogl, 2009). In this, perceiving energy issues as part of national strategies plays a pivotal role; this slows emergence of pan-European energy policy (Meritet, 2007). In order to tackle this problem, the Energy Community Treaty is promoted to be signed and ratified by all members and candidates like Turkey. Thus, the European energy policy should ensure effective solidarity, responsibility and transparency among members. Nevertheless, while doing this, other policy areas of

the Union should not be overlooked and the energy policy should be kept in a parallel position to the development, trade, climate, biodiversity, enlargement and Common Foreign and Security Policy (CFSP) targets (EC, 2010a). In sum, four actions are presented about external dimensions of the energy strategy as integrating neighbouring markets to Europe, establishing partnerships with key partners, promoting the global role of EU for low-carbon future and promoting security and non-proliferation standards.

2.2. Energy Roadmap 2050

Energy Roadmap 2050 document was prepared by the European Commission as a communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions and also was published by the Commission. In other words, it is a document prepared for own-use purposes just like the former document being examined.

One of the basic goals presented in the Energy 2050 report is commitment of the EU to reduce greenhouse gases emissions 80% of the 1990 levels by 2050. It is said that there is an ambiguity about what should follow the Energy 2020 goals in the long run; Energy 2050 fills this gap by exploring the challenges posed by delivering the EU's decarbonisation objective while at the same time ensuring security of energy supply and competitiveness (EC, 2011a). Energy investments are huge projects; therefore, they need stability and predictability to come into real. Energy 2050 recognises this fact and openly declares that the report aims to decrease ambiguity about future within a "European" framework. The study basically produces two types of scenarios as current trends scenarios which include the reference scenario and current policy initiatives scenarios as the sub-scenarios and secondly, decarbonisation scenarios which include high energy efficiency, diversified supply technologies, high renewable energy sources, delayed carbon capture and storage and low nuclear scenarios as sub-scenarios. The former group foresees a 40% reduction in greenhouse gases emissions by 2050 while the latter foreseeing 80%.

Besides scenarios exploring different paths to future, the report advises ten structural change proposals to construct an energy system compatible with the European standards in the long run (EC, 2011a). The first is that decarbonisation is possible and should be realised. Secondly, energy structure should evolve into a form of high investment-low fuel cost system from the current low investment-high fuel costs system which suits to fossil fuel dependent generation. Thirdly, electricity will play a much more fundamental role as electric-consuming agents increase; 40% of total final energy consumption will be in the form of electricity. Fourthly, electricity prices will increase till 2030 because of the cost caused by the need to replace outdated infrastructure with renewable sources, smart grids and efficient technologies, and after that they will start to decrease. Fifth, the household expenditure for energy will increase as parallel to the case at the fourth change, it will reach up to 16% but, after 2030s it will start to decrease. Besides, industrial sector will also be affected by energy bills, only energy efficient solutions seem to bring some relief to energy input.

Sixth is to achieve energy saving in the system as a whole; up to 40% energy saving is targeted by 2050 (EC, 2011a). Expectedly this will contribute much to the decoupling efforts of economic growth and energy consumption. Seventh is increasing the share of renewable energy sources in the total energy mix; as a consequence of this, more developed storage facilities are needed. Eighth is assigning a pivotal role to carbon capture and storage systems in the energy structure to lower carbon levels in the generation process. Ninth is keeping nuclear contribution balanced. Although it is a low-carbon source for electricity generation, safety and non-proliferation principles are advised not to be overlooked. The last is combining decentralised and centralised systems successfully such as renewable energy sources with nuclear plants. In this kind of a system, integration becomes almost compulsory because of the insufficient local production risk.

The document tries to explore beyond 2020 and puts emphasis on the transformation of the system towards a more efficient and sustainable one. In this perspective, the report recognises the need for more innovative business models and

greater access to capital for investments; these are features of competitiveness pillar of Europeanisation. Nonetheless, some surveys show that financial obstacles do not create a big problem before the investors (Battaglini, 2012). Due to nature of the renewable sources, decentralised energy systems require further market integration to secure supplies.

> Incentives in the future, with increasing shares of renewables, have to become more efficient, create economies of scale, lead to more market integration and as a consequence to a more European approach. This has to build on using the full potential of the existing legislation, on the common principles of cooperation among Member States and with neighbouring countries, and possible further measures. (EC, 2011a, pg.10).

Energy 2050 insistently prioritises the similar points about connectedness of the future European energy structure depending upon renewable sources: "With sufficient interconnection capacity and a smarter grid, managing the variations of wind and solar power in some local areas can be provided also from renewables elsewhere in Europe.

> ...The opportunity to import electricity produced from renewable sources from neighbouring regions is already complemented by strategies to use the comparative advantage of Member States e.g. such as in Greece where large scale solar projects are being developed." (EC, 2011a, pg.11).

Nonetheless, further utilisation of renewable energy and construction of new transmission lines cannot be decoupled. Prominent figures of energy business in Europe express their concerns plainly about any delays in developing new transmission capacities will increase bottleneck problem in future and this problem will directly decrease easier penetration of renewable sources (Makkonen, 2012).

Powerful emphasis upon the interconnection capacities is totally coherent with the previous policy papers such as Priority Interconnection Plan (EC, 2007a) which underlined the need for an urgent action to construct new transmission lines and as the Third Energy Package which underlined the same necessity. On the other hand, studies sign to a different reality in terms of interconnection. Although there is a persistent stress on being interconnected, several interconnection projects failed

throughout the continent due to a variety of reasons. According to a statistic, among 42 major projects, more than half are behind the schedule (Battaglini, et. al, 2012), despite the fact that there is a need for more than 42.000 km new transmission line in a report of ENTSO-e until 2020 (ENTSO-e, 2010).

As an addition to renewable sources, natural gas is also assigned a very vital role, particularly in terms of electricity generation and natural gas is predicted to have 800 TWh share in the total electricity generation by 2050 (EC, 2011a). However, there are severe question marks related to the role of gas in electricity generation. Natural gas which is an imported resource is seen as insecure in terms of supply and transit routes and a more secure gas system is needed with having enough infrastructures such as storage facilities, interconnector investments or liquefied natural gas (LNG) terminal capabilities to use it in electricity generation in a more viable form. At this point, a new, unconventional fossil fuel supply, shale gas, can change the picture in terms of diversification but, there are lots of uncertainties on the future of shale gas. Similarly to natural gas, coal which is abundant in the continental Europe and in British isles may increase its share in electricity generation. However, *Energy 2050* sets applicability of carbon capture and storage technologies as a precondition for it (EC, 2011a).

Europeanising the energy sector also requires re-thinking the energy markets, as the document puts. Intermittent contribution of renewable sources forces more flexibility-dependent system especially for electricity. Rather than public incentives prioritising renewables or subsidising some sources, flexibility should be rewarded at the markets in a liberal system. To fully coordinate markets for the most effective operation, integration capacity should be increased 40% until 2020; to achieve this, the document expresses that for further integration, the EU needs to eliminate energy islands by 2015 (EC, 2011a). There are some pieces defending the same thesis (Balaguer, 2011). Similarly, according to a study analysing the results of a questionnaire answered by energy experts (investors, decision-makers and analysts), deepening of a liberal pan-European energy market may not be possible unless cross-

border transmission bottlenecks are cured as parallel to the market needs (Makkonen, 2012).

To create and deepen the market structure requires mobilising investors. The 2050 strategy sees public sector as prominent actor:

> The public sector might have a role as a facilitator for investment in the energy revolution. The current uncertainty in the market increases the cost of capital for low-carbon investment. The EU needs to move today and start improving the conditions for financing in the energy sector (EC, 2011a, pg.16).

Yet, activity of private sector is not overlooked also: "Investment risks need to be borne by private investors, unless there are clear reasons for not doing so. ... Private investors will remain most important in a market-based approach to energy policy." (EC, 2011a). While the new technologies are being applied to the new sources within a liberal framework, the technological choices are wanted to take account the local environment and the citizens in that environment are seen necessary in the decision-making processes, as parallel to the social dimensions of EU policies and the normative values of the Union. Not only constructing a well-functioning domestic market, but also creating some, qualified engagements with non-EU actors is expressed as crucial at the document: "... Europe needs to secure and diversify its supply of fossil fuels while at the same time develop cooperation to build international partnerships on a broader basis." (EC, 2011a). Besides, the document defends that the Union's international energy relations should include normative values like strengthening the global climate action, as parallel to other norms-based EU approaches.

2.3. Progress Reports (1998 - 2012)

Apart from own-use documents prepared by the European organs for intra-Union purposes, regular progress reports prepared by the European Commission between the year of 1998 and 2012 are going to be examined. In doing this, the basic rationale behind is the need for understanding demands of the EU from Turkey. Methodologically, not the entire reports will be analysed. Although the general

course of the each progress report is going to be reflected, emphasis will be on energy chapter in the each report. By analysing the progress reports, it will more clearly be seen both what Turkey lacks in terms of Europeanising its energy sector and what the EU demands from Turkey during the accession negotiations.

At the first report prepared in 1998, it is openly expressed that Turkey had the institutional framework for a market economy and with the considerable contributions of the Customs Union, there is a good competition atmosphere (EC, 1998). Nevertheless, following these positive sentences, it is stated that the public authorities affected the price of state-owned enterprises' prices and the energy sector was the best example for that. When it comes to the energy chapter, the report continues with everlasting information on the Turkish energy mix: only 42% of the total energy demand was met by the domestic sources among which lignite had the lion's share. In terms of oil, Turkey holds 90-day reserve in accordance with the standards set by the Union. The report sees the state as the prominent actor in the energy sector and evaluates the privatisation plans in 1998 as insufficient in oil, gas, coal and electricity sectors. The document advises Turkey to attract more foreign direct investment to the energy sector in order to meet the increasing demand and reminds that the Build-Operate-Transfer (BOT) system requires competition at the market (EC, 1998). The document wants Turkey to prioritise energy efficiency, promotion of the renewable energy resource investments and approximation of the Turkish laws to those of Union.

At the second report prepared in 1999, objectives of the Turkish energy policy are evaluated as in line with that of the EU in terms of security of supply, diversification of routes and sources, applying market principles, environmental norms and increasing the energy efficiency (EC, 1999). Moreover, the Turkish government is also assessed very successful in expanding and upgrading the networks for energy transportation. Turkey's plans about establishing a regulatory body for the energy sector, creation of an inventory for legal harmonisation are regarded as positive, although restrictions on foreign direct investments pertaining to the mining and energy sectors are regarded as negative. Possible next steps during

the pre-accession period are advised as alignment in internal energy market, state interventions in solid fuels, improvement of energy efficiency in transmission and distribution and usage of more renewable sources in the energy mix (EC, 1999).

At the third report prepared in 2000, it is recognised that important steps have been taken for liberalising the internal energy market (EC, 2000). To this, constitutional amendments took place in the end of 1999, contributed much by allowing international arbitration and foreign investment in the energy sector; yet, no severe application of it was observed due to some remaining restrictions. The report expresses that thanks to vibrant debates about the energy sector caused by energy shortages which hit the country, a series of considerable investments were made to the energy network and some oil and gas pipelines were started to be constructed. However, in terms of harmonisation of the Turkish laws with the community energy *acquis*, only 16 out of 120 references were realised; more elaboration was needed. On the other hand, a very positive step was the ratification of Energy Charter. In terms of domestic market, because focal point of the Turkish strategy was attracting more foreign investments and furthering privatisations rather than ensuring competitiveness, there are some problems in liberalisation of the market despite the constitutional amendments (EC, 2000). A good example is given as the separation of transmission and generation in the electricity sector, the state holds monopoly in transmission although generation and distribution include some private investments. More liberalisation is expected to come after establishment of an Energy Regulatory Board with new laws. No new developments are stated in energy efficiency at the report.

At the fourth report prepared in 2001, it is again stated that some restrictions before the foreign investments remained in the energy sector (EC, 2001). On the other hand, it is added that severe initiatives to reinforce energy market liberalisation were being taken. According to the report, the state continued to play a monopolistic role in energy transmission in addition to its major roles in generation and this had some reflections on the prices and tariffs which were used as a kind of social policy producing sizeable deficits. The document regards Turkey as a strategic geography in

terms of security of the European supplies to which Baku-Tbilisi-Ceyhan contributes pretty much (EC, 2001). The report positively comments on establishment of the energy regulatory body which was instructed to harmonise the Turkish laws with that of the EU. The document concludes by demanding Turkey to prioritise energy efficiency measures about which no considerable developments were observed in the year of 2001.

At the fifth report prepared in 2002, it is appreciated that the reforms in energy sector continued, although privatisations slowed down (EC, 2002). The state interference started to decline and independent monitoring and regulatory bodies were established as fundamental developments but, energy prices still subsidised to appease the social costs of economic recovery program instead of reflecting market conditions. The document recognises that substantial progress had been achieved since the first report in 1998 regarding to electricity and natural gas sectors and in this, successfully aligning Turkish laws with the acquis were influential. In electricity market, large consumers were allowed to directly connect to the network as a first step of liberalisation yet, barriers before electricity export and import for private sector remain. The board of Energy Market Regulatory Authority was seen as a positive step, according to the report. On the other hand, neither in energy efficiency (EC, 2002), nor in renewable energy usage any significant progress could not be reported by the Commission. The report demands Turkey to prioritise gas usage in power generation and because there was a huge untapped energy efficiency potential, Ankara should give attention to it.

At the sixth report prepared in 2003, the overview again starts with the recognition of Turkish success in liberalisation of the energy market despite intense state ownership of many generation facilities and the report expects the newly-established agency, EPDK, to further the liberalisation process (EC, 2003). The document expresses that the limitations before foreign ownership in the energy sector remained in addition to still very high state inclusion in the sector. Yet, with the start of issuing production licences by the EPDK in electricity, a very substantial progress had been realised, according to the 2003 report. Another positive development is

seen as persistent endeavours to achieve diversification; it this, Blue Stream and planned Trans-Caspian pipelines are thought to increase strategic importance of Turkey for Europe as a transit country. Regarding integration with the European network, the report positively mentions from a memorandum of understanding to construct an electricity interconnector signed between Turkey and Greece and from another memorandum of understanding to create a regional electricity market in south eastern Europe (EC, 2003). On the other hand, energy efficiency in Turkey is regarded as insufficient by the document, electricity network as energy-inefficient and losses sourcing from distribution and theft as high. The only development in energy efficiency being observed by the report is in legal terms thanks to aligning the Turkish procedural laws with the acquis. The Commission wants Turkey to deepen its efforts in usage of renewable sources, to lift barriers before cross-border electricity trade by private sector and to strengthen EPDK by recruiting enough personnel.

At the seventh report prepared in 2004, Turkish success in liberalisation of electricity and natural gas markets are recognised without neglecting the need for more efforts in the markets like petroleum (EC, 2004). The document observes that the privatisation of generation and distribution facilities had started and continuing well. However, according to the report, unpaid bills with 20% ratio created a separate problem as addition to the existence of barriers before foreign ownership in energy sector. The 2004 report expresses that, although integration of the Turkish network advances via Babaeski-Filippi interconnection project, in terms of energy efficiency Turkey moves slowly; a timeframe is needed as addition to the already prepared energy efficiency strategy document which is insufficient alone (EC, 2004). The document reports no specific developments regarding to renewable energy sources, moreover it regards the Turkish performance related to renewables and energy efficiency as “weak”. On the other hand, the 2003 document assigns Turkey an important role: “Turkey will play a pivotal role in diversifying resources and routes for oil and gas transit from neighbouring countries to the EU.”.

At the eighth report prepared in 2005, the emphasis is put on the restrictions before the foreign ownership in the energy sector (EC, 2005). Also, some new emerging problems about the market structure is tried to be reflected, a special topic is lack of coordination between EPDK and the Competition Authority. In internal energy market, limited progress is said to be achieved, an example is seen as restructuring of TEDAŞ under 21 separate distribution companies which were planned to be privatised later. As parallel to that plan, Electricity Market Law allowing private distribution companies to generate electricity is seen as deepening of liberalisation. Yet, unpaid bills and losses remained as a significant problem regarding to distribution with 18.6% in 2004. Regarding integration, it is stated that no significant interconnection facility with the western European Electricity Networks there were although connections with Bulgaria and Greece under construction (EC, 2005). The report demands Turkey to give attention on the dominant position of the state trading company in the wholesale market, the current restrictions for cross-border trading, the existing long-term power purchase agreements and cross-subsidies; besides the reduction of distribution losses is also emphasised.

At the ninth report prepared in 2006, the Commission regards Turkey as slow in realising the necessary reforms in the energy sector and says that restructuring and liberalisation of the sector fall behind the schedule (EC, 2006). In a few words, the report defines major problems of the Turkish energy sector as cross-subsidies and large distribution losses; electricity losses, including technical losses and theft remained high. Despite those major problems, the document recognises Turkey's success in diversification of supplies and routes and assigns a distinguished importance to the Baku-Tbilisi-Ceyhan petroleum pipeline in terms of energy security of the Union. As addition to those, Turkey made some progress at domestic energy market by advancing the privatisation of three distribution companies. According to the report, BOTAS remained as monopole at the gas market although the EPDK limited the share of every private company at the market at 20%. Again as negatively, no considerable development in terms of energy efficiency and in

renewable energy usage, ambitious targets were needed to be set, report advises (EC, 2006). Another advice of the report is strengthening of the administrative capacity and independence of the regulatory bodies. On the other hand, the document demands Turkey to become a party to international cooperation endeavours such as the Union for the Coordination of Transmission of Energy and Energy Community Treaty.

