A STUDY OF POWER:
THE MAKING OF THE TURKISH ELECTRICITY MARKET

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Thesis Abstract

Pınar Sözer, "A Study of Power: The Making of the Turkish Electricity Market"

As a study of power and market-making, this thesis analyzes the political and economic dynamics of the making, maintenance, transformation, consolidation and current state of the Turkish electricity market. It examines the utilization of disciplinary discourses and expert knowledge claims; the manipulation of the dynamics with respect to market power and political power; market tools, devices, and information technologies; and the mechanisms and factors in the price realization from an actor-network perspective, which incorporates multiple market agencies and the active agency of the commodity under analysis.

The underlying research is based on an official document analysis that reviews the established legal framework for the marketization of electricity, non-structured and semi-structured in-depth interviews with market actors, and secondary data analysis which explores the dynamics that enframe the making, transformation and state of the Turkish electricity market.

The thesis illustrates that the most important determinant in the construction, establishment, maintenance, and consolidation of the Turkish electricity market is the active agency of the commodity itself. The analysis presents the ways in which, through the marketization process, not only the notion of the Turkish electricity market is constructed in terms of power relations in the exchange of electricity, but also how notions of the market, the economic, the social, and the political, as well as the conceptualization of individual and nature are recoded and transformed. It demonstrates that there is no economy without electricity, and no politics without economics within the current marketization process in Turkey.

Tez Özeti

Pınar Sözer, "İktidar Üzerine Bir İnceleme: Türkiye Elektrik Piyasasının Oluşturulması"

Bir güç ve piyasa oluşum incelemesi olarak bu tez; Türkiye elektrik piyasasının oluşturulması, idamesi, dönüşümü, pekiştirilmesi ve güncel çalışmasında etkili olan politik ve ekonomik dinamikleri analiz etmektedir. Bu amaçla; piyasa ve politik güç dinamiklerinin manipülasyonunu; piyasa alet, araç ve bilgi sistemlerini; piyasa fiyatını belirleyen mekanizma ve faktörleri; disiplin söylemlerinin ve ekspertiz bilgi iddialarının kullanımını, birden çok piyasa eylemliliği ve incelenen metanın aktif eylemliliğini kapsayan aktör-şebeke kuramı perspektifinden incelemektedir.

Piyasanın oluşturulma, dönüşüm ve mevcut işleyişini çerçeveleyen dinamikleri keşfetmek amacıyla, araştırma esasen; kurulan hukuki çerçeveyi değerlendiren resmi doküman analizi, piyasa aktörleriyle yapılan yapılandırılmamış ve yarı-yapılandırılmış derinlemesine mülakatlar ve ikincil veri analizi yöntemleri ile temellendirilmiştir.

Tez, Türkiye elektrik piyasasının oluşturulmasında, yerleştirilmesinde, dönüşümünde, pekiştirilmesinde ve güncel işleyişinde en önemli belirleyicinin metanın kendisinin eylemliliği olduğunu göstermektedir. Analiz, piyasalaştırma süreci ile sadece elektriğin el değiştirmesinde etkili güç ilişkilerine bağlı olarak Türkiye elektrik piyasası kavramının oluşturululduğunu değil; aynı zamanda piyasa, ekonomik, sosyal, politik kavramlarının ve bireyle doğanın kavramsallaştırılmasının da yeniden kodlandığı ve dönüştürüldüğünü ortaya koyuyor. Türkiye'deki mevcut piyasalaştırma sürecinde; elektrik olmadan ekonomi olamayacağını, ekonomi olmadan da politika olamayacağını gösteriyor.

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This thesis is dedicated to;

The precious memory of my beloved father Cevat Sözer and unconditional support of my loving mother Ümran Sözer.

CONTENTS

ABBREVATIONS

AC…….Alternating current
AEG…….. Allgemeine Elektricitäts-Gesellschaft Aktiengesellschaft
ANT…….. Actor Network Theory

BCM……..Billion cubic-meter
BO…….Build and operate
BOO…….. Build-Operate-Own
BOT…….. Built Operate and Transfer
BOTAS…. Boru Hatları ile Petrol Taşıma Anonim Şirketi (Turkish Petroleum Pipeline Corporation)

CHP……...Cumhuriyet Halk Partisi (Republican People's Party)

DC…….Direct current
DF……. Distribution fee

EEF…….... Electricity energy fund
EFET…….European Federation of Energy Trader
EML…….. Electricity Market Law
EMRA…...Energy Market Regulatory Authority
EMRF……Electricity meter reading fee
ENTSO-E..European Network of Transmission System Operators for Electricity
EPIAS……Enerji Piyasaları İşletme Anonim Şirketi (Energy Markets Operation Corporation)
EUAS……Elektrik Üretim Anonim Şirketi (Electricity Generation Corporation)

GENSED…Güneş Enerjisi Sanayicileri ve Endüstrisi Derneği (Turkish Photovoltaic Industry Association)
GW……Gigawatt
GWh……..Gigawatt hour

HESIAD…Head of Hydroelectric Plants Industry Businessmen Association
HPP……Hydroelectric power plants

kW…….Kilowatt
kWh……Kilowatt hour

LNG…….. Liquid natural gas

MCT……..Municipal consumption tax
MENR…...Ministry of Energy and Natural Resources of Turkish Republic
MW……... Megawatt
MWh……..Megawatt hour
MYTM…..Milli Yük Tevzi Merkezi (National Load Dispatch Center)

NG…… Natural gas

OECD……Organisation for Economic Co-operation and Development

OTC……Over the Counter Market

PMUM….. Piyasa Mali Uzlaştırma Merkezi (Market Financial Reconciliation Center)

RAPSIM…Radar Performans ve İz Analiz Merkezi (Radar Performance and Track Analysis Center)
RSS……Retail sale service

SG……. Shale gas

T-BSR)…..Temporary Balancing and Settlement Regulation
TEAS…… Türkiye Elektrik Üretim İletim Anonim Şirketi (Turkish Electricity Generation Transmission Corporation)
TEDAS…..Türkiye Elektrik Dağıtım Anonm Şirketi (Turkish Electricity Distribution Corporation)
TEIAS……Türkiye Elektrik İletim Anonim Şirketi (Turkish Electricity Transmission Cooperation)
TEK……...Türkiye Elektrik Kurumu (Turkish Electricity Cooperation)
TETAS….. Türkiye Elektrik Ticret ve Taahhüt Anonim Şirketi (Turkish Electricity Trading and Contracting Corporation)
TF……..Transmission fee
TL……..Turkish Lira
TOR……Transferring of Operation Rights Method
TRT…….. Turkish Radio and Television Corporation

USA…….. United States of America
USD…….. United States Dollar

VAT…….. Value added tax
VOB…….. Vadeli İşlem ve Opsiyon Borsası – Turkish Derivatives Exchange

YEKDEM..Yenilenebilir Enerji Kaynakları Destekleme Mekanizması (Renewable Energies Support Mechanism)

CHAPTER 1

INTRODUCTION

Electricity is power. It can kill, and it can change how people live. Very much like politics, it has a fundamental effect on life. Politics studies power; therefore, a study of electricity as power provides political scientists with a case-study of how power relations take shape to create possible fields of action in economic relations that draw directly on power—that is, electricity. How is this vigorous form of power produced? What are the dynamics of its making? How does it get transformed, preserved and marketed? Electricity is a natural phenomenon, and it exists even in the human body, as messenger of instructions from the brain to the muscles. Yet, its markets are not natural; they have to be constructed and maintained. This thesis studies power relations in the Turkish electricity market. As a study of power and market-making, the study demonstrates that there is no economy without electricity, and no politics without economics within the current marketization process in Turkey.

Electricity is powerful because it is a vital source. It is the ultimate form of energy source designed to satisfy nearly all daily, commercial and industrial needs. This fact makes the electricity market very particular, since it is not only fundamental in itself, but also because it constitutes the driving force behind other markets and industries. For example, if the milk market, as an essential market of nourishment, would be wholly disrupted for a month, then this would affect related industries such as the cheese and yoghurt industry; still, other markets would continue to operate. However, if the electricity market were disrupted even for one week, all other markets would come to a crushing halt. The electricity market is

indeed the central market. Correspondingly, in Turkey it has been conceptualized as a public good supplied by public institutions. But how does a vital resource for daily activities become transformed from a public good into an input of industry? The key is that electricity is not only a vital source, but also a very valuable commodity. Thus, electricity markets are central sites for profit-making. Particularly in the Turkish case, the market is identified as a profitable, yet controversial and non-transparent entity; politics is what lies at the heart of this market.

This thesis surveys the ways in which political relations enframe and simultaneously become enframed by the formation of the electricity market, tracing these dynamics via the concept of marketization. Marketization, a notion established by the economization approach, argues that, in order to grasp the dynamics of the making and maintenance of economic markets, markets need to be placed in the broader contexts of economization and marketization. Çalışkan and Callon (2009) have defined economization as the ongoing "processes of constitution of behaviors, organizations, institutions, and, more generally, objects which, in a particular society, are tentatively and often controversially qualified by scholars and/or lay people as economic" (p. 370). Correspondingly, instead of analyzing markets as objects to be grasped within their independent isolated spheres, the marketization approach focuses on the making of markets as political and economic processes in which academic and disciplinary discourses are involved. According to the notion of marketization, economy cannot be studied apart from the power relations that inform and simultaneously become informed by the market and market-making processes.

The main focus of this study, analyzing the making of the Turkish electricity market in terms of the existing political power dynamics, has personal orientations. The highly debated and politicized electricity blackout of July 2006, which left

thirteen cities in the dark for more than six hours, caught me in Balıkesir, where all daily and commercial activities were disrupted. The consumers' direct experience of the blackout lasted only for several hours. However, besides illuminating the vitality of electricity as a public good, the background as well as the repercussions of this blackout had far-reaching implications that turned my personal interest into an academic one. The contradictory explanations given by the many actors from different sectors operating in the market, the context of the blackout, and the resolution of the conflict between the actors illustrated the ways in which the electricity market has turned into a ground for major power contestations. The state departments claimed that the producers wanted to manipulate prices through their market power, whereas the producers claimed that it had been caused by a technical problem; when the draft bill on electricity producers was being debated in parliament, the conflict was resolved only after the ministry's declaration to increase the prices and to modify the entire electricity market's structure.[1] This made visible the need for a detailed study of the Turkish electricity market, with a focus on the various dynamics of the market. This includes the legal framework transforming these dynamics as well as the actors renegotiating these transformations and established market boundaries, in order to map the marketization of electricity in Turkey.

My academic interest was further piqued when I explored the particular nature of electricity and how its active agency is central in the making of its market. Electricity is very much like power. We do not see it, but we analyze it; it can kill, but it also helps us survive. It is fascinating that even electrical engineers have difficulty in describing its materiality, often saying "you would understand its

[1] Elektrik Mühendisleri Odası [Association of Electric Engineers], 2008, *From Darkness (1 July 2006) to Price Increases (1 July 2008)*, press statement dated 30 June 2008.

materiality only if you get shocked by it."[2] Similar to that of the Turkish Electricity Market Authority, the definition given by Ahmet Oçak, the Head of its Electricity Department, is as follows: "Electricity is the work of the devil, do not get close or you may get shocked."[3]

Electricity is a very particular commodity that needs to be produced, distributed, consumed, and controlled under very specific conditions and with the aid of special equipment and expert knowledge. Correspondingly, the construction, making, maintenance, transformation, and consolidation of its market are also realized under specific conditions and particular disciplinary discourses, implying that performativity is manifested at each stage of the electricity market. The present thesis will demonstrate that performativity is involved in the production of electricity (in scientific wars over electricity currents), that it informs its distribution, and that it enframes its exchange conditions and outcomes. This marks another particularity of the electricity markets, because in the majority of markets performativity cannot be explicitly observed at all market stages. For example, in the cotton market, neither its production nor its distribution require particular disciplinary knowledge and specialized equipment to construct their resultant separate markets; performativity manifests itself explicitly in the exchange conditions and outcomes (Caliskan 2003). As a result, the electricity market provides a valuable sphere of analysis in terms of performativity. The thesis explores the ways in which performativity enframes and relates to the law, economics, the social sciences, and engineering, by means of an analysis of the Turkish electricity markets.

The growing size of the electricity market—coupled with the Electricity Market Law (no. 6446), dated 30 March 2013, which aims to consolidate the

[2] "Ancak çarpılırsan materyali neymiş anlarsın."

[3] "Elektrik şeytan işidir, çok yanaşma çarpılırsın."

liberalization of the market in terms of production, distribution, and trade segments—further emphasizes the centrality of these power contestations in mapping the domestic political power relations in Turkey. The size of the electricity market does not only grow in the installed production capacity, total electricity generation, received investment levels, general consumption, and per capita consumption, but also due to the introduction of new primary energy resources and new market actors that transform the dynamics in terms of market possibility as well as actor proliferation. The legal regulation of the market, on the other hand, is fundamental for shaping the path this growth is to follow. The ultimate aim of the initial Electricity Market Law (no. 4628), dated 20 February 2001,[4] to liberalize the electricity markets transformed the market dynamics by enabling the entrance of new actors through large-scale privatization schemes. The new Electricity Market Law (2013) further consolidated this marketization process. The entrance of new actors into the market changed not only the market dynamics in terms of the entrance conditions, but also the existing power relations in the market, in that these proliferated agents renegotiated the established boundaries. The new Electricity Market Law (2013) further reinforced the goals of the initial law, through greater emphasis on the development of a private sector as well as a liberal market in general.

Since 2001, the electricity market has been shaped and reshaped by a number of factors: the entrance of new actors transforming the market shares of insiders as well as the established market structure; the introduction of new technologies that enlarge both the number of actors and the scale of the market (new licenses being distributed in solar and wind energies); transformations in the mechanisms of price

[4] The old Electricity Market Law (no. 4628) dated 20 February 2001 was amended as "Law on the Organization and Duties of the Energy Market Regulatory Authority" (2013) with the new Electricity Market Law (2013).

realization (introduction of the spot market); the utilization of market devices; the commodification, objectification, and standardization of electricity; disciplinary discourses and logical infrastructures that enframe market actors; and national as well as international legal regulations that set the conditional possibilities of the market actors and actions. Through an empirically backed analysis of these mechanisms, the present research aims to investigate the ways in which the electricity is marketized from a vital public good to an input into the Turkish economy.

In order to address my main concern—that is, identifying the political mechanisms, the different agency and action forms, dynamics, and processes that construct and maintain the current Turkish electricity market—I have conducted research based on the following: (1) official document analysis to review the established legal framework and the ways in which this process shapes the marketization of electricity; (2) semi-structured in-depth interviews with the actors that form and maintain the electricity market on an everyday basis; and (3) secondary data analysis. Together, these research methods assist in mapping the transformation of the electricity market as well as the market arrangement in terms of the entrance of new actors, changing market power, price levels, production conditions and network formation. Furthermore, I have conducted a review of the literature on the energy and electricity markets, particularly the Turkish electricity market, also as empirical research for the purposes and theoretical perspective of this thesis. Since, according to the theoretical perspective applied here, the sciences contribute to the performation of the markets they study, their disciplinary claims and discourses are analyzed together with the marketization of electricity in Turkey. Consequently, as a case-study of the making of the Turkish electricity market, my research utilizes

different methodologies to survey its main question holistically, both with respect to the sciences that perform the market and the market itself.

It is important to note that the electricity market in Turkey is not studied as an object to grasp within its independent sphere, but as a many-sided, diversified, evolving sphere of power struggles in which proliferated forms of actions and agency interact in order to make visible the ways in which the establishment and maintenance of the electricity market are informed by the active agency of electricity as well as by domestic political power relations and dominant disciplinary discourses that act as primary makers of the market. Furthermore, since the market is depicted and analyzed as an evolving sphere, instead of analyzing the electricity market with the aim of imposing generalizable findings, this thesis maps the marketization of electricity as a continuing process in which forms of resistance and counter-resistance interact.

As a case-study of power and market-making in Turkey, this research primarily investigates the making of the Turkish electricity market with respect to existing domestic power relations, focusing on its implications on an energy market that serves as playground for the system's major actors. In order to study the consolidation of power and its implications for the Turkish electricity market, I have carried out an analysis of the dynamics of the marketization of electricity in Turkey. My research has primarily focused on: (1) the dynamics of the construction, making, maintenance, transformation, and consolidation of the Turkish electricity market; (2) the multiplicity of agencies, their understandings of the market, and the role of electricity's agency in the making of the electricity market; (3) the utilization of disciplinary discourses and expertise knowledge claims in the marketization of electricity; (4) the manipulation of the dynamics of market power in terms of market

shares and the ability to structure preferred outcomes; (5) market tools, devices, and information technologies that enframe the marketization of electricity; and (6) the mechanisms and factors in the realization of price as the major market outcome.

The thesis demonstrates that the marketization of electricity and its regulation enframe a particular form of electricity market where the intertwined nature of political power and market power work to consolidate the established marketization of electricity and power relations arising from this particular arrangement. Analyzing the regulatory making of the Turkish electricity market together with the market practices that shape everyday market encounters provides valuable insights into the general law-making and governance practices, as well as the dominantly voiced political discourses, logical infrastructures, narratives, and rhetorics in the Turkish political arena. Together, these are utilized as tools of political power consolidation.

The thesis reveals that the initial intertwined character of the political and the economic emerges from the conception of electricity as public good, which is codified in the Turkish Constitution. The current marketization of Turkish electricity undermines this conception as the first step of marketizing electricity, while at the same time redefining the intertwined nature of the political and the economic in accordance with the particularities of this marketization. This thesis articulates this issue by making visible the ways in which the law-making authority, as a political authority, sets the conditional possibilities for marketization via controversial and non-transparent market-related regulations, which in turn construct market tools that enframe the marketization of electricity (such as licenses and tariffs). The political authority imposes the market price as well, through a public institution whose operational and management principles are defined by the political authority. The utilization of identical disciplinary discourses and expertise claims for both politics

and market-making further attaches these notions to each other in the Turkish electricity market. Finally, the conflicts between different political and market actors in their struggle for dominance over the marketization process show that the political and the economic are inseparable in the Turkish electricity market.

This thesis further depicts this intertwined nature by analyzing the ways in which not only the notion of economy, but also notions of the social, political, economic, individual, and nature are redefined through the marketization of electricity in Turkey. Since the marketization processes undermine the conception of electricity as public good and emphasize its conception as industrial input via dominant discourses, the individual's relation to nature is redefined since the sun, the wind, and water are defined firstly as primary resources of electricity plants, and not as vital lively resources. As the social conception of electricity is undermined along with its conception as public good, the notion of the political and the social are redefined, so that the political becomes the authority that will ensure the development of the Turkish economy by fueling the electricity market, while the notion of the social becomes increasingly invisible in the marketization process that lacks any reference to the distribution of the alleged economic development or equal access to the electricity supplied. The notion of the economic, in turn, is redefined as a macro-indicator represented by the measurable numbers of development percentages, and not as the daily exchange relations that affect all parties involved. However, since marketization is never complete, acts of resistance and the interplay of power relations reflect the simultaneous consolidation or reformation of politics and markets in everyday market encounters.

This thesis further illustrates that the active agency of electricity exists in each marketization stage, along with performative forces. As I will elaborate in the

literature review, the non-human agency, particularly the agency of the commodity, not only refers to the actor's (electricity's) planned actions and their consequences, but also to the intended and unintended consequences of the actor's actions that enframe and change a human sphere of conduct. It will be demonstrated that the inability of storing electricity wholesale, the need for simultaneous production and consumption, the different marginal costs of the same electricity due to the different primary resources each having different implications for its exchange, its conception as a public good, the requirement of expertise knowledge for electricity production and utilization, and its volatility in terms of production conditions all shape the marketization of electricity, which reflects itself in the making as well as the outcomes of the market.

Here, I will introduce a new conception of price with its own terminology and analytical tools that provide broadened pathways to be followed in marketization studies, especially in respect to the price realization mechanisms and the importance of a commodity's particularities in major market outcomes (such as price). I will introduce new price forms, such as borderline price, fragmented hourly price, summary price, consumer price, tariff price, and direct negotiated price. All of these will be analyzed on two levels of price-making and in terms of their negotiation forms, fixing mechanisms, and particularities. This study, then, reveals that price in the electricity market is partially negotiated, highly hybrid, fixed in a non-transparent manner, and imposed on the market players and the various parties engaged in the transaction. This reflects the dominant non-transparent and hybrid form of the marketization process and the established Turkish electricity market.

I will further present significant theoretical findings through the lens of political science, particularly with respect to the mutual informative relationship

between markets and power, the active agency of a nonhuman commodity enframing its own marketization, and the results of this process in terms of political power relations and market outcomes. These outcomes include the interconnected consolidation of political and economic power; the changing conception of political authority from a supplier of public goods to a regulator of commercial goods, undermining the conception of electricity as public good; and the transformation of notions of the political, social, and economic via processes of marketization, with the help of the presented theoretical and methodological tools of analysis. Finally, this study demonstrates that there is no economics without electricity and no politics without economics in the current marketization of electricity. It illustrates the intertwined character of the economic and the political, manifesting itself explicitly in the making of the Turkish electricity market.

The thesis contributes to bodies of literature in political science, political economy, and market studies, since it studies the Turkish electricity market through a theoretical lens informed by political science, marketization and actor-network theories, which together help to analyze the making, maintenance, consolidation, and transformation of the market with respect to its diverse agency and action forms, including the agency of electricity as well as the disciplinary discourses and market tools that enframe the market actors (Appadurai 1998, Beckert 2010, Beckert and Aspers 2011, Breslau 2003, Caliskan and Callon 2009, DiMaggio 1994, Dobbin 2004, Fligstein and Dauter 2007, Fourcade 2007, Granovetter 1985, Lapavitsas 2004, MacKenzie 2006, Maurer 2006, Myers 2001, Preda 2007, Smelser and Swedberg 2010, Swedberg 2004, Walsham 1997, White 1981). The thesis demonstrates the ways in which certain behaviors, organizations, institutions, and objects are qualified as economic in order to enframe a particular marketization process, which will

establish a particular form of electricity market that can only be explained holistically with reference to all these processes. It provides an extensive analysis of the expressions, self-fulfilling prophecies, and prescriptions that perform and encompass the Turkish electricity market.

The thesis consists of four chapters. The first, present chapter has introduced the subject, its importance, the main question and the theoretical as well as methodological ways in which these concerns will be addressed. The second chapter offers an extensive literature review. While the first part of the review section introduces the theoretical tenets and empirical research agendas that prevail in the market studies literature, the second part focuses on the empirical literature on energy markets, electricity markets, and the Turkish electricity market in particular, with simultaneous analyses of the ways in which the empirical literature communicates with the theoretical schools. The third chapter presents the research findings and analysis of the establishment and current workings of the Turkish electricity market in three sections. The first section elaborates on the market's establishment, historical development, and legal framework, while the second section builds on the first to demonstrate how the established market is reinforced, negotiated, transformed, consolidated and maintained within the everyday market transactions, from production to consumption, in the order of electricity's life cycle. The third section emphasizes the contributions of this thesis by providing further analysis of the interplay between my research findings and the theoretical literature. The fourth and final chapter concludes by way of re-emphasizing major findings, their implications for market studies and energy markets in general, my particular contributions to the marketization literature, prospects for further research, and long-term expectations for the marketization of electricity in Turkey.

A caveat on the limitations of this thesis is in order before proceeding: the research for this thesis was completed in February 2014, and its findings are based on market research and analysis conducted up to this date. Given that the Turkish electricity market is constantly experiencing major transformations, the research obviously could not incorporate the changing major actors, new regulations, or market information after that date. However, as a study of power and market-making, this thesis provides a comprehensive analysis of the marketization of electricity in Turkey, by surveying and presenting the main tenets of this marketization process and the ways in which it is initiated, established, consolidated or re-negotiated, and further maintained.

CHAPTER 2

LITERATURE REVIEW

Motivated by the primary theoretical question about the political mechanisms, processes, discourses, and dynamics which together establish and maintain a market, particularly the Turkish electricity market, this chapter reviews the existing literature with an eye to the particular theoretical frameworks, empirical guidance, and the output that each approach may provide to help answer this question. The existing approaches in the literature are grouped and analyzed as follows: (1) the neo-classical economic approach, which defines the market as the impersonal and self-regulating ground of the economy; (2) the Marxist economic approach that describes the market as a reflection of the macro-economic structure of inequality production; (3) economic sociology, which poses the market as socially embedded institution; (4) market culturalism, which defines the market as a cultural sphere of circulation; and (5) the marketization approach, which focuses on processes of market establishment, as opposed to defining the market as an object, structure, or social reflection. The chapter consists of two sections: the first analyzes the theoretical framework and the empirical guidance that these approaches provide, whereas the second focuses on the empirical literature regarding electricity markets, and the Turkish electricity market in particular.

Review of the Theoretical Literature

The existing literature concerning the organization of economic markets in terms of political power relations can broadly be examined under five categories—namely, the neo-classical/liberal approach, economic sociology, and alternative calls that originate from economic sociology, market culturalism, and marketization approaches, which investigate the operation of the social and political mechanisms within markets. It should be noted that politics in this theoretical context is not defined as everyday policy-making, but as the intertwined and diversified power relations that are at work in the construction of the Turkish electricity market. This section analyzes the theoretical foundations as well as the proposed empirical research agenda of each respective approach. Each analysis concludes with discussing the relevance of the approach for my primary research question and possibilities for utilizing the particular theoretical framework for the purposes of this thesis.

The Neo-classical Economic Approach: The Market as Impersonal Self-regulating Ground of the Economy

Neo-classical economic theory is one of the most dominant and oldest approaches in the literature. Its major theoretical tenets can be traced in assumptions about universal economizing individuals existing apart from time, space, and context, as well as in the belief in the organizing principle of supply and demand (Firth 1929, Marshall 1982, Balassa 1986). This theoretical framework claims an independent sphere for the economy apart from the social (Cook 1966). In this sphere, individuals

perform their choices through rational calculations based on utility (Scott 2000). The impersonal market is assumed to operate through the invisible elements of demand and supply and to realize prices accordingly (Smith 1937). Consequently, the market operates spontaneously, without any need for external intervention; it distributes scarce resources with optimal efficiency. Furthermore, because these prices and the distribution system are outcomes of impersonal market forces, they are not only the most efficient, but also the fairest outcomes (Hayek 1975). This line of theoretical argumentation is then followed by an emphasis on the importance of liberal price mechanisms in the private impersonal market, which according to Hayek (1975) ensures freedom. However, it is crucial to note, also for the purposes of this thesis, that the pre-requisite for this mechanism to operate is the separation of political from economic power, so as to prevent political power from intervening in economic relations (Friedman 1962).

Regarding the empirical agenda proposed by the neo-classical economic approach, the formalist scholars Friedman and Savage (1948), heavily informed by neo-classical market theory, have emphasized universalized individuals and transparent processes of price formation. The individual is identified as the major subject of analysis in empirical studies of the neo-classical economic approach, since the approach defines the economy and the market via its object, which is the individual. The main proposition claims that individuals, as market agents, can basically be understood in reference to utility analysis. Models based on principles of supply and demand propose a way for understanding the structure of the market and the mechanisms that realize price (Syverson 2004). Instrumental rationality, accordingly, emerges as the key concept to analyze the ways in which rational decision-making individuals choose between alternative means of utility

maximization in an environment in which each individual operates with the same ultimate aim, with the scarce resources available. According to this tradition, also pursued by the formalist approach dominant in the literature after the 1950s, markets and prices can be analyzed as results of the activities of these rational, choice-making, and thus economizing individuals (Belshaw 1965, Cook 1966, Cook 1986, Swetnam 1973, Schneider 1974).

Because the approach operates both theoretically and empirically through uniformly and abstractly defined individuals, it was forced to claim universality over these individuals so as to gain the explanatory power it needed. The notion of universality requires the existence of particularities in order to explain away the deviations from these universal models. Cultural differences, then, serve as the particular excuse needed for this universality claim and for justifying the key concept of instrumental rationality. In order to be able to explain why rational, utility-maximizing—that is, economizing—individuals value different things based on different kinds of logic, culture serves as reason behind the particular and the deviation. However, it must be emphasized that there is an inconsistency within this approach. On the one hand, the neo-classical economic approach claims universality and impersonality for the market forces. This notion implicitly assumes that culture is irrelevant to the establishment and workings of markets, because economy is abstracted from society. On the other hand, this universal claim needs the existence of the particular in order to explain away any deviations from the standard assumptions. Moreover, the elusiveness of the notion of culture in terms of empirical research constitutes another dead-end within the neo-classical economic approach. Through internalizing and externalizing certain market aspects and phenomena by

means of theory, the neo-classical economic approach lacks a clear explanation of the establishment and maintenance of markets.

As to the relevance of the neo-classical approach to the primary question driving this thesis, the neo-classical conception of economy, as normatively apart from politics and coupled with the assumption of the universal rational individual, evidently disqualifies to supply a theoretical framework for this specific research, since it aims to explore simultaneously the dynamics of political power and market-making. Furthermore, explanations based on assumed universal individuals operating in models of supply and demand to realize already determined prices basically fail to offer guidance for studying the power dynamics of market-making.

The Marxist Economic Approach: The Market as Structure of Inequality Production

The Marxist critique from the institutional strand undermines not only the theoretical foundations, but also the methodological principles of the neo-classical approach. The methodological individualism of the neo-liberal approach is opposed by the structuralist methodology of Marxism (Marx 1961). Marxist political economy analyzes markets through a macro-sociological lens and contends that markets are structures that produce social and economic inequality. Marxism focuses on the stage of production to explain the processes of inequality production, as the stage responsible for the existing economic structure to be explained. This notion implicitly assumes a distinction between production, distribution, and consumption—a notion that will be overcome by market culturalism.

Similar to the prioritization of society encountered in the economic sociological approach, Marxist political economy argues for the centrality of the economy and the economic structure that determine the structure of politics as well as of society. The structure of the economy, in turn, can be examined in terms of the production stage and especially ownership patterns. The empirical agenda of the approach focuses on the structures of production and ownership as they are analyzed by means of macro-sociological tools and mainly in respect to laws and institutions (Lin 1995, Hart-Landsberg and Burkett 2005). Marxist political economy poses severe criticism to this existing unequal distribution of economic power, which, according to this approach, is closely linked to political power and needs to be abolished. The Marxist vision of economy and society emerges as a society beyond commodity exchange, as well as beyond the law of value and money (McNally 1993). However, struggling to find solutions to the unequal economic structure and the corresponding operation of market forces, coupled with the over-determined nature of the economic structure, Marxism devoted little attention to empirical research for understanding how markets are constructed and how they work on the ground.

Contemporary reflections of the Marxist approach can be traced in the debates over market socialism. The notion aims to reconcile the inherent tension between liberally defined market forces and socialist claims for equal economic distribution and egalitarianism (Ticktin and Lawler 1998). Market socialists recognize the defeat of socialism at the hands of the capitalist system and the non-viability or undesirability of non-market forms of socialism; thus, they search for a solution within the existing system defined as the capitalist structure of the economy.

The approach identifies the problems in contemporary capitalist markets, including our modes of thinking, and proposes an alternative path—that is, market socialism.

Market socialism is defined as a viable economic system that is vastly superior, as measured by the widely held norms of socialists and non-socialists alike, to capitalism and as the only form of socialism that is both viable and desirable (Ollman 1998). While critics—both from within and outside Marxist traditions—have attacked the assumptions and propositions of market socialism (Ticktin 1998, Ollman 1998), market socialists have defended their own position by situating their arguments in the Marxist framework of socialism and the Marxist conception of the economy (Lawler 1998, Schweickart 1998). Market socialism aims to present a cure for the tension between socialism and the capitalist system (which it defines as contemporary) via the reconciliatory project that it undertakes. However, this project offers very little by way of understanding the workings of the markets on an everyday basis and the market actors that interact on a regular basis. Furthermore, Marxism's emphasis on constructing the theoretically ideal economic system resulted in the lack of a clear empirical agenda and substantial research. Moreover, market socialism, by acknowledging the explanatory power of liberal economics concerning capitalist society, does not even aim to present an alternative theoretical framework and suffers from the same failure as the neo-classical economic approach. Most importantly, the crucial questions of how markets are maintained, how they work, and how they can be analyzed remain not only unanswered, but even undebated within its framework.

Consequently, the Marxist approach for the primary research question of this thesis—that is, identifying the political mechanisms, dynamics, and processes that construct and maintain the Turkish electricity market in its current form—fails to

present a guiding perspective, since it remains silent on the major questions on the making and everyday working of the markets that it criticizes. Neither is helpful regarding market tools and major outcomes such as price, which are all central in analyzing the marketization of electricity.

Economic Sociology: The Market as Socially Embedded Institution

The macro-sociological methodology of Marxism emphasizes the interconnectedness of economic and political systems, which is, accordingly, established through governing institutions (Skocpol 1986). This methodological emphasis on institutions has inspired an extensive literature on the embedded nature of markets (Polanyi 1957). Having developed the substantivist approach and the notion of embeddedness, Polanyi (1957) has claimed that the economy is enmeshed in institutions that are both economic and non-economic, and mainly social. Following the theoretical and conceptual framework of Polanyi's work, researchers working from a sociological vantage point have argued that market relations and prices can be investigated in reference to institutional arrangements, because economic relations are embedded in the social and cultural contexts that form these institutions (Fligstein 2002, White 1981, Lapavitsas 2004, Dobbin 2004). The role of social structures, especially in the form of social networks, in shaping economic outcomes is examined as one of the main research fields proposed in this approach (Granovetter 1985). Emphasis is placed on the need to study these networks in order to understand markets, because markets are purportedly embedded in networks. Social networks are further emphasized for understanding economic outcomes; according to economic sociology, they affect the flow and quality of information, constitute an important

source of reward and punishment, and contribute to the emergence of trust in the context of a social network (Granovetter 1985).

It bears emphasizing that the notion of embeddedness introduces the implicit assumption that the economy cannot be studied as an independent sphere of economic relations and economizing behaviors, because the economy is enmeshed in society. The market, then, emerges as one representative sphere among many others, which reflect the particularities of the society at hand; thus, it can be analyzed with the analytical tools of sociology. In regard to the empirical guidance that this approach can offer, social and institutional arrangements emerge as the main focus of attention for investigating the foundations of the market (Halperin 1977). The corresponding research agenda possible within this framework focuses on demonstrating the irrealism of economics and the appropriate nature of economic sociology for studying markets, by illustrating the elements of the social within markets and the utility of sociological tools for analyzing them (Fligstein and Dauter 2007, DiMaggio 1994, Dobbin 1994, Granovetter 1985).

Economic sociology, and especially the new economic sociology, emerged as an established tradition within market studies, with substantial research agendas and professional organizations (Swedberg 2004). There exists extensive research on the networks of social relations constituting the economy, which can broadly be categorized in terms of social relations, institutions, social norms, cognition, social networks, and power relations (Dobbin 2004). Economic sociology has enlarged the analysis of the economy by freeing it from the market fundamentalism of the neo-classical economic approach. Economic sociology has illustrated that the narrowly and abstractly defined concepts of the economizing individual do not explain the sociological particularities of different societies (Polanyi 1957). Thus, the

economizing individual is replaced by the economizing society, because now society is considered the ultimate determinant, as well as the main sphere of analysis. However, the nature of this economization and the notion of the economy, especially in respect to what qualifies as economic, are adopted from the neo-classical approach. Moreover, by acknowledging the explanatory power of neo-classical economics for Western societies, the basic theoretical tools of the neo-classical economic approach are considered sufficient for analyzing markets, at least of certain societies.

Zelizer's work deserves further analysis, especially when it comes to the concept of earmarking in the analysis of regimes of valuation and the transformation of materialities through circulation mechanisms (Zelizer 1989, Zelizer 2002, Zelizer 2005). Earmarking as a concept can be defined as the giver/transmitter inscribing the materiality of the thing in circulation. Zelizer has analyzed the ways in which even money, as transformed through these processes, can acquire the quality of a gift through the giver's inscription. It is important to note that this inscription is not single and final, since the thing circulates to acquire different inscriptions and corresponding valuations. Thus, the concept incorporates the production of subjectivity and the dynamism of the market-making process as well. Market- and value-making is never final, as it is under constant de-contextualization and re-contextualization based on the particular way of transmission to the receiver, under particular social and cultural conditions. This reveals the theoretical elements of market culturalism in Zelizer's work, as well as her inspiration from economic sociology.

The lack of an alternative theoretical framework to study the economy, coupled with the replacement of the economizing individual with the economizing

society, has two important implications for economic sociology. Firstly, this marks the opening of certain dead-ends faced by the neo-classical approach, by deconstructing markets and introducing new possible forms of market-making, as well as by correspondingly incorporating new sites of investigation into market studies (Zelizer 1989, Swedberg 2009, Smelser and Swedberg 2010, Edelman 2004, Velthius 2005). However, it simultaneously weakens the explanatory power of the approach. Since it socializes everything and claims that the economy can be studied like any other social phenomenon, it lacks an analysis of the particularities of market-making. This tension is also evident in the circular nature of the approach, since at the end of the day the conclusions about the market being a social phenomenon failed to be explanatory and since discussions thereupon began to revolve around the boundary problems of the economic versus the social (Fligstein 2002). The literature has come to a point where scholars have finally called to study markets as fully appropriated social objects, while at the same time showing that the embedded character of the social is a major problem (Krippner 2007). It is worth emphasizing that the focus on the sociological aspects of the economy contributed to the deconstruction of the concept and undermined market fundamentalism. However, this contribution is accompanied by a different fundamentalism—namely, the over-determinism of the social. Since the economy is defined as a socially embedded institution, economic sociology does not introduce original theoretical tools to analyze markets and the economy with respect to their particularities, or the role of agency in market-making. For economic sociology, the tools to analyze society are sufficient to analyze the economy, because economy is merely a part of the social. However, when we say that everything is social, we basically fail to explain and analyze what it is in the first place.

Considering the theoretical relationship between economic sociology and the primary question underlying this thesis, the path proposed by economic sociology proves unsatisfactory, for asking as well as answering questions about the establishment and operation of markets in terms of their multiple forms of agencies, processes and respective power relations. The processes that realize price, the proliferated forms of agencies, the power struggles involved in the establishment and negotiation of market boundaries, and the possibility of alternative ways of market-making constitute a few potential sites of analysis overlooked in this approach. These shall be incorporated in the present analysis. Since my research aims to articulate and understand the dynamics, processes, forms of agencies, and political power relations involved in the establishment and operation of the Turkish electricity market, the economic sociology approach fails to present sufficient theoretical or empirical guidance.

Market Culturalism: The Market as Cultural Sphere of Circulation

Cultural and material anthropological approaches, which are interested in processes rather than institutions or structures, study the mechanisms and processes through which humans and non-humans enter economic relations. The particular focus of this body of literature is on the regimes of value and circulation in terms of the particularities of the circulating culture as well as the commodity that is being circulated. The approach proposes that there are different value regimes since there are different cultures and commodity exchange forms. Accordingly, different regimes of value, such as the commodity-based versus the gift-based valuation, and

different mechanisms of circulation constitute its major research agenda (Thomas 1991, Smart 1993, Maurer 2006, Beckert and Aspers 2009).

Since the approach focuses on processes of particular valuation, forms of circulation have emerged as a key topic for empirical research. Appadurai's (1998) notion of the career of commodities is crucial for an understanding of circulation via market culturalism. Attributing a career to commodities breaks certain distinctions between the links from production to consumption since these stages are now incorporated under one notion—that is, the career of the commodity. Moreover, it provides the necessary theoretical tools through which one can analyze the mechanisms of circulation, as well as the different valuations that a commodity experiences during the different stages of its career.

In the economic anthropological approach, the basic differentiation between the regimes of valuation is built on the distinction between gift and commodity regimes. The valuation mechanisms involved in gift and commodity exchanges are categorically and intrinsically different from each other (Thomas 1991). The mechanisms of gift valuation cannot be detached from the presence of its giver, and the value of the gift is realized accordingly; in contrast, the commodity detaches itself from any connection with the giver. Thus, the commodity begins its career with distinct appropriations and values and gains new appropriations with each exchange. Moreover, these processes are also shaped by the particular materialities that both reflect upon and are given form by the processes of meaning creation and valuation (Keane 2001). Thus, a constant process of de-contextualization and re-contextualization blurs the distinctions between production, circulation, and consumption, as well as the distinctions between the economy and the social. This opens up a new strand of research for market studies, research that focuses on the

ways in which things and their materialities are transformed, valued, and, re-transformed through mechanisms of circulation in a given society with particular cultural attributes (Weiner 1992, Myers 2001, Velthius 2005, Miller 2005, Zelizer 1989, Zelizer 2005).

The economic anthropological approach is crucial for introducing different meanings, the production of subjectivities, contextualization, regimes of valuation, and mechanisms of circulation to market studies, because it unpacks notions of value, appropriation, possession, and circulation in a dynamic, complex, and contextual market-making process. The approach shows that, without considering the transformation and particular valuation of the thing under study, it would be an incomplete endeavor to analyze the institutions and networks that regulate the circulation of things, by making visible the impossibility of circulation. It illustrates the importance of interdependencies, subjectivities and the materiality of the commodity under circulation, in that it blurs the assumed distinctions between agents and things, as well as the processes of production, circulation, and the consumption of things in the market. However, the elusive concept of culture, which is very much utilized in market culturalism, and the attribution of sole agency to humans while dismissing the agency of the commodity itself mark the two major problems that weaken the approach's contributions to market studies. The notion of culture is employed to account for the different processes of valuation between different groups of people; however, similar to the emphasis and lack of explanation of "society" in economic sociology, which claims differences to be solely based on culture, do not explain the differences themselves, unless supported by extensive research about how cultural characteristics are attributed to and gain dominance in that particular group of people in the first place. Culture, then, emerges as a practical

concept used primarily to explain away differences and weakens the approach's explanatory power. The problem of agency, however, makes visible how market culturalism employs an ontological asymmetry between humans and non-humans (Caliskan and Callon 2009).

Still, market culturalism presents a valuable contribution to market studies by incorporating the commodity's particularity in processes of valuation, and hence price realization. However, the approach has failed to further this analysis; it has made visible only the particularity of the commodity, but not the agency of the commodity itself. Thus, market culturalism introduces an ontological asymmetry between humans who decide and value, on one hand, and non-humans which are valued and decided upon by humans based on their characteristics and cultural judgments, on the other hand. However, the literature innovatively posits that the commodity itself has agency and influences not only its valuation and circulation processes, but also makes and maintains its market in the first place.

Note on the Theoretical Perspective and Agency of the Commodity Itself

It is very important to note here that a social study informed by concerns about the proliferation of actors and agencies should take into account non-humans. Latour (1991) opened up this theoretical path when he warned scholars to turn away from an exclusive preoccupation with social relations and to weave them into a fabric that includes non-human actants in order to study domination. The study of markets should also incorporate the contribution of non-humans and the interaction between the human and the non-human agency in order to study the making and workings of the markets that are always informed by power struggles arising from the actors' interactions. Since the electricity market is formed to regulate the interactions of

humans with a specific form of energy existing in nature—that is, electricity—I will study electricity as both commodity and agency. Significantly, non-human agency, and the agency of electricity, is not defined as an actor's planned actions and their consequences, but as intended and unintended consequences of the actor's actions that enframe and change a human sphere.

The specific materiality of electricity not only takes part in the valuation of itself, but also actively creates certain conditional possibilities through which market forces and actors operate. For example, electricity cannot be stored in substation-scales. This characteristic of its materiality creates the problem of ensuring continuous electricity supply and transmission services, which in turn affords to the agents of production and transmission a market as well as political power, since electricity is considered not only a public good, but also a vital resource. This example illustrates how electricity is not only valued for its particular characteristics, but also how it actively influences market maintenance and operation processes as well as the market actors' struggle for power over the market.

The example of electricity elucidates one other point that market culturalism has entirely failed to take up: in certain cases the activity of circulation can also emerge as a market in itself. Since electricity cannot be sold in supermarkets due its nature, it must be circulated and distributed via electricity transmission lines. This circulation not only marks the delivery stage of the electricity market, but it also forms the market for electricity transmission; thus electricity circulation itself becomes a market. These points will be further elaborated upon in the analysis in the third chapter, but it needs to be mentioned here for the purposes of theoretical emphasis.

In light of these analyses, the economic anthropological approach extends the sphere of market studies by incorporating different meanings, the production of subjectivities, contextualization, regimes of valuation, and mechanisms of circulation. Further, it unpacks notions of value, appropriation, possession, and circulation within a dynamic, complex, and contextual market-making process. Together, these issues can afford valuable insights for analyzing these different aspects from a process-oriented perspective. However, the above-mentioned elusive notion of culture and the lack of agency attributed to the commodity prevent market culturalism from supplying the required theoretical framework, as this thesis aims to incorporate proliferated agency forms and particularly the role of the commodity's agency in market-making and maintenance.

The marketization approach and the actor-network analysis method, to be discussed below, in contrast, not only enables this research to incorporate the commodity's agency stemming from its particular materiality, but also provides a theoretical framework and empirical guidance for this thesis, the aim of which is to identify the mechanisms, dynamics, and processes that construct and maintain the Turkish electricity market.

The Economization Approach: Marketization as Opposed to "the Market"

Following the four main approaches to market studies, as outlined above, a new turn within the literature may guide this research, as it questions the existing ways of analyzing markets and offers new inquiries into their everyday maintenance. This new turn takes a step back and questions the basis of discussion in the first place. This alternative approach is informed by the constitutive relationship between power

and knowledge (Foucault 1980). Mitchell (1998) has shown the ways in which the effect of the modern order of representation contributes to the construction of the economy as a material, non-discursive reality. From this standpoint, the economy is no longer studied as a self-contained sphere distinct from the social, the cultural or any other spheres. Another contribution emerges from the work of Callon (1998): he has illustrated the diversity of calculative agency forms and distributions, as well as their contribution to the making of the markets and the economy. Such an alternative approach is useful for addressing the market, according to Callon (1998), as "a many sided, diversified, evolving device which the social sciences as well as the actors themselves contribute to reconfigure" (p. 51). This theoretical claim is revolutionary for approaches that define markets via universal abstract uniform actors or mere reflections of the social.

The theoretical background of the economization approach can be traced to the works of Foucault (1980, 1997) and the notion of the constitutive relationship between power and knowledge. This relationship proposes that forms of knowledge do not merely describe the phenomenon under investigation, but transform it to construct new objects that are correlated with modern mechanisms of power. When we apply this understanding to the discipline of economics, the conception of market mechanisms is not just the analysis of what happens; it is also a program for what *should* happen (Foucault 1997, emphasis mine). Crucially, Foucault presents the theoretical and analytical tools through which one can analyze the ways in which the discipline of economics not only describes what is "economic" and what is "the economy," but it also constructs certain spheres as economic and transforms all forms of human conduct by seeing it through the lenses of the power mechanism at work. It not only describes, but also constructs the economy as we know it and as we

are enframed by it. Thus, following the Foucauldian constitutive relationship between power and knowledge, we can analyze how the discipline of economics *performs* the economy (emphasis mine). However, Foucault (1980, 1997) does not take his own analysis to the point of terming these market-making processes as performativity. Yet, he has opened up a theoretical path, which was then followed by Michel Callon (1998) in his analysis of the performative relationship between power and knowledge in the discipline of economics.

Michel Callon (1998) has claimed that "the economy" and what we qualify as "economic" are performed through the discipline of economics. In order to better analyze Callon's claim and to illustrate its link to the Foucauldian relationship between power and knowledge, the concept of performativity needs to be clarified. The word "performation" has been coined based on Austin's (1962) notion of "performative utterance" in linguistics. According to Austin, a performative utterance is an utterance that says and does what is says simultaneously. Thus, saying something goes beyond describing; it performs an effect of reality. Callon has furthered this analysis by claiming that a performative science is a science that simultaneously describes and constructs its subject matter. He has claimed that both the natural and life sciences, along with the social sciences, contribute toward enacting the realities that they describe (Muniesa, Millo and Callon 2007). Thus, when Callon (1998, 1999) claims performativity for the discipline of economics, it refers to the double aspect of a knowledge-making action, which simultaneously conceptualizes and enacts the economy. As a result, claiming expertise in any form of knowledge, and more importantly in the knowledge-making process itself, emerges as an exercise of power. Thus, the economy cannot be studied apart from

the power relations that inform, and simultaneously are informed by, the market and market-making processes.

The emphasis on process is crucial here, since, as Foucault, Çalışkan and Callon (2009) have claimed, these processes are never final. As MacKenzie, Muniesa and Siu (2007) have shown in their analysis of financial markets, they are always faced with resistance embodied in the acts of counter-performation. Çalışkan and Callon (2009) have called this process "economization"; it refers to the ongoing "processes of constitution of behaviors, organizations, institutions, and, more generally, objects which, in a particular society, are tentatively and often controversially qualified by scholars and/or lay people as economic" (p. 370). At the end of this process, certain spheres, institutions, relations and exercises are qualified as economic, as opposed to others. This process not only redefines the notion of the economy in regard to power relations, but also the notions of the economic, the social, and the political, and it recodes and transforms the conceptualization of the individual.

According to Callon (1998), this constantly renewed process of performation encompasses expressions, self-fulfilling prophecies, prescription and performance. Callon's (1998) theoretical framework, thus, has not only introduced points corresponding with the Foucauldian analysis of how neo-liberal forms of governance transform society, but also reflected on the operation of disciplinary power and the Foucauldian interplay between techniques of power and their object as carved out in reality (Foucault 1997). Furthermore, Callon (1998) has illuminated the performative relationship that *performs and produces* these objects in the first place (emphasis mine). The economy and economic man are not constructs or artifacts invented by the social sciences according to Callon (1998); they are enacted, performed, and

produced as realities through the performing acts of the sciences. A quote from Callon (1998) will better illustrate this point: "Homo economicus really does exist […] He is formatted, *framed* and equipped with prostheses which help him in his calculations and which are, for the most part, *produced by economics*" (p. 51, emphasis mine). Thus, the individual is performed through the relationship between an expert knowledge of economics and the correlating mechanisms of power. The implication here is that the economy is an achievement as much as it is an outcome or an external reality to be grasped. Moreover, since it is not a final outcome but an ongoing process, the process of economization is never complete. As also emphasized by Çalışkan and Callon (2009), this is not a relativist position; it is a constructivist position, since the economy is constructed through the actions of performation and since this construction is never final and complete.

I should emphasize that the economization literature calls for shifting the focus of analysis from the market to processes of marketization. Its proponents have argued that, in order to grasp the dynamics of economic markets, they need to be placed within the broader movements of economization and marketization. Drawing from the notion of performativity, the approach analyzes the ways in which these debates and negotiations within the discipline contribute to the qualifications of the economic, as well as to the corresponding construction of markets (Breslau 2003; Mackenzie, Muniesa and Siu 2007; Callon, Millo and Muniesa 2007; Fourcade 2007; Mackenzie 2009). The priority within the research agenda of this approach consists of economics' contribution to the constitution of the economy itself. In a nutshell, it proposes that there can be no economy without economics (Callon 1998). From this theoretical standpoint, the market is defined not as an object, sphere, or institution, but as a sociotechnical arrangement (*agencement*), as proposed by Çalışkan and

Callon (2009, 2010). This concept denotes the particular framing and organization of the activities to be qualified as economic through the realization of this particular interpretation. According to Çalışkan and Callon (2010), markets as sociotechnical agencements have three main characteristics:

> (1) Markets organize the conception, production and circulation of goods, as well as the voluntary transfer of some forms of property rights attached to them. These transfers involve a monetary compensation which seals the goods' attachment to their new owners. (2) A market is an arrangement of heterogeneous constituents that deploys rules and conventions, technical devices, metrological systems, logistical infrastructures, texts, discourses and narratives (for instance, on the advantages and disadvantages of competition), technical and scientific knowledge (including social scientific methods), as well as the competencies and skills embodied in living beings. (3) Markets delimit and construct a space of confrontation and power struggles. Multiple contradictory definitions and valuations of goods as well as agents oppose one another in markets until the terms of the transaction are peacefully determined by pricing mechanisms (p. 3).

Important to note here is that, even though certain spheres of conduct or certain relations are not qualified as economic, the criteria of decision and reference points still consist of the neo-liberally constructed notion of economy and the universalized rational entrepreneur individual. Correspondingly, this particular form of knowledge exercises power even over the spheres it excludes, because based on the very process of exclusion they are redefined through the lenses of this particular form of knowledge and the mechanisms of power in constant interplay with these knowledge forms. However, since marketization is an ongoing and never established process, this theoretical framework reserves room for possibilities of resistance to this exercise of power.

MacKenzie's work not only incorporates these acts of *counter-performation*, which can be qualified as acts of resistance, but also the role of the financial devices in performing the markets in a particular form (MacKenzie 2006, emphasis mine). MacKenzie has illustrated how the statements, models, and financial formulas work

to ensure the survival of the economy against any acts of counter-performation, as performed by financial knowledge forms and devices on the monitor (the screen where everyday financial transactions are performed according to pre-determined rules and formulas). Together with Callon, MacKenzie has illustrated that the processes of economization and financialization, which are conducted through the interplay between forms of academic knowledge and mechanisms of power, perform particular spheres and understandings of the economic, which enframe all subjects and their social and political relations while at the same time excluding certain forms as non-economic. The discipline of economics, then, is not merely describing the building of the economy; it is performing a particular form of the economy that enframes and exerts power over all forms of human conduct in the current marketization.

The empirical research proposed by this approach incorporates the constitution, reproduction, development, transformation, objectification, and maintenance of markets with their multiple forms of action and agencies. Following these propositions, the subject of research is not the market itself, but the on-going and never-ending processes that shape it. These processes relate to theoretical and practical knowledge—such as philosophy, religious doctrines, the social and human sciences, and economics and related disciplines—as well as the material technologies that contribute to the shaping of the markets and their functioning, and finally to social technologies such as law (Caliskan and Callon 2009). The most original contribution of this approach consists of the incorporation of those disciplines that analyze, and by way of analyzing construct, the dynamics of the market and the economy. This framework not only equips us with many tools for analysis thanks to

its multidisciplinary standpoint, but it also expands the limits and geography of market analysis.

Following the approach's original contribution to the relevant literature, one major strand of field research concerns the role of the discipline of economics in the construction of markets. Scholars have studied the role of the discipline, its theoretical teachings, its organization, institutionalization, evolution and implications in the construction of markets and particular market forms and outcomes (Breslau 2003, Lohmann 2005, Fourcade 2006, Guala 2007, Mirowski 2007, Callon 2009). Scholars grounded in the economization approaches have further emphasized the formative relationship between the economic sciences and markets, by making visible their mutually constitutive relationship (Mackenzie, Muniesa and Siu 2007; Muniesa, Millo and Callon 2007; Fourcade 2007). The commodification, standardization, objectification, framing and transformation of market agents and their interrelationships constitute one major sphere of research critical to the field, since these processes are crucial for the overarching process of marketization (Holm 2007; Dobrin, Austin, and Nathan 2007).

Studies on the commodification of non-human beings are of further interest, since the commodification required for market-making not only carves out passive and valuable market objects from living beings, but also transforms our relationship with other living beings and nature (Callon, Law and Rip 1986; Holm 2007). The need to carve out passive market objects raises questions about the nature of agency, particularly in regard to the distinction between active and passive agency. The marketization approach rejects to work with this imposed distinction and presents notions of proliferated action and distributed agency; thus, it incorporates different forms of action, as well as multiple and diverse forms of agency—including the

agency of non-human forms—that are involved in making markets (Lahire 1998, Bell and Callon 1994, Giere 2002, Garud and Karnoe 2003, Law and Urry 2004, Callon and Law 2005, Latour 2005, Boltanski and Thevenot 2006). Since action and agency forms are distributed and diverse, the calculative forms of these agencies are also proliferated and diverse, manifesting themselves within the theoretical framework of the approach (Kjelberg 2007, Cochoy 2008, Callon and Muniesa 2005).

The marketization approach offers extensive research on market tools, devices, and the different calculative practices of agencies that are informed by these tools and devices. Following the approach's theoretical propositions, these calculative tools do not merely equip agents with the technologies required to operate in the market, but they also frame and shape the realm of possibilities that constitute market calculation and action (Hopwood and Miller 1994, Muniesa 2007, Elyachar 2005, Zaloom 2006, Caliskan 2007, Mackenzie 2012). Of particular interest, MacKenzie's empirical work (2006) has analyzed the financial crises and shown the role that the Black and Scholes formula plays in engineering economic crises. He claims that this formula could have been amended, had it not been imposed by the Chicago School over other alternative financial formulas and knowledge-making devices. This competition over financial formulas, according to MacKenzie, equaled the competition between different programs to impose other statements, other worlds, and other sociotechnical agencements (MacKenzie 2006). Thus, acts of performativity do not operate in a one-way relationship that dominates and enframes all possibilities of knowledge formation alternatives; claims for alternative statements and financial devices illustrate that there are acts of counter-performativity and struggles, where their effect of use is to make these processes less

like their depiction (MacKenzie 2006). MacKenzie has further elucidated processes of financialization and the financial tools that make these processes possible, which are missing in Foucault's analysis; he has also shown that it is impossible to analyze the performative effects of the discipline of economics on the economy, if the roles of technological devices, particularly formulas in financial markets, are not also taken into consideration.

The studies by Knorr-Cetina and Bruegger and by Callon and Muniesa on financial electronic markets have demonstrated the role of market tools in shaping market agencies and outcomes (Knorr-Cetina and Bruegger 2002, Callon and Muniesa 2005). The role of the formulas employed by traders, the studies on arbitrage in trading rooms, and analyses of market information and communication technologies illustrate the complexity of sociotechnical agencements in the processes of value calculation (Beunza and Stark 2004, Preda 2007, Preda 2009, Millo and Mackenzie 2009, Lépinay 2007, Latour and Lépinay 2009). The marketization approach extends the sphere of market analysis by incorporating the role of market tools, devices, and calculative options in constructing market agencies, markets, and certain market outcomes.

The approach's definition of economic markets as "an on-going process of economization and valuation of goods" leads to the understanding of the fixing of a price as something that is negotiated and eventually imposed on the various parties engaged in the transaction, as opposed to other alternatives (Caliskan and Callon 2009). From this perspective, fixing a price is the outcome of the struggle between agencies trying to impose their value and thus their price over others' values. Price realization processes have been studied extensively through the theoretical lens of the marketization approach. Instead of treating prices as an outcome of social relations,

or an equilibrium point of supply and demand, scholars have investigated these processes, different forms of market encounters, proliferated forms of agencies, market tools and devices, and diverse calculative forms that together work to establish one price among many other possibilities (Caliskan 2003; Beunza and Stark 2004; Guyer 2004; Maurer 2006; Beunza, Hardie and MacKenzie 2006; Caliskan 2007; Zbaracki and Bergen 2010).

My research contributes to and furthers this literature by supplying an analysis of the Turkish electricity market, focusing on the processes through which the market is constructed and maintained by means of legal boundaries, everyday market encounters, distributed action forms, market tools and devices, diverse calculative forms, and a multiplicity of agency forms, which together establish the current Turkish electricity market and market outcomes such as price. The theoretical framework of the marketization approach will enable me to investigate the dynamics and processes under study without imposing certain claims and distinctions in terms of individuals, agencies, political relations, and social phenomena. Rather, it presents a framework through which I can integrate the particular nature and agency of the commodity, the processes of market establishment and maintenance, price realization, the nature of exchange, politics and lobbying, and the making of the legal framework in regard to the multiple forms of agencies, encounters, networks, institutions, and knowledge that can be captured through an interdisciplinary and process-oriented theoretical lens. The thesis presents an empirical map of the Turkish electricity market, while at the same time incorporating and furthering the marketization literature. It does so especially by introducing the importance of the commodity's agency on its own marketization, as well as by introducing a new

conception of price with its own terminology and theoretical and methodological tools of analysis.

The marketization approach provides a substantial theoretical ground for actor-network theory, a useful methodological base for asking and answering my primary research question: to identify the mechanisms, different agency and action forms, dynamics, and processes that construct and maintain the current Turkish electricity market. I should repeat here that the economic sociological approach, mainly as proposed by Granovetter, has introduced the importance of networks for studying markets and economic outcomes, because according to him markets are embedded in networks (Granovetter 1985). However, this thesis claims that this emphasis on networks calls for a supplementary analysis so as to incorporate the role of agency within the network. In terms of the missing agency and agency forms, Callon has taken up the issue where Granovetter left off, particularly in terms of a different understanding of embeddedness that emphasizes the different and distributed forms of agencies as well as networks. Callon (1999) has posited an emerging theory of the actor-network within Granovetter's theoretical framework, presenting a reversibility of perspectives between the actor and the network. Building upon these concepts, Callon has articulated the actor-network theory with an emphasis on the radical indeterminacy of a certain actor, because according to the actor-network theory agency as much as action is distributed. Thus, both distributed and diverse forms of agency, as well as established network and market forms can be brought to bear on an analysis within this theoretical framework.

The actor-network theory, developed by Callon, Latour and Law, has been applied especially in studies of organizational behavior, communication networks, information systems, strategy formation, and telecommunication markets (Walsham

1997; Czarniawska 2004; Lee and Hassard 1999; Doolin and Lowe 2002; Gao 2005; Rowley 1997; Tatnall and Lepa 2003; Salancik, Tolbert, Krackhardt and Andrews 1995). This study aims to contribute to and further this literature by extending the explanatory framework of actor-network analysis over market studies; because simultaneous investigation of the agency of actors and the networks has the potential of guiding this particular research both in terms of methodology and theory. Methodologically, it supplies a middle ground between structuralism and individualism. It binds together actors and structures by analyzing the ways in which actors interact to form networks and the emerging dynamic market system established by these networks. Moreover, it carries the theoretical framework that will guide this research in mapping the dynamics of the electricity market with its multiple agency forms and actions, as well as in mapping the ways of producing the trade forms and networks crucial in processes of market maintenance (Callon and Law 1986, Latour 2005). Furthermore, by acknowledging the agency of non-humans actors, actor-network theory allows to incorporate and articulate the agency of the commodity, electricity, which is central in making and maintaining a particular form of the Turkish electricity market and relative market outcomes.

After the 2007-2008 Financial Crisis

The global financial crisis of 2007-2008, initiated by the United States, has put not only markets, but also market studies on trial. The literature has questioned the reasons why the dominant disciplines within economics have been unable to foresee and alter the crisis. Post-crisis studies contain scholars' self-criticism and explain the crisis as resulting from economic authorities' inability to organize the economy in

accordance with their own theoretical approaches. The dominant themes within the post-crisis literature include: the importance of trust for market maintenance, the increased visualization of financial markets and its implications, the dangers of over-financialization, the need for economic sociology and for increased attention to social networks and institutions, knowledge- and cognition-focused analyses with an emphasis on decision-making, and discussions concerning performativity.

The economic sociological approach presents substantial work that explains the reasons behind the crisis and offers propositions to prevent possible future crises. The approach still calls for a study of the market as a social phenomenon. Trust, defined as a socially constructed motivator, and particularly the loss of trust are identified as the major reason behind the crisis (Sorge 2011). Scholars embracing this approach have emphasized the importance of sociologically conceptualized confidence and portrayed the main reason for the crisis as decline in market confidence (Swedberg 2010, Swedberg 2012). The role of intermediary institutions, such as corporate rating agencies, in the making of the crisis, is under investigation. Scholars working from an economic sociological perspective have argued that the corporate rating agencies made faulty decisions, leading to the crisis. Following this logic, they propose that, in order to prevent future crisis, corporate ratings should be conceived as public goods and produced by tax-financed public institutions (Rona-Tas and Hiss 2010, Carruthers 2010).

Mizruchi has identified the reasons behind the crisis in the change of the American corporate elite from a coherent pragmatic inner circle to a fragmented collection of CEOs that are incapable of collective action (Mizruchi 2010). Pitluck, aiming to provide an alternative explanation for trading in the stock market, has claimed that a sociological lens is needed since liquidity as the key requirement for a

financial market to work is a by-product of market participants choosing to trade in a financial instrument or in a market—which, in turn, is a social phenomenon (Pitluck 2011). Beckert has proposed that an economic sociological theory should be developed for economic action, since both economic action and prices in the market are socially constructed (Beckert 2009, Beckert 2011). He has contended that economic sociology has looked either at institutions, social networks, or cognition only; yet, these perspectives should be combined and the three aspects analyzed simultaneously in order to understand markets, since all of these are part of the social and, therefore, of the market and market action (Beckert 2010). However, the distributed forms of agency are still overlooked. There were also reconciliation claims from neo-classically inclined perspectives after the crisis. Boyer has proposed to move away from market economy to capitalism approaches, with the economy to be studied as a more complex and dynamic system that also includes social attributes (Boyer 2011).

Knowledge and discussions about the limitations of knowledge and cognition to foresee the crisis have emerged as another dominant theme in the post-crisis literature. There are many different arguments and frameworks concerning the discussion of knowledge: while some scholars have claimed that the knowledge perspective is problematic since it has its limitations and could not foresee the crisis, others have contended that knowing something is not always the optimal case, since sometimes knowing less may be strategically more advantageous or simply better for market operation. Bryan, Martin, Montgomerie, and Williams have argued that the knowledge perspective is problematic since the limitations of knowledge are also obvious from the fact that scholars working in knowledge studies did not see the crisis coming (Bryan, Martin, Montgomerie, and Williams 2012).

Beunza and Stark have advanced the analysis of the limitations of knowledge and emphasized the risks of cognitive interdependence between the market actors, by illustrating a situation in which market actors base their prices on different market actors' signs; once a large enough number of actors makes the same mistake, the market ends in collective failure (Beunza and Stark 2012). Davies and McGoey, on the other hand, have claimed that the reason behind the crisis was not the limits of knowledge, but the deliberate ignorance of market actors who considered a lack of knowledge as a resource to continue profiting from interactions doomed to burst (Davies and McGoey 2012, McGoey 2012). Dorn has further argued that knowing less would be better in a market context, because there are substantial numbers of market transactions that cannot be traced and known, so that the endeavor to know and review all these transactions would lead to market chaos (Dorn 2012).

The post-crisis literature has offered discussions about the notion of performativity and its application to the market studies via marketization approaches (Caliskan and Callon 2009). Langley has provided an extensive analysis of the post-crisis stress tests in the US in order to illustrate that these tests as scientific techniques had a performative power, which in itself turned the methodological application of these tests into an effective positive change so that a healing period could begin (Langley 2012). Svetlova has furthered the analysis of the performative power of financial markets, but worked to incorporate this notion into an institutionalist theoretical framework (Svetlova 2012).

The notion of performativity and its implications for the social sciences have been discussed in respect to their theoretical foundations. Butler has criticized the notion of performativity and the work of Callon mainly on two grounds. Firstly, she has criticized the notion of performativity itself, because according to her it

introduces a distinction between the political and the economic. Secondly, she has claimed that cultural constructivism is sufficient to explicate the entire phenomenon to be explained via the notion of performativity (Butler 2010). Du Gay has further criticized the notion as well as Butler and Callon for romanticizing the concept of the political, by defining it not as daily practice and policy, but as an intellectual operation of some sort of theory (du Gay 2010).