At the tenth report prepared in 2007, the Commission's emphasis on slow advance in Turkey remains, because the government postponed privatisation of electricity distribution assets; the document sees a need for major privatisations (EC, 2007b). Beside, large distribution losses continued; electricity theft and technical losses remained high at 17%, according to the 2007 report. Regarding the domestic energy market, the Commission observes five new implementations adopted: continuity and quality of electricity supply, monitoring distribution system investments, electricity market activities of organised industrial zones, a price equalisation mechanism and revenue requirements of 20 distribution companies. In gas market, BOTAS started to transfer its contracts as parallel to "competition" principle; moreover, privatisation process for Ankara natural gas distribution system started, the document puts (EC, 2007b). Regarding efficiency and renewable sources, framework laws were adopted yet, they did not include targets; the report advises Turkey to set ambitious targets for these two fields and strengthen the independent bodies. In terms of nuclear energy, the document sees Turkish plans to construct a nuclear power plant and demands the Turkish laws to be in line with the *acquis communutaire*.

At the eleventh report prepared in 2008, as it was in the previous reports, it is stated that barriers before foreign ownership in the energy sector continued (EC, 2008). It is recognised that Turkey made a lot in restructuring and preparing for privatisation in the energy sector, in one hand; problems related to cross-subsidies and large distribution losses were the two major troubles in the sector. Regarding energy security and integration, Turkey-Greece gas pipeline became operational and a new legislative package was adopted. In terms of domestic energy market, eligible

customer limit was lowered so, market opening ratio reached at 41%, as a success. Some other successes of Turkey according to the 2008 report were creation of a cost-based price mechanism and privatisation of four generation companies. On the other hand, the document observes that some non-cost items like the share of Turkish Radio and Television Corporation (TRT, in its Turkish acronym) remained in the electricity bills also theft and losses remained high at 15%, twice higher than the EU average (EC, 2008). Regarding natural gas, Ankara distribution was privatised as a positive step yet, the report also notes that BOTAS remained as the monopoly. In terms of efficiency and renewable sources usage, still there were no national targets set, this was a weakness in the Turkish energy structure. When it comes to nuclear, a Framework Law on the Establishment and Operation of the Nuclear Power Plants were adopted; but, the legal framework needed to be in line with the acquis, according to the report.

At the twelfth report prepared in 2009, it is again stated that the barriers before foreign ownership in the energy sector still maintained (EC, 2009). On the other hand, the document needs to recognise the Turkish success in market liberalisation regarding the energy sector; gradual opening of the market to competition, introduction of a new cost-based price mechanism empowering firms in financial terms and privatisation of 11 generation facilities and average decrease in theft and losses. Regarding natural gas, expansion of the network is noted as a positive step by the report as well as continuing privatisations. The report observes a good progress in the renewable sources usage sourcing from adoption of implementing regulations, privatisation of six geothermal facilities and setting 25% target for renewables by 2020 in electricity. In terms of energy efficiency, more implementing regulations and alignment of them with the community acquis were needed, the document says (EC, 2009). The 2009 report concludes with advices:

> Developments on renewable energy, energy efficiency and the electricity market have been encouraging. However, in the cases of natural gas, nuclear energy, nuclear safety and radiation protection Turkey needs to implement its legislation and strategies (EC, 2009, pg.60).

At the thirteenth report prepared in 2010, it is at first glance expressed that liberalisation of backbone services advanced and the ground was prepared for further privatisations in energy sector (EC, 2010b). In a classical way, the document again states that the barriers before foreign ownership in the energy sector continued. The ratification of Nabucco and signature of the Samsun-Ceyhan pipeline were two developments regarding the energy security, according to the report. In the electricity market, the private investments reached at €3.1 billion as addition to continuing privatisations. The environmental impact assessment was set as a precondition for licences, as a remarkable step towards sustainability. In natural gas, the report regards gas imports by two private companies as a positive step for competitiveness. Another positive development regarding to the renewable energy sources was the renewables' share in the Turkish energy mix which reached at 20% in energy generation; still, the Commission demanded Turkey to deepen its efforts to create incentives for renewables in implementing regulations. In efficiency, implementing regulations related to buildings adopted and also public awareness was endeavoured to be created as a good development towards Europeanisation (EC, 2010b). Regarding the nuclear energy, only limited progress was observed by the Commission; Turkey signed an agreement with Russia for the first nuclear power plant with 4.800 MW capacity and the Turkish strategy targets to meet 5% of total consumption from nuclear by 2023. According to the document, although Turkish Atomic Energy Authority (TAEK, in its Turkish acronym) prepared some regulations, Turkey needed a framework law in line with the *acquis*. The report concludes by emphasising the need for further efforts in gas, nuclear energy and energy efficiency topics.

At the fourteenth report prepared in 2011, integration efforts of Turkey including interconnection of the Turkish grid with that of EU are regarded as remarkable; another effort is seen as extension of Turkey-Iraq Crude Oil Pipeline for 15 more years (EC, 2011b). The document further adds that in order to create an energy hub, Turkey needs to liberalise its energy markets further from gas to electricity by assuring more flexibility. In electricity market, more regulations were

adopted to decrease theft and losses and the market opening ratio reached at 75% as a noteworthy progress. Regarding gas, although BOTAS maintained its almost monopoly position in the market by controlling 86% of total imports, implementing regulations on the usage of underground storage facilities were adopted and this significantly strengthened the energy security according to the document. A good progress was achieved according to the report sourcing from the incentives granted to the renewables by law, thanks to that, the report observes that the share of renewables reached at 26.4% in the Turkish energy mix (EC, 2011b). In terms of nuclear energy, still there was no Law on Nuclear Safety as the document monitors, Europeanisation requires compliance of the mentioned law with the acquis as soon as possible after it was adopted. The 2011 report demands further efforts from Turkey on further strengthening of EPDK and more detailed endeavours for energy efficiency and for the security of that energy.

At the fifteenth report prepared in 2012 which is the last report available, the Commission expresses the importance of Turkey in terms of future energy scenarios and sees a need to deepen the cooperation (EC, 2012). In terms of security of supply, regards the intergovernmental agreement between Turkey and Azerbaijan on TANAP targeting importing gas to Europe via Turkey and signature of the South Stream Pipeline as valuable for European and Turkish energy securities. Similarly, an agreement between BOTAS and a Chinese company to construct an underground gas storage facility in the Central Anatolia is regarded as valuable for energy security. Regarding the internal energy market, the Commission sees new issued regulations to encourage smaller-scale investments as positive but, criticises slowing privatisations also. In gas market, extension of gas network to 69 provinces are taken as a good progress with the continuing privatisation process of Ankara's gas distribution system; yet, maintenance of BOTAS' almost monopolistic role is described as negative (EC, 2012). In terms of renewable energy sources, EPDK issued two regulations on the use of domestic agro-fuels within gasoline and diesel which the Commission regarded as a progress like adopted new regulations providing renewables with more incentives. When it comes to the energy efficiency,

the report positively observes that a strategy was published targeting to decrease the energy intensity of Turkish economy 20% by 2023. The document advises that further efforts were needed particularly in gas market like introduction of cost-based price structure. The 2012 report concludes as: "Overall, in the area of energy, Turkey is at a moderately advanced stage of alignment." and this may give hope Turkey for the future.

When the findings about Europeanisation of the Turkish energy sector are placed in a more comparable framework, it can be seen that some demands of the Union disappear and some bring new criteria. Thus, three categories of demands are reached which can be named as "constant demands", "met demands" and "new demands". For example, the critiques about diversification of routes continuously appear from the first progress report in 1998 till 2010 intermittently. Similarly, emphasis on liberalisation of the Turkish energy markets (including natural gas and coal) holds a steady place at the progress reports and 11 out of the 15 progress reports include some demands related to liberalisation. This is exactly the same for the criteria on energy efficiency which are expressed at 11 reports out of 15 until 2012. Another chronic "problem" of Europeanisation of the Turkish energy sector is further utilisation of renewable energy sources; demands about renewable energy sources are constant as well. These four principles form the "constant demands" category. On the other hand, there are some criteria about diversification of routes and constructing interconnection facilities with the European neighbours. These constitute the "met demands" category. Demands about these criteria have been met by Turkey successfully and they have disappeared in time; the former disappeared in 2004 and the latter in 2011. A third category in comparison framework is "new demands". In this category, the weight is on the demands about developing enough storage facilities which appeared at the first report before it was strongly emphasised in both 2011 and 2012 reports. Thus, it should be regarded as the first sign for a "new demands" category in Europeanisation of the Turkish energy market.

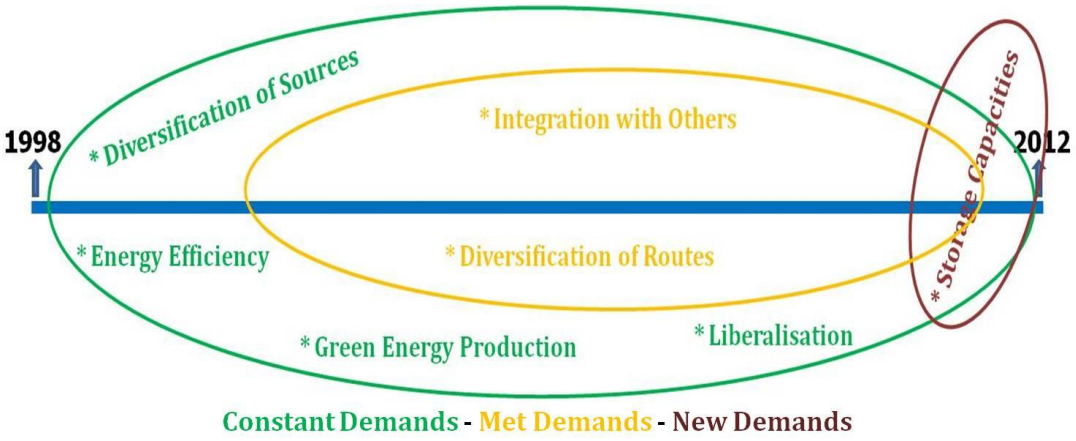


Figure 2.1. Change in Progress Reports

2.4 Three Pillars of Europeanisation

In this part, the meanings of Europeanisation in terms of energy sector will be defined and examined in a clear way as much as possible. Roughly, Europeanisation depends upon three pillars as security, competitiveness and sustainability. In other words, for a country to have a Europeanised energy sector, it should *create a secure system depending upon a competitive market structure being fed by sustainable supplies*. The pillars have been derived from the documents examined. As an example, the first document can be used; even the title and the foreword of the document is "*Energy 2020: A Strategy for Competitive, Sustainable and Secure Energy*" (EC, 2010a) and includes the same pillars as proposed by this study. Besides, there are some pieces in the literature accepting these three as the bases of European energy policy which has evolved to its contemporary meaning (in electricity) on the Electricity Market Directives and Regulations in 1996, 2003 and 2009 (Makkonen, 2012). In a similar way, these three pillars are sometimes labelled as "the European Union's trinity" (Pointvogl, 2009). The definitions of the pillars will be derived from the documents being examined and summarised above at the related sections.

Another point important to keep in mind about the nature of Europeanisation in energy sector is that it is an ongoing and developing process. Despite the fact that

the EU integration process has evolved notably, there are still spaces for national choices, as it is valid for French energy policy. As some researches sign, France has always had a "black sheep" position within the Union with its differentiating energy policies which prioritise high state intervention targeting cheap and secure electricity supply for French people and industry (Meritet, 2007).

All three pillars of Europeanisation include many complementary principles which are sometimes shared by more than one different pillar. For example, security pillar includes diversification of sources and routes; diversification of sources consists of both increasing the number of conventional supplies and a larger share for newly developing renewable energy technologies. At the same time, a larger share for newly developing renewable technologies constitute the very basis of sustainability pillar as it is indirectly included in the security pillar. In a similar way, all three pillars and their sub principles can be divided into two as normative ones and rational ones. As said before at the introductory paragraphs of this chapter, there is a strict relation between normative values of Europe and the Europeanisation process itself. For example, competitiveness pillar entirely depends upon a belief in liberalism, which is a pretty-much normative value; pillars of Europeanisation are going to be analysed from this perspective, too.

The first pillar of Europeanisation is security. This pillar can be examined under four principles as "diversification of sources", "diversification of routes", "having enough storage capacity" and "integration with the others". In terms of diversification of sources, there are severe problems at the pan-European level. Some countries are badly dependent on limited number of suppliers; much worse than this, the average EU dependency is around 50% and this rate becomes much more dangerous when main fossil fuels are considered: Dependency in natural gas is approximately 65% and dependency in oil is around 84% (EC, 2011c). In terms of supplier countries, almost one third of oil, gas and coal are imported from only one country: Russia. European dependency rates upon Russia for gas, crude oil and coal are 36%, 31% and 30% respectively (EC, 2013). These figures sign to a strategic vulnerability for the European Union. Due to the increase in economic activity and in

population, the need for energy is not expected to decrease; it can rather be expected to increase due to population increase. Because the Union heavily depends upon the Russian fossil fuel supplies in any form, solid, liquid or gas, this leaves a limited space for the EU to manoeuvre at the regional and global levels.

In order to diversify the supplies, the number of supplier countries is needed to be increased. As an addition to Russia, energy can be imported from other key energy exporter countries. Currently, only Denmark and Norway are net energy exporters within the Union. As addition to these, net energy exporter countries within the immediate neighbourhood can be considered as alternatives such as further exploitation of Libya and Algeria, reaching to Azeri and Iraqi supplies via Turkey or via other routes. At this point, unconventional alternatives show up such as wider utilisation of renewable energy sources, new technologies for more efficient and respectful use of conventional carbon sources and new indigenous alternatives like the shale gas; these options are often expressed at the both own-use documents examined above. By wider utilisation of RESs, the existing untapped capacity within the Union is planned to be used particularly for electricity generation. Because renewable sources are indigenous sources, further exploitation of them can very well contribute to the endeavours focused on decreasing pretty high import rates. On the other hand, renewable sources produces some significant security problems by their nature as much as they produce energy; these security problems will be examined at the "integration with others principle" part.

In terms of security of supplies, another principle is diversification of routes. Apart from the diversification of supplies, via which routes the energy from the same supplier is transported to the importer is vital. Transit countries can sometimes create significant problems for energy trade; one of the most well-known examples for this is Ukraine's attitude when the Russian gas cut-off to Ukraine hit the country at the New Year's Eve in 2005 (Kramer, 2006). As a precaution against the future problems sourcing from the transit countries, the supplies should be divided into the pieces accordingly. Because electricity and natural gas are line-dependent energy forms, diversification of routes gain importance in terms of them. The only solution

to this problem can be developing new routes connecting the supplier and the consumer. The European Union lays between two energy chokepoints, the Turkish and Danish Straits, through which a considerable share of annually traded energy is transported, this may create certain opportunities if smart projects are prepared. Among various projects, Russo-German plan Nord Stream and pan-European plan Nabucco are the prominent ones; this is openly declared at different platforms (Bareiss, 2011).

Nevertheless, not only diversifying the supplies both by source and route may not be enough; what is needed from the lenses of Europeanisation is having enough storage capacity in accordance with the consumption. Despite all efforts for diversification, if supply is interrupted, reserve energy may be needed. This is why almost all progress reports demands Turkey to store enough oil equal to the 90 days-consumption (EC, 2000; EC, 2002; EC, 2005). In a case of emergency, an uninterruptable supply of energy is regarded as a main basis of a Europeanised energy sector. Another way of providing the consumers with an uninterrupted supply is to create a pan-European network by integrating separate national infrastructures with the each other. This has particular importance for the increasing role of the renewable sources due to technical reasons. Technically, energy production by renewable sources has an intermittent character. Thus, there may always be a risk for insufficient production due to fluctuations in the production, despite enough installed capacity. In order to overcome this danger by transferring energy (especially electricity) from the place having it abundantly to the place lacking of it, many national networks are needed to be interconnected with each other. Within the framework of Europeanisation in the energy sector, there are several projects for this. The European Network of Transmission System Operators for Electricity (ENTSO-e) and The European Network of Transmission System Operators for Gas (ENTSO-g) are the two most prominent ones among the others (Maltby, 2013). As addition to these, some studies regard development of considerable storage capacities as a prerequisite for intra-continental integration which is a separate principle in Europeanisation notion (Rasmussen, 2012). In brief, Europeanisation puts four

principles for the security pillar; two of them are for preventing an interruption in energy supplies and two principles for maintaining the supply by taking precautions to be used in a case of interruption.

The second pillar of Europeanisation is competitiveness. This pillar can be examined under three principles as "liberalisation", "diversification of sources" and "diversification of routes". The first principle, liberalisation, entirely depends upon some normative beliefs such as efficiency of specialisation, of decreased role for state or the virtues of private entrepreneurship. Therefore, it advises all applications of a capitalist market economy for energy sector, like allowing private investments, privatisations and establishing a regulatory body to manage the sector accordingly. On the other hand, there are also some rational motives behind, the most important two among them are drawing the prices down in full competition atmosphere created by liberalisation and prioritising the consumers' benefits. As can be found at the related sections on Energy 2020 and Energy 2050 documents, competitiveness is insistently emphasised for this reason. Liberalisation requires a smaller role for the state and to accomplish this, transformation of state-owned enterprises are necessary; in other words, liberalisation of energy sector in the meaning of Europeanisation requires privatisations. Neither at only own-use documents of the Union, but also at almost every progress reports prepared for Turkey this point is put emphasis on.

Another basis of liberalism principle is allowing private investments as an addition to the privatisation process. To construct a fully competitive environment, there should be many firms at the market other than those of state. Thanks to the increasing private investments, the state's role can be lowered further more easily. As totally detached from political concerns, more cost-efficient investments can be made. Besides, thanks to the nature of renewable energy sources, instead of huge investments requiring public finance or inclusion of big capital owners, smaller-scale investment can be done by middle sized firms and this may boost the installed capacity of countries. There is a strict relation between liberalism and sustainability from this perspective, it will be examined in a more detailed way with the third pillar. Another feature of liberalism is that it also necessitates establishment of regulatory

bodies for the energy sector to regulate, issue licences, inspect, monitor and to punish necessary actors. Without regulatory bodies, neither the full competition system nor protection of the consumers cannot be maintained. To sustain the coordination between different regulatory bodies of member states at the pan-European level, there is an organ as The Council of European Energy Regulators (CEER).