As Callon himself has replied, these criticisms do not prove legitimate since the notion of performativity itself aims to illustrate the ways in which the economy and the political are intertwined, as every market choice and imposition is in fact an act of the political. He has further emphasized that the notion of performativity shapes the ways in which the economic is performed as we know it, via the choices and impositions of a certain discipline or group—this, obviously, is a political act (Callon 2010). Furthermore, by defining the political merely as a concept regarding everyday policy-making, du Gay himself excluded certain power exertions as non-political, and this act in itself can be defined as political from the perspective of performativity. Butler's second claim, that cultural constructivism is sufficient to explicate the entire phenomenon to be explained via performativity, also deserves attention. In making this claim, Butler fails to take into account the diverse and distributed forms of agencies and actions involved in the performation act, because in cultural anthropology agency attribution is limited to humans only. However, the notion of performativity and its respective theoretical framework can be utilized to incorporate different forms of agency, including non-human forms as well as distributed forms of actions other than cultural factors.

The increased visualization of financial markets is another theme raised within the post-crisis literature. Pryke has claimed that the visualization of financial

markets should be studied as a crucial phenomenon since financial markets are increasingly being visualized and since the analysis of these markets has now changed as a consequence of these visualization techniques (Pryke 2010). The increased visualization and enlargement of the financial markets has raised criticisms within the literature. Scholars working from an economic sociological perspective have asserted that the reason behind the crisis was the over-financialization of the markets and a corresponding lack of government control (Fligstein and Goldstein 2010, Dobbin and Jung 2010, Campbell 2011). Following these propositions, the solution to prevent future crises should consist of limiting the over-financialization of markets via social control, since markets are defined as social things in essence and thus must be returned to their nature.

The main themes in these studies demonstrate that the notion of social embeddedness still dominates the economic sociology literature as much as the market studies literature in general, and that the literature is still mainly concerned with boundary issues, but without providing a clear account of how markets are maintained and of which of their characteristics resulted in the crisis. Rather, economic sociology has perceived the crisis as a symbol to illustrate once more the need to study markets as a social phenomenon, since the main reason behind the crisis is identified to be economics as a discipline losing touch with other social sciences; the proposed cure would be to start a dialogue between economic sociology and economics, without seeking to provide a clear account of the making and maintenance of markets (Block 2010). This dominance, in turn, calls for furthering the marketization approach in studying markets, as it includes distributed forms of agencies and actions as well as diverse calculative forms and market tools utilized in establishing and maintaining a particular form of market, through an interdisciplinary

lens. This thesis will contribute to and advance the marketization approach in that it provides a multi-method and interdisciplinary case-study of the Turkish electricity market.

Review of the Empirical Literature

Electricity Markets

This review of the empirical literature concerning electricity markets presents studies conducted from all the theoretical perspectives examined above. These include the neo-classical economic approach, economic sociology, market culturalism, market socialism, and marketization, but they mainly cluster around studies from the neo-classical economic school and economic sociology.

The neo-classical economic school offers substantial research on electricity markets and constitutes the dominant approach within the relevant empirical literature. The neo-classical economic school holds sway over scholars working from the perspective of economic sociology and over alternative calls originating from social and political perspectives. These academic works study electricity markets mainly with respect to the application of neo-classical economic modeling, efficiency concerns, risk management analysis for investment advice, the utility of cognitive analyses for the neo-classical theoretical framework, the market reform process (with particular emphasis on market deregulation), market design, price analysis and prediction, firm behavior and decision-making analysis, the importance of legal frameworks, market power analysis, and the implications of renewable energy markets with particular emphasis on carbon-trading markets.

The Neo-classical Economic School

This literature contains extensive research on the application of neo-classical economic modeling to electricity markets in order to analyze levels of deregulation and market integration, to discuss the working of financial instruments in energy markets, and to illustrate deviations from the defined optimal economic models (Wen and Kumar David 2001; Makkonen and Lahdelma 2001; Andersson and Bergman 1995; Green and Newbery 1992; Deng, Johnson and Sogomonian 2001).

These models are grouped under the categories of optimization, equilibrium, simulations, game theory, demand-based, and agent-based models; the electricity market literature presents extensive research on and analysis of each of these models (Ventosa, Baillo, Ramos and Rivier 2005; Weidlich and Veit 2008; Garcia and Arbelaez 2002; Lise, Linderhof, Kuik, Kemfert, Östling and Heinzow 2006; Pineau and Murto 2003; Alvey, Goodwin, Ma, Streiffert, and Sun 1998; Baldick 2002; Song, Liu and Lawarree 2002; Hortacsu and Puller 2008; Ehrenmann and Nuehoff 2009). The common characteristics of these models stem from the theoretical shadow of the neo-classical economic approach, which can be identified as the lack of a clear perspective in defining the establishment and maintenance of the market and the problematic utilization of pre-established assumptions. These works neglect the main processes of market-making in that they put sole emphasis on fitting the existing markets into theoretically defined models, without defining their existence in the first place.

Claims of expertise, reflected primarily in the form of concerns about energy efficiency, arise as another dominant theme in the neo-classically inclined electricity

market literature. Extensive research has focused on increasing the efficiency of energy consumption, due to concerns about finance and the environment, by identifying the impediments to the market (Bower and Bunn 2001; Wolak 2003; McNeil Letschert 2006; Spees and Lave 2007; Garber, Hogan and Ruff 1994; Borenstein, Bushnell and Wolak 2002; Nicolaisen, Petrov and Tesfatsion 2001). The management of market risk arises as another theme extensively studied and analyzed. Scholars have worked to develop risk management schemes and methods to be followed by the main actors, for ensuring a better working of the markets (Liu and Wu 2007; Bjerksund, Rasmussen and Stensland 2010; Larsen and Bunn 1999; Vehvilainen and Keppo 2003; El-Khattam, Bhattacharya, Hegazy and Salama 2004).

Scholars have further discussed electricity market reform and put forward suggestions for optimal market design. The main goal of these studies can be considered the illustration of the need for a free and optimal working market, and the identification of the existing impediments that must be overcome in the process of regulation (Sioshansi 2006; Newbery 2002; Tishler and Woo 2006; Amundsen and Bergman 2003; Hogan 2002; Woo, Lloyd, Tishler 2003; Meeus, Purchala and Belmans 2005; Wu, Zheng and Wen 2006). These studies not only present models of how electricity markets should work, but also enframe the electricity markets by imposing assumed disciplinary discourses in order to perform a particular form of market. Consequently, a review of these scholarly studies provides a review of the literature on electricity markets as well as a sphere of analysis in terms of how the discipline of economics contributes to the performation of markets.

The importance of the existing legal framework has also received attention in the literature, particularly with respect to the impact of regulations on the working of markets (Ackermann, Andersson and Söder 2001). Market power has emerged as a

key concept in the analysis of markets and their workings. Scholars from the neo-classical economic school have argued for the need to study the patterns and structure of market power in order to analyze and ensure the proper working of markets, mainly by avoiding the concentration of power in any one actor's or institution's hands (Borenstein, Bushnell and Knittel 1999; Brennan and Melanie 1998; Bunn and Martoccia 2005).

Price is one of the major concerns of research based on the neo-classical economic approach, as it is for most other market studies. The neo-classical economic school presents substantial research on and analysis of the factors, mechanisms and patterns that determine price as well as the predictions of future price levels. The price of electricity—defined by neo-classical economic theory as the equilibrium outcome of the activities of rational choice-making, and thus economizing, individuals, firms and institutions—is to be analyzed and predicted by scholars at these levels in different contexts (Zachmann and Hirschhausen 2008; Son, Baldick, Lee and Siddiqi 2004; Bjorndal and Jornsten 2001; Lu, Dong and Li 2005; Fabra and Toro 2005; Nogales, Contreras, Conejo and Espinola 2002; Lora, Santos, Exposito, Ramos and Santos 2007; Contreras, Espinola, Nogales and Conejo 2003; Crespo Cuaresma, Hlouskova, Kossmeier, and Obersteiner 2004; Fleten and Pettersen 2005; Green 1999).

Scholars have further surveyed the ways in which electricity prices are determined in financial markets (Wolfram 1999; Botterud, Kristiansen and Ilic 2010; Green and Newbery 1992). The role of firm behaviors in the pricing of electricity has emerged as a sphere of analysis (Puller 2007). Behavioral approaches and cognition analysis have been incorporated into market studies for understanding in greater detail and predicting pricing behavior as well as price levels (Joskow and Kahn 2001,

Zhang and Gimeno 2010). Cognition-based analysis methods, particularly neural network analysis, supply a more comprehensive framework for explaining and, more importantly for the general purposes of the approach, predicting electricity prices (Mandal, Senjyu, Funabashi 2006; Pousinho, Mendes, and Catalão 2012).

The rise and construction of renewable energy markets—in other words, green markets—have attracted attention from all theoretical schools and scholars in the electricity market literature. The neo-classical economic approach, as a distinct school within market studies, has shown substantial interest in the integration of renewable markets within the existing electricity markets and in the implications of this development for the existing market forces. Scholars using the approach have put forward propositions regarding the optimal market design for renewable energy forms, with the aim of ensuring a proper and free working of the market once it is soundly established (Morthorst 2000; Ek and Söderholm 2008, Gan, Eskeland and Kolshus 2007; Fouquet 1998; Piwko, Osborn, Gramlich, Jordan, Hawkins and Porter 2005; Klessmann, Nabe and Bruges 2008; Holttinen 2005). Interest in the green market has been accompanied by studies on the possibility of a lower-carbon electricity economy and particularly on the issue of carbon emission and the carbon emission trade. Scholars using the neo-classical economic approach have investigated the possibilities of carbon emission trading for the electricity market, as well as the requirements for a proper working of this system (Chen, Lise, Sijm, and Hobbs 2012).

However, the empirical literature on electricity markets, as it sees through the theoretical and methodological lenses of the neo-classical economic approach, fails to define the establishment of the electricity markets under study in the first place. These studies have provided suggestions for a better working of the market, but

utilized pre-established assumptions that prevent them from explaining the establishment and workings of the existing markets. Furthermore, considered in the context of this thesis, the neo-classical economic model basically fails to account for the political power relations operating within the market, because it disregards these forces as irrelevant, as anomalies that need to be altered for a better working of the market. Consequently, it fails to map the dynamics of the existing political power relations that are crucial for understanding the establishment, the existing conditions, and the maintenance of the electricity markets within which the assumed individuals and institutions operate.

Economic Sociology

Economic sociology emerges as a second dominant perspective in electricity market studies. Research conducted under the theoretical guidance of economic sociology has emphasized the social, cultural, and institutional context of the market as the main focus of analysis (Eising and Jabko 2001, Glachant and Finon 2000, Glachant 1998, Eberlein 2000).

Granovetter's extensive studies on the electricity market industry deserve detailed elaboration, since they provide an economic sociological reading of the US electricity market. Granovetter, together with Schwartz, McGuire and Yakubovich, has analyzed the US electricity market via social networks and argued that the US electricity industry and electricity prices are socially constructed and politically manipulated (McGuire, Granovetter and Schwartz 1993; Granovetter and McGuire 1998; Yakubovich, Granovetter, and McGuire 2005). These scholars have explained the structure of the market as an outcome, not of optimizing rationality, but of

friendships, common experiences or dependencies, corporate interlocks, and the active creation of new social relations (Granovetter and McGuire 1998). However, Granovetter and his colleagues have failed to provide an empirical account of the concrete ways in which these personal and social networks are reflected in the everyday workings of the market and its major outcomes, such as price.

The role of social networks and personal relations in the construction of the electricity market is further emphasized by scholars working in economic sociology, particularly in explaining the reasons for the establishment of the current electricity market as opposed to more rational and efficient market systems (Chung 1997; Bonardi, Holburn, and Bergh 2006). The electricity market has also received study from the vantage point of insitutions. The institutional framework and reform policies have been investigated in order to analyze and understand the workings of the electricity market (Rufin, Rangan and Kumar 2003; Tsamenyi, Cullen, and González 2006; Künneke 2008; Sine and David 2003).

Scholars have paid attention to production and consumption networks as well. According to a study by Kok, Warmer and Kamphuis, decentralization and increase in electricity production levels is expected to evolve into a network of networks, composing a multi-agent system. In order to ensure the continuity of market exchanges in this structure, the simultaneous character of electricity production and consumption needs to be analyzed (Kok, Warmer, Kamphuis, Mellstrand, and Gustavsson 2005). This study is particularly valuable in that it introduces a simultaneous analysis of two different market stages that occur simultaneously only in the electricity market. However, the distributed condition of agency is overlooked, the market is still defined via the theoretical concepts of the neo-liberal economic school, and the methodological emphasis borrowed from economic sociology is only

applied to networks. Nevertheless, the recognition of the interconnected nature of different market stages, such as production and consumption, and of the role of agents and networks provides valuable insights into the electricity markets.

Electricity market studies that are theoretically and methodologically built upon the infrastructure of economic sociology reflect the theoretical and methodological complications of economic sociology, as detailed above. Their sole emphasis on social institutions and networks prevents these studies to integrate distributed agency and actions forms, price-making mechanisms, and even market establishment processes. This is due to the fact that the approach takes all these processes and mechanisms for granted and does not explain their assumed reflection of the social. Considered from the interdisciplinary theoretical stance and multi-method conception of this thesis, electricity market studies based on economic sociology are insufficient for explaining the making and maintaining of electricity markets, and this illustrates the need for a case-study that utilizes a marketization approach in order to provide a holistic study.

Marxism and Market Socialism

Marxist empirical literature on electricity markets is limited due to its theoretical concerns concentrated on the stage of production, at the cost of ignoring the ways in which the concrete markets work. McGuire has presented an analysis of the US electricity market from a combined perspective that utilizes the theoretical frameworks of both economic sociology and Marxism. In his study, he has investigated how class actors mobilize power, create policy and influence the structure of the electric utility industry, by analyzing the market-making processes in

respect to class structure (McGuire 1989). Pesic and Ürge-Vorsatz have studied the structuring of the Hungarian electric industry from a Marxist standpoint and investigated patterns of ownership and privatization for understanding the market dynamics (Pesic and Ürge-Vorsatz 2001). McDonald has investigated the African power grid from a Marxist perspective and illustrated the ways in which neo-liberal market forces re-colonized Africa via what he calls "electric capitalism" (McDonald 2012).

Even though these studies integrate a class perspective into electricity market studies, they reflect the theoretical and methodological limitations of the Marxist approach: they illustrate the lack of an explanation of the ways in which these markets are established, maintained, negotiated, and transformed by different actors and agency forms; of the negotiation and realization of price; and of the discourses and market tools utilized for making electricity markets. The relationship between politics and the market is diminished to a direct relationship in which economic power patterns consolidate political structure, whereas the marketization approach integrates multi-directional relations between the political and the economic. It does so not only by defining the notion of the political as including all forms of power struggles, but also by illustrating how political power, especially in the form of law-making, can establish or transform a particular market structure. Consequently, this thesis recognizes the contributions of Marxist electricity market studies, along with its limitations for studying the making and operation of electricity markets.

Market Culturalism

The electricity market literature includes very few studies from the market culturalism perspective. The existing work mainly concentrates on the cultural bases of household electricity consumption, rather than on a complete analysis of the making and maintenance of electricity markets. Wilhite has presented the findings of his ethnographic research in India where he examined changes in household electricity consumption practices and related them to political and social changes in the country (Wilhite 2012). Sahakian has worked on the social understanding of consumption, with particular emphasis on social and cultural motivations behind household electricity consumption (Sahakian 2011). The life-cycle perspective has also been incorporated in studies of electricity consumption: Sahakian and Steinberger have investigated ways of reducing electricity consumption by analyzing electricity usage over a life-cycle, with a social understanding of consumption grounded in market culturalism (Sahakian 2010, Sahakian and Steinberger 2011).

These studies are worth analyzing not only because they are some of the few examples of the market culturalism approach to electricity markets, but also because they offer a detailed elaboration of the consumption stage of electricity, which is neglected in both neo-classical economic and structuralist literatures, such as that espousing Marxism and economic sociology. Market culturalism examines the particularities of market geographies in order to explain the consumption stage of electricity markets, which is not only the last stage in the cycle of electricity's life, but also the realization of the ultimate aim of establishing electricity markets. However, in addition to inheriting the theoretical problems discussed above, the sole focus of economic anthropology on a certain market stage, as well as a complete lack

of knowledge about the initial establishment, everyday exchange relations, and price realization mechanisms cast a shadow on the explanatory power of this specific approach.

Marketization and Alternative Political Approaches

There exist alternative perspectives for studying concrete electricity markets; the scholars utilizing them have investigated the links between the electricity market and politics, policy-making, and market-making technologies, from different theoretical vantage points such as policy-oriented approaches, marketization, and actor-network theory. The links between politics and electricity markets have been investigated in this literature, particularly regarding the role of political power dynamics, political actors, and regulatory policies in constructing and transforming the existing electricity markets (Kellow 1996; Midttun 1997; Levi-Faur 1999; Levi-Faur 2003; Summerton 2004; Ardoin and Grady 2006; Branston, Sugden, Valdez and Wilson 2006; Högselius and Kaijser 2010; Joseph 2010). Eising and Jabko's work has combined a political approach with economic sociology and investigated the liberalization of the EU electricity markets via institutional embeddedness and domestic politics (Eising and Jabko 2001).

Even though it is a theoretical perspective introduced only recently, scholars have begun to study energy markets, nature-based industries, and carbon markets via the marketization approach (Callon 2009, MacKenzie 2009). These scholars have investigated the ways in which technological methods, calculative devices, disentanglement, and exclusion processes work to construct and maintain the existing forms of the concrete energy and energy-related markets. The making,

transformation, and any other aspects of electricity markets have also received analysis via marketization.

Wengle's work on the making of the electricity market in Russia deserves detailed discussion as one of the leading works in the field. She has analyzed market-making and state-building in Russia as mutually reinforcing processes and traced the role of managerial experts in the particular liberalization and marketization of the electricity market as part of a deeper political transformation (Wengle 2012). Doganova and Karnoe have studied the cumulative role of environmental concerns and economic worth in clean-tech markets as processes of marketization in green energy markets. Drawing on the theoretical underpinnings of marketization, they have investigated the construction of clean technology markets by focusing on the mechanisms through which new technologies succeed or fail to be transformed into goods that possess a twofold value: that of environmental quality based on their cleanliness, and that of economic worth based on their price (Doganova and Karnoe 2012). Verbong and Geels have presented an empirical study of the Dutch electricity system from a marketization perspective, even though they did not specify their theoretical standpoint as marketization approach. They have framed the transition of the Dutch electricity system in a socio-technical and multilevel analysis to investigate how technical developments, changes in rules and visions, and social networks support or oppose the making of a renewable electricity market (Verbong and Geels 2010).

The application of actor-network theory to the electricity markets is very limited; yet, there do exist studies on the energy markets in general and on carbon markets from an actor-network perspective (MacKenzie 2009, Rydin 2013). Callon, who has introduced actor-network theory to market studies, has studied not the

electricity market in particular, but the case of the electric vehicle in order to analyze the co-evolution of science and society and the influence of the former in shaping the latter (Callon 1986).

Mitchell has advanced science and technology studies of the carbon markets in order to illustrate the intertwined nature of politics and energy market-making via complex disciplinary discourses and socio-technical systems, referring to the ways in which the control over technical knowledge and practices is utilized to reflect political power. He has provided a comprehensive analysis to explain the switch from coal-based to oil-based energy production and the implications of this switch in terms of the particular form of democracy to be established. Accordingly, this particular switch enabled mass politics because oil production employs a smaller number of workers per unit of energy as opposed to coal production, limiting the possibilities of energy production interruption potentially exercised by these workers. Importantly, Mitchell's work recognizes and incorporates the agency of the commodity stemming from its particularity. The difference between the particularities of coal (being more labor-intensive) and oil (being less labor-intensive and easily transported) does not determine, but shape and enframe the making of a particular political form and energy market (Mitchell 2011).

Maassen has reviewed the social science approaches to energy markets and emphasized a move from a techno-economic to a socio-technical paradigm informed by actor-network theory (Maassen 2009). Tchalakov, Hristov and Mitev have studied the Bulgarian electricity market by combining actor-network theory and path dependency in order to analyze the key actors in electricity market transformation processes; thus, they have simultaneously traced the technological, legal, economic, political, and media aspects of this transformation (Tchalakov, Hristov and Mitev

2011). Cupples has applied the actor-network theory to the Nicaraguan electricity market, particularly to illuminate the relational materialisms in the consumption of privatized electricity and their potential for political transformation (Cupples 2011). Jolivet and Heiskanen have presented another application of actor-network theory not to the electricity market itself, but to a wind farm project, and investigated the contingencies that condition a project's success. They have done so by focusing on the micro-decisions that intertwine with the material aspects of the technology, the relevant geographical context, the participation process, and social relations (Jolivet and Heiskanen 2010).

Galvin has proposed to modify the actor-network theory for analyzing the electricity market in Germany and particularly the reasons why photovoltaic electricity generation is subsidized (instead of wind power) through the interplay of material and discursive factors. He has proposed to discard the radical human/non-human symmetry in the actor-network theory and to re-materialize the concept of discourse to study the German electricity market (Galvin 2009). However, by discarding the human/non-human symmetry in actor-network theory, Galvin has undermined his own theoretical perspective and exterminated the possibility of incorporating the commodity's agency into the analysis, which is a crucial aspect of market research, and particularly electricity market research, as will be demonstrated in this thesis.

My thesis will contribute to and further the electricity market literature, marketization literature in particular and market studies literature in general, by examining the Turkish electricity market through a theoretical lens informed by marketization approach and actor-network theory. I will analyze the making, maintenance, consolidation, and transformation of the market in terms of its diverse

agency and action forms, including the agency of electricity as well as the disciplinary discourses and market tools that enframe the market actors and the electricity market. The thesis, then, will illustrate the ways in which the constitution of behaviors, organizations, institutions, and objects are qualified as economic in order to enframe a particular marketization process, which will establish a particular form of electricity market that can only be explained holistically in reference to all these processes.

This research will demonstrate how expressions, self-fulfilling prophecies, and prescriptions are utilized to perform and encompass the Turkish electricity market. It introduces a new conception of price with its own terminology and analytical tools, which provide broader pathways to be followed in marketization studies, especially regarding price realization mechanisms and the importance of a commodity's particularities. The present analysis will furthermore contribute to the literature in that it makes visible the ways in which these processes not only redefine the general notion of the economic and the Turkish electricity market in terms of power relations, but also how they recode and transform the notions of the economic, social, and political.

The Turkish Electricity Market

The liberalization of the Turkish electricity market, which was introduced in the 1980s and is still in the process of consolidation and transformation, emerges as the major theme of research in the literature. It would not be amiss to claim that the backbone of the literature on the Turkish electricity market indeed consists of the issue of liberalization. As will be discussed below, while some scholars have framed

liberal reforms as a given and even criticized them for not being far-reaching enough, others have taken a critical stance. The stages of generation, transmission, distribution, and consumption have been analyzed in respect to this liberalization project. Therefore, Turkish electricity market research mainly clusters around this theme and does not reflect the main strands of research in market studies. However, at the same time, the dominance of the neo-liberal approach is easily traceable in many studies on the Turkish electricity market, particularly in long-term supply-demand forecast analyses that utilize neo-liberal economic modeling. There exists also extensive research on the prospects of renewable energy, particularly concerning the structure of the current possibilities and the impediments to establishing a renewable electricity market, which investigates the legal framework and history of renewable energy production in Turkey.

The Turkish electricity market has undergone a major transformation since the 1980s, aiming to establish a competitive and liberal market. The introduction of this reform to the Turkish electricity market, and particularly the legal-historical background, the content, and effects of the 2001 Electricity Market Law (no. 4628, hereafter EML) has attracted substantial attention from scholars in the field. In order to grasp the logic of this transformation and analyze the introduced reforms, scholars have studied the market's historical background in terms of its structure, its private/public initiative divides, national/foreign investment strategies, legal regulations, development plans, the utilization share of primary energy resources, electricity production capacity and demand levels, price and tariff levels, efficiency levels, financial structure, and regulatory authorities (Atiyas and Dutz 2003; Hepbasli 2005; Ozkivrak 2005). Other studies have analyzed the ways in which the reform affected the market by way of and in terms of these aspects (Hepbasli 2008;

Tor and Shahidehpour 2006; Ozturk, Yilanci and Atalay 2007; Canka Kilic and Kaya 2007; Uzlu, Akpinar and Komurcu 2011). Even though these studies present the necessary regulatory and historical framework of the market, they fail to supply an analysis of the facts on which they elaborate. Studies mostly present historical statistical data regarding the different stages of the electricity market (such as production, transmission, distribution, and consumption), or the changes in the regulatory structure in reference to specific laws and decrees, without discussing the ways in which the analyzed data is constructed by these laws.

Yet, the literature is not limited to descriptive studies, and many scholars have put forward recommendations regarding the processes, current situation, and preliminary results of the Turkish electricity reform. Informed by the neo-liberal economic approach, Bağdadıoğlu and Ödyakmaz have analyzed the general progress and current situation of the Turkish electricity market reform and identified as a major problem the dominant position of the public as both owner and decision-maker. Scholars then called for a further speeding up of the liberalization process to solve this current problem and to create the market structure required for meeting the increasing electricity demand (Bagdadioglu and Odyakmaz 2009). Erdoğan, Çetinkaya, and Düşmez Tek have further supported the reform project and particularly the 2001 EML, since, according to them, the law introduced an unbundling of activities and the establishment of a regulator, thus stipulating a bilateral contract model complemented by a balancing market, a regulated third-party access regime, and an eligible consumer scheme. According to the authors, this marked a substantial progress in the design of a neo-liberally defined electricity market structure (Erdogan, Cetinkaya and Dusmez Tek 2008).

Scholars have investigated the ways in which the 2001 EML introduced a vertical disintegration of the generation, transmission and distribution of electricity, with special emphasis on the impediments faced by the liberal reform process (Ozkivrak 2005; Tor and Shahidehpour 2005; Bagdadioglu, Basaran and Price 2007; Bahce and Taymaz 2008, Cetin and Oguz 2007; Erdogdu 2010). Erdoğdu has identified the main problem in the definition of the reform itself and claimed that, despite a good legislative framework, reforms in Turkey are mainly "textbook reforms" preventing the establishment of a fully-fledged energy market (Erdogdu 2007a).

Alongside scholars who promote and aim to further the liberal restructuring of the Turkish electricity market, there are also scholars who criticize the electricity market reform and call for alternative paths of market structuring, by pointing to the detrimental elements in the current reform project. Erdogdu has focused on the balancing and settlement system established by the electricity market reform regulations and illustrated how the balancing and settlement system transfers excessive profits to private generation companies, therefore undermining the healthy development of the electricity market in Turkey (Erdogdu 2010). Camadan and Erten have contributed from a related but different perspective that examines whether the electricity prices constituted in the transitional balancing and settlement market indeed reflect the real cost of imbalances. Scholars have concluded that the system prices are not reflective of costs or supply-demand forces and proposed a roadmap to be followed if reflectivity is to be achieved (Camadan and Erten 2011).

Kalaycı has re-introduced a political perspective via an emphasis on democratic debating processes. Since the competitive market creates foreign dependency, high profit margins, and lower employment, Kalaycı claims that the

liberal reform needs to be open to public discussion (Kalayci 2002). Çetin and Oğuz have added to the criticism from a political standpoint and contended that, since Turkey's institutional and political structure was not ready for creating an efficiently working competitive market, political preferences started to drive the industry as a result of the reform process (Cetin and Oguz 2007). The re-introduction of democratic political processes into market studies is very much welcomed for the theoretical framework of this thesis. However, in most of these studies the notion of the political is narrowly defined, as conventional policy-making and everyday domestic politics, whereas the notion of the political here comprises the everyday power struggles of market-making and operating actors. Furthermore, the dominance of a normative perspective over the descriptive and explanatory frameworks casts a shadow over these studies' contributions. The total dismissal of market agents, networks, and price-making mechanisms, coupled with the normative approach and un-problematized utilization of hypothetically defined neo-liberal theoretical concepts, further weakens their explanatory power in terms of the dynamic processes of market-making.

The theoretical shadow that the neo-classical approach casts on the literature is dominant particularly in regard to analyses of the workings of the market and market inputs and outcomes, such as demand and price. There exists an extensive literature focused on forecasting demand and consumption levels in the Turkish electricity market, in terms of both short-term and long-term forecasting, which applies the neo-classical economic models that work on pre-established assumptions and normative expected relations within the market (Erdogdu 2007b; Hamzacebi 2007; Halicioglu 2007; Akay and Atak 2007; Kucukali and Baris 2010; Filik, Gerek and Kurban 2011; Dilaver and Hunt 2011; Kavaklioğlu 2011). Certain works have

utilized neural network models for forecasting market inputs such as power distribution loads (Yalcinoz and Eminoglu 2005). Tunç, Çamdalı and Parmaksızoğlu have analyzed the consumption and production levels of the Turkish electricity market in comparison with those of European countries and proposed optimization models for future electrical power supply investments in Turkey (Tunc, Camdali and Parmaksizoglu 2006). Dilaver and Hunt, working from a neo-liberally inclined theoretical vantage point, have analyzed the industrial electricity demand in Turkey via a structural time series analysis (Dilaver and Hunt 2011).

Scholars have utilized these models not only for forecasting demand, but also for analyses of pricing, investment, and regulatory processes in the Turkish electricity market (Pasaoglu Kilanc and Or 2008). Another field that applies neo-classical economic modeling concerns the link between electricity consumption and economic growth. Altınay and Karagöl have employed neo-classical economic theories to claim and test that there occurs a unidirectional causality from electricity consumption to income levels (Altinay and Karagol 2005). Balat has advanced work on this link based on the same theoretical method and proposed that, since there is positive economic growth, electricity demand will increase accordingly; therefore, growth levels can be taken as reference points to predict the level of investment required for the Turkish electricity production sectors (Balat 2009). Akkemik, on the other hand, has utilized neo-classical economic models to review the reform process itself and argued that the regulation process is effective and that there are potential gains from such regulation (Akkemik 2009). Bahçe and Taymaz have furthered this application as they have investigated the impact of electricity market liberalization in Turkey by comparing two extreme cases: the case of a purely regional distribution monopoly, and the case of the purely free consumer. Both of these are defined

normatively, without any reference to the everyday working of the markets, a problematic inherited from the study's theoretical infrastructure (Bahce and Taymaz 2008).

Informed by the theoretical tools of neo-classical economics, Madlener and Stoverink have utilized the options theory to evaluate the feasibility and profitability of building an enormous coal-fired power plant within the current Turkish electricity market structure, a liberal structure as defined by themselves (Madlener and Stoverink 2012). Madlener, Kumbaroğlu and Ediger have developed a technology adoption model that is firmly rooted in economic theory in order to evaluate new investments in the Turkish electricity market (Madlener, Kumbaroglu and Ediger 2005). Kumbaroğlu, Madlener and Demirel have utilized the options evaluation model for analyzing the diffusion prospects of new renewable power generation technologies within the Turkish electricity market (Kumbaroglu, Madelener and Demirel 2008).

Even though the neo-liberally motivated empirical research on the Turkish electricity market is noteworthy for the proliferation of research topics and many different market stages investigated, the utilization of pre-established assumptions and the dominance of the normative theoretical stance of the neo-liberal school undermine the contribution of these studies. Not only do they blindly assume the points to be analyzed in the present thesis, but they also build their analysis and conclusions on these assumptions, which are not informed by market-making processes or the everyday making of the market. Consequently, the political mechanisms that establish and maintain the Turkish electricity market, the realization of prices, the everyday working of the market, and the proliferated agency forms are usually disregarded. However, these forces are crucial for analyzing the ways in

which the assumed market is established and maintained in everyday market activities.

Even though the neo-liberal economic school is by far the most dominant approach in studies of the Turkish electricity market, there are certain alternative works that incorporate institutional aspects of the market, macro-level international political economy perspectives, and under-studied areas such as the problem of illegal electricity usage, price realization in the market, financial mechanisms of the electricity market, and the issue of distribution industry privatization.

Oğuz has combined the neo-liberal perspective with an institutionalist analysis in order to investigate the establishment of competition in the Turkish electricity market by means of regulatory institutions and competition authorities. He claims that the absence of a well-established institutional environment reduces the potential role of the competition policy in the industry and increases political meddling in the Turkish electricity market; he subtly discusses the claimed separation between politics and economics, utilizing the theoretical foundations of neo-liberal economics (Oguz 2010). Türedi and Demirbaş have incorporated a macro-level international political economy perspective in their work on the strategic importance of electricity for Turkey. They have investigated the ways in which Turkey may handle the dilemma of how to invest in new electric power capacity while at the same time adhering to foreign debt ceilings under lending rules set by the International Monetary Fund; they have identified the solution to this dilemma to be the liberalization of all energy sectors via national and foreign investment tools (Turedi and Demirbas 2004). Even though the study is worth discussing at length because it combines an international economy perspective with neo-liberal economic

theory, it fails to provide an analysis of the making, and more importantly the workings, of the Turkish electricity market; to be fair, it does not even aim to do so.