Another principle of competitiveness is diversification of sources. This principle can be regarded as a reflection of liberalism principle which is the core of the competitiveness pillar. As a very natural consequence of liberalism, lots of different actors will be included at the market. In order to compete at the prices, every actor needs to have energy supplies at lower costs and this automatically brings different supplier countries or companies into the arena. Any actor may buy required amount or type of energy from different suppliers to decrease the prices. Thus, this contribute both to security of supply and to competitiveness. The last principle is diversification of routes. As similar to the second principle of the competitiveness pillar, diversification of routes is a natural consequence of liberalism; this third pillar is also strengthened by the second principle of the second pillar, which is diversification of sources. In a market where many actors buy energy from many different suppliers, many alternative different routes to transport supplies emerge at the picture almost spontaneously. The plausible outcome and prerequisite of diversification of sources is diversification of routes too, at a liberal Europeanised energy market.

The third and the last pillar of Europeanisation is sustainability. This pillar can be examined under three principles as “energy efficiency”, “green energy production” and “integration with others”. The energy efficiency principle basically depends upon energy conservation and more efficient use of energy. The basic rationale behind sources from the material realities of the current energy structure which fossil fuels has the lion’s share in. Because the use of fossil fuels produces high greenhouse gases emissions and this causes environmental damages at the global level by destructing climate, the current energy mix does not seem sustainable; at least, because the fossil fuels are finite sources, the current energy

structure will have to be changed dramatically. Thus, both to use the existing energy for a longer time and to cause less harm in the planet, energy efficiency is seen as fundamental in the Europeanisation of energy sector. This is expressed for many times at the documents examined above. For example, *Energy 2020* strategy document sets 20% energy efficiency by 2020 (EC, 2010a). Energy-inefficient buildings and transportation by more energy-efficient vehicles have utmost priority in this respect. At the both own-use documents of the Union, the necessity of National Energy Efficiency Action Plans and setting ambitious national targets at those plans are expressed for times; similarly, the Union demands the same thing at the Turkey progress reports.

The second principle, green energy production, places the main emphasis on the wider usage of renewable energy sources. As said at the previous paragraph, the current energy structure is not sustainable due to material and environmental reasons. However, energy demand is predicted to continue to increase globally; therefore, energy production has to be increased too. At this point, renewable energy sources appear as the most suitable option for Europe; as the Union recognise it at respective documents. A larger share for renewable energy sources is also entirely compatible with the targets set at the *Energy Roadmap 2050* for decreasing greenhouse gases emissions to the 80% of 1990 levels by 2050 (EC, 2011a). In this respect, another target set at the *Energy 2020* strategy, which is to produce 20% of energy from renewable sources becomes more meaningful within general framework of Europeanisation. Another reason for prioritising green energy production at pan-European level is Europe's strategic weakness in terms of primary energy sources. Because the European Union is highly dependent upon foreign energy supplies due to lack of indigenous carbon sources, the only way to increase European energy production is to increase the share of renewable sources. This also serves to the energy security of Europe, as it was said at the diversification of sources principle of the security pillar.

The last principle of the last pillar, integration with the others, which is a shared principle with also the security pillar, can be regarded as a natural

consequence of the emphasis on renewable energy. Because renewable sources produce energy intermittently, they are not completely reliable on their own. There can be fluctuations in the amount of produced energy by these sources; therefore, at a specific moment, there may be insufficient production in an area and excess production in another. In order to overcome interruption risks due to the nature of renewable sources, integrating separate national grids with each other seems as a plausible solution. Both Energy Roadmap 2050 (EC, 2011a) and Energy 2020 (EC, 2010a), offers the same option as the solution. With the construction of enough interconnection capability, free movement of energy at pan-European level will be assured. Thus, competitiveness pillar of the respective national energy structures can be strengthened as well.

In conclusion, there are three main pillars of Europeanisation in terms of energy sector as security, competitiveness and sustainability. Each pillar consists from several principles and sometimes one or more principles of a pillar are shared by more than one pillar. In total, there are seven different principles as diversification of sources, diversification of routes, integration with others, storage capacity, liberalisation, energy efficiency, green energy production. In other words, what Europeanisation means in the energy sector consists from three main pillars and seven main principles. These pillars and principles can be used when a specific energy sector is examined within the framework of Europeanisation. Lastly, it should be admitted that this pillar-principle structures-based definition of Europeanisation can be regarded as a kind of reductionism. This definition completely ignores geographical proximity. For example, if Burkina Faso develops its energy sector in accordance with the pillars and principles of Europeanisation, it still remains as a question whether it can be said that Burkina Faso has Europeanised its energy sector. By its nature, Europeanisation has a non-detachable geographical meaning with it. Before everything, a country can be expected to be within the close neighbourhood of Europe. Therefore, using the definition for such countries does seem more plausible. Turkey is such one. In the next chapter, evolution of the Turkish electricity sector will be examined.

CHAPTER 3

EVOLUTION OF THE ELECTRICITY GENERATION IN TURKEY

In this chapter, evolution of the electric power generation in Turkey will be examined. This approach is expected to exhibit a framework for a coherent analysis. Electricity has been the blood of the modern life since two centuries roughly and it seems to continue more for a foreseeable future. Electricity is a kind of flow of electrons, at the most basic meaning; it makes devices work with this power. In comparison to some other forms of energy, electricity is not a primary energy source. The sources such as wood, natural gas, oil or coal are the primary sources from which other forms of energy, like electricity, can be generated. Nevertheless, to produce electricity, a primary energy sources is needed, it cannot be obtained on its own. In technical meaning, electricity is one of the most user-friendly forms of energy; it can very easily and effectively be converted to the other forms of energy and to labour. Although electricity is pretty useful for the any aspect of economy, there are some technical problems about electricity by its nature. Among many other, one comes up the first: electricity is very hard to storage. Because electricity is almost impossible to storage in large-scales effectively, production and consumption needs to be balanced at a specific moment. This hardship forces decision makers to prioritise energy investments in the modern world in which almost every economic activity largely depends upon electricity consumption.

Although most of the fundamental features of electricity were studied and understood during the 19th century, the existence of electricity had been known for centuries. In 1752, Benjamin Franklin conducted an experiment with a kite which brought electricity to the scientific agenda again. Following him, Michael Faraday

opened the way to the current electricity production with his discoveries in 1831. In 1873, electricity transmission was developed by Zénobe Gramme and this was followed by the invention of efficient light bulbs by Thomas Edison in 1879. Lastly in 1886, William Stanley constructed the city electrification system by using alternating current in the United States of America (USA). This opened the way for mass usage of electric power as the basic energy source in all aspects of economic activities. However in Turkey, introduction of electricity had been quite late in comparison to the USA and the European countries. Still, electricity generation in Turkey started during the Ottoman Empire's time and fastened after the proclamation of the Republic in 1923. In separate sections, electricity production in Turkey is going to be tried to be examined below by detaching the Imperial and the Republican eras from each other.

3.1 Electricity Generation during the Ottoman Era

The first electricity generation trials were made at the late Ottoman era, during the last 15 years of the Empire. Although the world had already started to use electricity both in industry and in daily life for the purposes like enlightening the homes and streets or developing more effective, clean and speed public transportation systems thanks to electric tramway, the Ottoman Empire did let electricity to develop throughout the Empire quite late. Behind this, there were some specific reasons, as addition to the reasons related to the general development of the Empire. Among the specific reasons, those about the Sultan Abdülhamid II seem pretty interesting. Some sources claim that, late introduction of electricity in the Empire was due to the Sultan's personal phobias. Because the Sultan had concerns on the harms of electricity that it could have destroyed the entire electrified industry from thousands of mile away via a simple cable, he refused offers for introducing electricity in the Ottoman Empire (Kayserilioglu, 1998). Perhaps with that fear of Sultan, it can be assumed that the "energy security" concept emerged for the first

time in the history. Another reason for why the Sultan feared from electricity was about an assassination attempt against him at Yıldız Mosque on July 21, 1905. Because he mistook “dynamo” for “dynamite” which was used against him at the Yıldız assassination attempt, he strictly refused all developments related with dynamo and electricity (Bayril et al., 2009).

At the Ottoman era, almost all the projects about electricity generation and electrification plans were proposed, undertaken and realised by foreigners; due to lack of educated human resource, Ottoman citizens only played insignificant roles. Due to the general backwardness of the country, the only way to introduce electricity to the country appeared as privileges given to foreign real or legal persons. In this tendency, as addition to the lack of educated human resources, lack of domestic capital was another obstacle before Ottoman policy makers. On June 23, 1910, the Ottoman Parliament adopted the “Law on Concessions Relating to Public Service” to regulate the privileges system and consolidate the applications (Esirgen, 2011). This law can be regarded as the first law adopted about the electricity market to a certain degree; in this respect, the law deserves a detailed attention for the history of electricity in Turkey. Alongside the concessions granted to the foreign entrepreneurs, some concessions were also granted to the local municipalities and to the Ottoman nationals. For example, electricity generation concession was given to the local municipality in the city of Edirne in 1909, in Adana to an Ottoman citizen, Osman Vehbi, in 1913 for 50 years; Osman Vehbi were also granted the electricity generation concession of Aleppo in 1914 later. In the city of Eskisehir and Samsun, again local municipalities were given the concession for generating electricity in 1919 and 1920 respectively (Erol, 2007).

The first electricity generation at the Ottoman era was realised in Tarsus. An Austrian technician working for the Municipality of Tarsus, Dörfler, proposed a project to generate electricity from a small river near to the city centre. After installing a dynamo and connecting it to a mill’s shaft established next to a small river by a transmission band, the first hydro power plant of Turkey was established

on September 15, 1902 (Ozdemir, 2011). The plant having only 2 kW installed power was 1800 metres away from the city; with the electricity generated, the building of municipality, houses of two prominent figures of the local bureaucracy and some main avenues of the city were enlightened. During the following years, the installed capacity of plant was increased to 60 kW with new investments (Ozdemir, 2011).

After this the first preliminary step in the Ottoman Empire towards electrifying a city, the first large scale power plant of the Ottoman era was constructed in Istanbul, following the deposition of the Sultan Abdülhamid II. Silahtaraga power station, with its four pioneering features, the first large scale plant, the first coal-fired thermal power plant, the first application of build-operate-transfer (BOT) method and the first electricity production for commercial purposes, was a milestone for the Turkish electricity sector (Ozdemir, 2011). The construction started in 1911 in the Golden Horn and started to generate electricity on February 11, 1914 for street lights; some houses were also electrified three days later on February 14, 1914. The total installed capacity was 15 MW consisting from three separate generators; the plant reached the highest installed capacity in 1956 with 120 MW and stopped operating on March 18, 1983 (Santral Istanbul, 2013).

Except these two breakthroughs made, there were some other considerable developments throughout the entire Empire. Among them, the electrification of the city of Izmir and of Thessaloniki in the year of 1905, the introduction of electricity to Damascus in 1907 and to Beirut in 1908 were the outstanding ones. In Izmir, a plant with 118 kW installed power for a salt-marsh, a 82 kW plant for railway factory, a 54 kW plant for a wine factory and a 80 kW plant for wool factory were constructed. In the other parts of the Empire, a plant with approximately 560 kW installed power for copper production and in 1919, a 420 kW plant for textile production were constructed. Thusly, at the pre-republican era during the Ottoman Empire, the total installed capacity had been 33 MW and almost 50 GWh electricity power were generated annually (Dolun, 2002).

3.2 Electricity Generation during the Republican Era

Electricity generation during the republican era (1918 onwards) constitute the real story of the electricity generation in Minor Asia. Nevertheless, the structure established at the Ottoman era took much time to be changed according to the policies and needs of the newly established state. For example, among 201 newly-established Turkish companies between 1920 and 1930, only 9 of them were dealing with the energy business and all those companies were operated by foreigners somehow (Okcun, 1971).

When the republic was proclaimed in 1923, the country had 32,8 MW installed capacity in 38 separate power plants, of which total 14 owned by real persons, 13 by companies and 11 by local municipalities. Only three cities, Istanbul, Adapazari and Tarsus, had electricity which leaves 94% of the population out of electricity connection and means only 3 kWh electric power per person (TUSIAD, 1998). Despite this very weak structure of the Turkish energy sector and lack of capital, human resource and technical knowledge in the country, electricity spread fast relatively. Adapazari in 1923, Izmir city centre, Adana, Inebolu, Artvin, Trabzon, Aksehir and Mersin in 1925, Sivas, Aksaray, Konya, Ayvalik, Bursa, Malatya, Kutahya in 1926, Nazilli, Kirkagac, Antalya, Afyon, Kirklareli, Samsun, Corlu, Giresun, Eskisehir, Yozgat in 1928, Bandirma, Biga, Milas, Ordu, Bafra in 1929 and in 1930 Balikesir, Kastamonu, Tekirdag and Urfa were electrified; thus, the cities being electrified within the first ten years of republic reached at 105 (Ozdemir, 2011). In Ankara, the first plant was established in Bentderesi, in 1924 and was followed by a second constructed by German origin companies AEG and MAN (TUSIAD, 1998). In order to protect the electricity producers from fluctuations in the market, electricity was sold in a gold-standard system (Erol, 2007). Despite this kind of protective measures and privileges given to the producers, electricity production

developed very slowly until the Great Depression in 1929. *It can be said that 1930s had been the first period for takeoff of the Turkish electricity sector.*

Starting from 1929 and 1930s, electricity production for only industrial purposes was introduced to Turkey; thus, autoproduction of electricity spread across the entire country. Some of the prominent examples for autoproduction were a plant with 1500 horsepower installed capacity in 1927, a second plant with 5.571 horsepower capacity in 1929 and another with 5.920 horsepower installed capacity in 1930 (Ozdemir, 2011). These autoproducers not only met their own needs for industrial purposes, also sold electricity to their neighbourhood if they had excess generation. With the contributions of these autoproducers providing their neighbourhood with electricity, 105 cities were electrified within the first ten years of the republic (Ulken, 1981). Again in 1929, Visera (today known as "Isiklar") hydro power plant, which still continues to generation, was constructed with 1.1 MW installed power (Bulu, 2011). The plant is the first hydro power plant in Turkey and is among the first ten hydro power plants in the world. All these developments helped increasing the total installed capacity to 78 MW, the total production to 106.3 million GWh and electricity generation per person to 6.7 kWh in 1930 (Ozdemir, 2011). Nevertheless, the Turkey in 1930 was still pretty much behind the other countries in the world in terms of electricity generation; in comparison to the 6.7 kW/h electric power per person in Turkey, Morocco had 7 kWh, Australia and Tasmania had 440 kWh and the New Zealand had 367 kWh electric power per person in 1930. Besides very weak electricity generation, the existing facilities were mostly owned by the foreigners; in the total production, foreign companies had 94%, local municipalities had 4% and real persons had 2% share. Besides, there were only 75.000 electricity users amounting to 2.7% of the total population. There were 97 plants in total and 13 of them were using steam power, 13 using hydro power, 68 using motors and 3 using wood gas; in other words, 70% of total generation were made by using exogenous sources, namely by using motors consuming imported fuels (Ozdemir, 2011).

When the Great Depression hit the global economy in the year of 1929, investment capabilities of the private sector almost evaporated. Therefore, the only way to increase the national electricity generation in Turkey appeared as dragging state into the business, as it was the same for the sectors other than energy. Particularly towards the mid-1930s, municipalities were allowed and authorised to start and develop electricity generation and İller Bankası (Bank of Provinces) was directed to provide the municipalities with credits in accordance with this policy. Thus, the first preliminary strategy was structured in the 1930s: generation would be realised with the hand of both autoproducers and municipalities while distribution solely with the hand of municipalities. This strategy evolved into a nationalisation strategy in time, due to both political choices and the attitudes of foreign companies holding privileges. In 1935, a new directorate was established for central planning in the electricity sector as a significant step towards institutionalisation (YEGM, 2013). Starting from the dawn of the Second World War, almost all foreign companies were expropriated between 1938 and 1944 (Ozdemir, 2011). Before the 1930s ended, only 6.2% of the total electricity generation in Turkey was made with hydro power plants and hard coal and liquid fuels had 82.3 and 10% shares respectively in 1938 (Yogurtcugil, 1973).

Table 3.1: Electricity Production Figures (1930-1939) (TEIAS, 2013a)

YEARS	THERMAL	HYDRO	TOTAL (GWh)	INCREASE (%)
1930	*104,4*	*1,9*	*106,3*	*8,69*
1931	*114,5*	*3,4*	*117,9*	*10,91*
1932	*127,6*	*4,0*	*131,6*	*11,62*
1933	*147,9*	*4,0*	*151,9*	*15,43*
1934	*189,7*	*5,5*	*195,2*	*28,51*
1935	*205,9*	*7,0*	*212,9*	*9,07*
1936	*221,7*	*9,4*	*231,1*	*8,55*
1937	*280,0*	*9,8*	*289,8*	*25,40*
1938	*302,3*	*9,8*	*312,1*	*7,69*
1939	*342,0*	*11,3*	*353,3*	*13,20*

At the beginning of 1940s, the installed power in the country was 227.1 MW, of which only 6% was at hydro power plants and the remainder was at thermal power plants; the total production was 396,9 GWh (TEIAS, 2013a) and the electric power per person was 20,3 kWh. On 15.10.1947, Hasan Saka government declared electricity generation by using hydro power plants and endogenous lignite resources as the priority of energy policy (Ozdemir, 2011). There are enormous differences between the policy prioritising endogenous resources such as lignite and hydro power and the policy allocating 7% of the total electricity generation to these sources in 1938. Another feature of the 1940s for the Turkish electricity sector is the construction of the first large-scale regional power plant, Catalagzi power plant, in Zonguldak province (Bahadir, 2001). The plant was taken into operation with 40 MW installed capacity and later, in the year of 1953, was connected with the first

large-scale transmission line to the Silahtaraga power plant, to meet the fast increasing demand in Istanbul (Ozdemir, 2011).

Table 3.2: Electricity Production Figures (1940-1949) (TEIAS, 2013a)

YEARS	THERMAL	HYDRO	TOTAL (GWh)	INCREASE (%)
1940	*383,1*	*13,8*	*396,9*	*12,34*
1941	*394,5*	*20,7*	*415,2*	*4,61*
1942	*385,5*	*22,7*	*408,2*	*-1,69*
1943	*433,6*	*23,8*	*457,4*	*12,05*
1944	*470,0*	*26,1*	*496,1*	*8,46*
1945	*504,0*	*23,8*	*527,8*	*6,39*
1946	*535,6*	*27,1*	*562,7*	*6,61*
1947	*598,4*	*26,6*	*625,0*	*11,07*
1948	*645,9*	*30,4*	*676,3*	*8,21*
1949	*707,3*	*29,3*	*736,6*	*8,92*

1950s represent a series of large path-breaking investments in terms of the Turkish electricity sector. One of the most prominent ones among them was the above-mentioned transmission line which was constructed from Zonguldak to Istanbul in 1953. In 1956, Etibank, which was a state institution dealing with exploitation of natural resources and construction of large hydro power plants, constructed Sariyar hydro power plant which had 160 MW installed capacity. The plant was also the first hydro power plant in Turkey with a dam. Following Sariyar plant, Hirfanli hydro power plant, which was constructed with 128 MW installed capacity, was taken into operation in the year of 1959. With the help of huge investments, total electricity production of Turkey rose from 789,5 GWh in 1950 to 2815,1 GWh in 1960. According to the figures, Turkey realised a significant progress

in electricity and increased its generation 13,6 percent in average per year between 1950 and 1960 (TEIAS, 2013a).

Table 3.3: Electricity Production Figures (1950-1959) (TEIAS, 2013a)

YEARS	THERMAL	HYDRO	TOTAL (GWh)	INCREASE (%)
1950	*759,4*	*30,1*	*789,5*	*7,18*
1951	*843,4*	*44,5*	*887,9*	*12,46*
1952	*961,6*	*58,6*	*1.020,2*	*14,90*
1953	*1.133,3*	*67,5*	*1.200,8*	*17,70*
1954	*1.319,6*	*82,9*	*1.402,5*	*16,80*
1955	*1.490,7*	*89,1*	*1.579,8*	*12,64*
1956	*1.656,2*	*162,9*	*1.819,1*	*15,15*
1957	*1.745,4*	*311,3*	*2.056,7*	*13,06*
1958	*1.646,0*	*657,4*	*2.303,4*	*11,99*
1959	*1.896,4*	*690,9*	*2.587,3*	*12,33*

During the 1960s Turkey focused its efforts in decreasing the energy costs and in constructing more connected transmission network as much as possible. In terms of the former objective, the government of Prime Minister Demirel, considered nuclear energy as an alternative for the first time in the Turkish electricity history in 1965 (Ozdemir, 2011). For the latter objective, Bosporus strait was crossed for the first time with a 154 kW transmission line by Etibank in 1960. Another revolutionary step was the start of construction of interconnected network in Turkey. On January 6, 1963, energy transmission line between Bursa and Balikesir started to operate (Yogurtcugil, 1973). It can be said that this transmission line was the first step for interconnected network. As addition to the developments in generation and transmission, considerable progress in institutionalisation in management of the

sector was realised with the establishment of Ministry for Energy and Natural Resources in 1963 (ETKB, 2013a).

Table 3.4: Electricity Production Figures (1960-1969) (TEIAS, 2013a)

YEARS	THERMAL	HYDRO	TOTAL (GWh)	INCREASE (%)
1960	*1.813,7*	*1.001,4*	*2.815,1*	*8,80*
1961	*1.745,9*	*1.265,2*	*3.011,1*	*6,96*
1962	*2.436,1*	*1.123,7*	*3.559,8*	*18,22*
1963	*1.879,0*	*2.104,4*	*3.983,4*	*11,90*
1964	*2.802,8*	*1.648,1*	*4.450,9*	*11,74*
1965	*2.773,7*	*2.179,0*	*4.952,7*	*11,27*
1966	*3.238,1*	*2.338,1*	*5.576,2*	*12,59*
1967	*3.835,0*	*2.381,8*	*6.216,8*	*11,49*
1968	*3.761,0*	*3.174,8*	*6.935,8*	*11,57*
1969	*4.393,1*	*3.444,9*	*7.838,0*	*13,01*

The institutionalisation at the Turkish electricity sector fastened and deepened throughout 1970s. On July 15, 1970, Turkey Electricity Authority was founded in order to develop a central planning procedure for the Turkish electricity sector in accordance with the respective 5 Year Development Plans (TEIAS, 2013b). Because the global crisis in fossil fuel prices hit Turkey as it hit other countries, Turkey focused on hydroelectricity which was one of the most profitable and feasible renewable resource among the endogenous energy resources. As an example for this policy, two large hydro power plants became operational during 1970s. In the year of 1972, Gokcekaya hydro power plant was taken into operation with 278 MW installed power (EUAS, 2013). This dam on the Sakarya River was followed by another huge dam in 1974, by the largest hydro power plant being constructed until that date in

Turkey, Keban Dam. The Keban Dam was taken into operation with 1330 MW installed capacity and met 20% of the total Turkish electricity generation on its own in that year (DSI, 2012a). Apart from hydro power plants, a large thermal power plant, Seyitömer plant, started to operate with 600 MW installed capacity in 1977 (SOMTES, 2012). Thanks to these huge investments, the total Turkish electricity generation reached at 23275,4 GWh in 1980 (TEIAS, 2013a). Another feature of 1970-1980 period is the introduction of electricity import from Bulgaria. The trade started with a 96,2 GWh electricity import from Bulgaria and this was followed by a 390,7 GWh electricity import from the Union of Soviet Socialist Republics (USSR) in 1979. Thus, Turkey became interconnected with its neighbours to the west.

Table 3.5: Electricity Production Figures (1970-1979) (TEIAS, 2013a)

YEARS	THERMAL	HYDRO	TOTAL (GWh)	INCREASE (%)
1970	*5.590,2*	*3.032,8*	*8.623,0*	*10,02*
1971	*7.170,9*	*2.610,2*	*9.781,1*	*13,43*
1972	*8.037,7*	*3.204,2*	*11.241,9*	*14,93*
1973	*9.821,8*	*2.603,4*	*12.425,2*	*10,53*
1974	*10.121,2*	*3.355,8*	*13.477,0*	*8,47*
1975	*9.719,2*	*5.903,6*	*15.622,8*	*15,9*
1976	*9.908,0*	*8.374,8*	*18.282,8*	*17,0*
1977	*11.992,3*	*8.572,3*	*20.564,6*	*12,5*
1978	*12.391,3*	*9.334,8*	*21.726,1*	*5,6*
1979	*12.233,0*	*10.288,9*	*22.521,9*	*3,7*

The decade starting with 1980 brought both further central planning in one hand and a gradual liberalisation on the other. With the adoption of the code number

2705, distribution facilities belonging to municipalities were transferred to the Turkish Electricity Authority (Dolun, 2002). Later in 1984, code number 3096 was adopted and private sector was allowed to make investment in generation, transmission and distribution in accordance with the general policy emphasising privatisation and liberalisation (Dolun, 2002). In 1982, Yatagan thermal power plant started to operate with 630 MW installed capacity (YEAS, 2010). Only 2 years later, the largest thermal power plant of Turkey, Afsin-Elbistan Thermal Power Plant, was taken into operation in the south-eastern part of Turkey with 2795 MW installed capacity (AFELTESA, 2008). Another large thermal power plant was 1120 MW Hamitabat gas-fired power plant, which started to fully operate in 1989 (HEAS, 2013). As addition to these three thermal plants, many hydro power plants started to generate electricity during 1980s as well. Among them, the ones having more than 100 MW installed capacity are 500 MW Hasan Ugurlu Dam in 1981, 138 MW Aslantas Dam and 540 MW Oymapinar Dam in 1984, 1800 MW Karakaya Dam in 1987, 700 MW Altinkaya Dam in 1988 and 124 MW Menzelet Dam in 1989 (DSI, 2012b). These investments and other respectively smaller plants caused an admirable increase at the Turkish electricity generation; the total production rose to 57543,0 GWh in the year of 1990 (TEIAS, 2013a). In the last year of 1980s, in 1989, electric import of Turkey was 558,5 GWh as addition to the domestic production (TEIAS, 2013a). Another remarkable development in this period was the construction of a commercial wind power plant with 55 KW installed power in Cesme Altin Yunus region in 1986 (Ilkilic, 2009).

Table 3.6: Electricity Production Figures (1980-1989) (TEIAS, 2013a)

YEARS	THERMAL	HYDRO	WIND+GEOTHERMAL	TOTAL (GWh)	INCREASE (%)
1980	*11.927,2*	*11.348,2*	*0*	*23.275,4*	*3,3*
1981	*12.056,7*	*12.616,1*	*0*	*24.672,8*	*6,0*
1982	*12.384,8*	*14.166,7*	*0*	*26.551,5*	*7,6*
1983	*16.004,1*	*11.342,7*	*0*	*27.346,8*	*3,0*
1984	*17.165,1*	*13.426,3*	*22,1*	*30.613,5*	*11,9*
1985	*22.168,0*	*12.044,9*	*6,0*	*34.218,9*	*11,8*
1986	*27.778,6*	*11.872,6*	*43,6*	*39.694,8*	*16,0*
1987	*25.677,2*	*18.617,8*	*57,9*	*44.352,9*	*11,7*
1988	*19.030,8*	*28.949,6*	*68,4*	*48.048,8*	*8,3*
1989	*34.041,0*	*17.939,6*	*62,6*	*52.043,2*	*8,3*

During 1990s, liberalisation process of the Turkish electricity sector fastened, despite state's increasing consolidation in the sector. Despite significant reforms in the electricity sector, the most significant development was the completion of Ataturk Dam, which was the largest dam of Europe, Caucasus and the Middle East with its 2400 MW installed capacity and 8.900 GWh annual production capacity (DSI, 2012c). Another watershed in this decade was the beginning of electricity export from Turkey to its neighbours; in 1990, Turkey exported varying amounts of electricity to Bulgaria, Romania, Albania and Georgia in total 906,8 GWh (TEIAS, 2013a). Although Ataturk Dam was a huge investment, some more hydro power plants had been completed during 1990s such as 159 MW Gezende Dam and 124 MW Kilickaya Dam in 1990, 284 MW Sir Dam in 1991, 198 MW Batman Dam and 510 MW Berke Dam in 1999 (DSI, 2012b). As addition to these hydro power plants, some huge thermal power plants were constructed; 1034 MW Soma thermal power

plant was one of them (SEAS, 2013). In the year of 2000, the Turkish electricity production reached at 124921,6 GWh by increasing 80,9% in comparison to 1990 levels (TEIAS, 2013a).

Table 3.7: Electricity Production Figures (1990-1999)(TEIAS, 2013a)

YEARS	THERMAL	HYDRO	WIND+GEOTHERMAL	TOTAL (GWh)	INCREASE (%)
1990	*34315,3*	*23147,6*	*80,1*	*57543,0*	*10,6*
1991	*37481,7*	*22683,3*	*81,3*	*60246,3*	*4,7*
1992	*40704,6*	*26568,0*	*69,6*	*67342,2*	*11,8*
1993	*39779,0*	*33950,9*	*77,6*	*73807,5*	*9,6*
1994	*47656,7*	*30585,9*	*79,1*	*78321,7*	*6,1*
1995	*50620,5*	*35540,9*	*86,0*	*86247,4*	*10,1*
1996	*54302,8*	*40475,2*	*83,7*	*94861,7*	*10,0*
1997	*63396,9*	*39816,1*	*82,8*	*103295,8*	*8,9*
1998	*68702,9*	*42229,0*	*90,5*	*111022,4*	*7,5*
1999	*81661,0*	*34677,5*	*101,4*	*116439,9*	*4,9*

The first decade of the 21st century, marked a real watershed in terms of the Turkish electricity sector. Liberalisation and privatisation policies created the great transformation of the Turkish electricity sector. Details on the transformation will be given while examining the Europeanisation of the sector, at the following chapter. Nevertheless, establishment of Energy Market Regulatory Authority with the code number 4628 in 2001. Besides, many reforms concerning to the structure of the sector, huge investments continued particularly with the help of hydro power plants. 672 MW Birecik Dam, 180 MW Karkamis Dam and 170 MW Ozluce Dam in 2000,

160 MW Alpaslan-1 Dam in 2002, 140 MW Kigi Dam in 2003, 115 MW Muratli Dam and 100 MW Yamula Dam in 2005, 300 MW Borcka Dam in 2006, 203 MW Obruk Dam and 103 MW Torul Dam in 2007 and 115 MW Akkopru Dam and 305,5 Ermenek Dam in 2009 were constructed (DSI, 2012b). Apart from the hydro power plants constructed, 160 MW 18 Mart Can thermal power plant started to generate electricity in 2005 (EUAS, 2011). In the year of 2001, due to economic crisis in Turkey, electricity generation diminished for the first time after a decrease in 1942. Because of the negative effects of the crisis on the Turkish economy, energy import decreased to 3588,2 GWh in 2002 from its 2001 level (4579,4 GWh) (TEIAS, 2013a). Nevertheless, despite the crisis, the total electricity production in Turkey jumped to 210.180 GWh in 2010 as a result of all these investments (EUAS, 2010).

Table 3.8: Electricity Production Figures (2000-2009)(TEIAS, 2013a)

YEARS	THERMAL	HYDRO	WIND+GEOTHERMAL	TOTAL (GWh)	INCREASE (%)
2000	*93.934,2*	*30.878,5*	*108,9*	*124.921,6*	*7,3*
2001	*98.562,8*	*24.009,9*	*152,0*	*122.724,7*	*-1,8*
2002	*95.563,1*	*33.683,8*	*152,6*	*129.399,5*	*5,4*
2003	*105.101,0*	*35.329,5*	*150,0*	*140.580,5*	*8,6*
2004	*104.4637*	*46.083,7*	*150,9*	*150.698,3*	*7,1*
2005	*122.242,3*	*39.560,5*	*153,4*	*161.956,2*	*7,4*
2006	*131.835,1*	*44.244,2*	*220,5*	*176.299,8*	*8,8*
2007	*155.196,2*	*35.850,8*	*511,1*	*191.558,1*	*8,6*
2008	*164.139,3*	*33.269,8*	*1008,9*	*198.418,0*	*3,5*
2009	*156.923,4*	*35.958,4*	*1931,1*	*194.812,9*	*-1,8*

During the first three years of the second decade of the 21st century, namely the years between 2010 and 2013, the Turkish energy sector has focused on

endogenous sources. Among them, renewable sources and lignite-powered thermal plants have been the prominent ones. Regulation and supervision with the hand of Energy Market Regulatory Authority, which has developed and institutionalised considerably fast, have constituted the main story of the three years since 2010. In the year of 2010, EPDK issued 119 licences for generation and 16 licences for autoproducers in the electricity sector (EPDK, 2010a). The bulk of the issued licences were about hydro power plants adding a 1.944 MW to the Turkish installed capacity. As addition to the hydro power plants, gas-fired and coal-fired thermal power plants are expected to add a 520 MW installed capacity. Luckily for Turkey, licences issued for the electricity generation from the renewable energy sources constitute a 305 MW installed power in 2010 (EPDK, 2010a). Thus, the share of renewable energy sources increased in the aggregate Turkish energy mix in which thermal energy plants continue to hold two-third of the total production as it was the same in the early republican era. In the year of 2011, EPDK issued 311 licences for generation and 40 licences for autoproducers in the electricity sector (EPDK, 2011a). Among the licences issued, the ones about hydro power plants had the largest share by adding a 1841,16 MW installed capacity to the existing. Other than the hydro power plants, gas-fired and coal-fired thermal power plants are expected to add a 6451,15 MW installed capacity. Similar to the previous years, the share of the renewable energy sources increased with their licensed potential to add a 4237,66 MW installed power in 2011. Thusly, the total installed power of Turkey reached at 62.475 MW and the aggregate production at 229,395 GWh. The dependency of Turkish electricity generation decreased to 56% in 2011 (EPDK, 2011a). In this electricity generation structure, the mix of primary energy sources is also important. In 2011, natural gas had approximately 45%, hydraulic sources had 23%, lignite had 17%, wind energy had 2,1% and other sources had the rest.

Table 3.9: Electricity Production Figures (2010-2012)(TEIAS, 2013a)

YEARS	THERMAL	HYDRO	WIND+GEOTHERMAL	TOTAL (GWh)	INCREASE (%)
2010	*155.827,6*	*51.795,5*	*3.584,6*	*211.207,7*	*8,4*
2011	*171.638,3*	*52.338,6*	*5.418,2*	*229.395,1*	*8,6*
2012	*216.879,1*	*19.619,7*	*2.581,2*	*239,080,2*	*5,8*

At present, Turkey has developing interconnection capabilities with its neighbours. Among the operating cross bordering transmission lines, there are 2X400 KV connections with Bulgaria and Iran, 400 KV connections with Greece, Syria and Iraq; 220 KV connections with Georgia and Armenia and a 154 KV connection with Azerbaijan via Nakhichevan region. As addition to these, 400 KV transmission lines are under construction between Georgia, Iran and Iraq (Ozkok, 2008).