The issue of illegal electricity usage is an under-studied area in the literature, even though it is a widely discussed phenomenon and a substantial reality of the market, given that the Turkish Electricity Transmission Cooperation (*Türkiye Elektrik İletim Anonim Şirketi*, TEİAŞ) announced electricity loss to amount to 15.3 percent in 2012.[5] This marks an important aspect in the making as well as the outcomes of the market, not only in terms of price but also social and political implications based on the discussion of electricity as a public good. Cavdar has brought the subject to the forefront and proposed a technical solution that aims to detect illegal electricity usage via power line communications (Cavdar 2004). However, the social, political, and market-making implications of this phenomenon still remain under-studied. The major fact lies in the social and political roots of electricity loss. As will be elaborated further in the next chapter, the high percentage of electricity loss mainly occurs in the regions of Turkey that are dominantly populated by Kurdish people, the majority of whom refuse to pay electricity bills due to problems of state legitimacy and underprivileged economic conditions.

Another under-studied, but even more crucial phenomenon in the present context is the realization of electricity prices. Berktay, Demirbaş, Kaçok and Nas have provided an indirect study, by analyzing the price levels in order to investigate the ways in which electricity prices as well as electricity losses have an impact on the competitiveness of a country's industry (Berktay, Demirbas, Kocak and Nas 2004). However, they do not supply a comprehensive analysis of the mechanisms of price realization and of the processes through which a price is constructed and imposed on

[5] TEİAŞ, *Annual Development of Electricity Generation: Consumption and Losses in Turkey, 1984-2012.*

market actors, mainly on consumers believing that they receive bills based on imposed prices.

Gökgöz and Atmaca have incorporated financial mechanisms and tools in their analysis of the Turkish electricity market. They have applied Markowitz's mean-variance approach in order to analyze possibilities of establishing an optimal portfolio under the conditions of the known total electricity generation costs and bilateral contract prices (Gokgoz and Atmaca 2012). Even though these studies are worth mentioning because they represent the limited number of price studies in the Turkish electricity market, mainly due to tariff application and the only recent establishment of electricity spot markets, they are undermined by their own theoretical framework. The analyses are conducted within the boundaries of controlled conditions that do not reflect the everyday workings of the Turkish electricity market.

It is important to state that the marketization of electricity is mainly initiated through the privatization of electricity distribution rights; therefore, the distribution industry is currently experiencing major transformation and debate. The distribution stage of the electricity market was completely privatized as of 2013, marking the transformation not only of the electricity distribution sector, but also of the Turkish electricity market in general. However, the stage of electricity distribution and particularly the distribution industry are still under-studied. Erdoğdu has presented an analysis of the Turkish distribution sector and its processes, while at the same time offering suggestions for policy-makers to advance and finalize the liberalization of the distribution sector from a neo-liberal economic theory perspective (Erdogdu 2009). However, Erdoğdu's study suffers from the theoretical shortcomings of the neo-liberal school, which I have pointed out repeatedly in this chapter.

Since energy is considered one of the most valuable inputs by many industrial and industrializing countries, concerns over efficiency have been raised from different standpoints within the literature. The framework of efficiency literature, which is also dominant within the neo-liberal economic school, has re-emerged to investigate solutions for efficiency problems in liberal electricity markets in terms of investment, production, distribution, and consumption (Utlu and Hepbasli 2003; Kaygusuz 1999; Bagdadioglu, Price and Weyman-Jones 1996). Bağdadioğlu, Price and Weyman Jones have useed a non-parametric economic model to identify and alter the mechanisms that create inefficiency in terms of the current ownership structure of the Turkish electricity distribution industry (Bagdadioglu, Price and Weyman-Jones 1996). Soytaş and Sarı have focused on the link between electricity consumption and industrial production to conclude that these two are closely related; therefore, increased energy efficiency would indeed lead to increased economic growth (Soytas and Sari 2007).

Hepbaşlı and Özalp have concentrated on the issue of energy efficiency in respect to management implementation in the Turkish industrial sector and contended that there exists development due to the 1995 regulation concerning industrial energy efficiency (Hepbasli and Ozalp 2003). Akkemik and Oğuz have contributed to the analysis by focusing on the effects of government-led market regulations on energy efficiency. They have examined the potential impact of full liberalization on conditions of efficiency and competition in the electricity market, by using an applied computable general equilibrium model, and concluded that full liberalization would contribute to higher efficiency (Akkemik and Oguz 2011). Yet, not only the problematic use of neo-classical models, but also the lacking reflectivity of hypothetical situations to everyday market-making should be mentioned when

evaluating the findings of these studies. They are based on pre-existing assumptions and theoretical hypotheses that do not contribute to an understanding or analysis of everyday market-making and -maintaining dynamics, nor do they help us understand the political power mechanisms evidently involved in these processes.

Energy security is another widely studied theme, revealing the dominant utilization of the energy security discourse in the marketization of electricity. There are primarily two opposing groups in this discussion, and their explanations provide a link for the possibilities of a "renewable future." The first group argues for the need of a large-scale nuclear electricity substation, mainly by positing that a substantial increase in Turkish electricity production is necessary, given the enormous experienced and projected increase in demand, as Turkey is to ensure energy security within the medium-term future. The proponents of nuclear energy focus on the concern of energy security as part of Turkey's international strategies, claiming that Turkey has very limited domestic resources for electricity production (renewable sources are mentioned as having potential for development), but has considerable thorium reserves as future nuclear fuel sources (Balat 2010). The opposing group, on the other hand, focuses on the prospects of renewable and clean electricity production sources and claims that Turkey has substantial potential for renewable electricity production, in terms of both scale and proliferation, which needs to be prioritized over non-renewable primary resources (Kaygusuz 2002; Akpinar, Komurcu, Kankal, Ozolcer and Kaygusuz 2008; Bilen, Ozyurt, Bakırcı, Karslı, Erdogan, Yılmaz and Comaklı 2008; Balat 2008; Celiktas and Kocar 2010; Erdem 2010; Ari and Aydinalp Koksal 2011). Scholars have provided extensive studies that illustrate the environmental, economic, ecological, and social benefits of renewable

energy prioritization (Kaygusuz 2002; Demirbas 2005; Yuksel 2008; Kaygusuz 2009a; Tunc, Turut-Asik and Akbostanci 2009; Kaygusuz 2010).

One of the legitimate dominant spheres of research for renewable electricity production is the historical development and the current legislative framework that shapes the conditional possibilities for establishing a renewable energy market (Hepbasli and Ozgener 2004). The Law on the Utilization of Renewable Energy Resources for the Purpose of Generating Electricity (no. 5436) was introduced in 2005 with the aim to expand the use of renewable energy sources, by providing economic incentives to renewable energy producers. The law was then amended in 2010 to introduce different feed-in tariffs for each renewable energy source, as opposed to the initial regulatory framework, and provided clear and distinctive incentives also for the domestic manufacturing of mechanical components of generation facilities (Tukenmez and Demireli 2012). The technical potential, present production status, and regional distribution possibilities have all been evaluated to estimate the gains that Turkey may experience from developing a renewable energy market (Kaygusuz and Sari 2003; Ozgur 2008; Celiktas, Sevgili and Kocar 2009; Hepbasli, Ozdamar and Ozalp 2001).

The literature mainly concentrates on wind energy and its current utilization and potential, reviewing its situation both within the Turkish electricity market and in comparison to the world energy markets (Ozgener and Hepbasli 2002; Ogulata 2003; Kose 2004; Guler 2009; Kaygusuz 2010; Dursun and Alboyaci 2010; Akdag and Guler 2010; Celik 2011). It would not be wrong to claim that the attention given to wind energy in the literature on the Turkish renewable electricity market stems from the fact that the financial support for wind energy has been sufficient to attract investors, whereas the incentives provided for solar or bio-sources did not lead to

profitable investment. The renewable electricity market was established with wind plants in mind, and this market-making particularity has reflected itself in market studies. Hepbaşlı and Özgener have provided a review of the development of wind energy in Turkey in terms of its history, scholarly literature, the restructuring of the Turkish electricity market and wind energy applications (Hepbasli and Ozgener 2004). They have not only focused on environmental and ecological gains from wind energy, but also illustrated the ways in which wind energy has played, and is still playing, an important role in the historical and economic development of Turkey's regions (Hanagasioglu 1999). Alboyacı and Dursun have further analyzed the contribution that exploiting the wind energy potential would have in the reconstruction of the Turkish electricity market structure and advocated for extensive investment in wind energy production facilities (Alboyaci and Dursun 2008).

It shall be noted that scholars working on the Turkish electricity market support not only wind energy utilization, but also focus on other renewable forms of primary resources. Hydropower, geo-thermal energy, and bio-energy receive particularly substantial support in the literature (Hepbasli 2003; Kincay 2003; Hepbasli and Ozgener 2004; Balat 2005; Erdogdu 2008). Demirbaş and Bakış have analyzed the possibilities and current utilization of geo-thermal and hydropower sources in Turkey and proposed that electricity production from biomass is a promising and feasible method for a sustainable electricity market (Demirbas and Bakis 2004). Günerhan, Koçar and Hepbaşlı have identified geo-thermal energy as a clean and cheap source that needs recognition and support from the public (Gunerhan, Kocar and Hepbasli 2001).

Küçükali and Barış have focused on small hydropower development from a political economy perspective that incorporates current laws, regulations,

government policies, and European Union policy perspectives in order to illustrate the ways in which these policies have increased the potential of hydropower plant construction by fifteen percent (Baris and Kucukali 2012). Yüksel has presented a review of the potential and current utilization of renewable energy sources in Turkey and put emphasis on hydropower, especially small hydropower plants, in meeting Turkey's increasing energy demand (Yuksel 2010). Many other scholars support these recommendations and promote large-, medium- and small-scale hydropower plants as the optimal way to consolidate the tension between a sustainable future and concerns of energy security (Yuksel 2008; Kaygusuz 2009b; Ozturk and Kincay 2004; Yuksek, Komurcu, Yuksel and Kaygusuz 2006; Dursun and Gokcol 2011; Erdogdu 2011). However, the validity of these studies is undermined by the fact that the undesirable social and agricultural effects of hydropower plants are not addressed in their research agenda. Considering the significance of agriculture for women's employment and the importance of water access for daily livelihood and agricultural activities in rural regions, the potential effects of hydropower plants should be integrated in any complete cost-benefit analysis of these plants.

Since the literature is in partial agreement regarding the desirability of developing a renewable electricity market, the necessary policies deserve further attention (Demirbas 2006; Ulutas 2005). Kaya has focused on the utilization of Turkey's renewable energy potential, current energy politics, political organizations, the necessary incentives, pricing and buying mechanisms, technical research and development studies, and finally the barriers to the development of renewable energy market. In terms of the technological aspects, he has proposed a regular evaluation of the potential of existing and newly developing renewable energy sources. In terms of policy-making and implementation, he has recommended that cooperation between

public management and private investment is vital in this development; the government should formulate and implement policies favorable for renewable energy development, while the private sector should support these implementations by mobilizing funds (Kaya 2006).

Nalan, Murat and Nuri have examined the renewable energy market conditions and barriers in the Turkish electricity market. They have identified the main barriers as follows: the high cost of renewable energy technologies, and the lack of knowledge about renewable energy technologies by most policy-makers, potential consumers and energy firm managers (Nalan, Murat and Nuri 2009). It should be emphasized here that the lack of regulatory clarity and corresponding indirect impediments faced by renewable energy resources contribute to the opposing camp's claim that renewable energy resources are unable to meet Turkey's increasing demand and that there is a "real" need for nuclear plants. Thus, law-makers legitimize the establishment of nuclear power plants by constructing this particular regulatory framework which provides more impediments than incentives for the development of a renewable electricity market.

It is also important to emphasize at this stage that renewable energy sources other than wind, hydropower, geo-thermal energy and bio-energy are completely neglected within the literature. For example, even though Turkey has a daily average of more than seven hours of sunlight,[6] there is very limited research on and support for solar energy. Kaygusuz has vividly demonstrated the high potential of solar power in Turkey and emphasized that solar power generation is a proven renewable energy technology, for it produces electricity solely from solar radiation (Kaygusuz 2011). However, the production share of solar power in Turkey is below 1 percent as

[6] Ministry of Energy and Natural Resources of the Republic of Turkey, Renewable Energy General Directorate, *Solar Energy Potential in Turkey*, 2013.

of 2013 and not even included in the monthly reports of TEİAŞ. The reason behind this fact goes beyond technological impediments, as will be demonstrated in the third chapter; it results from deliberate decisions taken by policy-makers. Even though the Renewable Energy Law was issued in 2005,[7] its legal directives that translated it into an applicable law were not issued until December of 2010. The basis and procedures which make the application of the law possible on an everyday basis have still not been clearly defined in its various aspects. Thus, the process is a legal as well as political one. It becomes evident here that politics affects not only the prices and the major actors of the market, but even the share of primary resources and how we relate to electricity and nature.

The above review of the empirical literature on the Turkish electricity market has demonstrated that the main focus of this thesis, the power dynamics that enframe the making of the Turkish electricity market in regard to its multiple agents and agent-network interactions, remain unexamined. Upheld by the theoretical framework of Callon's contribution to the actor-network theory, this particular research aims to further the literature by incorporating the actor-network perspective to market studies so as to investigate the consolidation of political power and its implications for the electricity market. Among the different approaches discussing the workings of the market and the many possible ways of study, many fail to explain how markets work in everyday interactions, to establish, maintain, renegotiate, and transform not only the existing power relations, but also notions of the political, economic, and social.

Informed by the existing literature and alternative approaches, this research aims to contribute to the literature by studying the electricity market in Turkey, not

[7] The Law on the Utilization of Renewable Energy Resources for the Purpose of Generating Electricity, 2005.

as an object to grasp within its independent sphere, but as a many-sided, diversified, evolving sphere of power struggles that hosts multiple agencies, trade networks, the manipulative power of agencies, market tools, disciplinary discourses, logical infrastructures, and dynamics of price realization. It does so in order to elucidate the ways in which the establishment and maintenance—in other words, the marketization—of the Turkish electricity market are enframed, transformed, negotiated, consolidated, and maintained by the existing power relations.

CHAPTER 3

RESEARCH ON THE TURKISH ELECTRICITY MARKET: THE ESTABLISHMENT AND CURRENT WORKINGS OF THE MARKET

The first part of this chapter will analyze market-making with a view to the historical development and legal framework of the Turkish Electricity Market. The underlying research is based on official document analysis, which outlines the market's legal framework as well as the boundaries within which the actors operate. The archival research covers the period from the beginning of the twentieth century to the present day, but particularly focuses on the 1980s when major market reforms were instituted. I will analyze the legal regulations concerning the production, distribution, exchange, and taxation of the electricity market in order to identify the conditions under which market actors conduct their daily and long-term market activities and encounters.

Based on this analysis of the legal framework, the second part of this chapter focuses on the ways in which market actors operate within and negotiate these legal limitations, both in their daily market operations and in their resistance to them. The ways in which the actors negotiate the established legal framework become visible through the twenty six semi-structured in-depth interviews and twelve non-structured interviews I conducted with the main actors working in the regulation, production, transmission, distribution, exchange, and consumption stages of the electricity market. Since particularly the public authorities bluntly refused my interview requests, I conducted non-structured interviews that took place in the form of five-to-fifteen-minute conversations during conferences and business meetings. These

groups were then divided into sub-groups, and I conducted separate interviews with both private and public producers, own-use electricity-producing companies and individuals, non-licensed and licensed electricity producers, distribution companies, eligible and non-eligible consumers, and retail and wholesale electricity suppliers.

The second part of the chapter benefits from secondary data analysis based on market data research dating to last twenty years. The data set reflects the transformations in the market shares, analyzed in terms of major actors and the private/public distinction, the evolution of the electricity market structure in regard to power contestations, the evolution of price realization mechanisms, and the changing shares of primary energy resources in the electricity market; these will be analyzed in terms of the conditions provided for each primary resource type.

The secondary data analysis, accompanied by an analysis of official documents and semi-structured in-depth interviews, aims to further my investigation of the marketization of electricity, the market powers of the major actors in terms of market share and their ability to structure preferred outcomes, price realization mechanisms, and the established market structure, in order to explore how these structures and mechanisms work to establish and maintain a particular form of market, especially given the nature of the commodity at hand.

All these data gathered from official document analysis, semi-structured in-depth interviews, and secondary market data analysis will receive discussion from the theoretical and methodological standpoint of the economization approach, so as to advance this approach and to analyze the political mechanisms, dynamics, and processes that construct and maintain the current Turkish electricity market. The analysis simultaneously discusses the implications of these phenomena for the market studies literature in general and marketization theory in particular, for the

utilization of market tools and devices for market-making, for the importance of the commodity and its agency in market-making, for electricity markets in general, the Turkish historical and political context, and the evolving domestic power relations.

The third and last section of this chapter analyzes the findings of the research in reference to the existing theories and approaches to market studies. It provides theoretical and methodological tools for analyzing the Turkish electricity market from a politically inclined standpoint, with special emphasis on the particularity of the commodity as a major market-making agency. The section further provides a new framework for an analysis of market price, which is as multi-layered and fragmented as the commodity itself, with its own terminology derived from the conditions and characteristics of each price determination process. The third section concludes by providing a summary of the major theoretical findings of the present research and how these findings relate to the existing literature on market studies and political economy in general.

Following the theoretical framework of economization, the thesis will trace the processes that constitute the behaviors, organizations, institutions, and objects that are qualified as economic. The analysis will investigate the ways in which these processes not only redefine the notion of the economic and the Turkish electricity market in general in terms of power relations, but also how they recode and transform the notions of the economic, social, and political. The thesis will illustrate how certain expressions, self-fulfilling prophecies, and prescriptions perform and encompass the Turkish electricity market.

Since the market is defined as sociotechnical agencements, I will also articulate and analyze in detail the three characteristics of these agencements: firstly, the ways in which markets organize the conception, production and circulation of

goods (changing the conception of electricity as public good and the corresponding establishment of its market); secondly, the rules, conventions, technical devices, logistical infrastructures, texts, discourses, and narratives, the technical and scientific bodies of knowledge that the market deploys (law, market devices such as licenses, discourses on security of supply, the texts and narratives of market actors from all stages of the market, the importance of technical knowledge due to the nature of the commodity); and, thirdly, the ways in which markets delimit and construct a sphere of confrontation and power struggles that continue via contradictory definitions and valuations of goods as well as via agents that oppose each other in the market until the terms of transaction (the inclusion of the private sector and the exclusion of civil society organizations and environmental concerns in new electricity legislation, the exclusion of major consumption segments from tariff-making procedure) have been determined.

It shall be emphasized that, in incorporating the actor-network theory and the notion of non-human agency, this section will discuss the constitution, reproduction, development, transformation, objectification and maintenance of markets in regard to multiple forms of action, networks, and agencies, including the agency of electricity as the commodity under study. The market tools, devices, and calculative practices of agencies will receive scrutiny. I will illustrate that licenses, tariffs, and laws serve as market devices and tools in order to establish and maintain a particular form of electricity market, whereas the law is identified as major device in this marketization process, by determining the initial conditional possibilities for the market actors.

Finally, I will survey the most important market outcome, the price, by making visible the ways in which a certain price, as opposed to other alternatives, is negotiated and eventually imposed on the various parties engaged in the transaction.

In most of the cases, price is not even negotiated in the Turkish electricity market; it is imposed especially on the end-users via tariff tools, and only the mid-prices (the price of electricity sold from the producing to the supply company) are negotiated to an extent that is not transparent. Finally, the present chapter will demonstrate that the price in the Turkish electricity market is not only not transparent, but also very hybrid and informed by the nature of commodity; the price and the nature of the commodity together will be analyzed to arrive at a new conception of price with its own particular tools for analysis.

Note on the Methodology:

This thesis utilizes different methods in order to survey the making and maintenance of the Turkish electricity market as well as the sciences that contribute to its performation. Firstly, I have reviewed the legal documents that construct and define the boundaries of the Turkish electricity market. I have studied legal regulations both as contextual infrastructures that define the conditional possibilities for market actors and actions; and as a marketization technology that enframes, transforms, and maintains the Turkish electricity market. Together with the interviews that trace everyday market actions, I investigated the ways in which the established legal framework channels market actors and actions.

The non-structured and semi-structured in depth interviews constitute the second source of my research. In order to provide a complete analysis on the enframing effects of regulatory framework, the disciplinary discourses, market conceptions, calculative mechanisms, relative market positions, and distributed agency forms of different actors; I interviewed market actors from all market stages

and sectors. The interviewees are composed of owners, executives, and traders of both conventional resource based and renewable resource based electricity production plants; operators of public electricity production plants; public officials and executives from regulatory and supervisory authorities of EMRA, TEİAŞ, and MENR; electricity traders from both retail and wholesale electricity supply companies; electricity market analysts; executives and members of independent associations related to the electricity market; owners, executives, and traders of private distribution companies; unlicensed electricity producers both for own use and commercial use; eligible and non-eligible consumers; and representatives of environmental organizations.

The semi-structured interviews were scheduled in advance by taking appointments from the interviewees via e-mails or verbal communication which provided information about my affiliation and study. Depending on interviewees' preferences; the meetings took place either in interviewees' offices, houses, or neutral places such as cafes; in cities of İstanbul and Ankara. The interview questions aimed to detect the dominant discourses utilized in market actors' conception of the market, their opinions about the marketization of electricity from a public good to an industrial input, the ways in which they describe the market and enframe the market while they are describing it, their personal and commercial relations with other market actors, how market actors relate to the regulatory framework, the knowledge of market actors about the market commodity, and the calculative forms they utilize in the negotiation and realization of the price. Taken together, their answers assist in the analysis of the ways in which actors describe the marketization process and the conditions they find within the established electricity market.

Out of the 26 interviews, 14 interviewees requested their name and affiliation to be kept confidential for various reasons, such as their affiliations' restrictions on conducting interviews (mostly public institutions), or the fact that the interview included confidential trade information. One interviewee (from a public regulatory institution) stated that, since the electricity market is very political now, their statements could be twisted by certain groups who want to stymie their efforts to develop the electricity market. In two of the interviews, the interviewees requested to exclude substantial data from the research. On the other hand, small-scale own-use electricity producers, an independent lawyer specializing in the electricity market, heads of associations such as the Unlicensed Electricity Generation Association, and several executives from private-sector companies did not request confidentiality when it came to their own or their associations' names. Additionally, it must be noted that the interviewees did not consent for recording of the interviews. Correspondingly, the interviews were conducted by taking notes and I received the consents verbally as well.

The non-structured interviews, on the other hand, were not included in the original design of this research; however, they are integrated into the thesis as a result of the accessibility problems. The officers of public institutions such as EMRA, TEİAŞ, and MENR and few market actors from private sector refused my verbal and written interview requests consistently. Majority of these actors did not even reply to my requests; while few actors stated that it was forbidden for them to give interviews or they were unavailable. The most interesting for me, however, was Ahmet Ocak, the Head of the Electricity Department of the Energy Market Regulatory Authority (EMRA), who personally declined my request for an interview

with the justification that there was no need for an interview since my thesis could legitimately conclude that "the electricity market is just going very well."[8]

However, these actors that regulate and supervise the Turkish electricity market were crucial for my research in terms of tracing the disciplinary discourses and expertise knowledge claims utilized by market designing and regulating authorities. Consequently, I have tried to reach these actors mainly in conferences where I had the chance to introduce myself, my affiliation, and ask few questions (ranging between two to five questions) regarding the dynamics of the Turkish electricity market. I have conducted twelve non-structured interviews where I have addressed relatively smooth questions (such us their general opinion about the market, production levels, and transition from physical to financial markets), because my interviewees were extremely sensitive and precocious. In several instances the interviewees quit the interview without giving any answer if they were addressed questions that problematize about environmental issues or electricity losses being compensated from consumers. My primary aim with the non-structured interviews was to integrate the public segment of the electricity market into my analysis and trace the disciplinary claims and discourses that are dominantly utilized by the market regulators. Out of the twelve non-structured interviews, eleven interviewees consented to reveal their names and affiliation. Only one interviewee requested confidentiality for his name while consented to reveal his affiliation.

In addition to the non-structured and semi-structured interviews, I have visited the city of Diyarbakır, which belongs to the Dicle electricity distribution region with highest electricity losses ranging between sixty to seventy percent. Even though not a major concern of my thesis question; I have visited the region to trace

[8] "Elektrik piyasası gayet de iyi gidiyor."

the reasons for these extreme losses. The city of Diyarbakır is chosen for reasons of convenience and as being one of the biggest cities in the region. I visited the city center and approached to people by introducing myself, affiliation, and my research. I have assured confidentiality to the interviewees in advance, due to the sensitivity of the issue, and asked two questions only. Firstly I asked whether they use illegal electricity or not; and if the answer was yes, I asked the reason. In total, I have approached forty two interviewees and finalized the interviews once I have reached twenty interviewees who responded yes. I must emphasize that these interviews are not considered as main sources of this thesis; but are included as secondary resources that provide insights to one particular aspect of the Turkish electricity market.

In order to provide a complete analysis on the making and maintenance of the Turkish electricity market; the interview findings and review of the official legal documents are aided with secondary data analysis based on market data research dating to last twenty years. I have gathered market data from yearly and monthly reports and statistical information issued by TEİAŞ and EMRA. The data set primarily focuses on the transformations in the market shares of major actors (including the public sector), the evolution of the electricity market arrangements and price realization mechanisms, and the changing shares of primary energy resources in the installed electricity production capacity.

Finally, considering the theoretical and methodological framework of this thesis, I have surveyed the literature on the Turkish electricity market. The marketization approach, aided with actor-network theory and a new understanding of agency, proposes to study the academic disciplines as marketization technologies. Following this theoretical infrastructure; I have traced the academic disciplinary discourses that are dominantly utilized in empirical studies of the Turkish electricity

market; focusing particularly on the ways in which these studies describe and simultaneously enframe the electricity market by presenting a normative conception of the market. Analyzing the literature in connection with the interview results will reveal that disciplinary sciences enframe the market conceptions, definitions, claims, and actions of market actors.

The Establishment of the Market: The Historical Development and Legal Framework of the Turkish Electricity Market

The Turkish electricity market has undergone a major transformation, initiated in the 1980s and accelerated by the Electricity Market Law (no. 4628) dated 20 February 2001 and new Electricity Market Law (no. 6446) issued in 2013. Before this reform, all segments and stages of the Turkish electricity market had been under the sole management of the publicly owned monopoly corporation called the Turkish Electricity Authority (*Türkiye Elektrik Kurumu*, TEK). This section provides a review of this reform and the stages of the transformation that the Turkish electricity market is experiencing. It will illustrate that Turkish electricity production, marking the initial making of the electricity market, can be traced to 1902 with the establishment of a 2-kW dynamo-substation in Tarsus, used for the city's lighting. The complete legal and institutional structure of the market, however, was only established in the course of the 1970s and 1980s.

The Foreign Investment Period: 1910-1930

The first company established for the production and distribution of electricity was the Ottoman Electricity Incorporated Company, founded in 1910 under 100-percent foreign ownership. The first large-scale power plant was built in İstanbul in 1913, again with foreign investment. At the time of the establishment of the Turkish Republic, the total installed capacity amounted to 29,664 kW, and electricity was available only in İstanbul, Tarsus and Adapazarı (Ozturk, Yilanci and Atalay 2007).

Over the course of this period, the development of the electricity industry and its market was mainly conducted by and dependent on foreign investment. The German company Allgemeine Elektricitäts-Gesellschaft Aktiengesellschaft (AEG), for example, joined to build a diesel generator in Ankara in 1925, and this can be identified as the only development in this period. However, towards the end of this period national investments were flourishing in the sector with the establishment of the first Turkish electricity company, Kayseri ve Civarı Elektrik Türk Anonim Şirketi (Hepbasli 2005). At the end of the 1920s, the total number of power plants amounted to 48, together producing 106.30[9] GWh[10] of electricity (total electricity production in 2012[11] was 239,496.80 GWh).[12]

[9] TEİAŞ, *Short History of Electrical Energy Development in Turkey and Some Statistical Figures*.

[10] 1 gigawatt (GW) equals 1,000.,000,000 watts, the standard measuring unit of electricity. GWh equals the electricity output generated in one hour.

[11] TEİAŞ issued official electricity statistics only until 2012, and EMRA issued official market reports only until 2011. Consequently, the official statistics and market information used in this thesis only include the years until 2012 or 2011. However, the thesis includes updated data gathered from interviews or independent research organizations.

[12] TEİAŞ, *Annual Development of Installed Capacity and Generation in Turkey (1970-2012).*

The Nationalization Period: 1930-1960

The Turkish electricity market witnessed the effects of the period's dominant wave of nationalism across the world. In 1933, the government announced a five-year industrial plan which suggested an active role for public institutions in searching for new sources of energy utilization. In order to ensure the national development of the electricity industry within given budget limits, the government issued legislation that gave the municipalities the right to build and operate power plants. National research and investment was further catalyzed by the establishment of Etibank, the Mineral Research and Exploration Institution, and the Electrical Power Resources Survey Administration in 1935 (Hepbasli 2005).

The nationalization project started to bear fruit when Etibank installed the coal-based Zonguldak-Çatalgazi Electricity Power Plant in 1941. In 1944, the nationalization of the electricity sector was completed, and all foreign investments were nationalized. In the 1950s, the sector witnessed substantial public investment for both the construction and operation of electricity generation plants. Together with the production investments, all stages of the industry benefited from this project. In 1952, for example, a 154-kV transmission line was erected and integrated into the Turkish electricity network.[13] Towards the end of the 1950s, the installed capacity totaled around 410 MW,[14] generating 789.5 GWh for a per capita consumption of 32

[13] TEİAŞ, *Short History of Electrical Energy Development in Turkey and Some Statistical Figures*.

[14] 1 megawatt (MW) equals 1,000,000 watts, the standard measuring unit of electricity. 1 MW electricity capacity means that the amount of electricity that can be produced within one hour with the given technology is 1 MW.

kWh; however, only 23 percent of the population benefited from the electricity provided.[15]

The Legal and Institutional Establishment of the Electricity Market: 1960-1980

In the 1960s, the concentrated interest in investment was diffused, and government interest in the legal-institutional aspect of this nationally developing electricity industry flourished. The Ministry of Energy and Natural Resources of the Republic of Turkey was established in 1963 as authority in charge of developing and implementing Turkey's energy policy. In 1970, the Turkish Electricity Administration Commission (TEK) was founded and appointed to serve as monopolistic administrator for regulating all stages of the electricity market, based on the 1970 Turkish Electricity Cooperation Law (no. 1312).

One may legitimately claim that the main reason for establishing TEK was the absence of an administrative institutional authority in charge of implementing the general investment strategies set by the government and the ministry. This happened within the context of the growing scope of generation, distribution and transmission as well as of the substantial increase in both consumption of and demand for electricity. As part of this project, the generation assets, all public, were handed over to TEK, except for the assets of the Çukurova Elektrik T.A.Ş. and the Kepez ve Antalya Havalisi Elektrik Santralleri T.A.Ş. (Hepbasli 2005). In the 1980s, Turkey's electrical capacity showed a tremendous increase, doubling the existing capacity from 2,235 to 4,988 MW within a decade; TEK was the single central administrative

[15] TEİAŞ, *Short History of Electrical Energy Development in Turkey and Some Statistical Figures*.

authority in charge of regulating the production, distribution, transmission, and consumption of electricity.

The Initial Liberalization and Decentralization Period: 1980-2000

Following the political context of the 1980s and the general wave of liberalization that dominated all spheres and industries in Turkey, the government and the Ministry of Energy and Natural Resources started to promote an alternative route for the development of the Turkish electricity industry, in almost complete opposition to the strategies that had been pursued in the preceding decades. The government pursued policies that gave incentives to the private sector for investing in the electricity industry.

In 1984, TEK's monopoly was further diminished based on the Law on Respecting Authorization to Institutions other than the TEK for Generation Transmission, Distribution and Trade of Electricity (no. 3096), dated 19 November 1984. The Law (1984) entitled the private sector to intervene in the generation, transmission, and distribution of electricity, while redefining TEK as a state-owned enterprise. The first step that the government took was to pass the remaining assets from the municipalities to TEK. Although this action seems contrary to decentralization, its aim was to centralize the industry so as to facilitate an infrastructure for private companies (Hepbasli 2005). The second step proves this argument, since the legislative framework provided the private sector with the right to build power plants and sell the electricity produced to TEK, a right that previously had been under TEK's monopoly.

The 1984 law can be identified as a mile-stone in the liberalization of the market, since for the first time it opened up all of its stages to the infiltration of the private sector. The private sector infiltrated the administrative spheres of the Turkish electricity industry as a result of the law amendments that changed the regulatory framework of the Turkish electricity market and as a result of the supplementary incentives provided by the government. For the first time in the history of the Turkish Republic, the private sector was allowed and encouraged to build and administer electricity generation, transmission, and distribution systems.

One of the major encouragements was the Build, Operate and Transfer (BOT) model introduced with the 1984 law, which aimed at providing incentives for the private sector to invest in electricity plants that would be built and operated for several years and then eventually sold to the state (at first the limit was up to 99 years, later on decreased to 49). Crucial to note here is that the incentive provided was not only the state's buy-out of these plants, but also the right to sell the electricity produced to the national grid via the state-owned electricity authority.

The reflection of the BOT model in the distribution stage manifested itself in the Transferring of Operation Rights (TOR) model, put in practice in 1990. The idea was to grant private investors the exclusive right to operate in one defined distribution area for thirty years. The private companies would participate in the tender with two prices, one for the fixed cost of this transfer and the second for the cost-based electricity distribution tariff. The private company gaining the right of distribution would also be responsible for the electricity losses to be defined in accordance with international standards; the company would benefit if the electricity loss was below this limit, and lose if it was above. In 1996, the country was divided

into 29 distribution areas and the transfer of distribution rights to private companies initiated (Ozkivrak 2005).