As seen in this chapter, history of the Turkish electricity sector tells a success story in many respects. With its fast increasing installed power, a primary sources mix evolving from dependent upon exogenous sources to endogenous sources and from fossil fuels to hydraulic and other renewable sources, the Turkish electricity sector has deserved attention. Besides, Turkey has started to build further interconnection capabilities in the recent years. These two features of it seem meeting two criteria of Europeanisation, security and sustainability, at first glance. At the following chapter, structure of the Turkish energy sector will be compared and contrasted with the three pillars of Europeanisation examined at the previous chapter.

CHAPTER 4

EUROPEANISATION AND THE TURKISH ELECTRICITY SECTOR

At this chapter, the definition of Europeanisation will be applied to the Turkish electricity sector as a measure in order to create a plausible idea about the level of Europeanisation of the sector. At the second chapter, the basic constituents of the Europeanisation in the energy sector have been defined and studied in depth. As a result of the previous endeavours, the "Europeanisation in the energy sector" concept has been encapsulated in the three main pillars and seven sub-principles belonging to those pillars. The three main pillars are security, competitiveness and sustainability while the sub-principles being diversification of sources, diversification of routes, having enough storage capacity, integration with the others, liberalisation, energy efficiency and green energy production. By analysing the general course of the Turkish electricity sector and by comparing and contrasting some specific examples from directly inside the practice, compatibility of the sector with Europeanisation will be reflected. "Security of Supply Strategy Document", which directly and indirectly emphasises the aforementioned pillars and principles, does present a sound basis for initial steps of the analysis (DPT, 2009). As an addition to this document, "Electric Power Sector Reform and Privatisation Strategy Document" does also constitute an operational starting point particularly for the second pillar *inter alia* (DPT, 2004). Compatibility with the three pillars will be examined separately and the seven pillars will be integrated into the parts related to the respective pillars.

4.1 Security in the Turkish Electricity Sector

The security pillar of the Europeanisation is one of the most important pillars in terms of world politics with its strategic extensions. Therefore, this pillar should be studied through the lenses of world politics and through political realism which has been emphasised at the introduction. Turkey is not an exception among the other actors of global politics and has very few other options other than pursuing an intense energy security agenda (Babali, 2010). Because this is the case, the role of energy within the general framework of the Turkish foreign policy should not be neglected. This chapter will roughly touch upon the role of energy in the Turkish foreign policy first and then intensify its focus on the security issues in the Turkish energy strategy related to the electricity sector.

Turkey does regard itself as a *sine quo non* element of the entire regional energy equation with its lucky geographical position lying between the major energy suppliers and the major energy-thirst countries, including itself. This geostrategic strength of Ankara is endeavoured to convert into other types of strength such as economic and political ones. By dragging more oil and natural gas pipeline projects into the Turkish territory, it gradually supports its foreign policy strategies by evolving itself to an energy hub empowering the energy security of Europe and to a reliable partner in the energy business. The Ministry of Foreign Affairs of Turkey emphasises this goal on its page (MFA, 2011):

> Turkey is geographically located in close proximity to more than 70% of the world's proven oil and gas reserves. Turkey, forming a natural energy bridge between the source countries, the Middle East and the Caspian basin, and consumer markets, stands as a key country in ensuring energy security through diversification of supply sources and routes, considerations that have gained increased significance in today's Europe. In this respect, major pipeline projects, realized and proposed, will both contribute to Europe's energy supply security and enhance Turkey's role as a reliable transit country on the East-

West energy axis as well as on the North-South one. Turkey aims at establishing an uninterrupted and reliable flow of the Greater Caspian and the Middle East hydrocarbon resources to Turkey and to Europe via the Turkish territory.

The first principle of the first pillar, diversification of the sources, is not directly related with the electricity generation. Because electric power is a secondary source of energy, in order to generate electricity, a form of primary energy is needed such as fossil fuels, hydraulic or biomass. Therefore, there is an indirect relation between diversification of sources and the electricity generation. Nonetheless, the indirect connection in between does not necessarily mean a weak correlation. At the most simple meaning, it can be said that security of the electric generation increases as parallel to the increase in the number of the sources added into the mix of primary sources being used in the generation processes. In other words, the more sources get diversified, the more the electricity generation becomes "secure".

In terms of the diversification of sources, the situation of Turkey can be regarded as problematic to a certain degree. In the year 2011, the share of natural gas in electricity generation was around 45%, according to the publications of the Energy Market Regulatory Authority (EPDK, 2011); it accounts almost half of the total electric power produced in the country. The natural gas is followed by hydraulic with 22,8% share, by lignite with 16,9% share, by the imported coal with 10%, by the wind energy with 2,8% share, by fuel-oil with 1,5% share and by a combination of other sources with 2% share in total. In terms of the principle dealt with, 45% dependency upon a single primary source of energy seems dangerous. The problem springs from the source of the natural gas used; similar to the "imported coal", natural gas in the Turkish electricity mix is also "imported gas". Thus, the share of imported primary sources in the Turkish electricity mix reaches at almost 60% in total.

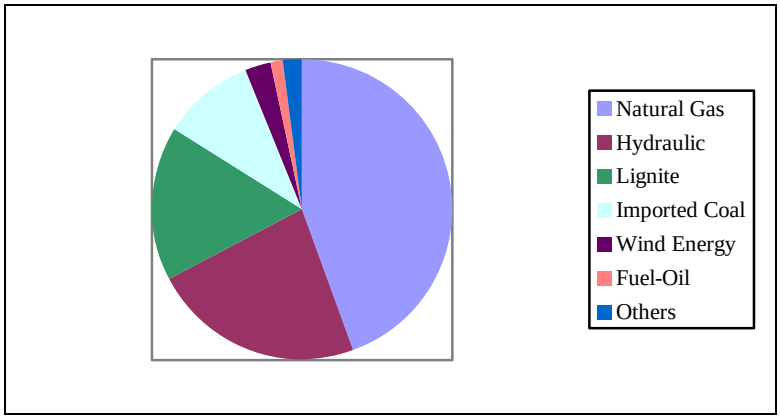


Figure 4.1. Shares of the Primary Sources in the Electricity Generation in 2011

Although 2011 figures seem problematic in terms of security of supply, a simple comparison between 2008 and 2011 figures tells completely a different story. In the year of 2008, the bulk of the mix of primary sources was again constituted by the natural gas; yet, in 2008, natural gas had a much larger portion than that of the one in 2011. In 2008 the natural gas had 49,74% share; in other words, 4,74 percent higher than 2011 (EPDK, 2010a). In the 2008 figures, natural gas was followed by coal with 29,09% share, by hydraulic with 16,77% share, by fuel-oil with 3,79% share and by a combination of other sources with 0,62% share.

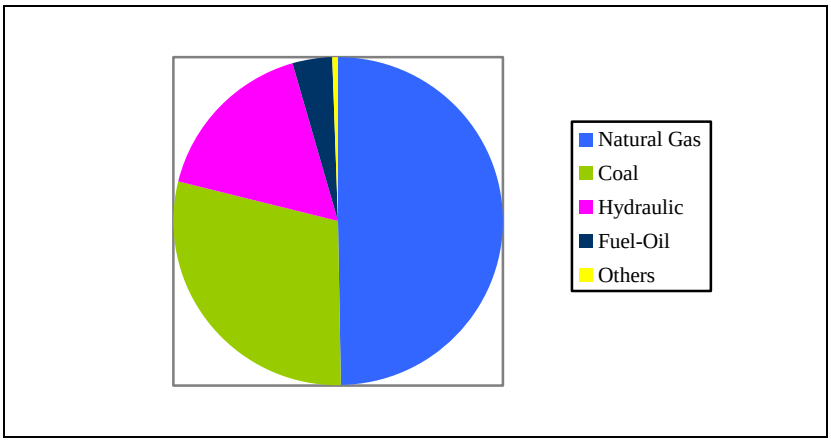


Figure 4.2. Shares of Primary Sources in the Electricity Generation in 2008

As these figures point out, a considerable degree of diversification has been succeeded just in three years which means almost “one day” in terms of energy investments. A considerable decrease in the shares of natural gas, coal and fuel-oil with the respective rates exceeding 4,50%, 3% and 2% was marked by the increases in the shares of hydraulic, wind and other primary sources with the respective rates reaching nearly at 7%, 2,5% and 1%. These changes sign to positive development in terms of security. Because Turkey is very weak in terms of fossil fuels, a transition from these “exogenous” sources to the more renewable and “endogenous” sources increases the security of supply in Turkey, in terms of electricity generation.

Another problem related to the natural gas usage in the electricity generation is the shares of supplier countries of the imported natural gas; this also creates some problems in terms of the diversification of sources. In the year of 2011, 58% of the total imported natural gas was imported from a single country, the Russian Federation (EPDK, 2011b). In same year, Iran had 19% share, both Azerbaijan and Algeria 9% and Nigeria 3%. As addition to these, 2% of the total demand was met by buying natural gas from spot markets at varying price levels. Nearly 60% dependency upon a single supplier is a serious problem for secure supply of electricity. Nonetheless, when the dependency rates are examined, it seems that the Turkish strategy works very well. For example, in the year of 1999, the dependency rate upon the supplier having the largest share in the Turkish natural gas imports was around 70%; later during the years in between, the rate continued to decrease and in 2003 it decreased to 60% (EPDK, 2009). The trend continued and in 2008, it reached down to 60% for the first time. The year of 2010 witnessed the lowest dependency rate upon Russia, it was only slightly above 40%, which marked an era for Turkey to gather the fruits of its endeavours to diversify the natural gas supplies (EPDK, 2011b). In the coming years, Iran and Turkmenistan are thought within the possible suppliers list, if a relief at the political realm concerning Tehran realises (Bilgin, 2010). At the 2010-2014 Strategic Plan of the Ministry of Energy and Natural Resources, Turkey sets a plausible objective; it aims to decrease the share of the

largest supplier below 50% by 2015 (ETKB, 2010a). As these figures point out, Turkey makes steady efforts to diversify its natural gas supplies being used in the electricity generation to increase its energy security. This may contribute to realisation of the diversification of sources criterion on the Europeanisation way of Turkey.

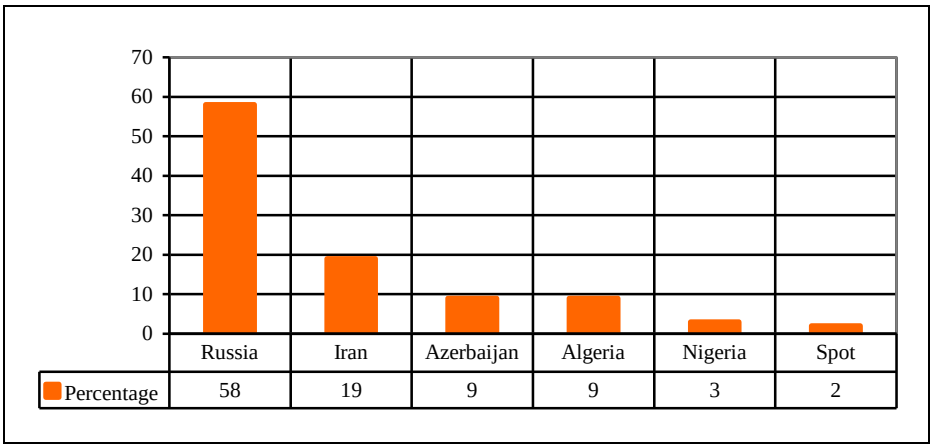


Figure 4.3. Shares of Natural Gas Suppliers of Turkey in 2011

The only exception of this generalisation is lignite, which is a low-calorie coal. Turkey is known with its moderate lignite deposits and in the recent years, new discoveries enlarged the Turkish capabilities to generate electricity with lignite-fired thermal plants. Turkey holds 6% of the global lignite reserves with its 11,8 billion tonnes proved lignite reserves (TKI, 2011). As an addition to the deposits being already exploited, new discoveries throughout the country seem to increase the Turkish reserves severely. Because this fuel is a completely national source, future scenarios on the Turkish electricity production include lignite usage as one of the major bases. 2010-2014 Strategic Plan of the Ministry of Energy and Natural Resources assigns an undeniable significance to lignite-fired thermal plants (ETKB, 2010a). By attracting foreign investment in large portions, Turkish national strategy targets to integrate the lignite deposits into the electricity generation. A very recent

example of this strategy is the cooperation between Turkey and the United Arab Emirates (UAE) in constructing a huge lignite-fired thermal plant in Afsin-Elbistan region, in Turkey (ETKB, 2013b). As parallel to this example, a similar lignite-fired thermal power plant is planned to be constructed with the state-private sector cooperation in Konya. The target of Turkey is to take into operation at least 3.500 MW installed capacity consuming endogenous lignite resources (ETKB, 2010a).

Although there are certain endeavours producing positive outcomes for Turkey, some specific problems continue to sustain alongside a series of diversification accomplishments, particularly in terms of natural gas fired thermal plants. In the year of 2010, Energy Market Regulatory Authority issued electricity production licences for 2.769 MW installed power in 119 separate facilities. Among them, the natural gas had only a 420 MW share with 7 plants. It was followed by the wind energy in 6 plants with 220 MW installed power. The bulk of the licensed issued was constituted by hydraulic power plants in 94 different facilities with 1944 MW installed capacity (EPDK, 2010a). Unlike 2010 results, Energy Market Regulatory Authority issued electricity production licences for 12.529,37 MW installed power in 351 separate facilities in 2011. Among them, the natural gas had a 6332,90 MW share with 60 plants. It was followed by the wind energy in 120 plants with 4070,20 MW installed power and by hydraulic in 150 different facilities with 1841,16 MW installed capacity (EPDK, 2011c).

According to the 2010-2014 Strategy of Turkey, electricity produced by natural gas is planned to be largely replaced by a combination of renewable sources, endogenous fossil fuels (that is, lignite) and the nuclear power. At the strategy paper, it is obviously set as a prioritised target to start construction of a nuclear power plant (ETKB, 2010a). The inclusion of the nuclear power in the Turkish energy mix is expected to contribute to the diversification in the Turkish energy policy (Yildiz, 2010a). The targeted share of nuclear power at the 2010-2014 Strategic Plan of ETKB is in full compatibility with the Energy Roadmap 2050 targets (EC, 2011a). The Turkish Plan foresees a 5% share for the nuclear contribution and the Energy

2050 highlights the importance of keeping the nuclear contribution balanced although it is a low-carbon solution for the electricity generation. In terms of nuclear power plants, the most eminent issue is safety measures. Turkey's membership in the Non-Proliferation Treaty relieves the Turkey's hand. Nonetheless, a very large part of the negotiations between Turkey and the Union has been allocated to the nuclear safety topics. Currently, there are no nuclear power plants in Turkey, but the construction of two nuclear power plants are under way. The first nuclear plant will be constructed by a Russian company in the south of Turkey, in Mersin/Akkuyu. The second one will be constructed by a Japanese company in the north of Turkey, in Sinop, but will be operated by a French company GDF Suez. Having the latter nuclear plant operated by a European company is expected to make positive effects on the Turkey-European Union energy integration. After these two nuclear plants are completed, they will highly contribute to the diversification of the Turkish mix.

On the other hand, further utilisation of renewable energy sources is one of the major bases of the strategy paper and is one of the main path to diversify the electricity generation. The ministry targets to have 30% share in the total electricity production in Turkey (ETKB, 2010a). To accomplish this goal, not only traditional renewables such as wind and hydraulic, but also geothermal sources are planned to be exploited. In wind energy, Turkey plans to increase the installed power which was only 802,8 MW in 2009, to 10.000 MW in 2015. Similar to the targets set for wind, Turkey plans to quadruple its installed capacity in geothermal to 300 MW in 2015 from its 2009 level 77,2 MW. As parallel to the strategy, if the current trends prioritising renewable and endogenous sources continue, Turkey can be predicted to have a more secure supply for the electricity generation. Thus, the first principle of the first pillar of Europeanisation, the diversification of sources criterion, can be met.

The second principle of the first pillar, diversification of the routes, provides a complementary assurance for the security of supply in the electricity markets where a large portion of electric generation is dependent upon natural gas fired thermal plants. When this principle is materialised with the previous one, diversification of

sources (diversification both by the source and by the supplier), a secure flow of primary sources can be realised to a great extent. Diversification of routes is a vital topic especially for the importers at least one or more transit countries away from the main supplier country. A simple example can perfectly explain this principle. Germany, as one of the largest natural gas importers in the world, is a few countries away from its main supplier, Russia; any onshore pipeline between Russia and Germany has to cross at least two countries. After the Russo-Ukrainian gas dispute in 2005 which led Kiev to transfer the shares of the downstream countries, such as the ones in the Eastern Europe, to its domestic consumption and left the other importers without gas during a bitter winter, the construction of Nord Stream fastened. The Nord Stream, which brings the Russian gas to Germany via the Baltic Sea without crossing the territories of any transit country, provides Germany with a great capability in diversifying its routes to import natural gas against any future risk of interruption caused by a transit country. Thus, diversification of routes gains importance.

Similar to this example, Turkey must have as many routes as possible for its imports in order to avoid any problems springing from the attitudes of the transit countries. At this point, suitable geographical position of Turkey eases the Turkish decision-makers' job (Yildiz, 2010b). Turkey, with its shores on the three main seas and long land borders with major suppliers, can import oil and natural gas from the suppliers directly (Winrow, 2004; Kilic, 2006). This advantageous situation of Turkey also puts it in a position of natural energy bridge between energy producers and consumers. It seems that the Turkish decision-makers are very well aware of this fact and exploits the unique geopolitical position of the Turkish Republic not only in *realpolitik* sense but also in terms of diversification of the routes (Davutoglu, 2008). The more Turkey takes advantage of its strengths, the more it increases the diversification of routes. Indeed, Turkey does not face with big problems in terms of diversification of routes. In the year of 2011, Turkey imported 43.874 million cubic meters natural gas from different suppliers including the spot markets and the

Russian share was 25.406 million cubic meters (EPDK, 2011); of the total Russian share, two-thirds was imported via the Blue Stream, which is an offshore pipeline crossing the Black Sea, and the remainder one-third was imported via the West Stream, which is a pipeline starting in Russia and reaching to Bulgaria by lying parallel to the Black Sea shore (BOTAS, 2008). In a near future, some huge investments are expected to contribute to diversification of routes in Turkey such as Trans-Anatolian Pipeline (TANAP), which will transport Azeri natural gas to Turkey and to farther in world markets and Interconnector Turkey-Greece-Italy (ITGI), which will integrate the networks of all three countries. Although Turkey does not face with big challenges in diversification of routes, these projects will further develop Turkish capabilities in diversification. Thus, the second principle of the first pillar can be met easily on the way of Europeanisation.