Another crucial incentive was the introduction of the autoproduction system under the same law. Autoproducers can be defined as private firms that generate electricity primarily for their own needs and operate in parallel to the transmission and/or distribution system. Furthermore, autoproducer groups can be defined as those private firms that generate electricity primarily for the needs of their affiliates. The autoproduction system gave these small- and middle-scale producers the right to generate electricity as an input into their primary activity and, most importantly, the right to sell any excess to the system.

Finally, the most important incentive was making available the financial support required for these investments. In March of 1990, the regulatory framework introduced the electrical energy fund, and in 1991 the relevant regulation was issued to provide the investors with the financial support required to build and operate electrical power substations. In 1994, financial support was also granted to BOT projects, in the form of treasury guarantees for fuel and tax exemptions (Cetin and Oguz 2011). The government purchased a certain quantity of the produced electricity for high prices for the time-span of twenty to thirty years, based on the conditions of each agreement (Ozkivrak 2005).

Between 1988 and 1992, approximately ten private companies were given the right and the necessary incentives to accomplish the generation, transmission, distribution, and trading of electricity along with TEK. This was revolutionary when compared to the regulatory framework that had dominated the previous two decades. The result of this government project manifested itself in the increase of installed capacity, total electricity production, consumption, and electrification percentages

over the following years, due to the improved conditions that the regulatory framework provided to market actors.

Decentralization was further consolidated with the Decision of the Council of Ministers (no. 93/4789), dated 12 August 1993, which was issued based on Law Decree no, 233. This decree divided TEK into two separate, state-owned enterprises: the Turkish Electricity Generation Transmission Corporation (*Türkiye Elektrik Üretim İletim Anonim Şirketi*, TEAŞ) and the Turkish Electricity Distribution Company (*Türkiye Elektrik Dağıtım Anonim Şirketi*, TEDAŞ), both beginning operations in 1994 (Ozkivrak 2005). With this separation, distribution activities were taken away from the other stages of the electricity market and would be operated accordingly. The main purpose of this separation was to render the distribution sector fully available for privatization. The fact that the distribution sector is the only private stage of the electricity market as of 2013 proves this claim's validity.

The government further reinforced the institutional establishment of market liberalization and centralization in the second half of the 1990s, via regulations that made the application of the issued laws possible. Regulation no. 85/9799 in 1995 consolidated the authorization of autoproduction owners, both individuals and institutions. Regulation no. 96/9670, published in 1996, further outlined the practical application of the autoproduction system, by clarifying issues such as authorization criteria, over-production and its selling price, and the transmission and distribution cost of produced energy. The Law on the Construction, Management and Sales of Electricity Generated in Built Operate Systems (no. 4283), issued in 1997, incorporated the BOT system; in this system, the private builder company owns the electricity production plant and can sell the produced energy to both an end-user or

the state-owned electricity authority, as in the BOT system (Ozturk, Yilanci and Atalay 2007).

However, the openings in the legal regulations were not always immediately followed due to the existing limitations of previously established regulations. For example, even though Law no. 3096 (1984) authorized the private sector to build electricity production plants in 1984, the first generation project could be initiated only in 1996. Özkıvrak has identified the main reason for this delay in the contradiction between Law no. 3096 (1984) and the Constitution of Turkish Republic, which established electricity as a public good. When a commodity or service is identified as a public good under the constitution, it has to be regulated under the public law, which does not grant the investor the right to apply for an international arbitration of disputes, thus contradicting Law no. 3096 (1984) which allows the application of private law to BOT projects (Ozkivrak 2005). The tension between the two different spheres of the regulatory framework illustrates that there existed resistance during the marketization process, even from the preceding establishment of the same mechanism; hence, negotiation was needed. Additionally, the process for applying for and building BOT projects required approval from many different public entities, such as the Ministry of Energy and Natural Resources, the State Planning Organization, and the administrative high court. This ensued considerable bureaucracy and long periods of waiting time, which in turn further diminished the conditions encouraging BOT projects. Nevertheless, because of strident development, towards the end of the 1990s the total installed electricity capacity amounted to 26,116 MW (19 percent furnished by private investment), and the gross production totaled 116,439.9 GW (21 percent by private investments).[16]

[16] TEİAŞ, *Short History of Electrical Energy Development in Turkey and Some Statistical Figures*.

The First Reform Period, 2001 to 2013: The Legal Infrastructure of the Current Electricity Market

The EML (no. 4628), dated 3 March 2001, marks the beginning of the Turkish electricity market's reform period. (The EML no. 4628 later became the Law on the Organization and Duties of the Energy Market Regulatory Authority with the new EML no. 6446, issued in March of 2013.) The purpose of the EML no. 4628, as stated in the law itself, is as follows:

> To ensure the development of a financially sound and transparent electricity market that will operate in a competitive environment under provisions of civil law and the delivery of sufficient, good-quality, low-cost and environment-friendly electricity to consumers and to ensure the autonomous regulation and supervision of this market.[17]

Correspondingly, the main objectives of the law are to foster competition in order to increase efficiency and decrease costs in the electricity sector, to facilitate private participation and privatization in general, to ensure stability in the energy supply, to establish cost-reflective prices so as to make the sector's financially viable, to guarantee stability in wholesale prices until wholesale prices can be determined entirely in a competitive environment, and ultimately to create a liberal electricity market.[18]

The scope of the EML no. 4628 (2001), as per Article 1:

> Covers the generation, transmission, distribution, wholesale retailing and retailing services, import, and export of electricity; the rights and obligations of all real persons and legal entities directly involved in these activities; the establishment of the Energy Market Regulatory Authority and the determination of the operating principles of this authority; and the methods to

[17] Electricity Market Law no. 4628 (2001), Article 1.

[18] Electricity Market Law no. 4628 (2001).

be employed for the privatization of electricity generation and distribution assets.[19]

In more concrete terms, the EML (2001) consisted mainly of two parts: the first includes the general provisions, whereas the second provides the regulation for the electrical market's regulatory council and related provisions. The first part is further composed of two sections: the first provides the purpose, scope and definitions of the law, and the second covers electricity market activities and license issues. The second part of the law includes four sections: the responsibilities and rights of the electricity markets regulatory authority and the council, sanctions, tariffs, support for consumers, privatization provisions, and provisional clauses. When evaluating these objectives and the scope of the law in respect to the existing system, tone may claim that the 2001 EML did initiate a major reform and substantial reconstruction period.

The 2001 EML established the Electricity Market Regulatory Authority as independent regulator of the market. Later on, with the amendment made by the Law on the Natural Gas Market and Amendment to the Law on the Electricity Market (no. 4646, 2001), its name became the Energy Market Regulatory Authority (EMRA). This is purportedly an independent, administratively and financially autonomous public institution. Its headquarters are located in Ankara, and it is connected to the Ministry of Energy and Natural Resources. EMRA is authorized to enforce the Law on the Organization and Duties of the Energy Market Regulatory Authority (no. 4628, dated 3 March 2001), the Natural Gas Market Law (no. 4646, dated 2 May 2001), the Petroleum Market Law (no. 5015, dated 4 December 2003), and the EML (no. 6446, dated 30 March 2013), as per the current legislation. The members of the board assumed their duty on 19 November 2001.[20]

[19] Electricity Market Law no. 4628 (2001), Article 1.

[20] EMRA, http://www.epdk.gov.tr. Retrieved 17 August 2012.

In terms of the electricity market, the scope of EMRA, as stated by the authority itself, covers the activities, obligations and rights of all real persons and legal entities arising from these activities; the monitoring of their market performance; the definition, amendment, implementation and supervision of performance standards and customer service regulations; and the determination of tariff principles for non-eligible consumers and price-setting mechanisms in the electricity market.[21] Its duties concerning the electricity market, correspondingly, include the evaluation and issuance of the necessary licenses at the stages of generation and transmission; following the performance of all actors in the market; the preparation and publication of secondary legislation concerning the market; the mediation of disputes between parties; the approval of and revisions to the demand forecasts prepared by the distribution companies and finalized by TEİAŞ; the definition and enforcement of security standards and requirements for generation, transmission, and distribution companies as well as autoproducers and autoproducer groups; the examination and approval of the wholesale price, transmission, distribution and retail tariffs set by the Turkish Electricity Trading and Contracting Corporation (*Türkiye Elektrik Ticaret ve Taahhüt Anonim Şirketi*, TETAŞ); determining basic principles regarding transmission, distribution, wholesale and retail pricing and, if necessary, revising these prices in accordance with the terms and conditions of the respective licenses; and the imposition of administrative fines and license revocation in case of non-compliance with the provisions of the 2001 EML and the regulations issued by the board.[22]

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[21] EMRA, *2009 Annual Report*.

[22] EMRA, *2003 Electricity Market Implementation Paper*.

The board is defined as an independent sphere in terms of its income, its authority over licensing and decisions about market-related activities; there is no parliamentary committee to oversee its activities. Thus, one may argue that EMRA has administrative and financial autonomy. It does not receive any funding from the state budget, but instead independent revenues from electricity and gas licensing fees as well as surcharges on the third-party access tariff (Erdogdu 2007a).

Within this context and based on the defined role of EMRA, the Ministry of Energy and Natural Resources is now focused on the development and enforcement of general energy policies, privatization proposals, import and export policies, and the promotion of supply security through subsidies and incentives, rather than on the everyday regulation of electricity production and consumption. The state, however, continues to play a role in the transmission and the balancing and settlement mechanism. Yet, in the newly opened market segments, the state's role has shrunk to a regulatory role undertaken by the EMRA. The main task of the state is to control the electricity market operations with the ultimate aim of ensuring a free and liberal working of the market.

The 2001 EML aimed at creating a liberal market by restructuring the publicly owned monopoly system in the electricity market. The law's objective of unbundling the electricity sector became reality via the vertical disintegration of the market in terms of generation, transmission, distribution, and retail sale activities. The Decree of the Council of Ministers no. 2001/2026, dated 5 February 2001, regulated the restructuring of TEAŞ in order to form three state-owned public enterprises—TEİAŞ, EÜAŞ, and TETAŞ—which were in charge of transmission,

generation, and trading activities, respectively.[23] The 2001 EML furthered this disintegration by requiring separate licenses and accounts for each of these activities.

As one of the most important objectives of the EML, it introduced regulations that would establish competition in non-monopoly segments—namely, the generation, distribution and retail sale stages. The inclusion of competitive private companies into these sectors became possible through the licensing system to be administered by EMRA. All potential private participants in the system had to receive licenses from the relevant authority. Licenses had to include the details of the activity in terms of price-setting methods, the length of the license term, license cancellation conditions, dispute resolution mechanisms, terms and conditions that could cause invalidation, and the compensation for losses that could arise due to interruptions in supply (Ozkivrak 2005). These licenses would be granted for the generation, distribution, wholesale, retail sale and service, as well as import-export activities in the electricity market.

The first step towards the implementation of the EML (2001) occurred with the introduction of the draft of the Energy Market Licensing Regulation and the Electricity Market Tariff Regulation in 2002. With these documents, EMRA announced a four-stage approach to establish the desired competitive electricity market. These stages can be summarized as follows: (1) granting licenses to firms in the electricity and natural gas markets; (2) granting eligible industrial users the right to determine their electricity provider; (3) founding the Market Financial Reconciliation Center for balancing and settlements related to the market activities; and (4) making the established Market Financial Reconciliation Center fully operational.

[23] TEİAŞ, *Short History of Electrical Energy Development in Turkey and Some Statistical Figures*.

The implementation of the 2001 EML occurred with the regulations issued in 2002 and 2003. These regulations include: the Electricity Market Licensing Regulation (August 2002), the Electricity Market Tariffs Regulation (August 2002), the Electricity Market License Fees (August 2002), the Eligible Consumer Regulation (September 2002), the Import and Export Regulation (September 2002), the Customer Service Regulation (September 2002), the Communiqué Regarding Wind and Solar Measurements (October 2002), the Communiqué Regarding Meters (December 2002), the Grid Code (January 2003), the Distribution Code (February 2003), the Communiqué Regarding Regulatory Accounting Guidelines (January 2003), the Communiqué Regarding Settlement (March 2003), the Communiqué Regarding the Connecting and Use of the System (March 2003), and the Electricity Market Import and Export Regulation (April 2003).

Together, these regulations and communiqués outlined the market activities that would contribute to the 2001 EML's main aim to establish a competitive and liberal electricity market. The Electricity Market Implementation Manual issued by EMRA in 2003 further consolidated the practical application of the law. The 2001 EML promoted a market model that could only be realized via large-scale privatization and the establishment of a liberally working market as defined by the neo-liberal economic school. The Electricity Market Implementation Manual's most important task was to provide easily applicable guidelines and details to realize these steps and to create a market model based on bilateral contracts between market participants (Hepbasli 2005).

The realization of price within this new context was defined via tariffs (TETAŞ's wholesale price, transmission, distribution, and retail tariffs) to be imposed by EMRA. The legal infrastructure regulating the tariff determination rested

on the Electricity Market Tariffs Regulation. In this legal framework, transmission tariffs, distribution tariffs, the retail sale of electricity, and wholesale prices are regulated according to different principles, such as a revenue cap (setting prices by limiting the total revenue for a given period), project-based pricing, and cost-based pricing. The transmission activities are of two kinds, and each activity's tariff is determined separately; while the connection charge is defined on a project basis, the use of the system price is determined via the revenue cap method. Similarly, in terms of distribution activities, the system operation price is determined via the revenue cap method, whereas the connection charge is determined via project-based pricing and standard connection charge methods. In terms of the retail service price, the use of the system price is determined via hybrid methods, but the retail service price is determined via the price cap method. The average retail price is also determined via the price cap method. Finally, the average wholesale (TETAŞ) price is determined with the help of the cost-based method (Bagdadioglu and Ozyakmaz 2009). Third-party access to the established electricity transmission grids and distribution networks, together with the relevant connection fees and system usage tariffs, are also subject to EMRA regulations due to the provisions of the 2001 EML.

As discussed by Bağdadioğlu and Özyakmaz, one can legitimately define the market structure newly established by the 2001 EML as a bilateral contracting market complemented by a balancing and settlement mechanism. This balancing and settlement market, aimed to complement the underpinnings of a free market, is managed by TEİAŞ. Electricity generation would be sold to retailers, wholesalers and consumers directly or via the spot market. The balancing market is compulsory for all the generators generating over 20 MW, and they are obliged to submit bids

and offers to TEİAŞ within this system. Since TEİAŞ is the holder of all transmission assets, it serves as transmission system operator and market operator.

The balancing system has two stages as defined by the regulation: at the first stage, TEİAŞ performs a day-ahead scheduling based on the given bid and offer prices. The hourly prices for the next day are then calculated by TEİAŞ, and each generator receives the system price for meeting the demand forecast. At the second stage, which takes part within the same day, TEİAŞ accepts real-time bids and offers to meet the fluctuations in supply and demand. The real-time offers and bids are paid at their offer price. Following the real-time bids, trades are finally settled by TEİAŞ using system marginal prices, bid prices and system imbalance prices.[24] These settlement calculations, central to the working of the envisioned system, are made each month, and market participants are either invoiced or receive payment accordingly.

As part of the reform process, and particularly of the opening of the market, in March 2003 eligible consumers were defined as being free to choose their suppliers. Initially, the eligible consumer was defined as those agents that are directly connected to the transmission grid or with an annual consumption exceeding 9 GWh. As per the current legislation, these consumers do not have to buy electricity from their regional supply company, but may purchase directly from a wholesale company, an independent retail supply company, or an independent generator. Non-eligible consumers, however, must purchase their electricity from the distribution retail supply company in their region. EMRA, as the regulatory authority, has the right to lower this threshold over the years, with the ultimate objective of rendering all customers free to choose their suppliers. Even though full eligibility was expected

[24] The system imbalance price is defined as the weighted average of the system marginal price, calculated for every hour within the particular settlement period. The periods consist of day (06:00-17:00), peak (17:00-22:00), and night (22:00-06:00).

to happen in 2011, the latest decision by EMRA reduced the eligibility threshold to annual consumption of 5,000 kWh and announced 2015 as date for full eligibility.[25]

Within the legal framework of the newly established system, which restructures the entire electricity sector from production to consumption, each stage's activities are planned and regulated separately. The generation activities are defined as the responsibility of the state-owned Electricity Generation Corporation (*Elektrik Üretim Anonim Şirketi*, EÜAŞ), EÜAŞ affiliates, autoproducers, and private generation companies. Electricity generator companies with generator licenses have the right to sell the generated output or capacity to wholesale license holders, retail license holders, and eligible consumers through bilateral contracts. The transmission activity of the generated electricity is defined as the responsibility of TEİAŞ only, as both transmission system operator and market operator. The distribution of the generated and transmitted electricity falls into the responsibility of TEDAŞ, TEDAŞ affiliates, and private sector companies that hold the distribution licenses in their regions. In the final stage—that is, the trading of the generated, transmitted and distributed electricity—TETAŞ and private sector companies hold the right to conduct wholesale activity, whereas the retail and distribution companies holding retail licenses may conduct retail activities.[26] TETAŞ is also the holder of the existing Build-Operate-Own (BOO), BOT and TOR contracts that include long-term power purchase agreements with Treasury guaranties. This stage lies at the heart of the market maintenance, since it not only completes the commodity's life cycle with the consumption stage, but it also has implications for the realization of price with bilateral contracts where the main actors encounter each other, through the

[25] EMRA's Decision on Electricity Market Eligible Consumer Regulation, dated 24 January 2013, www.epdk.gov.tr. Retrieved19 February 2013.

[26] EMRA, *2003 Electricity Market Implementation Paper*.

generation companies making contracts with wholesale trade companies (TETAŞ and new market entrants), distribution companies, independent retail supply companies, and even direct (eligible) consumers.

Privatization is a major element of any liberal reform process. The new regime introduces direct privatization in generation and distribution activities, as discussed in this section. It is important to note that the transmission assets remain under government ownership and public administration. The 2001 EML was reinforced by the Strategy Paper Concerning Electricity Market Reform and Privatization, issued by the High Planning Council of Turkey in March 2004, providing the procedures for the privatization of distribution and generation assets and power plants. The strategy paper announced that privatization at the distribution stage would start in 2005 and be completed in 2006. Following the completion of the distribution assets, privatization was announced to start in mid-2006 for the generation stage. In order to enhance the competition, the strategy planned to bring all generation assets together into several groups composed of different types of assets. The strategy paper further defined those assets and spheres that would not be privatized in the first stage, as the 17 key hydropower plants (with a total capacity of 7,055 MW) and TEİAŞ would remain under state ownership. However, the privatization of the first stage, the distribution activities, had been completed only in the end of 2013; the reasons behind this will receive discussion in the second section of this chapter.

When reviewing the achievements of the EML (2001) together with EMRA's work and related regulations, one can see that EMRA was very active in the initial years of its establishment. In 2003, EMRA started to grant licenses for the first time. The private sector showed substantial interest in acquiring these licenses, so that the

investment license applications for electricity generation reached 8,000 MW in total at the end of that year. EMRA submitted licenses corresponding to 3,400 MW in total for examination and granted licenses amounting to a capacity of 1,000 MW; yet, at the same time it announced the decision on the adoption of an installed power of 700 MW. Upon further review of the developments in numbers, one can see that EMRA granted 161 licenses for electricity production, 132 for autoproducers, 59 for autoproducer groups and 5 wholesale licenses within 2003. Of these 161 licenses, 36 were granted to the private sector, while the remaining 125 were related to the plants in operation or under construction by EÜAŞ.

The distribution of the 36 power plants installed by the private sector can be grouped according to their primary energy sources as follows: 6 plants based on natural gas, 8 wind plants, 11 hydropower plants, and 11 oil-fuel, naphtha, biogas and geothermal plants (Hepbasli 2005). The tariff approval procedure was also exercised for the first time in 2003. The approved tariffs were the tariff determined by TETAŞ, the public wholesale company, which took over the existing contracts, the transmission system tariffs, the use of operating and transmission system tariffs, and the distribution and retail sale tariffs of TEDAŞ.

The period witnessed substantial regulatory developments in the renewable electricity sector as well. In 2005, the Law on the Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy (no. 5436) was issued. It was a mile-stone in the establishment of the regulatory framework to fuel the development of renewable electricity production in the Turkish electricity market. However, the lack of secondary legislation and practical guidelines for investors resulted in unrealized potential of renewable electricity until the beginning of the 2010s. The Law on Amendments to the Law on the Utilization of Renewable Energy

Resources for the Purpose of Generating Electrical Energy (no. 6094) was issued on 29 December 2010 in order to render the existing regulation applicable. This new law introduced applicable procedures and a subsidy table for renewable electricity plants. I will further elaborate on the outcomes of this process below, in the section analyzing the establishment and workings of the renewable electricity market; however, one may already conclude here that the regulatory framework of the renewable electricity market was outlined also in this period.

As of 2013, EMRA continues to approve the tariffs to be implemented in the electricity market. The privatization of the distribution sector has been finalized on paper, as the President of EMRA's Regulatory Board announced that the transfer of the distribution contracts will be completed soon. The production sector has experienced accelerated privatization, and the private sector has infiltrated retail and wholesale electricity sales, while transmission activities still remain under public ownership and administration.

The Accelerated Reform Period, March 2013 to Present: Sketching the Legal Framework of the Current Electricity Market

The Turkish government's major aim is to establish Turkey as one of the biggest ten economies in the world, with a corresponding installed electricity capacity need of a minimum of 100,000 MW (as opposed to the current capacity of 59,000 MW), and a corresponding investment need of nearly 128 billion USD (9 billion for natural gas, 36 for hydroelectric power, 5 for coal, 19 for wind, 21 for nuclear, and 18 for distribution and transmission). Moreover, the government aims to become an energy trading hub in the region, with the east offering generation and the west

consumption.[27] Hence, the government intends to provide incentives to private investors via an accelerated liberalization of the Turkish electricity market and has consequently issued the new EML (no. 6446) on 30 March 2013.

Even though the related regulations that will make the new EML applicable have not been fully issued as of February 2014, an analysis of the law's provisions provides valuable insights into the legal framework it establishes, along with the corresponding conditions within which the market actors will operate within the market. The EML no. 6446 (2013) defines its aim in the following manner:

> To ensure the development of a financially sound and transparent electricity market *operating* [as opposed to the phrase "that will operate," used in the 2001 EML; emphasis mine] in a competitive environment under the provisions of civil law, and the delivery of sufficient, good-quality, low-cost and environment-friendly electricity to consumers and to guarantee the exercise of autonomous regulation and supervision of this market.[28]

The aim of the new EML (2013) is very similar to the stated aim of the previous EML (2001), with only one change. The 2001 EML defined the desired market structure as a future point to establish, whereas the 2013 EML defines the desired market structure as at least partly established and currently operating. Thus, it is legitimate to contend that the 2013 EML marks the beginning of a deepened and accelerated liberalization period.

The 2013 EML has six sections in which the generation, transmission, distribution, wholesale, retailing and retailing services, import and export of electricity, market operation activities, as well as the rights and obligations of all real persons and legal entities related to these activities are defined. The first section includes the aim, scope and definitions of the law, while the second defines the electricity market activities and licenses. The third outlines the governance and

[27] Speech given by Taner Yıldız, the Minister of Energy and Natural Resources, given at the 19th International Energy and Environment Fair and Conference, 24 April 2013.

[28] Electricity Market Law no. 6446 (2013), Article 1.

sanctions; the fourth the tariffs, consumer supports, privatization, the nationalization of lands needed for electricity investments, and security of supply; and the fifth other provisions such as taxes, technical issues, regulations, and the evaluation of applications. The last section defines transitional provisions.

Before further analyzing the 2013 EML, it is important to recall that the previous EML was not abrogated with the enactment of the new one, but that its title was changed to "The Law on the Organization and Duties of the Energy Market Regulatory Authority" and that it was partially amended. Accordingly, the provisions regarding the organization and duties of EMRA remained in effect, as under the 2001 EML.

In the 2013 EML, the licenses and relevant rules are based on the different types of electricity market activities, meaning that the law is structured around types of activities rather than types of licenses. Those electricity market activities that require a license are listed under Section 2, Article 4, of the new EML, as generation, transmission, distribution, wholesale, retail sale, market operation, and export and import activities. The license types encompass the different market activities in the Turkish electricity market—namely, the production, autoproduction, autoproduction groups, distribution (including retail sales activities), wholesale distribution to organized industrial estates(meaning, the trading activities of supply companies), the production, transmission, and market operation activities of organized industrial estates, and the corresponding licenses.

All these licenses are acquired by applying to EMRA and undergoing an evaluation process. There are license fees that range from 5,000 to 250,000 TL for production licenses based on their capacity, 0.003 TL/kWh for transmission licenses, fees ranging from 25,000 to 750,000 TL for distribution licenses based on the energy

amount to be distributed, a fee of 275,000 TL for electricity wholesale licenses, 200,000 TL for electricity retail sale licenses (companies with a distribution license can acquire this license with 10 percent of the distribution license fee), and fees between 5,000 and 250,000 TL for organized industrial estate production and distribution licenses based on production/distribution capacity. Additionally, there are annual license fees that are charged to the license holder, based on their transaction volume measured in kWh; these range from 1 to 3 percent of the initial license acquisition fee.[29]

As an important contrast to the previous one, the new EML (2013) does not mention retail sale service and trade activities as separate types of market activities, but introduces market operation as a new type of market activity that is subject to a market operation license to be regulated and governed. Market operation activity is defined as the operation of organized wholesale power markets and the financial settlements of the transactions conducted in these markets. Organized wholesale markets, in turn, are defined as: (1) day-ahead markets and intra-day markets, where electricity, capacity, and retail sale activities are conducted and operated by an intermediary legal entity holding a market operation license, the Energy Markets Operation Corporation (*Enerji Piyasaları İşletme Anonim Şirketi*, EPİAŞ); (2) markets with standardized electricity contracts (*i.e.*, capital market instruments) and derivative transactions where derivatives based on electricity and/or capacity are traded and operated by the Istanbul Exchange (*Borsa İstanbul Anonim Şirketi*, *Borsa İstanbul* for short); and (3) power markets such as the balancing power market and the ancillary services market, organized and operated by TEİAŞ. Accordingly, the new EML refers to three market operators: EPİAŞ, *Borsa İstanbul*, and TEİAŞ. At

[29] EMRA's Decision on Electricity Market License Fees, dated 15 August 2012, www.epdk.gov.tr. Retrieved 11 February 2013.

this point, the most crucial amendment to the law can be identified as the designation of multiple market operators for spot transactions, derivative transactions, and settlement transactions of electricity.

There is one important existing electricity market trade form that is excluded from the new EML, yet must be mentioned here since its exclusion is crucial for market-making. Over the counter markets (OTC), referring to bilateral trade agreements, are excluded from the definition of the organized wholesale markets in the law, even though its initial version submitted to the assembly included OTCs in this definition. OTCs faced strong opposition in the assembly, due to the claim that the definition has never been clarified in Turkish legislation. However, as will be illustrated in the second section of this chapter, OTCs constitute an important trade form in the electricity market and can be legalized by referring to the fact that both the 2001 and the 2013 EML recognize electricity trade based on bilateral agreements. Still, the exclusion of OTCs from the 2013 EML has resulted in the relative disadvantage of this trade form. This is because the law provides a stamp duty exemption for transactions made within organized wholesale markets, and when OTCs are not included in this definition, they remain subject to stamp duty. As will be discussed below, this causes bilateral contracts to remain unregistered, thus unrecorded and informal, which in turn contributes to confidentiality of market information, as envisaged to be transparent by the 2013 EML.

At the stage of production, new legal entities are entitled to produce electricity both with and without licenses according to the 2013 EML. Organized industrial estates as legal entities have the right to produce electricity along with public and private production companies, but with the additional right to produce and distribute electricity within defined limits, without the need to establish a legal

corporation, and the right to connect directly to the transmission system. The existing autoproducers are therefore transformed into producers as well as sellers of electricity via the transformation of autoproduction licenses to production licenses. Moreover, autoproducers have the right to sell a maximum of 20 percent of the produced electricity in the electricity markets (although the maximum limit of 20 percent can be increased on grounds of the national security of supply).

The new EML has increased the investment possibilities and the sphere of non-licensed electricity production activities with the ultimate aim of increasing Turkey's installed electricity capacity. The law has granted the right to conduct production activities without licenses to the following entities: (1) emergency groups and generation facilities which are not connected to the transmission and distribution systems; (2) generation facilities that are based on renewable energy sources, with a maximum installed capacity of 1 MW (although the Council of Ministers has the right to increase this limit to 5 MW); (3) municipal solid waste facilities and generation facilities established for the disposal of mud from treatment plants; (4) micro co-generation facilities and co-generation facilities that meet the efficiency figures to be determined by the ministry and that fall within the categories determined by EMRA; and (5) renewable generation facilities that consume all the electricity that they generate, without feeding electricity into the transmission or distribution systems (no production limit).

The 2013 EML has provided substantial incentives to private investors with the introduction of a pre-licensing procedure for electricity generation activities and the general relaxation of authorization and approval requirements. In this procedure, EMRA provides a pre-license to the investor for 24 months in order to assist the investor in acquiring the necessary documentation (such as grants, authorizations,

and permits), as well as in acquiring the property or right of using the land for the electricity production plant. Furthermore, the new EML has relaxed the authorization and approval requirements in the establishment of a production plant, by recognizing a two-year period after licensing. Within this period the investor may complete the required official documentation and permits while at the same time conducting production activities (the two-year period has also been extended by a provisional clause in the law until 31 December 2018).

Another exemption from permits applies to EÜAŞ, its affiliates (including in the case of their privatization), and its administrative units in the form of a grace period that enables facilities to complete the necessary environmental permit requirements until 31 December 2018, while at the same time conducting their activities. The law contends that no monetary or administrative penalty may be applicable to these companies during this period. This exemption has attracted substantial attention, since it *de facto* grants the sector the right to overrule environmental protection regulations.

The 2013 EML has further relaxed the use and transformation of agricultural lands with the aim of establishing electricity production plants. Agricultural lands that are also open to non-agricultural use may be utilized for electricity production purposes, under the condition of presenting a land protection project and the relevant fees; moreover, the legal status of these lands can be transformed permanently in accordance with the decision of the investor. Furthermore, the 2013 EML provides incentives by allocating the use of state properties for renewable energy facilities and generation facilities exploiting mines and mineral resources. According to the provisions of the law, if any state property is used for generating electricity from renewable resources or mines and mineral resources, the Ministry of Environment

and Forestry or the Ministry of Finance shall permit the use of such properties for the facility and the access paths and energy transmission grids up to the connection point of the grid in return for a certain fee.

Since the new EML aims to realize the necessary investments via private financing, one of the most crucial provisions concerns financial incentives and encouragements. Accordingly, a discount of 85 percent shall be applied to fees for the permission, lease, right of easement and right of usage for the first ten years of the investment and operation period for facilities that are to start operating before the end of 2020. The law further introduces incentives for generation facilities and distribution companies by granting a 50-percent discount on the transmission system utilization fee for those legal entities that own licensed production plants to come into operation for the first time before 31 December 2015. The law further provides financial incentives for non-import coal plants, similar to the incentives for renewable energy resources, for five years (this period can be extended by decree of the Council of Ministers). Moreover, earnings resulting from transfers, mergers, and spin-offs to be executed for the privatization of the distribution companies and generation facilities will be exempt from corporate income tax until 31 December 2023 (this period can also be extended by decree of the Council of Ministers).

Production companies with production licenses will have the right to participate in other market activities as well, including the supply and sale of electricity other than their own production. The production company may purchase electricity from organized wholesale electricity markets to fulfill their sales contract commitments, trade both electricity capacity and energy in these markets, and sell the produced and/or purchased electricity capacity and energy to supply companies,

eligible consumers, and consumers that are provided with direct transmission lines from the production plant.

According to the law, the license-granting procedure will be in compliance with market competition rules, and EMRA will be in charge of acting with care and diligence in granting all types of licenses so as to protect the competitive market environment. This requirement is also reflected in the production stage, since the new EML contends that the total installed capacity to be owned and/or controlled by a public or private company shall not exceed 20 percent of total installed capacity calculated in the preceding year.

The 2013 EML defines new and existing actors and their rights and responsibilities at the stage of transmission and trading of the produced electricity and installed capacity: it merges wholesale and retail sale activities into one license type, the so-called "supply license." (The existing wholesale and retail sale license holders will be *ex officio* granted with supply license without prejudice under the existing licenses.) The law regulates and extends the rights and responsibilities of the supply companies as wholesale and retail sale activities, as well as import and export activities without any regional restriction, but with approval by EMRA.

The new EML has introduced the term "authorized supplier" to the electricity market. Retail and distribution activities had previously been provided under the umbrella of one legal entity, the distribution company. Upon the separation of the retail from the distribution arm of distribution companies as of 1 January 2013, retail companies were recently established to conduct these separated activities and correspondingly defined as "authorized suppliers." Under the new law, authorized suppliers are entitled to sell electricity to eligible customers and non-eligible

consumers across Turkey, as well as to customers of last resort as "last-resort supplier" in the relevant distribution region.

It is important to note that suppliers that currently hold a wholesale license are granted the right to sell electricity to eligible consumers only. Thus, supplier companies and authorized supplier companies will not have equal rights, unless the eligible consumer limit is decreased to 0 kWh (a limit that EMRA hopes to achieve by 2015). The aim of this regulation, according to Arkın Akbay, the Director of the Electricity and Gas Group of Turcas Energy Holding Inc., is to protect the competition in the market, by eliminating distribution companies with very high market shares and preventing them to manipulate the market with their high transaction volume. The distribution companies, in this new system, are defined as grid operators only. However, the majority of the interviewees from the distribution sector reported that they will also acquire a supply license and continue their operations in the market via these licenses. Thus, whether this regulation will reach its aim remains unclear, and my research findings are not optimistic given that the regulation will not be able to change much in terms of operation. The same companies will continue to conduct the same operations, only under different yet combined license types.

The same competition protection clause equally applies to supply companies. According to the new EML, the total sales/purchase amount of a company shall not exceed 20 percent of the total produced electricity output in Turkey as calculated in the preceding year (TETAŞ is excluded from this restriction). TETAŞ will be responsible for managing the existing energy sales contracts, have the right to conclude new sales contracts, and sign international energy import and export contracts within the framework of international agreements.

The most important introduction of the new EML can be identified as the establishment of EPİAŞ. According to the law, EPİAŞ's organizational structure and operation principles will be fully established within six months from the law's issue date of 2013 via secondary legislation; then, EPİAŞ will be in charge of the management of the Turkish electricity market. According to the envisioned partnership structure, a maximum of 15 percent of the company shares will be held by public companies (excluding the Istanbul Stock Exchange Market [*İstanbul Menkul Kıymetler Borsası*]), and other institutions may hold partnership in this structure. The 15-percent limit can be increased to 30 percent by decree of the Council of Ministers. Bora Oruç, the President's Councilor of the Capital Markets Board of Turkey, reminds that, according to the Law on Government Business Enterprises, public institutions can hold 15-percent ownership in such organizations; thus, he legitimately claims that, with this limitation, TEİAŞ is considered a public partner of this company.

Furthermore, shareholder institutions, state-owned institutions, and *Borsa İstanbul* will each be represented in the management of EPİAŞ. Since the new EML refers to "institutions" as shareholders of EPİAŞ without specifically stating their qualifications, one can conclude that the law suggests that private sector companies can also be shareholders in EPİAŞ. This condition is extremely important and must be strongly emphasized, because for the first time the private sector is afforded the possibility to infiltrate the operation and maintenance of the market as an administrative agent. Moreover, this right is very much celebrated by the private sector and all the company executives with whom I have conducted interviews. Without exception, all of them expressed their interest in this partnership, stating that

they would most definitely hold a partnership in EPİAŞ if the secondary legislation would follow the opened path.

EPİAŞ will coordinate the management activities of the organized wholesale electricity markets, except for those markets that are managed by *Borsa İstanbul* and TEİAŞ. Thus, EPİAŞ is designed as market operator for the day-ahead and intra-day markets where wholesale electricity, electricity capacity, and retail electricity sale activities are conducted. Furthermore, EPİAŞ will not only manage the existing wholesale electricity markets, but also conduct work to establish new electricity markets and report to EMRA.

One other very important role of EPİAŞ concerns the financial settlements in the market. According to the new EML, the financial settlement of transactions made in organized wholesale markets, including the markets operated by TEİAŞ (such as the balancing power market and the ancillary services market), will be realized by EPİAŞ. The central clearing bank, Takasbank, is still responsible for certain financial transactions, and the details of this responsibility matrix are to be determined by secondary legislation.

There are important clauses in the new EML as to the export and import of electricity capacity and energy. TEİAŞ is granted the right to establish and manage the international interconnection transmission lines outside of national boundaries. It will have the right to establish and/or hold partnership in international companies and participate in organizations related to the administration of regional electricity markets. Furthermore, TEİAŞ is not defined as the sole agent with the right to operate in international electricity markets. Supply and production license holder companies are also granted the right to participate in international electricity markets via the export and import of electricity capacity as well as energy itself.

The tariff-approving role of EMRA has been consolidated under the new EML. EMRA is still responsible for setting the national tariff and approving the connection, transmission, wholesale, distribution, retail sale, market operation, and last-resort supply tariffs. Tariffs are differentiated according to consumption characteristics: household, industrial, commercial, agricultural, and general lighting tariff. Relevant details will receive more attention in the second section of this chapter.

The last-resort supply tariff, a new tariff introduced by the 2013 EML, will apply to eligible consumers that do not purchase their electricity consumption via the market, but continue to purchase via the supply company that holds a license over that area. The law explains that this tariff will be more expensive than the national tariff in order to create incentives for consumers to enter into the "free competitive market." Consumers are further provided incentives to enter the market by exempting them from the electricity loss still compensated by the consumers. EMRA will continue to issue a separate tariff for consumers with consumption below a certain level, based on socio-economic conditions. However, the law also includes that the national tariff and cross-subsidization will continue until 31 December 2015. Another tariff application that will continue until this date is the silent compensation of electricity losses from consumers. According to the law (even though this cost is no longer shown separately in electricity bills so as to reduce consumers' reactions), electricity losses will still be compensated from consumer electricity bills.

At the stage of consumption, the new EML aims to extend the proliferation and action sphere of the consumers not only by providing incentives and infrastructure for the eligible customer system, but also by defining new legal entities as eligible customers. Organized industrial estates as legal entities are defined within

the new law as eligible customers, regardless of their consumption level. The law further defines the possibility of a crucial infrastructural development for the eligible customer system, by introducing the opportunity to allocate private lines in the transmission system between the production plant and the consumer. These allocations will be provided via system control contracts, entered between TEİAŞ and the production company.

The 2013 EML defines the governance, auditing and sanction provisions in its third section. EMRA continues to fulfill its role as regulatory and supervising authority in charge of and responsible for protecting the consumers both directly and indirectly, ensuring the healthy distribution of licenses as well as the coordination of market actors' activities. EMRA has monetary sanction authority for up to 1 million TL and the authority to reimburse the company's non-fulfilled services through directing company gains or assets; it also has administrative sanction authorities such as cancelling granted activity licenses and replacing executive board members. However, the new EML has introduced a major change in that it has handed over the responsibility for auditing distribution companies (the only fully privatized stage in the electricity market) directly to the ministry instead of EMRA. The ministry, in return, has the right to fulfill its responsibility via public companies and institutions. This is a silent, yet very crucial amendment in terms of the relationship between market maintenance and political authority. It shall be emphasized that the transfer of the audit power to the political authority marks not only a reverse breakdown of the liberal market rhetoric, but also an example on the integration of political power into market forces via legal regulations.

There also exist restrictions imposed upon the distribution companies' market share and activities. According to the new EML, a distribution company cannot

engage in any activity other than distribution, or be a direct shareholder of a legal entity engaged in any other market activity. Additionally, as part of the competition rules, the total amount of electricity to be sold by a distribution company or retail sale company cannot exceed 20 percent of the total electricity consumed in the market within the preceding year.

Another important point consists of the liberalization and privatization acts within the 2013 EML, since the private sector demands full liberalization and privatization if it is to undertake the financial investments required in the electricity sector.[30] The new EML draws a general framework and a medium-range goal as well as particular details for this process. The Privatization Board of Turkey will be responsible for the privatization of the ministry's, TEDAŞ's, and EÜAŞ's assets and companies.

Given the theoretical framework of this thesis, one should recall that law-making processes are as crucial as the outcome. EMRA emerges as the secondary law- and regulation-maker, even though it is in fact not a representative authority. As discussed above, EMRA is not composed of elected representatives, but of appointed technocrats. This is extremely problematic since the secondary laws and regulations concerning the electricity market, which directly or indirectly influence every market actor and citizen in Turkey, are not shaped by elected persons. However, none of the market actors are questioning this, and some even welcome it. For example, Nihat Özdemir, the Chairman of Limak Holding, evaluates the new EML and its complimentary legislation as central to the market and argues that their establishment constitutes 80 percent of EMRA's role and 20 percent of the ministry's.

[30] This was a common concern raised in all of the interviews conducted with private sector actors.

Moreover, even though EMRA works to create the perception that the law draft is being discussed by each market segment, my research reveals that the process is open only to certain private investors, whereas civil society organizations and consumers are excluded from the law-making processes. For example, Muharrem Yılmaz, the Chairman of the Turkish Industrialists' and Businessmen's Association, expressed his gratitude to EMRA for the inclusion of the private sector in the law-making processes. Selehattin Hakman, the Head of the Energy Group of Sabancı Holding, supported this claim and contended that there has been substantial development in the electricity market particularly over the last eight years; a leading role in this development is played by the transparency and democratic nature of the processes run by EMRA and MENR, and the private sector's inclusion in these processes.

However, an executive working in an international energy trading company criticized the law-making processes as simply non-transparent, needing no further explanation. Supporting these claims, the general manager of a company operating in the distribution sector, who requested confidentiality, stated:

> The doors are open to few investors only, and these people are already having dinners together, or they have close personal relations. But others, including my company, see the law or regulation drafts only after they are issued, and our comment is requested half-heartedly, without being taken into consideration. What is even more ironic is that the minister talks at conferences to the public that they request all of our participation, and we are put into a position to make a comment knowing that it will never be integrated into the law-making process. This is all about creating the image of a democratic process, whereas in reality it is only a theater on stage. The back stage, however, is a whole different story which I never get to see.

I have personally witnessed these calls from the minister at energy conferences and meetings. At the same time I have witnessed a question addressed to Ahmet Ocak, the Head of EMRA's Electricity Department, after his speech at a conference in 2012, which raises doubts about the sincerity of these calls. A private investor asked

Mr. Ocak about the reason why certain investors are included in the law-making process only after the law draft has been issued. Ocak replied to this investor: "Do not worry, we are thinking for your and on your behalf when we write the drafts, and we take on comments from the relevant authorities defined in the law."[31] At these conferences, I have noticed another problem: the lack of participation of civil society organizations. At none of these meetings were civil society organizations publicly invited to join the law-making processes and express their comments.

The law-making process in the electricity market further reveals the importance of trade networks and the intertwined nature of personal, political, and economic relations. The electricity market in Turkey cannot be analyzed without reference to its political links. Taner Yıldız, Minister of Energy and Natural Resources, defines electricity investment policies as state policies in themselves, since energy is the most important determinant in state policy for all countries in the twenty-first-century world. However, it is important to emphasize that this is not a one-way relationship. Not only is the market informed by political relations, but the electricity market is utilized for establishing, reinforcing, or legitimizing certain political discourses and positions.

For example, at the 2012 International Energy and Environment Fair and Conference in 2012 Minister Yıldız stated that Turkey's increased financial credibility and pioneering electricity market could not be analyzed without reference to the political stability established by his party, the Justice and Development Party, and if one desired to develop the Turkish electricity market, one must first protect the national will and political stability, since they reinforce each other. He then continued to state that the success in the electricity sector was mainly built by private

[31] "Merak etmeyin, bir kanun yaparken sizin için ve sizin adınıza da düşünüyoruz ve kanunla belirlenen ilgili kurumların yorumlarını da alıyoruz."

investors who believed in the importance of sustainable political stability and presented his gratitude to these investors in the name of the government. He finally concluded by announcing that they would always be supportive of these investors. The minister's discourses and narratives illustrate that there is a two-way relationship between economics and politics, and that there can be no economy without electricity, and no politics without economy.

Furthermore, the potential collapse of the maintained market structure is utilized as a threat over those market actors that profit from the system maintained. The political actors legitimize and reinforce their position and established power relations by controlling the marketization of electricity that is so crucial for ensuring everyday commercial and industrial activities; their disruption would result in substantial losses for market actors, based on their market positions. If there were any disruptions in electricity supply, this would translate into a disruption of industrial production activities and commercial conduct. This, in turn, would initiate a disruption and gradual collapse of the energy-dependent Turkish economy and ultimately result in accusations towards the authority responsible for the regulation of the sector, which is the political authority in Turkey. It would further create political instability and a possible loss of political power. The availability of this tool of threat, stemming from the intertwinedness of political and economic power, further contributes to the hybrid structure of the market in terms of public-private governance; as the political authority continues to use threat as a tool, the marketization of electricity is redefined through the lens of political power.

In another example, in response to the claim that the electricity market has effects on Turkish domestic and international politics, Nail Opak, the Chairman of the Independent Industrialists and Businessmen's Association, stated that the

development plans of the Turkish electricity market contributed to the normalization of previously tense Turkish-Israel relations and to the initial resolution of the Kurdish Question. According to him, if Turkey would like to become a leading energy sector in the Middle East and the energy hub between Europe and the region, then these are the two major impediments that the government is working to overcome. Zafer Benli, Deputy Undersecretary of the Ministry of Energy and Natural Resources, further emphasized the importance of the electricity market for the consolidation of political power:

> In the new market system, we will let the private sector live, but also make them feel that we are always watching them; however, please do not let this mentality intimidate you, we are well aware that the collapse of the sector would mean our own collapse, too.

This phrase further demonstrates that there is indeed no economy without electricity and no politics without economy.

The market and the political dynamics are not necessarily in a relationship that reinforces or consolidates each other; there may at times be tensions between political authorities and market regulatory actors. Zafer Benli confessed:

> Independent organizations such as EMRA or EPİAŞ are organizations that are not much favored by the long-term political authorities. The members are assigned to their positions, but after a certain while they cannot meet the political authority's expectations. Especially when they were appointed for a second time, they became even more dysfunctional. I have observed in my career that such organization-like corporations are never favored by long-ruling political authorities. And I also believe that giving these organizations the right to law-making processes is basically authority abuse.

Thus, the principal law-making and regulatory authorities should not be considered as uniform actors acting with the same agency forms and agendas. Each agent, and its agency, should be analyzed individually also in the regulatory section of the Turkish electricity market.

There are limits to legislation, along with new possibilities, that enframe the everyday market operations and the encounters of proliferated actors from different market sections. For example, Halil Alış, General Manager of EÜAŞ, shared the story of the rehabilitation of the Afşin-Elbistan thermic power plant which is under public ownership and management:

> When a turbine of the plant was disabled due to a technical disturbance, we opened a tender for the rehabilitation of the turbine, but no company was interested due to the heavy bureaucratic requirements of the tender. The technical requirements could only be met by foreign companies; they are already the initial builders of the plant, but none of them would comply with the bureaucratic requirements. In the end, we could not stand watching the daily damage it caused the national economy and directly made a contract with a foreign company for a total amount of 37 million €. The daily cost of this non-working turbine was 1 million TL a day, equaling nearly 420,000 € at the time, redeeming itself within only three months. But I must say that I fear that something may happen to me with bribery allegations. This turbine remained switched off for almost a year, equaling a loss of 365 million TL. According to the law, no one can ask me to account for these losses, but I may be guilty of rehabilitating the turbine by direct contract, even if this contract saves the Turkish economy a lot of money. Sometimes you need to subtly by-pass the law, if you really want to do something for this sector and this country. Believe me, as a bureaucrat, I am more troubled with by bureaucracy than anyone else.

Even though the details of this story cannot be verified with any public data, nor whether the direct contract was indeed illegal, the general framework of the story reveals that in certain instances regulations present an inefficient framework in which no actor is satisfied.

As preliminary conclusion of this section, the new EML has reinforced a market system within which the activity regions of market actors are sharply defined via licenses and restrictions. However, at the same time the actors, especially the investors, are given a free pass when it comes to environmental regulations and permit requirements. This can be analyzed under the rubric of the law-maker's twofold aim of financing electricity sector investments via creating incentives to liberal market-desiring private actors, while at the same time being able to monitor

and intervene in these actors' actions. These limits and market opportunities are crucial for understanding the framework within which the actors operate and negotiate, as well as for analyzing the ways in which the conception of electricity is transformed from a public good into an input of industry, a driving force for the Turkish economy.

The hybrid market-making system continues with the inclusion of the private sector in the operation and management of the market (via partnership in EPİAŞ), and at the same time with the consolidation of the regulatory as well as governing role of EMRA with its extended sanction authority. As Minister Yıldız claims, the aim is to establish a private sector under public supervision. Considering this together with the increased emphasis on market operation in the new EML based on the first-time introduction of market operation licenses, this continued hybridization of the market will provide insights as an important element for determining not only market structure, but also market operating and maintenance mechanisms as well as market outcomes such as price. The importance of the framework drawn up by the laws and the secondary legislation will be further illustrated in the following section, as I will elaborate on the conditions that the law sets for the market actors and their actions at each stage of the market and on the ways in which the established framework is maintained, reinforced, or negotiated via everyday market activities and encounters.

Market Maintenance and the Current Workings of the Market:

The Life of Electricity

In this section, the making and maintenance of the Turkish electricity market will be analyzed by following the life cycle of electricity, from its production to its consumption, in order to grasp the proliferated actors and dynamics involved in the marketization of electricity. Corresponding to each market stage, I will discuss the findings from the semi-structured and non-structured interviews, as well as present a simultaneous analysis of the regulatory framework and market data findings from EMRA's and TEİAŞ's reports and market news gathered from the published press and conferences I personally attended.

The Birth of Electricity and its Market

Electricity has always existed in nature. It is not a human invention and may be observed in many forms, the most large-scale being lightning and the most neutral bioelectricity, the medium through which the nerve cells pass signals to the muscles. However, its use and its market are not neutral; for these purposes, electricity needs to be re-invented and tamed first. The word electricity is rooted in Latin, in the word *ēlectricus*, meaning "amber-like," because the electrical effects were initially produced by rubbing amber. The name was coined at the beginning of the seventeenth century, by William Gilbert (Heathcote 1967). This name then gave rise to the English words "electric" and "electricity." first used in a publication in Thomas Browne's *Pseudodoxia Epidemica* in 1646:

> Again, the concretion of Ice will not endure a dry attrition without liquation; for if it be rubbed long with a cloth, it melteth. But Crystal will calefie unto

> electricity; that is, a power to attract strawes and light bodies, and convert the needle freely placed (p 51).

Scholars such as Otto von Guericke, Stephan Gray, and Charles François de Cisternay du Fay advanced scientific work on electricity and invented new ways of use (Mayer 1971). Benjamin Franklin devoted substantial funding and research to exploring and utilizing electricity in the sixteenth century. Franklin identified the positive and negative electrical charges and the fact that electricity is always in balance (Randolph 2003). In June 1752, he conducted his most reputed experiment: flying a kite in thunder storm to test the presence of electricity in lightning. This experiment was first reported in writing in Joseph Priestley's work entitled *History and Present Status of Electricity*, dated 1767. Priestly argued that the experiment was conducted by attaching a metal key to the bottom of a dampened kite string and by flying the kite in a thunder storm; even though Franklin was not electrocuted by lightning as he was insulated, his assistants were killed. Based on this experiment, he proved that lightning was indeed electrical in nature and invented the lightning rod and the application of electrical grounding (Priestley 1769).

Although many scholars have theoretically referred to the above-mentioned work on exploring, taming, and using electricity for different purposes, accelerated progress in electrical engineering and science mainly took place in the nineteenth century. With the research of Nikola Tesla, Thomas Edison, Sir Charles Parsons, Joseph Swan, Ernst Werner von Siemens, Alexander Graham Bell, and George Westinghouse, electricity became an essential driving force of the Second Industrial Revolution in the nineteenth century.

It is important to note that the work of these persons was crucial for the establishment of the electricity market, in terms of the electricity auxiliary market, such as electrical equipment and machinery, as well as for setting the technical

limitations for the electricity market in all of its stages, from production to transmission, trading and consumption. Correspondingly, the above-mentioned studies were not free of political implications and witnessed power struggles over market dominance. The major technically framed, yet market-power-based contestation can be identified as the war of currents that took place at the end of the 1880s, a crucial era for industrial development as well as for the initial marketization of electricity (McNichol 2006, Rosenberg 1998).

In 1879, Thomas Edison invented the first commercially practical as well as profitable incandescent light bulb and started its commercial production. Furthermore, Edison discovered a carbonized bamboo filament that lasted over 1,200 hours. Following these inventions and the opening up of commercial opportunities, Edison concentrated on commercial applications of electricity to advance his technology over direct current (DC) and became able to sell the concept to individual homes based on the mass-production of bulbs and by creating a complete system for the generation and distribution of electricity. In 1878 Edison established the Edison Electric Light Company with other financiers, including J.P. Morgan. In the following year, he made his famous declaration: "We will make electricity so *cheap* that only the rich will burn candles" (Mills 2005). It is important to emphasize the wording cheap, as opposed to free.

In 1887, Nikola Tesla filed for and was granted seven patents in the field of alternating current (AC) motors and power transmission equipment, which together formed another complete system for electrical equipment, such as generators, transformers, transmission lines and lighting. Given that power transmission constituted a problematic link in the electricity markets of the time, George Westinghouse invested in these patents and started manufacturing the equipment

under these patents. This move, then, marked the beginning of a full-scale industrial market war between Edison's DC, supported by J.P. Morgan, and Tesla's AC, promoted by Westinghouse. The stakes were high; the war would determine the current that would be the driving force of the US industry and, therefore, the dominant form of technology that would rule the market in the very long term.

Edison launched an enormous campaign to demonstrate that AC was far more dangerous than DC, the current he promoted (McNichol 2011). As part of this campaign, Edison became involved in the development of the electric chair (using an illegally purchased Westinghouse AC generator) and used it for the execution of the convicted ax-murderer William Kemmler in August 1890. Even though he publicly opposed capital punishment, as part of his war and struggle to gain dominance over the newly establishing electricity market, he invented the electric chair (Essig 2009). Furthermore, Edison's employees publicly electrocuted animals in order to demonstrate the dangers of AC, which runs at higher voltages than DC.

However, for this very reason the transmission and maintenance cost of AC was lower than of DC, because as voltage increases, transmission losses decrease. This factor enabled Tesla and Westinghouse to win the bid for lighting the first electricity fair in the world, in Chicago. They presented a bid that was half that of General Electric, which had acquired Edison's company and furthered the promotion of AC. The fair opened its doors in 1893, and after President Grover Cleveland pushed a button and simultaneously lit thousands of lamps, it was not surprising that 80 percent of all henceforth ordered electrical devices were running on AC. In 1892, General Electric started to invest in AC as well. Thus, this very system eventually won the war, and the US distribution system is now built on AC (McNichol 2006). In

Turkey, the dominant current is also AC, due to its advantages in the efficient transmission of large-scale electrical energy.

Although this thesis focuses on the Turkish, and not the US electricity market, an analysis of the initial marketization of electricity is crucial since it demonstrates the ways in which the establishment of electricity markets globally are closely tied to the power struggles over market dominance and the aim of establishing a certain form of market as opposed to other alternatives. The competition over direct and alternating current was not merely a technical competition; it was also about the party/company that would be able to establish its dominance on the market to produce more, sell more, and profit more. The moment when electricity becomes subject to commercial common sale, a war over market dominance between competing technological discourse-backed claims ensues. This analysis demonstrates once more that politics and power struggles lie at the heart of the marketization of electricity and that techno-expertise claims are utilized as market tools in order to gain dominance over the market, by excluding alternative forms of market-making and operating.

The Production/Generation of Electricity

Even though electricity exists in nature without any industrial production, it occurs on a minor scale (such as in rubbing your hands), or in untamed dangerous forms (such as lightning). In order to make electricity usable and stable, it needs to be produced, or more accurately generated, under specialized industrial conditions that utilize different forms of primary resources. Its value chain follows from production to transmission, distribution, and consumption, while wholesale and retail sale

activities interfere with this cycle in order to ensure that the commercial flow of this commodity is completed along with its physical flow.

Even though the statistics of Turkish electricity production demonstrate an increasing trend, the majority of the actors operating in the market claim that this increase is not sufficient to ensure the security of electricity supply. Muharrem Yılmaz, Chairman of the Turkish Industrialists' and Businessmen's Association, claims that energy investments should reach a minimum of 100 billion USD until 2020, because Turkey is the first among the Organization for Economic Co-operation and Development (OECD) countries in terms of the increase in demand for electricity over the last two years. According to him, not only the cash flow, but also the full liberalization of the electricity market is required in order to achieve the desired investment levels and the needed installed capacity for ensuring security of electricity supply. Nihat Özdemir, the Chairman of Limak Holding, which operates in the Turkish electricity production and distribution sectors, as well as in construction and tourism, supports this claim and warns that the reason behind the oversupply experienced in 2012 was only due to a warm winter and cool summer and that this oversupply should not be interpreted so as to relax concerns about the security of supply. He furthermore contends that the only way to ensure security of supply is via the government providing a desirable profit margin for the private sector as the only actor able to accomplish this mission and through the immediate establishment of nuclear power plants so that by 2023 a minimum share of 25 percent share of energy production will be based on these.

As demonstrated, the security of electricity supply is a dominant discourse in the Turkish electricity market, often utilized by market actors, especially those operating in the regulatory and production spheres of the market. It is employed with

the aim of enframing the market and establishing a certain form of electricity market as well as structuring preferred outcomes such as financial incentives and regulatory exemptions for the production sphere. In another important example, Ahmet Çalık—the Chairman of Çalık Holding, which mainly operates in the Turkish media, electricity, and construction sectors and is publicly known for economic and personal alliances with the governing Justice and Development Party's ruling elite—declared that he was glad to be instructed by the Minister of Energy and Natural Resources, Taner Yıldız, to give a presentation on the issue of national security of electricity supply at the 2013 International Energy and Environmental Fair and Conference. He started his speech by pointing to the importance of energy efficiency in consumption and the required proliferation of different primary resources addressing Turkey's estimated need of an installed capacity of 100,000 MW by 2023. He continued with the current situation of the Turkish electricity production sector and emphasized the dominance of imported primary resources, mainly natural gas. The proposed solution to the current situation, then, consisted of a call for the government to support those Turkish companies that operate in the energy sectors of the neighboring natural-gas-rich countries (such as Turkmenistan where Çalık Holding is working to acquire energy sector tenders worth 1.2 billion USD), and to establish at least two nuclear substations (for which Çalık Holding will bid to construct the required nuclear power plants). Considered together with Çalık Holding's activities in the national and international electricity markets, the speech illustrated not only the intertwined nature of trade and political networks manifested in lobbying activities, but also the utilization of certain texts, narratives and discourses to divert the development of the market towards a particular path, as opposed to others, and to structure politically and economically preferred outcomes.

It is important to note that the most effective logical argument for the establishment of the nuclear power plant, which is strongly opposed by consumers and civil society organizations alike, consists of the national security supply discourse. By defining electricity supply as a national security issue, the political authority renders itself integral to the market, based on the required public management on national security issues. This integration consolidates not only the market position of political authority holders, but also their political position. As a result, market discourses and narratives emerge as political tools of ensuring political support and power.

Yet, this discourse works as a self-fulfilling prophecy that can be traced to the lacking subsidization of solar and wind energy plants. Without exception, all of the investors who aim to establish wind and especially solar power plants explained that the lacking subsidization of these resources force them to refrain from such investments. A Turkish private sector investor, who has established solar power plants in Germany over the past seven years, claimed that there are other market tools to create the effects of subsidization, such as carbon emission assets that can be traded between electricity producers; the revenue from this system can indeed work as a direct subsidy. However, he stated that both EMRA and the Ministry of Energy and Natural Resources rejected his efforts towards the establishment of such a system. These findings show that the lack of incentives for solar and wind power plants results in their under-utilization, and this contributes to the rhetoric of a "supply security threat," and finally to the legitimate establishment of a nuclear power plant.

Turkey's territory includes regions optimal for wind and solar power plants; yet, it is clear that government and private sector support for nuclear plants had less

legitimacy if these potentials were realized. For example, Adnan Polat, the Chairman of Polat Holding, the leading company in building wind power plants in Turkey and operating in the wind energy industry, has also recognized the issue of security of supply as an important threat to the Turkish industry; however, he suggested as a solution the proliferation of primary resources and the development of renewable energy resources that are both local and in essence free.

Significantly, the rhetoric about the national security of electricity supply also contributes to the legitimation of the considerable incentives, which the government provides to private investors in the form of financial incentives and environmental free passes, as mentioned above. Since the government is responsible for ensuring security of supply, it is expected to fully support these investments. Zafer Benli, Deputy Undersecretary of the Ministry of Energy and Natural Resources, has stated that the government and ministry are now responsible for the full liberalization of the Turkish electricity market as a matter of national security of supply. Since the public sector cannot realize the required investments, the private sector must be presented with an attractive market. The first step to create such an attractive market is to create a liberal market where price can be used as a transparent and predictable signal for financing these investments and for foreseeing their returns. Abdülkadir Ongun, the Head of the Department of Supply Security of the Ministry of Energy and Natural Resources, has confirmed Benli's rationale and stated that the reason behind the establishment of the liberal market is to enable the private sector to realize the required investment levels, since this is a matter of supply security.

When reviewing the distribution of the primary energy resources utilized by the total installed capacity of 57,059.40 MW based on the latest official report by TEİAŞ for the year 2012, the following picture emerges: 20,997.10 MW came from

natural gas, 19,609.40 MW from hydroelectric power, 8,193.30 MW from lignite fuel, 4,382.50 MW from hard coal, 1,285.50 MW from fuel oil and diesel oil, 331.00 MW from geothermal and renewable wastes, and only 2,260.60 from wind.[32] There are also discussions about the possibility of exploring shale gas in Turkey and its neighboring countries, following the US model where shale gas made the country an energy exporter for the first time in its history. Yet, the effects of this potential exploration can only be given approximately in Figure 1, since shale gas exploration as well as utilization technologies are only newly developing and will take substantial time to mature.

[32] TEİAŞ, *Annual Development of Turkey's Installed Capacity by Primary Energy Resources (1984-2012).*

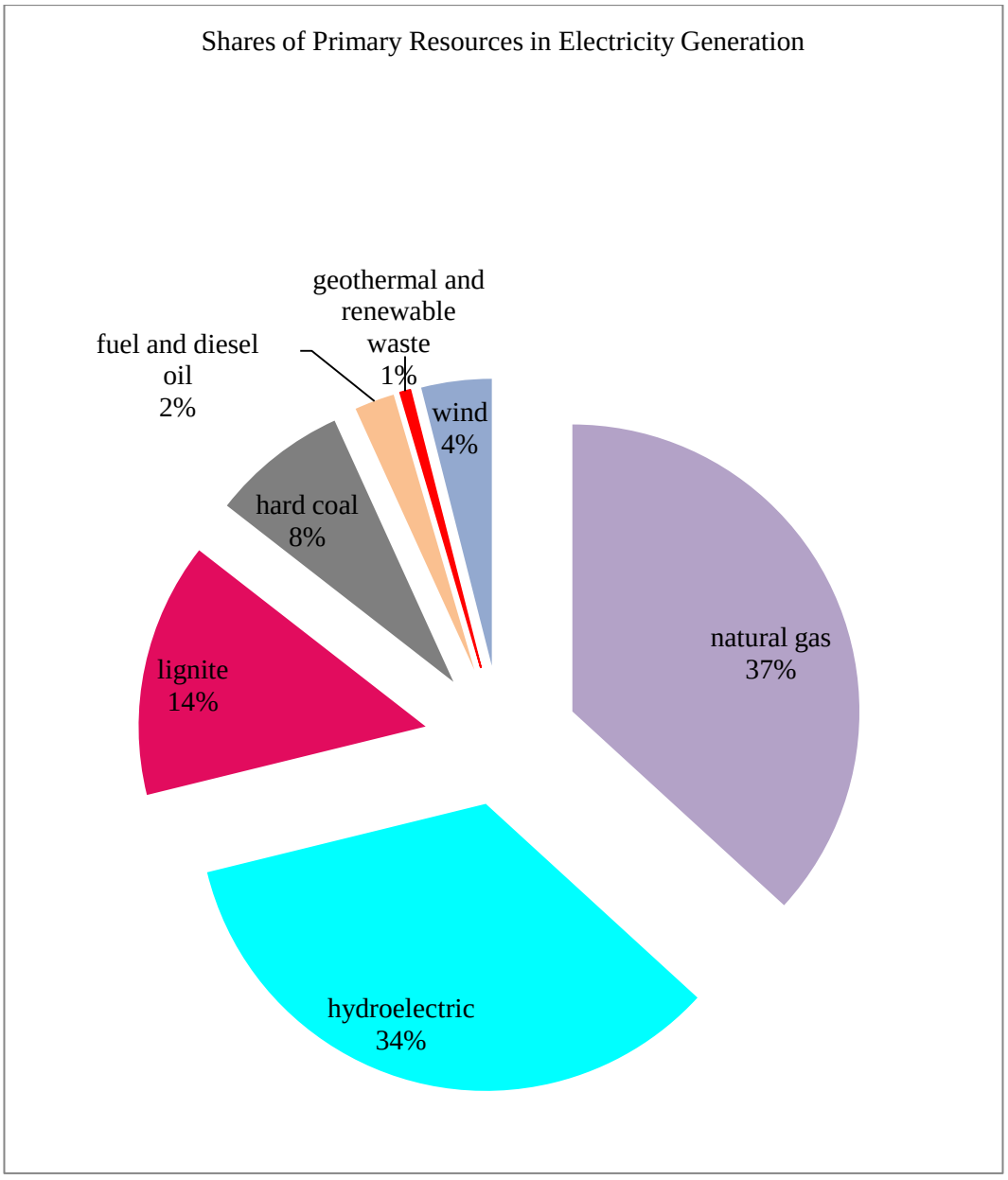

Figure 1: Shares of primary resources in installed electricity capacity

According to the records of the Market Financial Reconciliation Center (*Piyasa Mali Uzlaştırma Merkezi*, PMUM), there exist 403 private electricity-producing companies that operate along with EÜAŞ and build-operate (BO), BOT, and TOR

systems.[33] Accordingly, the power plants under the BO, BOT, and TOR systems should be considered and analyzed as "must-run" power plants, meaning that regardless of price and marginal costs, these plants will continue to generate electricity. The potential costs of the must-run system are then socialized by subsidies, because this system has been established based on the rationale of supply security.