The third principle of the first pillar, having storage capacities, is another principle indirectly affecting the electricity sector. Unlike the previous two principles, this one focuses on the question of "What can be done if the exogenous supplies are cut off?" The answer which this principle favours is to meet the demand from the pre-stored reserves as much as possible. As it was also valid for the previous two principles of the security pillar, this principle will mainly deal with the natural gas much more than electric power itself. There are two reasons behind this; the first is that electricity is not a storable (in large amounts) form of energy with the available level of technology and therefore there is nothing meaningful as the "electricity storage". The second is that the electricity generation in Turkey, although their share is planned to be decreased and steadily decreasing, is still very much dependent upon the natural gas-fired thermal plants so, in a case of interruption in gas supplies, natural gas storage facilities may play a pivotal role for the continuation of electricity generation.

At present, Turkey has several storage capacities in varying scales. The first storage facility in Turkey was constructed in Marmara Ereglisi (in Tekirdag province) in 1994 with a negligible capacity as an extension of a Liquefied Natural

Gas (LNG) terminal, just with the purpose of storing small-scale LNG before pumping it to the network (EPDK, 2009). A similar small-scale storage facility was taken into operation in the year of 2006 in Izmir and belongs to Ege Gaz. The former facility belongs to BOTAS and has 255.000 m^3 capacity, while the latter having a capacity of storing 280.000 m^3 LNG. The necessary regulation for well-functioning of the LNG market was published in 2009.

Later, in June 2007, the first underground storage facilities of Turkey, Northern Marmara and Degirmenkoy, both in Silivri, were taken into operation (EPDK, 2010b). The both storage facilities were constructed in the former natural gas production fields belonging to the Turkish Petroleum Corporation (TPAO, in its Turkish acronym). The Silivri storage facilities constitute the biggest facility in Turkey with their aggregate capacity to store 2.661.000.000 m^3. As an addition to these, another large-scale storage facility is being constructed in Sultanhani, in Aksaray. The Sultanhani storage facility will be constructed underground of the Tuz Gölü and large salt reservoirs will be filled up with natural gas in huge amounts. In the framework of the project, 12 reservoirs are planned to be constructed each with a 630.000 m^3 capacity and constituting a total of 1.478.000.000 m^3 capacity for storage (EPDK, 2011b). When the construction is completed, Turkey will have capability to pump 40million m^3 natural gas to the national network daily. A Chinese company, China Tianchen Engineering Corporation, is responsible for the whole project which is expected to cost near to 570 million $US (Bakir, 2012). Roughly, Turkey has 120.946.797 m^3 daily consumption (EPDK, 2011b); in this respect, the total storage capacity of Turkey will be equivalent to its 35–days consumption when the storage facility in Aksaray is completed.

Table 4.1. Storage Facilities in Turkey

Company Name	**Type**	**Place**	**Capacity**	
BOTAS	LNG	Tekirdag	255.000 m^3	
Ege Gaz	LNG	Izmir	280.000 m^3	
TPAO	Underground	Istanbul	2.661.000.000 m^3	
BOTAS	Underground	Aksaray	1.500.000.000 m^3	
			4.161.535.000 m^3	***TOTAL*** (underground)

As it is seen in the table, in terms of having enough storage capacities principle, Turkey is trying to increase its capacities as parallel to the requirements of the Europeanisation process. If the mentioned underground facility is completed and if some new others can be taken into operation in accordance with the grow in the aggregate demand and supply, Turkey can have the capacity of storing excess supply during warm summer days and burning it during bitter winters (O'Byrne, 2013). To conclude, the performance of Turkey can be regarded as positive, Ankara is engaged with increasing its storage capacities and its operational equivalent of 35-days storage seems a sign for the future successes of Turkey. Ankara can be accepted capable of meeting the third principle of the first pillar of Europeanisation.

The fourth principle of the first pillar, integration with the others, will mainly be examined in terms of electricity, unlike the previous two principles strictly related with the major role of natural gas in electricity generation; yet, the meaning of this principle for natural gas will not be neglected at all. Although the positive effects of the former two principles can provide a country with a certain degree of energy security, integration with the others, can enable the country to buy energy from the others in a case interruption.

When this principle is taken as "integration of gas pipeline networks", it can be said that the situation of Turkey is pretty much positive. Turkey has an

interconnection pipeline having an annual capacity of 11.5 billion cubic meters with Greece being known as the Turkey-Greece Natural Gas Pipeline, which was constructed as a part of Interstate Oil and Gas Transport to Europe (INOGATE) program of the European Commission (BOTAS, 2008). The Turkey-Greece pipeline starts in Karacabey, in Turkey and reaches to Gumulcine in Greece with its almost 300 km length. It was taken into operation by the late 2007. Another significance of this pipeline is its extension towards Italy via the Adriatic Sea, which makes it Interconnector Turkey-Italy-Greece. The Interconnector Italy-Greece part of the project will be 800 km long and be constructed with a huge capacity to transport 10 billion cubic meters natural gas per year (Edison, 2013). This interconnector facility is planned to be taken into operation by 2018. If the pipeline is completed, not only Greece but also Turkey will have chance to benefit from excess gas in the networks of western countries, in a future case of interruption. Thusly, electricity generation at natural gas fired thermal plants in Turkey will be continued thanks to the gas provided via the constructed integration capabilities.

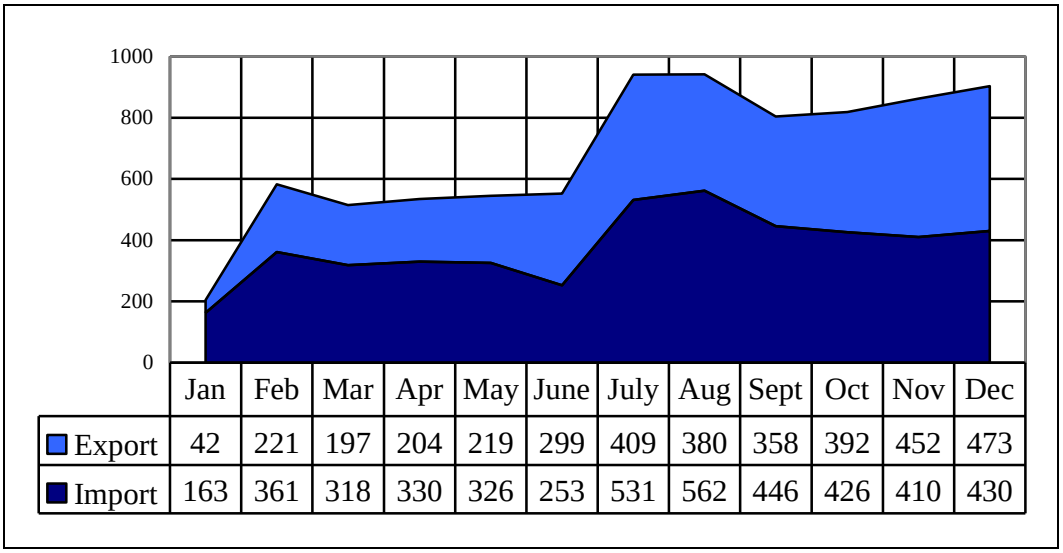
The other aspect of the integration principle is integration between national electricity grids; this is much more directly related with the electricity sector in comparison with the integration between natural gas networks. Electricity, similar to the natural gas, is a network-dependent form of energy; this does not seem to change in a near future, at least with the current level of energy. Therefore, for a meaningful integration between independent national networks, there have to be large scale interconnection capacities connecting the respective national networks to each other. As it has been mentioned at the second chapter, The European Network of Transmission System Operators for Electricity (ENTSO-e) is responsible for developing a pan-European electricity system. The main purpose is to realise free movement of electric power throughout the member countries without facing with any restraints sourcing from the technical and infrastructural capabilities of the countries. In this respect, 2050 Electricity Highways project has utmost importance.

As parallel to the changes in the production/consumption balances of member countries, it will be possible to exchange electricity between different countries.

Table 4.2. Integration Capacities of Turkey

Integration Facility	With Greece	With Bulgaria
Electricity	400 kV - operational	400 kVx2 - operational
Natural Gas	11,5 bcm - operational	Under Construction

Turkey does endeavour to synchronise its electricity network with those ones in Europe by cooperating with ENTSO-e. This deserves a particular attention at a time when interconnection capacities between member countries, even between the ones like Germany and France, are decreasing (Balaguer, 2011). In this framework, there are continuing projects to connect Turco-Bulgarian and Greco-Turkish networks. The former, Turkish-Bulgarian interconnection, consists from two separate 400 kV transmission lines currently. The both transmission lines start in Hamitabat in Turkey and ends in Maritsa in Bulgaria; one of the lines has 149 km length, while the other having 158 km length (TEIAS, 2013c). The latter, Greco-Turkish interconnection consists from only one 400 kV transmission line starting from Babaeski in Turkey and ending Filippi in Greece with its 128 km length. Thus, of the total trade capacity between Turkey and the ENTSO-e, 65% was allocated for Turkish-Bulgarian and 35% was allocated for Greco-Turkish trade. Tenders for both of the capacities started in June 2011.



	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Export	42	221	197	204	219	299	409	380	358	392	452	473
Import	163	361	318	330	326	253	531	562	446	426	410	430

Figure 4.4. Volume of Traded Electricity Between Turkey – Greece/Bulgaria

As it can easily be seen in the Figure 4.4, the volume of the traded electricity has increased following the tenders held in June 2011. Because the main purpose of the integration with the others principle is to boost the volume of traded electricity between the member states, increase in the volume of Turkish-Bulgarian and Greek-Turkish electricity trade perfectly fits to the principle. If the previously mentioned Electricity Highways materialise, Turkey can have access to the electricity markets of the Western Europe by increasing its integration with the others. To conclude this principle, it can be said that Turkey has already developed considerable interconnection capacities with its western neighbours from now. Moreover, the integration can be expected to deepen as Turkey develops more institutionalised relationships with the ENTSO-e. In terms of the integration with the others principle of the security pillar of Europeanisation, Turkey seems "Europeanised" quite well.

4.2. Competitiveness in the Turkish Electricity Sector

The second pillar of Europeanisation in the energy sector is competitiveness. Competitiveness is, converting the energy sector to an energy market, at its most

basic meaning. Thus, "marketisation" becomes one of the suitable notions defining the competitiveness pillar. The second pillar, consists from three principles, unlike the former pillar, security, which consists from four. Among the constituting principles there are diversification of sources, diversification of routes and liberalisation. As it is seen, the first two principles are the ones shared by the first pillar. The third principle of the pillar is the soul of the pillar; nonetheless, without the first two principles, the principle of liberalisation cannot be achieved and sustained. Therefore, in order to have an electricity "market", diversification by both sources and routes has significance.

Another important point needs to be emphasised in terms of the competitiveness pillar is that this pillar, particularly as a reflection of the liberalisation principle, targets de-politicising the energy sector. As it has been exemplified during the previous parts, political tensions may sometime cause interruptions in the energy supplies and this is because the energy is perceived and exploited as a mean of the foreign policy by the respective national decision-makers. In order to save energy business from the dominancy of world politics and to make it run in full accordance with the rational of economy, liberalisation in the sector is pretty much needed (McKeigue, 2009). In this respect, competitiveness pillar can be regarded as a complementary of the first pillar, security. Another significant feature of this pillar is that prioritising the benefits of the downstream users not only by directing the prices downwards in the full competition atmosphere, but also by providing them with chance to select their service supplier according to their own needs.

The first and the second principles of the second pillar, diversification of the sources and the routes, do constitute a prerequisite for a competitive market structure. These principles can be approached from two different angles, as similar to the meaning of this principle for the previous pillar: diversification by the source and by the supplier. The former, emphasises diversification in sources being used in the electricity generation while the latter emphasising diversification by the supplier

country. In both meanings of this principle, the basic rationale behind is that importing the cheapest source from the cheapest supplier in order to have electricity generated as cheapest as possible. Diversification by the source, leads countries diversifying the primary sources constituting their energy mix to take advantage of the price fluctuations.

When the current situation in Turkey is examined, it can be observed that there are some specific problems related to the electricity generation. In the today's Turkey, as it has been said at the previous parts, natural gas has 45% share in the electricity generation and the rest 55% is divided among the all other primary energy sources. This distribution may distort full competition environment due to explicit weight of some circles and pressure groups. These pressure groups may influence decision-makers to the detriment of the advocators of other energy sources (Atamer, 2011). Different circles may be pulled in to the electricity market by encouraging and giving incentives to the other sources; thus, increase in the number of investors in the market may serve to the downstream users. Another aspect of diversification is increasing the number of supplier countries. Currently, the Turkish electricity production is undeniably dependent upon the natural gas supplies of Russia. As it can be seen at the Figure 4.3., Moscow supplies 58 units of the every 100 units of natural gas which Ankara imports. Because Turkey does not announce the official prices for its natural gas, an exact and concrete idea on competition among the suppliers of natural gas to Turkey cannot be had. Nevertheless, it can be said that the very high dependency rate of Turkey upon the Russian natural gas supplies, pretty much distorts the competition environment from which not only Turkey will benefit at the macro level, but also downstream users will appreciate lower natural gas prices such as private electricity generating companies at natural gas fired thermal plants. The both principles prioritising diversification in sources and suppliers require a complementary principle for well-functioning, liberalism, which constitute the core of the competition pillar.

The third principle of the second pillar, liberalisation, is not only the core of the second pillar, but also provides the main theoretical, normative and legal bases for it; thus, this principle holds a basic position *inter alia*. Because this thesis focuses on the electricity market, this pillar is going to be examined in terms of the liberalisation of the Turkish electricity sector. The main emphasis of liberalism is on the necessity of creation of a market structure where any type of energy can be sold, bought and traded in a competition environment under supervision of an independent authority. Thus, the first and the most prominent necessity emerges: An independent regulatory authority. This prerequisite of liberalisation was met by Turkey in the year of 2001. In 2001, the Energy Market Regulatory Authority (EPDK), which performs the duties by using the powers entrusted by the Electricity Market Law (No: 4628, adopted in 2001), Natural Gas Market Law (No: 4646, adopted in 2001), Petroleum Market Law (No: 5015, adopted in 2003), Liquefied Petroleum Gases Market Law (No: 5307, adopted in 2005), was established. The objectives of the aforementioned laws were to establish a financially viable, stable and transparent energy market, which would function as per the provisions of private law and within a competitive environment to ensure the independent regulation and supervision of the market in order to provide sufficient electricity, natural gas, petroleum and LPG of good quality to consumers, at low cost, in a reliable and environment friendly manner. Establishing a regulatory body is mentioned at the 1999 Progress Report for the first time and is regarded as a positive development (EC, 1999). Following the first reference in the 1999 Report, progress reports in 2000 (EC; 2000), 2001 (EC; 2001) mention from the same topic; but, the latter congratulates Turkey for its establishing EPDK with the Electricity Market Law (NO: 4628).

There are two other aspects of this principle as the privatisation of state assets and liberalisation of the market structure. The two aspects serve to the purpose of attracting huge amount of investment to the Turkish electricity sector. A report of the State Planning Organisation regarded the state's need for more finance in energy sector as the only major factor behind liberalisation of the sector (DPT, 2001). As

addition to this report, there are some other pieces in the literature defending the same thesis. For example, Coskun and Carlson says:

> It is clear that large investments in the energy sector will be required. Starting in 2001, the energy market has been slowly liberalized and private companies have been investing and building new power plants and other forms of infrastructure. Since 2003, just over half of all new power plants built are privately owned ... (Coskun and Carlson, 2010, pg.212).

The former aspect targets to decrease the role of the state in the electricity sector by increasing the role of the private investors. In this manner, transition of state assets to the private sector and abolishing monopoly of the state companies are the main constituents. The privatisation of the state-owned plants has been one of the major tenets of the Europeanisation process since the very beginning; it was not only mentioned at the 1998 Progress Report (EC, 1998), at the 1999 Progress Report (EC, 1999) and at the all following reports but also at the Turkeys letter of intent presented to the International Monetary Fund (IMF) in the year of 1999 (IMF, 2013):

> First, the realization of an electricity reform has been underlined by the international financial institutions that have supported Turkey through the economic crises under the Stand-by Arrangements. Second, the electricity reform has also paralleled the Turkey's longer term objectives of accession into the EU and has needed to approximate laws to EU acquis consequently, which requires progressive liberalization of electricity market (Ozkivrak, 2005, pg.1340).

Erdogdu mentions from the same motives behind the large liberalisation process and says:

> The need for an energy market reform has regularly been underlined by various international institutions (especially IMF, World Bank and OECD) that have supported Turkey during her frequent economic crises. The reform is also a precondition for Turkey's longer term objective of EU membership, which requires progressive liberalization of energy markets (Erdogdu, 2007, pg.986).

Another example is the study of Ulusoy and Oguz, who try to summarise the rationale for the liberalisation in the energy sector:

> The growing empirical evidence on the inefficiency of state-owned enterprises and a worldwide trend toward liberalization were the main motivations of privatization in many developing countries. Another key factor was the lack of public funds for needed investment in state-owned companies." (Ulusoy and Oguz, 2007, pg.5022).