The 403 private sector companies, however, organize and realize their generation levels based on their own analysis, which includes many variables such as electricity price, their own marginal cost, their supply commitment to third parties (such as wholesale companies and distribution companies), and their long-term strategies aimed at manipulating price levels or market structure. The interviews I conducted for this thesis illustrate that, without exception, all of the private electricity producer companies are dissatisfied with the price levels; their officials continuously referred to the dependency of the Turkish industry as well as households on electricity and reminded me of electricity blackouts and their potential recurrence any time, especially in times and seasons of high electricity need (such as in June 2006 and February 2012).

When analyzing the public/private distinction in electricity production, one can see that the private sector's share in the installed electricity production capacity has increased from 55 to 62 percent from 2011 to 2012, marking 12.2 percent increase within one year.[34] Considering this share within the particular marketization of electricity and given the special emphasis on increasing production via the private sector, one can predict that over the following years the private sector's share will

[33] www.pmum.gov.tr. Retrieved11 May 2013.

[34] Elektrik Üretim Anonim Şirketi (EUAS), Elektrik Üretim Sektör Raporu, 2012. Retrived 30 January 2014 from http://www.enerji.gov.tr/yayinlar_raporlar/Sektor_Raporu_EUAS_2012.pdf.

increase, but not reach 100 percent. As announced by Minister Yıldız, the Atatürk and Keban Dam Plants will remain in public ownership due to their high capacity as balancing units for the market.

In the same time series, the installed capacity has also undergone development in terms of major primary resources. In 2004, the share of primary resources consisted of 65.98 percent thermal (natural gas and coal), 34 percent hydroelectric, and 0.02 percent wind energy, whereas in 2012 61 percent were thermal, 34 hydroelectric, and 4 from wind energy.[35]

When analyzing these data together with the newly established legal regulations, and especially with the operation of the Renewable Energies Support Mechanism (*Yenilenebilir Enerji Kaynakları Destekleme Mekanizması*, YEKDEM), which works as a feed-in tariff for production plants based on renewable primary energy sources, my research indicates that, even though these supports are not sufficient for the high-cost technology of solar energy, there will be substantial increase in biogas and geothermal power plants, and some increase in wind energy investments in the medium term. YEKDEM is not only a subsidy, but also a financial tool, because investors can present it as a financial guarantee to potential financiers. Muharrem Yılmaz, the Chairman of the Turkish Industrialists' and Businessmen's Association, supported this argument, claiming that it is impossible for the wind and solar energy share in the electricity production to increase based on the current investment incentives. Since the technologies for solar and wind electricity production have a much higher cost when compared to conventional electricity plants, these renewable sources must receive more substantial and consistent subsidies.

[35] Speech given by Hasan Köktaş, President of EMRA (2008-2014), at the 19th International Energy and Environment Fair and Conference, 24 April 2013.

If one wishes to analyze the share and the possibilities for each primary resource utilized in the Turkish electricity market, it is necessary to start with natural gas (NG), as it constitutes the dominant primary resource. Natural gas and fuels based on natural gas make up a major part in the generation of electricity in Turkey. Thus, the electricity market cannot be analyzed without grasping the main dynamics of the NG market, of which Turkey is a part. Batu Aksoy, Chief Executive Officer of Turcas Energy, argued:

> Whether we like it or not, even though we would like to exclude natural gas in the generation of electricity, we must admit that natural gas will continue to play an important role in electricity generation, and thus the realization of the electricity price, in Turkey for a very long time.

Turkey has utilized and imported NG since 1976, mainly via its contract with Russia executed in 1986 for 6 billion cubic meters (BCM) of per year. While the total NG consumption in Turkey hovered around 6 BCM in 1995, in 2012 the total NG consumption amounted to 46.3 BCM—to be divided into 48 percent for electricity generation, 22 percent for industrial consumption, and 30 percent for heating. The Turkish Petroleum Pipeline Corporation (*Boru Hatları ile Petrol Taşıma Anonim Şirketi*, BOTAŞ), a 100-percent public corporation—to be de-integrated and privatized based on the 2001 Natural Gas Market Law (no. 4646), although the deregulation period has not yet been initiated as of February 2014—is the sole responsible agent for the import, wholesale, transfer and export of NG in Turkey. In 2012, only 1.37 percent of the total consumed NG was supplied from domestic resources (mainly from BOTAŞ), while over 98 percent of the NG consumed was imported. Of the imported NG, 58 percent came from Russia, 18 from Iran, 9 from Algeria, 7 from Azerbaijan, 3 from Nigeria, and 5 from spot liquid natural gas (LNG)

markets.[36] As the data illustrate, Turkey mostly depends on foreign trade, not only for NG, but also for continuous electricity generation.

The terms of trade for NG is crucial for understanding the price and exchange forms in the electricity market, since the major production cost emerges from NG. There are two forms of trade, the dominant being the long-term "take of pay" contracts, and the alternative the spot LNG market. BOTAŞ executes long-term contracts mainly with the Russian Federation, Algeria, Nigeria, Iran, Turkmenistan, and Azerbaijan. These contracts are identified as "take of pay" contracts, because if 80 percent of the agreed volume is not consumed, the seller gains the right to collect this non-consumed amount. There exist minor differences between these contracts; for example, while there are daily limits in certain contracts, others may allow the transfer of the non-consumed amount to the next year without any claims for compensation.

[36] EMRA, Natural Gas Department Directorate, *2012 Natural Gas Market Report*.

Table 1: Long-Term Natural Gas Contracts Executed by BOTAŞ.[37]

Contract Party	Contract amount (BCM /year)	Signature Date	First Gas Transfer (Contract Effect Date)	Duration (Years)	Termination Date	Contract and Trade Status
Russian Federation (West)	6	14.02.1986	1987	25	2012	Extended in 2011
Algeria (LNG)	4	14.04.1988	1994	20	2014	On
Nigeria (LNG)	1.2	09.11.1995	1999	22	2021	On
Iran	10	08.08.1996	2001	25	2026	On
Russian Federation (Black Sea)	16	15.12.1997	2003	25	2028	On
Russian Federation (West)	8	18.02.1998	1998	23	2021	On
Turkmenistan	16	21.05.1999	-	30	-	Off
Azerbaijan	6.6	12.05.2001	2007	15	2022	On

The table summarizes the long-term natural gas contracts executed by BOTAŞ and includes important information for analyzing the NG trade. However, the most crucial trade-related information in these contracts (such as payment terms, contract execution and termination terms, compensation terms, and so on), including even the contract price, are considered confidential information and not released publicly. The current contracts in total constitute a trade volume of 51.8 BCM; it is known that BOTAŞ is obliged to "take or pay" the agreed volume, regardless of whether this amount is consumed. However, no information is provided as to whether this sanction is applied under all contracts, or whether this cost will be indirectly reflected in the price of NG and, therefore, in the electricity market. At this stage, it is only declared that BOTAŞ socializes its losses under the principle of public good. Certain other details are occasionally revealed due to their relevance for other macro-

[37] Petroleum Pipeline Corporation, "Natural Gas and Purchase Agreements," http://www.botas.gov.tr/index.asp. Retrieved 14 July 2013.

economic conditions, such as gold being the indirect means of payment in the trade of NG with Iran;[38] any other terms of trade are kept confidential.

There also exist private companies that enter contract transfers from BOTAŞ for the international trade of NG, such as Enerco, Bosphorus Gas, Shell, Avrasya, Akfel, and Batı Hattı. However, the only dominant and influential actor in the Turkish NG market is still BOTAŞ. The same terms and conditions, and especially the "take or pay" clause, applies to these contracts due to the fact that there are only three reservoirs for NG in Turkey, making it impossible to store it on a large scale for shortages. On 13 February 2012, Turkey suffered from its inability of large-scale NG storage when Russia undercut the supply due to extremely cold weather and its own increased need. Unable to undercut NG from households with a primary need of heating, BOTAŞ undercut the NG supplied to electricity-producing plants. Consequently, on 13 February 2012 the electricity price amounted to 2,000 TL/MW,[39] the upper limit according to PMUM and around ten times higher than the usual price for peak hours in that particular month, and many industrial as well as residential electricity services could not be performed. Under these conditions, forced to ensure continued NG supplies for heating, industrial usage and electricity production, but unable to optimize storage, BOTAŞ had no other option but to accept the clause of "take or pay."

The most important dynamic concerning the "take or pay" NG contracts is its reflection in the contracts with NG-based electricity producers, since these actors are also forced to undersign contracts with "take or pay" clauses. This, in turn, obliges these producers to generate a certain level of electricity regardless of price, resulting

[38] Speech by Ali Babacan, Deputy Prime Minister, http://www.zaman.com.tr/ekonomi_altin-ihracati-irana-dogalgaz-odemesi-cikti_2020119.html. Retrieved 6 July 2013.

[39] The average electricity price in February 2013 was 140.07 TL.

in over-generation and a corresponding substantial decrease in the electricity price, mostly under the marginal cost level. These generators, seeking ways to compensate their losses, then spend great effort to increase the electricity price during peak hours (17:00-22:00) and high seasons (winter and summer). For example, since the winter of 2013 was quite mild, NG-based electricity producers faced a risk of under-consumption, which would force them to pay the un-consumed NG. This, in turn, resulted in over-priced bidding in the summer of 2013, a hot summer when high demand that could not be satisfied by the coal-based, hydroelectric, and wind plants necessitated the inclusion of NG-based plants. This point will be further elaborated upon in the section concerning the exchange of electricity.

The trade of LNG is mainly conducted by BOTAŞ, in contracts with Algeria (4 BCM) and Nigeria (1.2 BCM). In the LNG trade, the terms of trade and price are also kept confidential. Another important global development with potential effects on the Turkish electricity market via NG is the recent utilization of shale gas in USA. There exists a common-sense assumption among the market actors about the availability of shale gas (SG) in Turkey, but concerns about triggering earthquakes have resulted in hesitations about utilizing shale gas since it is extracted by means of explosives underground and since Turkey has a history of very damaging earthquakes. Still, there exists a potential of SG for Turkish market, particularly after 2018, when Centrica, a UK company, will start providing US shale gas to Europe and may create an over-supply in the region, thus contributing to the fall of NG prices. At this point, according to Fatih Birol, the Chief Economist of the International Energy Agency, Turkey will have the chance to re-negotiate its terminating contracts under more favorable conditions, because the buyer will now have the upper hand. Potential consequences will only be observable in the coming

decade; however, this scenario may contribute to a fall of NG prices and, thus, electricity prices. At the same time, it may further consolidate the importance of NG for the Turkish electricity market, by increasing its share as a cheap and reflexive electricity plant type.

The primary resource of coal presents a completely different framework, in terms of its origins, utilization, and the practicality it presents to plant owners and the market at large. The most crucial aspect of coal is its origin: it is locally available and thus contributes to the minimization of the current account deficit within the Turkish economy. However, it is well known that Turkish coal contains only one-third of utilizable calories (average 1200-1400 kcal/kg) in comparison to imported coal. Yet, a managing representative from Ciner Holding, a company holding and operating thermal coal-based power plants in Şırnak, Kırklareli, and Kars, assured that this was not a major disadvantage, due to the fact that Turkey is rich in coal reserves in terms of quantity; therefore, one can obtain the same caloric level by burning three times the amount of coal. Also, increased labor costs can be compensated by the low cost of Turkish coal. Halil Alış, the General Manager of EÜAŞ, supported this argument in his speech at the 2013 International Energy and Environmental Fair and Conference, further emphasizing the macro-economic importance of national coal.

Following this argument, the executive of Ciner Holding concluded that both its labor intensity (a 1-MW coal plant employs a minimum of four workers) and its domestic availability make coal the ultimate solution for the current account deficit, which is continuously increasing due to the dominance of NG on the Turkish electricity production market. Additionally, when the average marginal cost of coal-based electricity production is compared with that of NG-based, NG plants produce electricity for a price at least twice as high as coal plants, mainly due to the high

price of NG. Another coal-based production company owner, who requested his name and company to be kept confidential, claimed that, if all the electricity were to be generated from domestic coal, then the price would fall to half within a day, because not only it is cheaper than NG, but coal prices are also stable and independent of international politics, and its supply is much higher than its demand. He concluded: "Coal is not the old king; it will continue its rule at least one more generation, and that's the reason why China and India are investing heavily in coal."[40]

Unfortunately, given all these advantages, domestic coal is still a black-and-white formula, much like NG. While NG-based thermal plants can increase from minimum to maximum generation load within a matter of several hours, coal-based thermal plants need 24 to 48 hours, depending on the technology available at that particular plant, due to the gradual heating and cooling process of the coal-fired boiler. Thus, according to the representative of Ciner Holding, these power plants are "semi-must-run"; they should work at a minimum of 40 to 50 percent production capacity, regardless of the electricity price in the market and regardless of the fact that the available price may be below their marginal cost. This is because cooling the boiler has substantial long-term production costs, if it is to be reheated later. Consequently, most of the coal-based electricity plants run around the clock, and along with wind-based power plants sometimes cause an electricity price of 0 TL/MW, thus disrupting market balance as well as the price stability. This also creates arbitrage and market manipulation opportunities for market actors, and these opportunities are not missed, as I will discuss below.

[40] "Kömür eski kral değil, saltanatını en az bir jenerasyon daha devam ettirecek, Çin ve Hindistan'ın ağırlıklı olarak kömüre yatırım yapması da bu yüzden."

Moreover, there exists an additional handicap for coal plants. Halil Alış, the General Manager of EÜAŞ, has declared that, according to signed international agreements nature, date, and details of which are kept as secret, Turkey would not be allowed to establish native coal power substations after 2020; thus it is expected that coal plant investments will be fostered temporarily in the short run. However, according to Batu Aksoy, the Chief Executive Officer of Turcas Energy, since it takes about seven years for coal plants to go from idea to implementation, it is not very realistic to expect that coal will have a sustainable future in Turkey.

The environmental effects of these plants also deserve mention, since ironically nature is the only agent completely ignored on the Turkish electricity market, even though the primary resources as well as electricity itself are natural phenomenon. Thermal power plants, and particularly coal-based plants, receive severe criticism from environmental civil society organizations. According to a the representative of Greenpeace Turkey, with whom I have conducted an interview, coal is extremely dangerous not only for nature, but also for the plant workers as well as the households nearby, since burning coal causes acid rain, diseases due to small particles and radiation, and climate changes by increasing the carbon dioxide level. Yet, not only private producers but also the law-makers and EMRA support coal-based plants without any justification. Even the Head of the Environment Commission of the Grand National Assembly of Turkey, Erol Kaya, has criticized this willfully ignorant cooperation between EMRA, the Ministry of Energy and Natural Resources, and the private sector (in his speech in Energy and Environment Fair and Conference in April 2013), referring to the prioritization of low-cost energy supply over environmental concerns. He claims that he is the only person willing to

speak up for the environment within the current framework, with EMRA and the ministry being under pressure by the private sector. Hopelessly, he stated:

> The only way to bring nature back into the picture is to speak to people's hearts, because their minds are driven by profit. Turkey might fall into poverty, if we cannot keep the rich satisfied, and they continue to conceive of nature as an input into their industry, although it should mean life to us.

The market's dilemma, in favor of profit as opposed to nature, will be analyzed further below, by giving space to the voices from each camp, and to voices that claim to be able to reconcile this dilemma. The executive from Ciner Holding addressed these environmental claims with the statement that "we are always in the crosshairs of smear campaigns; however, these critics should think of the sacred labor that is put forward to keep the Turkish industry running."[41] He thus employs emotional politics without providing a clear explanation of how these power plants take precautions to alter environmental effects.

Environmental criticisms address hydroelectric power plants (HPP) as much as coal-based plants, maybe even more controversially so. The origin of the criticism towards HPPs primarily stems from the vital nature of water. According to the regulations, the prioritization of the water use is first for drinking water, second for agricultural uses, and third for industrial uses. However, this prioritization is disrupted in certain localities, and this creates a growing discontent concerning HPPs. The major problem with HPPs is the ignorance of private investors and of the regulatory as well as supervisory authorities when it comes to protecting access to soil and water for local residents. In 2012, 34 percent of Turkey's installed capacity was achieved by HPPs with a total capacity of 19,609 MW, and this is expected to

[41] "Biz sürekli karalama kampanyalarının hedefindeyiz, ama bu eleştirenler Türkiye endüstrisini ileriye taşıyan emeğin kutsallığını da düşünmeliler."

increase by a minimum of 1,000 MW in 2013.[42] In 2012, according to TEİAŞ's statistical reports, 38 percent of the HPPs were owned and operated by the private sector,[43] and this number is expected to increase over the coming years, based on the revised legal framework and the direct (through subsidies, tax exemptions, and so on) as well as indirect (through exemptions from bureaucratic and environmental requirements) incentives, in terms of both private ownership and general production levels.

The primary advantage of HPPs is the renewable quality of the primary resource utilized, relatively low production costs when compared to NG plants, and relatively reliable and predictable energy volatility when compared to wind energy, as generation capacity increases in the spring months and decreases during summer, especially in July and August. At the same time, HPPs afford the potential of market arbitrage and manipulation to plant owners who have at their disposal reservoirs, which enables the plant to withhold and release water as desired and to influence the supply level as well as the market price. As a result, in 2012 many HPPs withheld water during day and night so as to release it in the peak hours or *vice versa*, depending on the desired outcome; according to Fahrettin Arman, the Chairman of the Hydroelectric Power Industry Businessmen Association, only 40 percent of the total HPP potential is therefore utilized. Furthermore, HPPs' practices may disrupt the soil as well as the water flow systems crucial for a country where 24 percent of employment is found in agriculture.[44]

[42] Speech given by Fahrettin Arman, Chair of the Hydroelectric Plants Industry Businessmen Association (HESİAD), at the 19th International Energy and Environment Fair and Conference, 24 April 2013.

[43] TEİAŞ, *The Distribution of Installed Capacity by Primary Energy Resources and the Electricity Utilities in Turkey, 2012*.

[44] TEİAŞ, *The Distribution of Installed Capacity by Primary Energy Resources and the Electricity Utilities in Turkey, 2012*.

For evaluating the environmental effects of a power plant, Fatih Birol, Chief Economist of the International Energy Agency, has proposed to look at the emission level and the effects of the plant for the relevant local area. HPPs are some of the cleanest plants in terms of emissions; however, they pose a serious threat to the local ecological and social environment if the type is not appropriate for that specific area. Thus, it would not be appropriate to reject HPPs categorically, but their potential ecological and social effects must be carefully evaluated, and the operation of the HPP should be monitored by the public authorities. It is important to emphasize the social effects of HPPs in Turkey, via their effects on agriculture. Employment in agriculture has not only macro-economic, but also gender and social implications, since out of 100 employed women, 49 work in agriculture;[45] as agriculture employment decreases in general, women's employment decreases even more substantially.

At first glance, wind and solar energy emerge as the cleanest energy forms, since they are totally renewable, free, and domestic, and because their plants cause minimal effects in their environment. However, as of May 2013, the registered and active wind power plants constitute an installed electricity capacity of no more than 2,370 MW; this number is very low when compared to Germany, which initiated its renewable energy support program also in the early 2000s, roughly at the same time, and has already reached an installed solar capacity of 32,600 MW in 2012.[46] According to Adnan Polat, the Chairman of Polat Holding, if desired, the same capacity can be reached in Turkey, where this would result in many positive side effects such as employment opportunities and side industries for building and

[45] Turkish Statistical Institute, *Agriculture Statistics, 2013*.

[46] Paul Hockenos, Heinrich Böll Foundation, "Germany's PV Branch: The Once-Mighty Solar Industry in Germany is Straining to Reinvest Itself," 2013. Retrieved 28 January 2014.

operating these wind plants. It would also mean a lower current account deficit due to an increase in the share of wind energy of up to 20 percent, thus saving the corresponding 6 billion USD of NG cost. He claims that Turkey has an inland-wind potential of 20,000 MW, corresponding to the current 37 percent of the total installed capacity and roughly 20 percent of the total installed capacity aimed for by 2023. Following this argument, he contends that the surplus of 6 billion USD then can be directed to Eastern Turkey, and this can serve as a solution for the region's political problems. This once more illustrates the implicit conception of market actors in terms of the intertwined nature of politics and markets.

Similar claims and observations can be put forward for solar energy as well, maybe even more so, since Turkey has a daily average of 7.2 sunlight hours,[47] a number that is more than sufficient for a solar-dominant electricity production system. However, there are even fewer solar than wind power plants. The reasons are technical, especially where concerning wind energy, due its nature, both regulatory and commercial. There are certain crucial technical impediments, such as the unpredictability of wind. Wind energy depends solely on nature, on whether there will be sufficient wind during specific days or hours; thus, an investor cannot predict revenue. The volatility of wind energy can also cause a major issue due to the over-pressure it creates for the transmission system. Since wind energy cannot be tamed and controlled, high wind velocity results in the injection of extremely high levels of energy within short periods and wears out the power plant system, connection feeders, and transmission lines. In the long run, this makes wind energy quite costly for the whole system. However, not even one wind energy investor has described this as a problem.

[47] Ministry of Energy and Natural Resources, General Directorate for Renewable Energy, "Solar Energy Potential in Turkey," 2013.

My interviews with private electricity production investors, however, indicate that the primary reasons for the lack of investment are regulatory and commercial. The two private investor company representatives referred to the same story when I asked them about the impediments they faced and are still experiencing in their wind energy investments. Technical obstacles exist, but these problems can be resolved, by regularly rehabilitating the transmission lines and by acquiring the appropriate technology, which they would claim to shoulder if the commercial and regulatory problems were completely resolved.

The major limitations in terms of regulations can be traced to the granting procedure for wind energy plant licenses. On 1 November 2007, EMRA began to accept wind energy license applications; there were submitted applications for a total of 78,000 MW, but only 8,000 MW worth of licenses were granted. Not only did the evaluation process take a substantial amount of time, but the licenses were also granted to investors incapable of making these investments. As a result, a new market was born: a market where these license-holding companies approached viable investors to sell their licenses, the *çantacı* market. These licenses will expire in 2015, but only 2,370 MW have been installed as of 2013. Thus, these misgranted licenses will cost Turkey nearly 5,000 MW of unrealized wind power potential. Moreover, as Adnan Polat has pointed out, the Renewable Energy Law (2005) was issued ten years ago, after a five-year-long struggle by potential investors and civil society organizations, but due to the operational legislative and commercial limitations, the law is still far from supporting the development of a renewable energy market. Polat further indicated that, even though Turkey and Germany were at the same level of development regarding the renewable energy market fifteen years ago, Germany has

now reached solar energy capacity of approximately 32,000 MW, whereas Turkey's is still only 2,370 MW. Regarding the reason behind this delay, Polat stated:

> We have the money, we have the know-how, and we have the best wind; however, the license mechanism is not working properly, and the relevant bureaucracy is working so as to make serious investors loose time. For example, there are certain limited periods within which you can submit license applications, once in five years, and I cannot understand the reason why.

Another crucial impediment that Polat pointed out together with other market actors operating or wishing to operate in the wind sector, is the inefficient financial incentive of 7.3 US Cent/kWh provided for wind energy (which may increase to 10 US Cent when domestic products are used for the plant's construction). Both of the wind energy investors with whom I conducted interviews determined the required incentive for wind energy as 12 US Cent for investments to repay within a due period of time. Market actors operating in the solar electricity sector agree with these comments about the inefficiency of financial incentives provided for wind- as well as solar-based production facilities. Even though these incentives can be increased with the second schedule defined in the 2001 Renewable Energy Law (no. 6094), which concerns the incentives to be provided for domestic construction materials used for the plant, certifying the domestic origin of the equipment is extremely difficult and finding the necessary technology and equipment in Turkey poses a major problem.

However, these same investors profit from their existing wind energy plants, even though these profit margins are unknown. Yet it seems that these profits are less than those based on NG and coal plants, given the private sector's eagerness to infiltrate these markets. Osman Özberk, the Vice Chairman of SolarTurk, a company developing solar energy systems, reminds that solar energy is starting to reach investable levels; SolarTurk has produced a solar system with the potential of paying

itself off within six years.[48] The head of a company operating in the renewable energy sector has stated that solar and wind investments only start to become profitable eight to eleven years after their establishment, while NG plants or HPPs do so after a maximum of five years. Thus, wind does bring money to investor, but it is not an attractive deal. Özberk furthermore claimed that the ministry and EMRA initially discussed the new law with the investors, and it was agreed that € would be the currency for the subsidies, as opposed to USD, because the wind turbine and solar technologies are mainly imported from European countries. Yet, following the issuance of the law, the private sector investors were forced to accept USD as currency. Consequently, solar and wind plant investors are also open to currency risks.

Given all factors concerning renewable and non-renewable electricity-producing systems, solar and wind power plants must be subsidized on a larger scale in a market system where NG plants are indirectly subsidized, because these sources are both native and completely renewable. Moreover, since NG, as the dominant primary resource, can only be acquired by importation, it is not only an important source for current account deficit, but also dependent on Turkey's international relations with its neighbors. Nihat Özdemir, the Chairman of Limak Holding which operates in the Turkish electricity production and distribution sectors, reminded that over the last decade 70 to 90 percent of the current account deficit has been caused by the prevalent usage of NG in the electricity market.

The conditions for solar energy are even more limited than for wind energy. The costs of solar energy are higher and would need to be subsidized consistently. However, the current frameworks and the newly developing regulations indicate a

[48] Erman Çimen, "Güneş enerjisi yatırım yapılabilir seviyeye ulaştı [Solar energy has reached a level worth investing]," *Enerji Günlüğü*, http://www.enerjigunlugu.net Retrieved 15 May 2013.

different path. For example, incentives for solar energy were first discussed to amount to ca 25 € Cent between EMRA and private investors; however, in the end the amount was determined to be 13.3 US Cent only. Furthermore, after 2015 it is not certain whether there will be any subsidy at all, forcing investors to exit the solar market. It should be noted that a subsidy system is not the only financial support mechanism in a market. The market actors that invest in solar plants present an alternative, namely the "primary resource certification" mechanism. The system has two legs: first, consumers can choose the primary resource through which their electricity is generated. Investors believe that, considering the growing consumer sensitivity to environmental concerns, renewable electricity would be valued more and that the system would work without subsidy. Secondly, with this certification the renewable energy generators must be able to trade their carbon emission rights with NG, coal and future nuclear power plants. If this system can work as envisioned, then one may conclude that wind and even solar energy can easily develop to increase their share in the Turkish electricity generation market considerably.

However, as the majority of the market players have expressed, it is unlikely that a carbon emission market would be established in Turkey in the short term. The most important obstacle to such a market is the particular marketization of the Turkish electricity market. The prioritization of the increased number of production plants against environmental and consumer interests results in the dismissal of the significance of carbon emissions. Especially the renewed interest in coal production plants, as cheap and high-volume base-load electricity suppliers, requires that the issue of carbon emissions remains out of the picture. If it does not, and if the carbon emission market would be established, then coal-based electricity would not remain a cheaper option. Furthermore, renewable energy resources contribute to energy

volatility, especially when it comes to HPPs without reservoirs and wind plants. Thus, renewable energy resources do not correspond to the disciplinary discourse on the predictability of electricity price and the establishment of a long-term reference electricity price, which are central in the making of the financial electricity market as desired by the 2013 EML.

Regulatory issues are as effective as the lack of subsidies in presenting obstacles. One very problematic point concerns the regulation of the measurement of solar energy in a potential solar plant area and the distribution of this potential plant site between the relevant licenses. The rules and conditions require that, if the application for a particular land is submitted by the owner, then no other projects on this land would be evaluated. All applicants have to present one-year solar measurements conducted within the previous three years, and then the technical feasibility of projects, the environmental reports, general layout projects, bank guarantee letters, and financial investment revenue plans are evaluated. The first rule, the dismissal of all other projects on a land if the landowner submits an application, is extremely risky, because the owner may not be technically or financially capable of establishing a solar power plant on that land, so that the project would remain unrealized even where the land offered optimal conditions. Furthermore, the regulations accept more than one applicant for the same land; then, the land is divided between these applicants without their consent. For example, if the land is appropriate for a 50-MW solar plant and if the plant costs are calculated accordingly, this company cannot work with the same costs if granted a land appropriate for only 5 MW. This company then cannot follow through even if granted the license and the license will become null and void, similar to the situation encountered with wind energy.

In order to improve this procedure, Erinç Kısa, a member of the Turkish Photovoltaic Industry Association (*Güneş Enerjisi Sanayicileri ve Endüstrisi Derneği*, GENSED), has proposed as solution the dispensing of unnecessary bureaucracy and instead focusing on the technical and commercial potency of the applicant. Accordingly, the project must be reviewed and evaluated in detail, the vendor list and reference list of the applicant should be examined closely, and financial guarantees should be requested from the applicant during the application process. Otherwise, he justly believes that the procedure will result in a stalemate, as it did with the wind licenses distributed to companies that were either technically or commercially incompetent, resulting in unrealized solar energy investments. However, the application procedure continues to be loaded with unnecessary bureaucracy and inadequate criteria, likely to result in void licenses and unrealized investments in a country that is eminently suitable for the development of solar energy. When I asked EMRA official Hasan Alma about the reasons behind this application procedure, he simply replied that "the law-making authorities have no idea what is going on here in practice, and EMRA's hands are tied; we are just obliged to apply the law as is."[49]

Furthermore, the Turkish government gives signals that the current incentives will not be increased; on the contrary, market incentives and subsidies will gradually be removed since the ultimate aim is to fully liberalize the market. Minister Yıldız stated in a unstructured interview that "Germany has provided 30 billion Euros in subsidies to the solar sector in the last fifteen years, and now even Germany is in the

[49] "Kanun yapıcı otoritelerin burada pratikte ne olduğu konusunda hiçbir fikri yok ve Elektrik Piyasası Düzenleme Kurumu'nun da elleri kolları bağlı, biz sadece kanunu uygulamak ile yükümlüyüz."

reverse trend, so why should Turkey fall into the same mistakes?"[50] However, it must be noted that there is a major difference: the solar sector in Germany is well-established, whereas Turkey has only made baby-steps. Furthermore, Germany is witnessing a substantial fall in demand, in contrast to the rising demand in Turkey. Yıldız then continued:

> If we provide more subsidies to solar and wind instead of natural gas resources, then it would mean a capital transfer to these investors which according to my political views would simply mean an injustice. It would also increase expenditures on solar technology that is usually imported. The investors shall earn money, but not too much, just a reasonable margin. This is a state policy above political parties, but could only be established under the rule of the Justice and Development Party.

Considering these statements, not only does the organic link between politics and economics become visible once again, but they also illustrate the ways in which the same discourses are sometimes utilized and sometimes avoided for similar situations. For example, the same minister supports nuclear power plants in all his personal and public speeches, even though nuclear technology is also imported and although the project will be carried out by a Japanese firm. Thus, the same rules, conventions, logistical infrastructures, texts, discourses, narratives, and technological and scientific knowledge forms are deployed for certain conditions and dismissed for others, according to the envisioned market and according to how these tools would serve to enframe the envisioned market structure.

Between 10 June and 14 June 2013, EMRA accepted solar energy applications for the first time, even though there has been an incentive mechanism since 2005, introduced by the first Renewable Energy Resources Law (2005). Although it is too early for a complete analysis, research on the initial stage of the submission process reveals that there is over-submission, similar to what happened

[50] "Almanya geçtiğimiz on beş yılda güneş enerjisine otuz milyar Euro üzerinde teşvik verdi ve şimdi Almanya bile ters yönde, peki Türkiye niye aynı hatalara düşsün?"

with the wind-licensing procedure, by companies that have not yet proven their technical and financial competency. The initial results of the license-granting process will reveal more concrete points for analysis concerning the future of solar energy in Turkey, once the license-granting and -exercising processes have been carried out.

The production stage cannot be solely explained in reference to the public/private divide and the distribution between primary resources; there is another very important and relatively new possibility on the market. As of 2013, all consumers (regardless of the amount they consume) have the right to establish their own electricity-producing system based on renewable resources with a capacity of up to 1 MW without any license requirement. This is revolutionary since now consumers can also be producers and since they have the right to choose and know the primary resource of their consumption.

According to my interview with a member of the Unlicensed Electricity Generation Association, an average household with a population of four needs 230.40 kWh for a minimal living standard. During the peak hours of the peak seasons, this can increase to up to 400 kWh. This output can be produced with a 5-kW electricity-generating system. The costs for these systems are approximately 1,550-1,750 € per kW for wind systems and 1,750-2,500 for solar systems, depending on the geography of the area, the connection to the transmission system, and the scale of the project. The surplus electricity energy, then, can be injected into the transmission system and sold. The distribution company, licensed for that particular area, collects the applications for these plants' connection to the transmission system and serves as buyer of this electricity surplus at the end of the day.

The price is fixed in accordance with the subsidy price for renewable energy as determined by the Renewable Energy Law (2010): 13.3 USD Cent/kW for solar and 7.3 for wind, together with a purchase guarantee for ten years. The distribution company shall make its payments within ten working days from the invoice date, which the unlicensed plant owner determines based on the monthly counter results. If the payment does not arrive within ten working days, then the unlicensed plant owner can recoup its losses from the distribution company. However, Erdal Alkış, the Head of Icon Wind Energy Corporation, has warned that the increase in unlicensed electricity production would equal the decreased number of customers for the distribution company, corresponding to diminished revenues for the region, for which the distribution company has paid substantial amounts of money. When coupled with the fact that the distribution companies are the applicants for the sale of unlicensed electricity generation, then distribution companies would soon work to prevent the development of the unlicensed electricity generation sector. Ateş Uğurel, the founding partner of GENSED, agreed, giving the example of Germany and other European countries where distribution companies have obstructed the unlicensed electricity generation sector, arguing that Turkey will face a similar situation before 2020.