In the year of 1984, a law on electricity generation by the companies other than Turkish Electricity Company (TEK, in its Turkish acronym) was adopted in 1984 and thus, private investors are allowed to enter to the sector. This law created a legal basis for the inclusion of private investors and for privatisations to be initiated and furthered. The first step in practice was to split the monopolistic structure of the state companies operating in the electricity sector. For this purpose, TEK, which was a vertically integrated company, was split into two companies, one for retail sales, (TEDAS, in its Turkish acronym) and one for generation and transmission (TEAS, in its Turkish acronym). The both companies started to operate in 1994. In 1996, TEDAS were again divided into 29 distribution companies. Later, when privatisations and initiatives for private generation started to be furthered, some legal constraints by the Turkish constitution, which regarded electricity as a public good and did not allow private companies to appeal to the international arbitration, appeared. With the application of Build-Operate-Transfer (BOT) system depending upon the law number 4628 (adopted in 1996), a 1566 MW installed capacity was constructed by the private sector and 30,1 MW hydro power plant was transferred to the private sector, according to the reports of the State Planning Organisation (DPT, in its Turkish acronym; currently known as the Ministry of Development) (DPT, 2001). In terms of wind energy, the first application of BOT system was a plant with 12 MW installed power in Alacati in 1998 (Ilkilic, 2009). In 2000, Cayirhan thermal power plant was privatised by using Transfer of Operating Rights (TOR) method. According to these figures, the private sector had only a 21% share in the total production in 1999.

With the adoption of Electricity Market Law (number: 4628) in 2001, a new era has started in Turkey. The basic rationale behind the restructuring was not only increasing efficiency, but also finding necessary capital for new investments to meet the demand by attracting foreign capital (Ozkivrak, 2005). With the new law and establishment of EPDK, the state's role has been reduced to deciding the framework of general energy policy of the country and ensuring competition at the electricity market by regulating and inspecting it. As parallel to this, EPDK have been responsible for making secondary jurisdiction and implementing regulations. In the same year, TEAS was divided into four companies as Turkish Electricity Transmission Company (TEIAS, in its Turkish acronym), Electricity Generation Company (EUAS, in its Turkish acronym), Turkish Electricity Distribution Company (TEDAS, in its Turkish acronym) and Turkish Electricity Trading and Contracting Company (TETAS, in its Turkish acronym) as seen in the Figure 4.5.

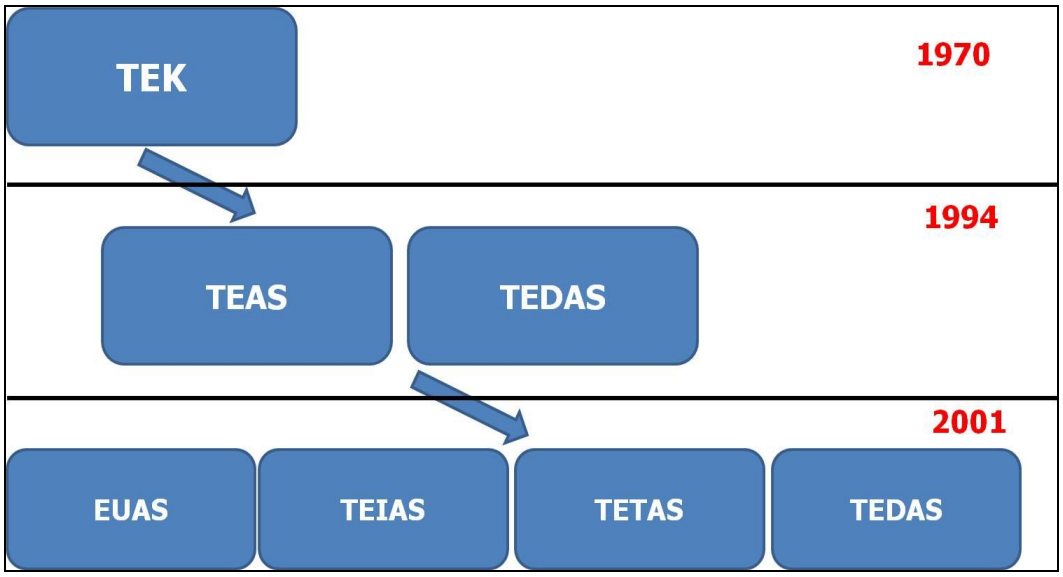


Figure 4.5. The Evolution of the State's Role

In 2008, Aras Electricity Distribution Company (EDC) was privatised for 128,500 million $US (RG, 2013a), In 2009, Baskent and Sakarya Electricity Distribution Companies were privatised for 1,225 billion $US (RG, 2008a) and 600 million $US (RG, 2008b) respectively, Meram EDC for 440 million $US (RG,

2009). In 2010, Yesilirmak EDC was privatised for 441,500 million $US (RG, 2010a), Camlibel EDC for 258,500 million $US, Firat EDC for 230,250 million $US (RG, 2010b), Coruh EDC for 227 million $US (RG, 2010c). In 2011, Trakya Electricity Distribution Company was privatised for 571.500 million $US. In 2012 Bogazici EDC was privatised for 1,960 billion $US, Gediz EDC for 1,231 billion $US (RG, 2013b), Akdeniz EDC for 546 million $US. As a last step in terms of the privatisation of electricity distribution companies, Dicle EDC was privatised for 387 million $US, Vangolu EDC for 118 million $US, Toroslar EDC for 1,725 billion $US and Ayedas EDC for 1,227 billion $US in the year of 2013 (Hurriyet, 2013). Thus, approximately 11 billion $US was transferred to the Turkish treasury thanks to privatisation of distribution companies only. According to the statements of the officials of the ETKB of Turkey, privatisation of distribution companies will be followed by privatisation of the public assets in the electricity generation sector and a 30 billion $US income is expected from the privatisations in the generation sector (AA, 2013). Nevertheless, some pieces in the literature does not approve this rapid privatisation process. For example, Karbuz and Sanli warn Turkey by saying: "Energy is too important to be left in the hands of private enterprise alone" (Karbuz and Sanli, 2010). According to them, some privatisations have turned into guaranteed business opportunities for the private sector. In order to avoid from this negative situation, they advise the state to create and keep some national champions in the energy sector. Furthermore, since the distribution privatisations were completed at the end of 2012, a new era in terms of the Turkish electricity sector is expected to start by 2013 (Camadan, 2011).

As parallel to the progress in the privatisations in the distribution sector, the limit for the free consumers has been taken down gradually. To be a free consumer brings some advantages for the eligible consumers because, they have chance to select their own electricity supplier at an advantageous price in accordance with the prices set in a free market. In the year of 2004, the EPDK set the limit for free consumers as 7800MWh which accounted to 29 percent market openness (EPDK, 2011c). In the following years, the limit was decreased to 7700 MWh in 2005, to

6000 MWh in 2006, to 3000 MWh in 2007, to 1200 MWh in 2008, to 480 MWh in 2009, to 100 MWh in 2010 and to 30 MWh in 2011 by the EPDK. Thusly, the theoretical market openness rate gradually but steadily increased to 31% in 2005, to 35% in 2006, to 40% in 2007, to 42% in 2008, to 50% in 2009, to 62% in 2010, and to 77% in 2011. Although the theoretical rate of market openness is notably high, the inability of small-scale customers in choosing their supplier keep the actual rate low. Nonetheless, since the rates are very close to those in some EU countries, Turkey should not be regarded completely unsuccessful (Makkonen, 2012).

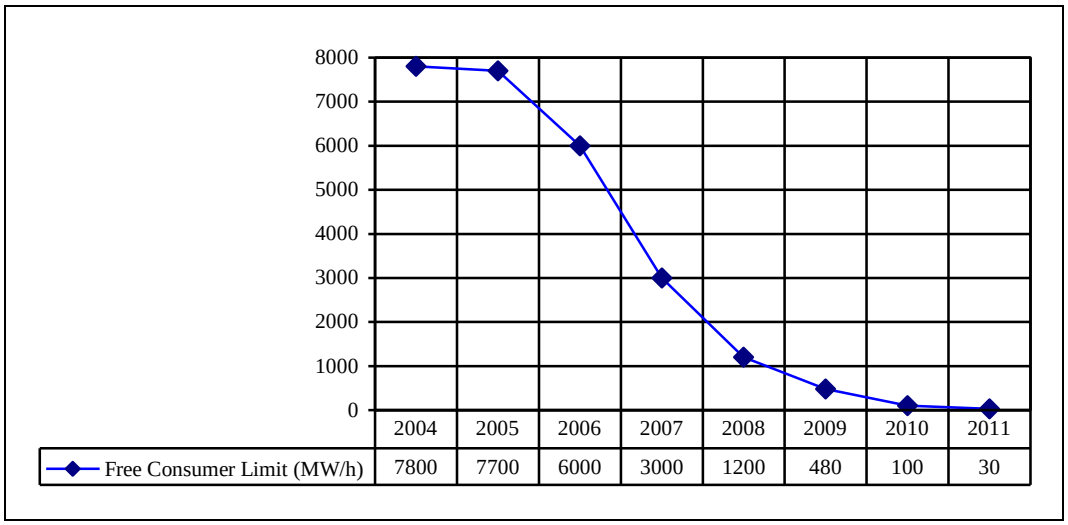


Figure 4.6. Evolution of the Limit for Free Consumers

Another aspect of liberalisation is allowing the private sector for electricity trade at international scale. As it has been studied in-depth at the previous parts of the thesis, Turkey has considerable interconnection capacities with its European neighbours to west, Bulgaria and Greece. After the completion of interconnection criterion with Europe on September 18, 2010, capacity bids started in June-2011 (EPDK, 2011a). In the year of 2011, the average price for electricity import was 1,86€/ MWh while the price for export being 1,49€/MWh. In order to attract more investors to the market, particularly to the generation sector, Turkey abolished licence requirement for the generation facilities with an installed power up to 500 kW on 21.07.2011 (EPDK, 2011a). This development is expected to bring more

investment to the Turkish power generation sector and strengthen the market structure in the electricity sector.

Briefly, in terms of the competitiveness pillar, Turkey appears to do pretty good until now. Change in the competitiveness of the Turkish electricity market is remarkable, according to some researches; it increased almost three times between 1975 and 2007 (Ertugrul, 2010). Besides, some reports of the Organisation for Economic Co-operation and Development (OECD) supports this claim and regards competitiveness level of the Turkish electricity market as at OECD average (Conway, 2006). In terms of diversification of sources and routes, effects of liberalisation can be observed easily. Moreover, as addition to the decreasing role of the state in the electricity sector, the entire sector evolves into a market being free and competitive, and being highly attractive for private investors.

4.3. Sustainability in the Turkish Electricity Sector

The third pillar of Europeanisation in the energy sector is sustainability which targets to make electricity generation more independent of the today's fundamental energy sources which are finite fossil fuels. The main logic underlying the pillar is to realise an energy structure being environment-friendly, prioritising renewable sources, allocating more rooms for the concerns for the generations of the tomorrow's world and increasing energy security by developing abilities to meet its needs endogenously as much as possible. The sustainable energy production is suitable both in rational terms and in idealistic terms. This not only is a requirement of European values but also a rational choice of energy-dependent actors; the Turkish minister, Taner Yildiz emphasises the importance of sustainable electricity generation and energy efficiency in his articles in this sense: "...all of us must move rapidly towards a more diverse, sustainable set of energy resources. This move depends on the aggressive development and deployment of more sustainable energy sources and alternative fuels." (Yildiz, 2010a). This pillar has strict relations with other two pillars, security and competitiveness. Particularly in countries where the

fossil fuels are not abundant but on the contrary there is a considerable potential for sustainable energy sources, such as Turkey, relations between sustainability and the other pillars gain significance. Because these countries usually heavily depend upon foreign supplies, further exploitation of their endogenous sources contributes to their energy security positively. Besides, since the renewable sources most of the time offer small-scale generation opportunities in large numbers, in comparison to the huge installed powers for the conventional energy sources, more investors are needed to develop and maintain these sources. This pillar of Europeanisation in the energy sector consists from three principles as green energy production, energy efficiency and integration with the others. Among these principles, the third one is also shared by the first pillar, security.

The first principle of the third pillar, green energy production, includes a strong emphasis on the further exploitation of sustainable sources such as wind energy, solar power, biomass, hydraulic, or geothermal energy. In terms of wind energy, the potential of Turkey in electricity generation by wind energy is estimated to allow an installed power around 50.000 MW (ETKB, 2010b). A guidebook for energy investors published by the EPDK, declares potential as 48.000 MW in wind energy (EPDK, 2012b). The same study expresses a similar potential for hydropower, which seems the most reliable and profitable renewable source; the estimated potential for hydro power is 45.000 MW. According to the same study, solar energy, geothermal and biomass have considerable potentials as 300 TWh per year, 600 MW and 117 MTEP respectively (EPDK, 2012b).

Table 4.3 Turkish Potential in Renewable Sources

TYPE	POTENTIAL	IN OPERATION
Wind	*48.000 MW*	*1792,7 MW*
Hydro	*45.000 MW*	*17359,3 MW*
Solar	*300 TWh/year*	-
Geothermal	*600 MW*	*114,2 MW*
Biomass	*17 MTEP*	*117,4 MW*

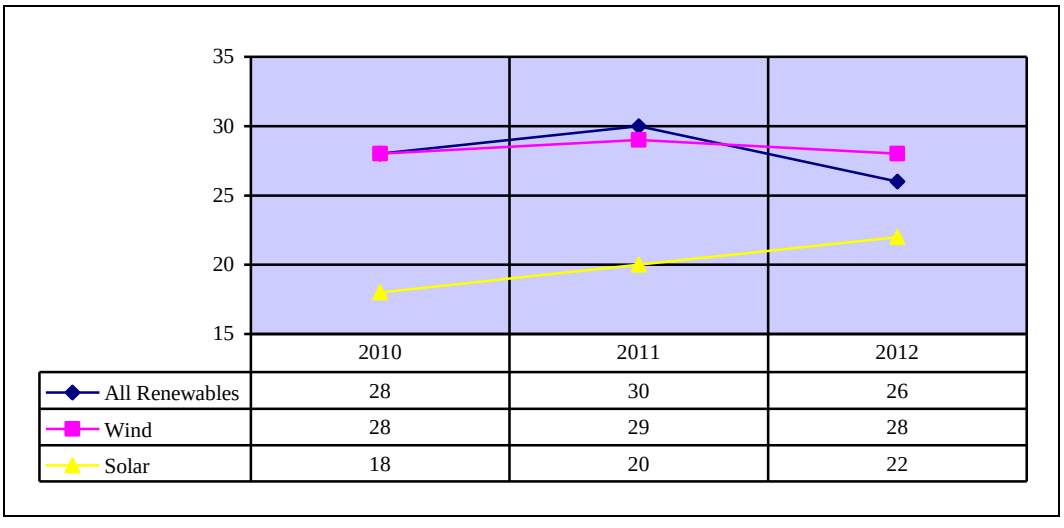
Despite these huge potentials, Turkey benefits from its renewable sources quite limitedly. Although there is a significant increase, particularly in wind energy, the great part of potential remains untapped still. Nevertheless, there has been a severe increase since an incentive mechanism for the electricity generation from the renewable sources has been put into force in December 2011. In the year of 2010, the share of renewables in the installed power was 35% (EPDK, 2010a); later in 2011, it rose to 36% (EPDK, 2011a) and in 2012, the aggregate share of renewable sources climbed up to 39,5% (DEKTMK, 2012). When examined, it can be seen that the rise in the share of wind energy is a positive example for Turkey. For example, wind energy had only 0,87% share in the electricity generation in 2008, it later rose to 1,77%, to 2,67% and to 3,25% during 2009, 2010 and 2011 respectively (EPDK, 2012b). Another lucky development in terms of further exploitation of the renewable sources by the Turkish electricity sector is the current licensing tendencies which directly determine the future energy mix of Turkey. In the year of 2010, according to the EPDK, an amount of 2769 MW installed power were licensed and 2249 MW of the total constituted from renewable sources with a 81,2% share (EPDK, 2010a). In a similar way, licences for 12.530 MW installed capacity were issued and among them

renewable sources constituted 6078,82 MW of the total which corresponded to 48,51% (EPDK, 2011a). These figures show that Turkey endeavours to enrich its energy mix by adding up more green sources than conventional high-carbon generation facilities.

Another advantage of Turkey in the green electricity generation is the legal allowance in Turkey for free electricity generation at the plants with an installed capacity up to 500 kW. The regulation related to the free electricity generation, was first adopted on December 3, 2010; yet, it was later renewed after the law regulating the exploitation of the renewable sources, on July 21, 2011. The regulation has created an opportunity for the investors to sell their excess production to the network and create a suitable environment for increases in the aggregate supply. The significance of this regulation is intrinsic to the enormous untapped renewable potential in Turkey. In terms decreasing bureaucratic procedures and investment costs, this regulation presents great opportunities for investors. Thus, not only sustainable generation capabilities of Turkey develop but the new private investors empower the market structure which is a basic principle of the second pillar of Europeanisation. If this tendency can be maintained, the official target of Turkey set at the 2010-2014 Strategic Plan of the ETKB to realise 30% of the aggregate generation from the renewable sources can be materialised (ETKB, 2010a).

Nevertheless, the existence of some specific problems related to the renewable energy investment in Turkey cannot be overlooked; that is to say, there are some certain problems related to Turkey's attractiveness. According to a study, Turkey is only the 28th most attractive country in the world in terms of making an investment to the renewable energy sector in 2010 (Ernst&Young, 2010). Although the rank of Turkey seems weak, country has a fluctuating profile in different types of renewable sources. The rank of Turkey is 18th in solar indices, 10th in geothermal and 24th in biomass (Ernst&Young, 2010). The same study, regards Turkey as the 30th most attractive country for the renewable energy investments in 2011 (Ernst&Young, 2011). Again, the attractiveness of Turkey fluctuates in different types of green

sources. In terms of the wind energy, Turkey is the 29th most attractive country, but this rank increases to 20, when it comes to solar energy (Ernst&Young, 2012). In the year of 2012, Turkey seems to benefit from the reforms concerning the Turkish electricity market much so that the attractiveness of the country jumped up to 26 at the same study (Ernst&Young, 2011). In terms of wind energy, Turkey's attractiveness stood at 28 (Ernst&Young, 2012), while it catching up 22 when it comes to solar energy. In this to happen, the incentive mechanism created for the further exploitation of renewable energy sources, can be predicted as influential. Nonetheless, despite all problems, Turkey's position can be regarded as positive since the Turkish decision-makers continue their engagement with the values of Europeanisation in the energy sector. As parallel to this position, Turkey increased its installed capacity in wind energy 132% from 2008 to 2009 and ranked second after Mexico (Yildiz, 2010b). If the target of Turkey, the one set at the 2010-2014 Strategic Plan of the ETKB, can be reached, Turkey can maintain its chance to catch European 2050 targets for generating 40% of the total electricity from green, sustainable sources and meet a very important criterion on the way to Europe (Yazar, 2010).



	2010	2011	2012
All Renewables	28	30	26
Wind	28	29	28
Solar	18	20	22

Figure 4.7. Attractiveness of Turkey

The second principle of the third pillar, energy efficiency, at its most basic meaning, is consuming as least energy as possible to maintain the economic, social, cultural and other activities so that the same level of life standard is sustained by using the least amount of energy in any form. Karbuz and Sanli seems to have a practical explanation for energy efficiency:

> A definition of energy efficiency in a meaningful strategy should start with the primary energy source. This means that we should consider each and every step from primary energy to end use. Any effort to increase efficiency must also focus on losses, especially transmission and distribution losses, as well as illicit utilization." (Karbuz and Sanli, 2010, pg.98).

The energy efficiency is needed to be examined under three categories in the Turkish case as losses in the electricity distribution, efficient lightening and efficiency in the building sector. As Atamer defends in his book, the cheapest electricity is the conserved electricity (Atamer, 2011). The very first step for increasing energy efficiency in Turkey was the adoption of Energy Efficiency Law on May 2, 2007.

The losses at the Turkish electricity distribution network is a severe problem. This problem has been emphasised for many times at the progress reports. In order to create a trend analysis, the rates of losses in the Turkish grid will be reflected in the graphical form.

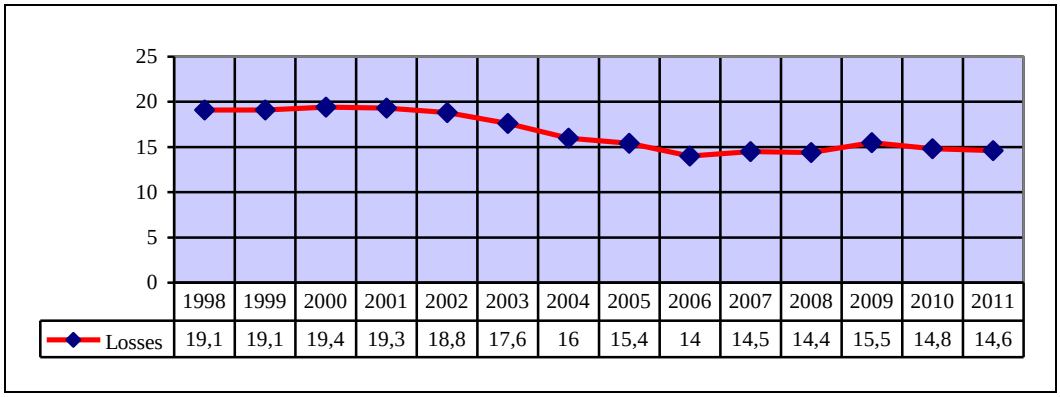


Figure 4.8. Rate of Losses Between 1998-2011

As it can be seen at the figure above, the rate of losses in the Turkish electricity grid was above 19% in the year of 1998, when the first progress report was published about Turkey. Later, thanks to the measures taken, the same rate decreased around 14,5% in 2011 (TEIAS, 2013a). Unfortunately for Turkey, this rate is still pretty much above the rate of losses in the developed countries and those of Europe. The rate of losses in Germany, the US, Japan and the South Korea are 5%, 7%, 4% and 5% respectively (DEKTMK, 2012). In some other members of the EU these rates are 5% in Austria, 10% in Bulgaria, 7% in Denmark, 6% in France, 7% in Greece, 4% in Iceland, 4% in Spain and 7% in Italy (WB, 2013). Still, there are some examples with a very high rate of losses such as Lithuania, which losses some 20% of the total electric power in the grid.

Table 4.4. Rate of Losses in Some European Countries in 2010

COUNTRY	RATE OF LOSSES
Germany	*5%*
Austria	*5%*
Bulgaria	*10%*
Denmark	*7%*
France	*6%*
Greece	*7%*
Iceland	*4%*
Spain	*4%*
Italy	*7%*
Lithuania	*20%*
Turkey	*14,8%*

In fact, the losses sourcing from distribution and transmission lines constitute only a very small portion of the aggregate loss. According to a study of EPDK, the rate of losses sourcing from distribution and transmission lines is only 2,99% in the year of 2010, in which the total rate of losses was 14,8% (EPDK, 2011a). Thus, it becomes almost concrete that the losses which the Turkish electricity operators face with springs from illegal usages and unpaid bills. A study of the State Planning Organisation mentions from the same topic and makes the same observation (DPT, 2011).

Another important topic related to the energy efficiency is building sector. Building sector mainly includes efficient lightening. For this purpose, one of the first steps in Turkey was the initiation of the project of efficient lightening in public buildings (KVAG, in its Turkish acronym). In the framework of this project, all lightening equipments were replaced by energy-efficient compact fluorescent bulbs.

This project was started with a circular letter published on the Official Gazette (RG, 2008c). The main rationale behind this project was decreasing lightening costs of the public institutions. The project aimed to compensate the replacement costs within a 3 month's time and the objectives were achieved. The total cost of replacement, 11,5 million Turkish liras, was compensated in 101 days (ETKB, 2009). Moreover, a 41 million Turkish liras saving was realised for the central budget. In the framework of the project, 1.828.742 light bulbs were removed and 1.758.954 new energy-efficient compact fluorescent bulbs were bought. As a result of the project, the electricity need for lightening was decreased as equal to the generation of a power plant with 102 MW installed capacity. Another rationale underlying the project can be claimed to create an example for people by the hand of the state in accordance with the features of Europeanisation. The official documents of the ETKB support this idea (ETKB, 2009). The Turkish minister explains in a clear way why Turkey spontaneously focuses on the energy efficiency from a realistic perspective: "Demand side energy efficiency investments create three to four times more jobs than new energy supply investments. Another simple fact that reflects the importance of energy efficiency is the fact that investing a single dollar for more efficient electrical equipment saves 3.5 dollars of energy supply investment." (Yildiz, 2010a).

The third principle of the third pillar, integration with the others, which is a shared principle with the security pillar, is a complementary feature of green energy production. Green sources, because their generation capacities are heavily open to the negative effects of the natural events, are not as reliable as the conventional power plants. In order to avoid from any risk of interruption sourcing from fluctuating nature of the green sources, a considerable degree of integration infrastructure should be constructed between the countries. Similar to the logic examined at the respective parts of the "Security in The Turkish Electricity Sector" section, countries with enough interconnection capabilities, can arrange the aggregate supply in accordance with the aggregate demand more easily. Turkey, in this sense, as it has been examined in-depth at the previous parts, has large interconnection capabilities. If these interconnection capabilities can be operated as parallel to the ENTSO-e regulations, the Turkish electricity sector can easily meet these criteria of Europeanisation.

CHAPTER 5

CONCLUSION

The Europeanisation process of the Turkish energy sector is a political and economic choice of the Turkish decision-makers, as it has been said before. Thus, further Europeanisation of the Turkish energy sector is totally a dependent variable changing as parallel to the attitudes of the respective Turkish authorities and to the Turkish foreign policy. Nevertheless, during particularly the last 15 years, since the beginning of the Turkey progress reports, a considerable degree of Europeanisation has been realised at the Turkish energy sector, including the power generation sector. By moving from this fact, it can be claimed that the Turkey progress reports of the European Commission have been influential in the Europeanisation of the Turkish electricity sector and they will continue to be influential in shaping the future of the Turkish energy sector as long as Turkey insists on membership to the Union. Because the whole Europeanisation process itself is a political and economic one, further Europeanisation of the Turkish energy sector may provide Turkey with significant positive contributions in its stalled accession negotiations with the European Union. Because there are 33 separate chapters in the accession negotiations and energy is one of them, further Europeanisation of the Turkish energy sector, may help Ankara to conclude one of the chapters on the way to European Union full membership. Still, as it have been stated at the introduction, due to zero-sum game nature of the current energy structure, conclusion of the energy chapter does not seem possible, until the Southern Cyprus stops blocking the negotiations.

In order to clarify how much the Turkish electricity sector is compatible with the EU policies, the results generated at the previous chapters should be put in a

coherent framework created as parallel to the seven principles of the three pillars. Each principle has been exemplified by utilising the relevant developments at the Turkish electricity sector. Before moving deep into the compatibility of the Turkish energy sector with the seven principles, a note on Europeanisation of the energy sector being put at the second chapter should be remembered again: "... for a country to have a Europeanised energy sector, it should create a secure system depending upon a competitive market structure being fed by sustainable supplies."

For the first principle, diversification of the sources, both diversification of supplier countries and of the type of supplies, Turkey has done much so far and still trying to do more. In terms of the former aspect of the principle, Turkey has managed to decrease the share of natural gas around 45%[1] and targets to decrease more by prioritising on the other primary energy sources like domestic lignite, a series of renewable sources such as wind, biomass, geothermal and solar energy, intense utilisation of hydropower and possibly of nuclear power. Although lignite-fired power plants come forward with their some features *inter alia*, the Turkish energy mix increasingly consists from more diversified supplies. In terms of the latter aspect, Turkish energy policies has started to produce some results and the supplier with the largest share in the natural gas imports of Turkey, has lost a large portion of its market share in Turkey. The share of the largest supplier has decreased below 60% from a 70% peak and the target is dragging it below 50%[2]. The Turkish achievements up till now, can be perceived as a sign for future successes. In brief, Turkey can be regarded as "successful" in meeting one criterion, the first principle.

The second principle, diversification of routes, is another field in which Turkey has been quite successful. Because this principle is more about natural gas rather than the electricity sector itself, the principle has been examined by focusing on natural gas import routes of Turkey. The Turkish Republic currently imports from

[1] See Figure 4.1.

[2] See Figure 4.3.

via 6 different routes: from Russia via the Blue Stream and trans Balkan pipelines, from Azerbaijan via the Baku-Tbilisi-Erzurum (BTE) pipeline, from Iran, and from Algeria and Nigeria via liquefied natural gas terminals as addition to some purchases at spot market. As addition to these, Trans Anatolian Pipeline project and another possible pipeline transporting Egyptian (and perhaps future Israeli) supplies via Syria are planned. In any case, Turkey seems considerably successful in diversifying its import routes which makes Turkey "successful" in meeting the requirements of the second principle.

The third principle, having enough storage capacity, similar to the first two principles, is more about the primary energy sources rather than the electricity which is a secondary one with no current technical solution to store it in large amounts. Therefore, this principle has been investigated in terms of the Turkey's storage capacities of natural gas. After the first natural gas storage facility of Turkey was taken into operation in the year of 2007, Turkey continued to develop ambitious storage facility projects and currently as an addition to one huge facility in Silivri, another huge facility is under construction in Aksaray[3]. With the completion of the latter facility, Turkey's natural gas storage capacity will rise to 4.161.535.000m^3 which is around 10% of the Turkey's annual consumption. In other words, Turkey will have a natural gas storage equal to 40 days' consumption when the facility in Aksaray is completed. When compared with the standards of oil storage, which requires storing an amount equal to 90 days' consumption, 40-days' consumption storage may seem insufficient. Nevertheless, there is a basic difference in between: Oil, because it is mainly used as a transportation fuel, is much less substitutable when compared to natural gas, which is mainly used for heating and power generation. Both power generation and heating, can be realised without an obligation to use natural gas. Still, in a time of crisis, a storage equal to 40 days' consumption may not be enough; for this reason, Turkey may be advised to develop its storage capacities in the future progress reports. In any case, because the most recent

[3] See Table 4.2.

progress reports does not make any complaints on this issue, Turkey can be regarded as "partially successful" in meeting this criterion as well.

The fourth principle, integration with the others, unlike the previous two principles, has been studied by looking from both electricity and the natural gas aspect, because gas is an inseparable part of the power generation sector[4]. In terms of the integration of the Turkish electricity grid to those ones in Europe, it can be said that Turkey has developed considerable integration capacities with its both European neighbours, Greece and Bulgaria. When used with full capacity, Turkey can meet its 15% of its annual electricity consumption through electricity import. In this respect, Turkey's integration capacities is compatible with the e-Highways project of the EU, as set at the Energy 2050 document. The integration of national natural gas networks, is another branch of the integration. Turkey has a large interconnection facility with Greece, known as Turkey-Greece Pipeline (ITG), which is planned to be extended towards Italy. If this can be materialised, Turkey will be connected to the pan-European natural gas network strictly. Besides, Turkey and Bulgaria has prepared projects to construct a pipeline to connect the national networks. With the help of these two natural gas pipelines and the existing electricity interconnections, Turkey will have sufficient integration capacities with its both European neighbours. Thusly, Turkey will be able to be regarded as "successful" in meeting integration with the others criterion, when the electricity connection becomes fully operational and the Turkish-Bulgarian pipeline completed soon.

The fifth principle, liberalisation, is one of the major principles of Europeanisation and has been studied in-depth at the previous chapter with its three sub-branches. In the framework of this principle, establishment of an independent supervisory authority, EPDK, in 2001 contributed to Turkey's liberalisation efforts much. Another aspect of this principle, privatisation, has been one of the most elaborated fields in Turkey due to high capital need of the state. As an outcome of

[4] See Table 4.3..

quick process, privatisation of the electricity distribution companies was completed towards the end of 2012. In the privatisation field, privatisation of the power generation assets except some huge hydropower plants such as Ataturk and Keban Dams, are planned to be initiated in 2013. As addition to these two aspects, a series of functional measures have been taken by the Turkish government for the sake of liberalisation of the electricity sector to turn it into a market. In this framework, the limit for free consumption have gradually but steadily been decreased and theoretical market openness have exceeded 80% in the year of 2012[5]. Moreover, the existing interconnection lines have gone out to tender for private entrepreneurs. Thus, the Turkish electricity sector has evolved into "the Turkish electricity market", specifically thanks to the developments after the establishment of EPDK. To sum up, Turkey can be seen as "successful" in liberalising its electricity sector.

The sixth principle, green energy production, is directly related with the further exploitation of the renewable energy sources. Turkey, particularly with its vast untapped potential for electricity generation from renewable sources, has great chances to meet this criterion[6]. Although the state does not neglect the significance of the green sources and allocate a severe portion of funds to encourage the utilisation of these sources, they still have a quite limited share in the Turkish energy mix. On the other hand, their contribution has been slowly but interruptedly rising since 2010 and when the share of renewables is examined in the licences issued by the EPDK for generation facilities, their share can be predicted to rise much faster in the years to come. Moreover, the attractiveness of Turkey is also on rise which helps to attract more investments to the Turkish renewable sources[7]. If Ankara can utilise more renewable sources in accordance with the increase in the aggregate demand,

[5] See Figure 4.6.

[6] See Table 4.4.

[7] See Figure 4.7.

Turkey can meet this criterion at the accession negotiations. However, currently Turkey can only be regarded as "partially successful" in this principle.

The seventh principle, energy efficiency, is a field to which Turkey has not given as much importance as it deserves. One of the biggest problems which need to be solved is the very high rate of losses in Turkey. Since the first progress report in 1998, the rate of losses has only been decreased 5% in 15 years[8]. Despite the hopes for decreasing these rates with the completion of distribution network, this may be seen as a complete failure whatever the reason is. Although there are some positive measures taken by the Turkish government such as the adoption of Energy Efficiency Law and replacement of inefficient bulbs with the efficient compact-fluorescent bulbs at the public sector, these steps have only little effects on the energy efficiency, if not zero. In terms of energy efficiency principle, Turkey is "not successful" ultimately. In any case, because the Turkish decision-makers are very well aware of significance of the energy efficiency, Turkey can be expected to meet the requirements of this principle in a few years' time.

In conclusion, it can be said that the Turkish electricity sector has some problems in meeting the European demands, although it is not very far away from the European standards. The problematic fields are having enough storage capacities, green energy production or energy efficiency. Briefly, Turkey does seem "successful" in many of the pillars and principles; yet, there are some criteria in which Turkey needs to do much. On the other hand, the current trends at the Turkish energy policy help to keep hopes for the future of Europeanisation of the Turkish electricity sector alive. Nevertheless, because the membership process of Turkey to the European Union is a political and economic choice made by the respective decision makers at the both sides, the whole of the accession negotiations may be stalled at some point as parallel to the conjuncture as it was during the term presidency of the Southern Cyprus in the year of 2012. Therefore, even if Turkey

[8] See Figure 4.8.

successfully continues to Europeanise its electricity sector, energy chapter may not be opened. In other words, although apolitical criteria of Europeanisation on which this thesis has focused do not seem completely problematic for Turkey, the political developments may be much more influential in the process. As the last word, it can be advised that the benefit of Turkey is in de-politicisation of the energy sector altogether in order to protect it from distortions sourcing from the political realm, this may spontaneously contribute to the accession process.

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