Ateş Uğurel, has warned that this system does not equal the old system of heating water with solar energy, but that it should be conceived and realized as a project in itself. As mentioned above, solar systems start to accrue profit after seven to eleven years and wind systems after five years, depending on the consumption levels of the unlicensed plant owner. However, wind systems require at least 5 m^2 of empty land for each kW, whereas solar systems can sit on building roofs. The Unlicensed Electricity Generation Association works to provide assistance to

consumers willing to establish unlicensed electricity production plants and keeps statistics of these submissions. According to the association's records, there have been 922 unlicensed electricity production plant submissions with a total capacity of 213 MW as of May 2013. Of the 546 approved submissions, 372 concern solar plants, 144 wind plants, 7 are cogeneration plants, 14 biogas plants, and 9 hybrid plants. There are also submissions for HPPs, but these submissions are undermined by the extremely long approval procedures of the General Directorate of State Hydraulic Works. Kıroğlu confirmed that they are expecting additional between 250 and 300 submissions by the end of 2013, stating that there currently exist twenty unlicensed production plants connected to the transmission system. Most attention is paid to solar plants since the wind turbines require large swathes of land, as opposed to solar systems that can be mounted on roofs.

The regulation of unlicensed electricity production provides the right to generate electricity without any limit, if this output is to be consumed in its entirety, or if the plant is not integrated with the transmission system for commercial purposes. However, the legislation also impedes unlicensed electricity production, especially due to the lack of secondary legislation and the onerous bureaucracy involved in the approval of unlicensed electricity-producing plants. For example, the project approval legislation is the same for licensed and unlicensed electricity generation plants; thus, the project design and approval procedure is costly and time-consuming. Submissions require more than forty documents from different authorities. Particularly with the introduction of special measuring requirements from the Radar Performance and Track Analysis Center (*Radar Performans ve İz Analiz Merkezi*, RAPSİM), the submission period has been extended by 180 days, the time required for RAPSİM to issue the requisite report. Furthermore, the project approval

fee is identical regardless of the plant's scale; thus, small-scale plants are burdened with large-scale project approval costs. Another obstacle is found in the fact that unlicensed producers do not have the right to apply for the expropriation of the land required for the plant or the transmission system, a right granted only to licensed generation plants. Kıroğlu summarized these legislative impediments: "Consumers are very enthusiastic about unlicensed electricity production; however, we cannot say that we see the same enthusiasm from our bureaucracy."[51] Furthermore, these producers become not only surplus energy injectors into the system (thus collecting from the distribution company), but they also subtract at least one consumer. My research and interviews with unlicensed electricity generators reveal that the distribution companies are not particularly enthusiastic about the unlicensed electricity production mechanism and that they do not help to simplify this procedure.

One very important, yet at the same time very controversial, issue in the electricity's production stage is the privatization of state (EÜAŞ)-held production plants. At the beginning of 2013, Minister Yıldız announced that the privatization of the electricity production sector would be fueled with the privatization of state-held plants with a total capacity of more than 16 GW, equaling 68 percent of the total capacity of EÜAŞ holdings, and 39 percent of Turkey's total installed capacity.[52] The majority of medium-scale plants were privatized in 2013, along with the three major and most controversial thermal power plants, the thermal substation of Hamitabat (Kırklareli), Kangal (Sivas), and Seyitömer (Kütahya). Hamitabat is NG-based, whereas Kangal and Seyitömer are lignite-based production plants. While the

[51] "Tüketiciler lisanssız elektrik üretimi için çok hevesli, fakat bürokrasiden de aynı hevesi gördüğümüzü söyleyemeyeceğim."

[52] Institute of Energy, "Özelleştirmede sıra elektrik üretim santrallerinde [It is the electricity plants' turn for privatization]," http://enerjienstitusu.com. Retrieved 22 March 2013.

Hamitabat NG-based production plant has the largest installed capacity, Seyitömer is accepted as the most profitable lignite-based production plant due to its low marginal costs. Hamitabat was purchased by Limak Holding for 105 million USD; Seyitömer by Çelikler İnşaat for 2,248 million USD, and Kangal by the Konya Şeker-Siyahkalem Mühendislik Consortium for 985 million USD. These are already powerful market players operating in the production, wholesale, and distribution sectors of the Turkish electricity market. However, the purchases all received approval from the Turkish Competition Authority.

Minister Yıldız announced that the privatization of these large-scale thermal power plants was a success and that the privatization revenues in general were higher than expected. He explained:

> In two and a half months in 2013, we have achieved privatization revenues of 5.7 billion USD, which is higher than the target that was set for us. This means not only an input into the Turkish economy, but also easing the burden on state-owned EÜAŞ in regard to power plants that are in need of constant repair and maintenance.[53]

However, the ways in which these targets are defined offer no transparency and are unaccounted for, reflecting the general characteristics of the Turkish electricity market. Turgut Dibek, a Member of Parliament from the oppositional Republican People's Party, for example, has claimed that especially "Hamitabat is privatized for nothing,"[54] undersold for an amount much lower that its value. He stated:

> Hamitabat has approximately 85 million USD in cash in a bank, 50 million USD receivables from the distribution companies in the short term, and 30 million USD worth of gasoline in its warehouse. Also, its vast land and agricultural land is very valuable. Considering these, Hamitabat's privatization price is illegitimate.[55]

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[53] "Özelleştirme geliri beklentinin üstünde [Privatization revenues are over expected levels]," *Enerji Günlüğü*, http://www.enerjigunlugu.net. Retrieved 19 March 2013.

[54] "Hamitabat hiç değerine satıldı."

[55] "CHP'den Hamitabat tepkisi! [CHP's Hamitabat reaction]," *Enerji Günlüğü*, http://www.enerjigunlugu.net. Retrieved 28 March 2013.

Dibek's claims are valid, given that even the liquidated assets of the production plant are worth 165 million USD, much higher than the purchase price. Furthermore, the lack of any explanation from the Ministry of Energy and Natural Resources affirms the controversies over these privatization acts and their legitimacy.

The production stage illustrates how electricity's characteristics as a commodity shape the conditions under which it can be generated. Electricity is not a uniform commodity, like a notebook which is produced from paper; there are proliferated resources and systems, all of which utilize a different resource that creates certain limitations and possibilities through which the market actors operate. For example, while wind plants are inconsistent in their input and thus unpredictable in their generation in the medium-term, they can be shut down within an hour, whereas coal plants are consistent and low-cost, but their capability to switch on and shut down is extremely limited and costly. Consequently, in order to analyze a market, one also has to consider the production possibilities stemming from the commodity's particularity and these possibilities' respective market reflections. A market, especially an electricity market, cannot be analyzed without simultaneous reference to its materiality. The nature of electricity establishes a certain form of marketization process, which enframes the conditions and structure of the electricity production stage. These in turn inform all other stages of the electricity market, since due to the particular nature of electricity all market stages are realized simultaneously.

The Transmission of Electricity

The making of the electricity market requires physical construction as well. In order to establish the envisioned liberal and international electricity market, international transmission lines must be built, existing transmission lines rehabilitated, and new transmission lines constructed, all of them currently under the responsibility and authority of TEİAŞ.

The transmission stage of the electricity market is the only stage determined to remain public, under the sole authority of TEİAŞ, not only in the short but also in the long run, due to the nature of electricity. The transmission agent is both the realizer of market exchanges, since it makes the final commodity delivery, and the sole auditor and settler of the market, since only the transmission agent possesses the information regarding the exact amount of electricity transferred. Ahmet Ocak, the Head of EMRA's Electricity Department, has stated that "the transmission system shall and will be a monopoly in the hands of the public; even if privatized at one point, it shall be under substantial regulation and auditing."[56] As claimed, the government does not liberalize or privatize the transmission sector due to the public good rationale.

All the licensed and non-licensed electricity producers inject their electricity energy output into the transmission system via the bus-bar through which they are connected to the main transmission line. The transmitted energy is measured via the connection bus-bars and the sold amount calculated accordingly. Due to the common transmission line, the electricity market is a very particular market in terms of the sale, purchase, and delivery realization. Physically, all sellers make their sales to the

[56] "İletim sistemi kamu tasarrufunda olmalıdır ve olacaktır; eğer bir gün özelleşirse bile çok ciddi düzenleme ve denetime tabi olmalıdır."

transmission system (with the exception of direct transmission lines between certain producers and their few wholesale customers), and purchases are realized by drawing electricity from the transmission system. Thus, even though the electricity is produced by many different agents—on either side of the public/private divide and by particular producing companies—and by different primary resources, it is transformed into a uniform commodity once injected into the transmission system. Correspondingly, the standardization of the commodity, which is a crucial step for the commodification and marketization of electricity, occurs at the transmission stage.

This fact has one very important implication regarding the opportunities provided to the customers and their power to manipulate the market. For example, although many consumers are against certain HPPs and the potential nuclear power plant, they do not have the right of non-purchase, basically the most effective right of any consumer. This, in turn, provides additional market power to the production agents in the market. As Hasan Köktaş, the President of EMRA from January 2008 to January 2014,[57] stated, "there must be a consolidation between the production and transmission of electricity by nature, if we are to work within economies of scale." [58]

The rehabilitation of transmission lines and their continuous maintenance is conducted by TEİAŞ and financed by the market actors of each stage, the share to be determined by EMRA for each year. The transmission system depreciates with each kW it carries, needing constant maintenance and even repair and reconstruction in order to prevent electricity losses currently still compensated by consumers. Not only

[57] On 20 Febraury 2014, Mustafa Yılmaz was appointed as the new President of EMRA, based on the Decision of the Council of Ministers no. 28919. Hasan Köktaş served as President of EMRA between January 2008 and January 2014, which includes the active research period of this thesis (April 2010 to February 2014). Consequently, when speaking of the President of EMRA, I refer to Hasan Köktaş.

[58] "Ölçek ekonomisi istiyorsak üretim ve iletim arasında bir bütünlük olmalıdır."

the public authorities, but also the distribution companies that will be responsible for electricity losses after 2016 recognize this necessity, which may increase as the transmission system is depreciated. Accordingly, the distribution companies may be considered as volunteers who repair and reconstruct the transmission system, but of course for a fee. Nihat Özdemir has proposed that, "given that the distribution companies are financially and technically capable of reconstructing the transmission system, EMRA shall hold these companies responsible for these works, yet the tariffs shall be revised to include these costs."[59] He stated that the major thirteen distribution companies have already spent 2.1 billion USD just to prevent technical losses without making any financial demands; yet, these investments can only redeem themselves after ten years. According to him, this emerges as an illegitimate penalty that needs to be compensated by the market.

Ceyhun Saldanlı, the Chairman of Aydem Electricity Distribution Inc., has emphasized the role of the transmission stage as the market realize and settler, as well as the importance of market information. He argues that, if the ultimate goal for 2023 is to double the current electricity production and, thus, the transmission amount, then the whole system must be reconstructed in an automated technology where market information will be made available to all market actors at the same time. Selehattin Hakman, the Head of the Energy Group of Sabancı Holding, however, has emphasized the importance of uninterrupted market delivery and argued that it is not only the depreciated transmission system that is the root cause for technical losses, but also the power cuts that disrupt market activity as well as daily and industrial activities of consumers. He also reminded that unlicensed electricity production should be supported, since this system eases the burden of the

[59] "Dağıtım şirketlerinin iletim sistemini yeniden yapılandırmaya finansal ve teknik olarak yeterli olduğu düşünülürse, Elektrik Piyasası Denetleme Kurumu bu şirketleri bu işten sorumlu tutmalıdır; ama tarifeler de bu masrafları kapsayacak şekilde revize edilmelidir."

transmission system, by creating a system in which a household produces and consumes its electricity without injecting its consumption output to the transmission system. Ahmet Ocak, the Head of EMRA's Electricity Department, also emphasized this point:

> I personally very much support the unlicensed electricity generation system, because the electricity is produced and consumed in the same place without getting injected into the transmission system. Because when it is injected into the system, it not only becomes a burden on the transmission system and on us as its regulatory authority, but it also results in electricity losses as the distance between the producing and the consuming area increases.

Increasing import and export activities further requires the rehabilitation and reconstruction of the transmission system. Abdülkadir Ongun, the Head of the ministry's Department of Supply Security, has argued that according to the ten-year master plan of energy development for Turkey, the transmission lines will be rehabilitated particularly with respect to the international standards, in order to enable large-scale import and export of electricity.

Electricity generators are also discontented with this issue, particularly when it comes to the transmission costs imposed upon them. Fahrettin Arman, the Chairman of the Hydroelectric Power Industry Businessmen Association, has argued that transmission fees must be decreased, especially for the eastern and southeastern regions of Turkey, if it is desired that investors invest in these regions where sociopolitical losses are already very high. The issue of regionalism, however, leads to the alternative project of market segmentation in the maintenance of the transmission system. When examining the Turkish electricity production, transmission, and consumption map, it becomes clear that the main production is in the eastern, whereas the main consumption area is in the western part of the country. This creates an overload on the transmission system and a corresponding increase in rehabilitation costs. The market segmentation project envisions that Turkey will be

divided into three or four regions, with each region acting as an independent market with different prices. Many market actors debate whether such a division is feasible by dividing Turkey in half both vertically and horizontally to create four regions. Yet, there is no official statement regarding the details or future application of such a market segmentation. The main idea behind electricity market segmentation is that, since prices in the eastern region would be substantially lower than in the west, the sociopolitical electricity losses would decrease and the eastern parts of Turkey be developed by means of industrial plant transfers from west to east, where electricity would now be cheaper.

However, the majority of market actors do not support this system, mainly for political reasons. An executive working for a Turkish company operating in the electricity generation, supply and distribution sectors (known for its close relations with the government) has stated that he and his company are very critical of this project, because he believes that it is mainly political and intended to establish federal rule in Turkey. The true intentions are unknown as of yet; however, it is legitimate to raise concerns that the market segmentation project is indeed political when considered together with the government's aim of establishing Turkey as an energy hub, based on the resolution of the political conflicts with Israel and the Kurdish Question, in order to establish the political stability desired by the investors. The coming decade will reveal whether the transmission system will be completely reconstructed by the distribution companies, or whether its burdens will be partially lightened by the market segmentation and rehabilitation project.

Sale and Exchange of Electricity

The sale and exchange of electricity occurs via proliferated actors and within very hybrid trade forms. These processes are not transparent; they are open only to the participation of certain corporations that hold the necessary licenses. This situation contributes not only to the fluctuation of prices on a daily basis due to the actions of a few strong actors, but also to the image of an expertized market where not everyone can work and where only insiders have the knowledge to do so.

The electricity exchange market was initially established in December 2003, following the introduction of the day-ahead market by the Communiqué on the Procedures and Principles Regarding the Financial Settlement of the Electricity Market. The four conditions of an exchange market are defined by EMRA as follows: (1) a virtual or real environment where sellers and buyers interact; (2) a timely and low-cost distribution of market transactions and market information to all market players; (3) providing a financially safe zone where investors are protected, without preventing or diminishing the volume of market transactions; and (4) the protection of market players against counterparty risk. The following market analysis will illustrate that, while the day-ahead market and the balancing power markets are able to provide the first and fourth conditions, they prove inefficient for the third and especially second conditions.

Before the establishment, a nine-month-long virtual application process was initiated in March 2003, as a test drive for the communiqué. The communiqué structured PMUM as an independent department under the body of TEİAŞ in July of 2003. Market participants are defined as legal persons holding a license to engage with electricity production activity and as legal persons holding retail and wholesale

licenses to make sales to eligible consumers, under Article 6 of the communiqué. While the number of market participants registered under PMUM amounted to 77 and the number of eligible consumers to 1,290 in 2003, the numbers reached 176 and 4,324 in 2006, respectively. The total amount of electricity traded in this mechanism was approximately 750 million kWh monthly (equaling 750,000,000/1000 = 750,000 MWh, 750,000/720 = 1,042 MW of production capacity, which in turn equals approximately 9.25 percent of the total electricity production) in 2003,[60] and 1 billion kWh in 2006 (equaling 1,389 MW production capacity based on the same calculation, which in turn equals approximately 9.83 percent of the total electricity production).[61]

The financial settlement period established a system in which only private sector organizations were subject to the communiqué. Bilateral agreements regarding the amount of electricity that would be sold to consumers were reported to PMUM at the beginning of each month, and then TEİAŞ passed the meter reading information of the producers and consumers on to PMUM. The distributed electricity amount was compared to the notices of the bilateral agreements. Finally, TETAŞ's charges for the deficient amounts (the difference between the contracted and supplied electricity amounts) were calculated based on the over-generation tariffs approved by EMRA, and TETAŞ made payments to the producers that supplied the corresponding excess electricity based on the up-generation tariffs approved by EMRA. The period served as a test period during which regulatory actors and voluntary market players from production and distribution sectors exercised the virtual application of a potential Turkish electricity market.

[60] TEİAŞ, *Annual Development of Electricity Generation: Consumption and Losses in Turkey (1984-2003).*

[61] TEİAŞ, *Annual Development of Electricity Generation: Consumption and Losses in Turkey (1984-2003).*

The financial settlement period between December 2003 and August 2006 was then followed by the temporary balancing and settlement regulation period. The most important introduction of this period was the differentiation of daily calculations according to day, night, and peak hour criteria. The imbalances were calculated separately for these three different intra-day periods and settled by PMUM monthly. It is important to note that TEİAŞ started to work on the temporary balancing and settlement regulation in 2004 and that the regulation's first version was published in the Official Gazette on 3 November 2004. EMRA considered the regulation as a step on the path towards the final market structure and related legislation.[62] However, the preparation for the required metering and data-processing infrastructure was ready only in 2006, and the implementation started under the extreme pressure from production companies on EMRA and TEİAŞ. The production companies claimed that they could not cover their costs under the procedures of the communiqué and avoided production. On 1 July 2006, an extensive electricity blackout in the Aegean region forced EMRA and TEİAŞ to commence immediately the implementation of the temporary balancing and settlement regulation in August 2006.

The Temporary Balancing and Settlement Regulation (T-BSR) was based on the initial EML (2001) and the Electricity Energy Sector Reform and Privatization Strategy Document. Since the regulation was still temporary, certain aspects concerning the market and market exchange regulation were left incomplete. The basic principle of the T-BSR was to settle the market transactions, by simultaneously considering the results of the instructions of the balancing mechanism—such as giving instructions to a producer to over-generate if another producer was unable to

[62] EMRA, *Electricity Market Report, 2010*.

fulfill its commitment, or instructing a producer to under-generate or not generate at all if another producer was generating over its commitment—in terms of the total amount of the bilateral agreements made by the market participants.

The workings of the mechanism are based on daily expectations and bids by the market actors. Firstly, the production companies prepare their daily production program and their price offers for up-generation and down-generation to operate at a load above or below the load value given in their daily program. The National Load Dispatch Center (*Milli Yük Tevzi Merkezi*, MYTM) evaluates and accepts these offers with the ultimate aim of ensuring the balanced operation of the system and the operation of production companies in the daily production schedule. The imbalances between these offers and the actual injection/withdrawal values emerge as energy deficit or energy surplus and are financially settled by PMUM by the end of each month. It is important to note that not every company gets paid according to its offer price. These offers are lined up according to their price and the MWh available for that price. The calculation begins from the lowest price and the available MW is added on, until the required MW for over- or under-generation is reached. The price is then determined by the last offer added up to reach the required MW and is imposed on all bidders. Thus, many of the producers are paid over their offer price. All the system imbalances, energy deficiency as well as surplus, are settled at a single system imbalance price, only differing for different intra-day periods of day, night, and peak.

The temporary balancing and settlement regulation period ended formally with the publication of the Final Balancing and Settlement Regulation in April 2009 and practically with the market implementation in December 2009. The most important introduction of the final regulation is the separation of day-ahead

balancing and the real-time balancing stages. With this introduction, the market operator not only can acquire knowledge about possible system shortages one day ahead, but also has the opportunity to interfere and resolve these possible imbalances within the day, therefore easing the burden on the exchange market that is created by intra-day imbalances and compensation instructions.

The period between December 2009 and December 2011 marked the transition to the existing market form. The transition started with the day-ahead planning market and ended with the establishment of the day-ahead exchange market in December 2011. The short-term aim was to create an exchange market where price would be determined by the balance between supply and demand, while the long-term major aim was to create not only an exchange market, but also an electricity market in general, where the existing generation capacity would be most efficiently utilized and the market exchange prices could be used as reliable signals for long-term investments.

The concept of balancing responsibility was introduced with the aim of preventing market participants from falling into real-time imbalances and of correspondingly ensuring a balanced purchase/production-sale/withdrawal balance by the closing hour of the day-ahead market. Following this argument, the fulfillment of this responsibility was expected to encourage market actors to execute long-term bilateral agreements favoring more stable prices and decreased financial risks. The details of this will be elaborated upon below, in the analysis of the electricity market trade mechanisms. The last major introduction of the regulation consisted of the opportunity of portfolio optimization, granted to the market players via the right of free trading and bid combination. The market players are given the right of freely trading in order to optimize their physical portfolio stemming from production and

consumption outputs. Its major aim is to satisfy the daily electricity demand in Turkey from those producers that have the lowest marginal costs. Furthermore, the regulation gives market players the right to form groups in charge of group imbalances and authorizes them to act on behalf of the group in order to minimize these imbalances. This implies that the market players are also given the possibility of portfolio mergers with different market players in their market transactions. However, Nail Opak, the Chairman of the Independent Industrialists and Businessmen's Association, has warned that this would only consolidate the strong market players' market power and be detrimental for a competitive market as well as for the protection of consumers. According to Opak, portfolio mergers will become a means for establishing monopolies in the market, which will work to structure their preferred outcomes—primarily higher prices to enable higher profits.

The balancing in this system occurs via day-ahead balancing and real-time balancing mechanisms. The day-ahead balancing is finalized in the day-ahead market, as implied by its name; the real-time balancing happens via the balancing power market, as it is done by the National Dispatch Load Center. The National Dispatch Load Center accepts offers for over- and under-generation from the production companies and gives instructions concerning the fulfillment of these offers, if required; it obtains tertiary reserves necessary for frequency control and executes the primary as well as secondary frequency control services so crucial for ensuring the delivery of electricity as an act of market contract fulfillment.

The balancing power market participants are composed of production companies. In order for these companies to be qualified as balancing agents, they must have at least one balancing unit within their legal entity. Exceptions to this rule concern the production facilities that depend on nature for their generation due to

their primary resource types. They are defined in the regulation as follows: hydroelectric production facilities of channel- or river-type, production facilities based on wind energy, production facilities based on solar energy, production facilities based on tidal energy, cogeneration facilities, and geothermal production facilities. However, if requested by the producer market participant, and found appropriate by TEİAŞ and MYTM, these production facilities can participate in balancing activities on occasion. Even though not explained in the regulation, the reason for these exemptions is due to the unreliability of these production facilities in the short term, as they rely on natural conditions beyond human control. The most utilized balancing production facilities are the NG-based electricity production plants, because they can immediately over- or under-generate without increasing marginal costs. Coal-based plants can also over- or under-generate by human decision, but the heating of the coal bunker takes at least several hours, depending on the utilized technology, and is very costly. As a result, the planned production does not have the same marginal cost with over- or under-production.

In December 2009, when the day-ahead market and the balancing power markets were introduced separately, 18 percent of the trade volume was realized in the day ahead-market, and 11.5 percent in the balancing power market. In 2010 and 2011, the trade volume in the day-ahead planning market fluctuated between 13 and 20 percent, whereas in the balancing power market the volume amounted to between 9 and 14 percent. In summary, during the period of final settlement and balancing regulation, between December 2009 and December 2011, the trade volume in the spot market totaled between 20 and 34 percent.[63]

[63] EMRA, *Electricity Market Report, 2011*.

There is one very important point to raise in terms of the compensation of system constraint costs in the final balancing and settlement regulation. EMRA defines the system constraint cost as "the extra cost occurred by the use of more expensive recourses for energy generation due to the technical constraints in the system,"[64] meaning primarily the costs occurred via the instructions given for resolving market imbalances. These constraint costs are socialized and charged to the end-users in proportion to their consumption under the final balancing and settlement regulation. This point is very much debated by the market actors, and particularly by the end-users, citing just claims about the illegitimacy of charging consumers. The regulation defines the market balance as the responsibility of the market players. However, the same regulation does not hold these players financially responsible for the imbalances for which they are legally responsible and passes these costs on to the consumers who are not responsible for achieving market balance and irrelevant to market imbalance and balancing processes.

Table 2: Turkish Electricity Market Stages

Time Period	Market Structure
December 2003-August 2006	Financial Settlement Period
August 2006-April 2009	Temporary Balancing and Settlement Period
April 2009-December 2011	Final Balancing and Settlement Period (Day-Ahead Planning)
December 2011-Present	Day-Ahead Exchange Market

In December of 2011, the transformation from day-ahead planning to the day-ahead market was completed, and the day-ahead market became fully operable and no longer virtual. Originally, the regulation had foreseen that the transition would occur

[64] EMRA, *Electricity Market Report, 2010*.

in May 2011; however, EMRA revised the date to December 2011 with the justification that TEİAŞ, the system operator, was unable to complete the necessary regulatory and operational framework. The day-ahead market was intended as an organized electricity exchange market where supply and demand would intersect to construct the market price in a liberal framework. Participation in the day-ahead market is not compulsory, but private companies in the production, distribution, supply, and sales sectors participate voluntarily since it is a spot market and open to substantial profits (along with losses). The bids are made on a portfolio basis, for the trade of a certain amount of electricity for each hour for a said price, and each market player is to balance its portfolio at the end of the transaction. The transactions are executed daily, on an hourly basis. The bids are not given for a day, as each hour in this day is specified. Even though the block bids have the same price for every hour, this must be specified in the bid as per the requirements of the bidding screen. The calculative unit for the bid is a lot, and ten lots equal 1 MWh.

One major introduction of the day-ahead market regulation is the financial guarantee mechanism. As of December 2011, each transaction must be backed with a financial warranty defined in accordance with the market actor's trade volume. Another amendment in the regulation is the market fragmentation application for the compensation of large-scale and constant market constraints, which is executed based on TEİAŞ's instruction. However, this is not a common application, and daily constraints are still compensated by the end-users. For example, in 2011 the market constraint cost totaled 779 Million USD, and this cost was socialized by imposing extra costs on the end-users. If this system prevails, it is just to expect that the market constraint costs will not be minimized, because those who cause these costs are not held responsible for the consequences. A trader from a company operating in both

production and wholesale electricity has said that "the constraints arise due to the inability of TEİAŞ to do its job properly, and the consumers and market actors pay for its incompetency."[65]

On the market as a whole, there are four electricity trading mechanisms currently legally available (in terms of regulations): (1) power exchange or pool trade, (2) the over-the-counter mechanism, (3) over-the-counter swap contracts and contracts for differences, and (4) financial derivatives. The power exchange or pool trade mechanisms refer to the day-ahead market, the intra-day spot market (not fully established yet), the real-time balancing market (which TEİAŞ exercises and imposes on market players), the ancillary services market, capacity-trading mechanisms (available only for import and export with Greece and Bulgaria, and newly with Iran), and zonal pricing (only initiated, but not yet established and practiced in the Turkish market).

The dominant trade form, as of 2013, is the day-ahead market in practice, in essence a spot market. According to an electricity market analyst, trader, and consultant, even though 80 to 90 percent of the generated electricity trade occurs through bilateral agreements, as per PMUM records, 90 percent of these bilateral contracts are long-term contracts concluded by EÜAŞ and TETAŞ; consequently, the majority is this volume is not executed by private market actors. For example, according to EMRA's 2012 Electricity Market Report, 80 to 90 percent of the generated electricity was traded via bilateral agreements, 15 to 25 percent via the spot market (day-ahead market), and 2 to 5 percent in the settlement market (intra-day market).[66] However, the majority of the bilateral agreements was constituted by

[65] "Kısıtlar TEİAŞ'ın işini düzgün yapamamasından geliyor, ama onun yetersizliğinin bedelini tüketiciler ve piyasa oyuncuları ödüyor."

[66] EMRA, *Annual Activity Report, 2012*.

long-term public agreements. Thus, he legitimately claims that nearly 80 percent of the private-private daily electricity trade happens in the day-ahead market.

The everyday working mechanism of the day-ahead market starts with the submission of bids between 09:30 and 11:30 every morning. Between 11:30 and 12:00, TEİAŞ evaluates the bids for their validity. The price is fixed between 12:00 and 13:00 and announced to the market players. The market players then learn the fixed market price and whether their bid is to be turned into a transaction or not. Between 13:00 and 13:30, TEİAŞ accepts objections to the bid results, usually on the basis of "miscalculation" or "entering incorrect bids into the system by mistake." The price is publicly announced between 13:30 and 14:00, and all the market actors plan their coming day accordingly. The bilateral agreement notifications go ahead simultaneously, between 00:00 and 16:30 of the same day. However, as will be discussed below, the majority of the bilateral agreements are not reported to the day-ahead market, since they are not notarized due to the stamp duty issue rooted in the regulatory framework of the market.

The bids marked (+) represent a purchase as an entry to that market player, and those marked (-) represent sales as an exit from the seller. An actor cannot bid for both sales and purchase on the same price level in a particular hour, but for the same hour with different price levels. The sales-bidding market actor has to list its price bids from lowest to highest and provide the bid within certain margins. For example, the market actor states that, with the bid for a price interval between x and x+1, he can supply a units of electricity, and for a price interval between x+1 and x+2, he can supply a + b units of energy. The exact price, or whether the price for a unit of electricity would be closer to x or x+1, is fixed and imposed on the market actors by the market settler, TEİAŞ—a procedure called interpolation.

To obtain more concrete information, I observed the trader of a well-established producing company for one whole day as part of my thesis research.[67] The trader first evaluated all of his generation facilities and their corresponding expected capacity for the next day, with respect to his supply commitments on the same day. The company held one 15-MW hydroelectric generation plant, several NG-based production plants, the most active of which has a capacity of 115 MW, and a 114-MW wind-based generation plant with approximate marginal operational costs of 65, 110, and 70 TL/MWh,[68] respectively. Each of these power plants has efficiency statistics and technical loss statistics, all of which enter into the trader's calculative framework. The trader then evaluates the expected generation from these plants for the next day.

He told me that the first thing he did in the morning was to check the weather data for wind expectations, because if there was wind, he could acquire approximately 110 MW of electricity (considering the efficiency and technical loss statistics) from its own facility for only 70 TL/MWh, whereas without wind he would have to find this amount from the market, and the cost of electricity in the peak hours double and sometimes triple his marginal cost for the wind plant. He also told me that he looks at the football league's schedule of the day and the week, because on days of important football games the industry demand decreases—he thinks that this is due to the workers' reluctance to work overtime and the desire to go home or to a café to watch the game—and household consumption is not very much affected; thus, the general demand falls. He said that as a company they also

[67] The trader requested confidentiality since the information I gathered qualifies as trade secret. Following the interview, the trader accepted my request to observe his bidding for the next day.

[68] In fact, the marginal cost of a HPP is around 0 to 10 TL/MWh. However, in reservoir-type HPPs, the plant owner has the possibility to hold back the water for the peak hours. Thus, the cost of 65 TL/MWh is calculated as the opportunity cost of releasing the water that could be utilized in the peak hour.

conducted a long-term demand analysis, but he found it useless because the market is not a long-term market. The longest bilateral agreement he had ever seen was for one year; my other interviews supported this claim.

Following the technical and daily evaluation of his production plants, the trader evaluates their commitments for the subject day. On the particular day I observed him, the commitment portfolio was 250 MW for the peak hours. He was told by the meteorologist that sufficient wind was expected for the day after, and the technical specialists reported that the wind plant could supply approximately 102 MW, the NG plant 110 MW, and the hydroelectric plant (reservoir-type) 14 MW during the peak hours; this equaled 226 MW of expected guarantee supply, but all with different marginal prices. Since each production plant introduces different dynamics for the market and the bidding, the trader then started with an asset optimization.

The trader listed these plants from minimum to maximum marginal cost. The hydroelectric power plant has a minimum marginal cost of 65 TL/MW for 14 MW, the wind plant follows with 70 TL/MW for 102 MW of expected generation, and the NG plant has 110 TL/MWh of marginal cost for 110 MW of expected electricity output. Having created this list, he started entering the bids. He declared via the bidding screen that between the intervals of 0-64.99 TL he would bid to purchase 250 MW, because this was cheaper than operating any of his plants. Between 65 and 69.99 TL, he bid to purchase 250 – 14 = 236 MW because he could operate his hydroelectric plant for a cost lower than the 14 MW, whereas in the interval between 70 and 109.99 TL, he bid to purchase 250 – 14 – 102 = 134 MW because he could also operate his wind plant. For the interval between 110 TL and the upper price limit (which was never officially announced, but revealed on 13 February 2012 as

2,000 TL/MW),[69] he would only purchase 250 – 14 – 102 – 110 = 24 MW, because for a price higher than 110 TL he would have to operate all of his plants at their maximum capacity so as not to be forced to purchase for a price higher than his own plants' marginal costs for the fulfillment of his sales commitments. The obligation to fulfill the commitment, at the same time, forced the trader to take the risk of purchasing the 24 MW from the market at any cost, because otherwise the company would not be able to fulfill its commitments.

Before entering the final bids onto the day-ahead market screen, the last but most important task of the trader was to forecast the position of EÜAŞ, as the biggest market actor in the production sector in terms of trade volume. The production company traders bid not only to make a moderate profit, but to make the highest profit attainable on that particular day for each hour, by forecasting the actions of other actors, and whether there may be possibilities for arbitrage. If EÜAŞ under-produces by forecasting a low demand, this may create possibilities of arbitrage for the power plants, which in turn may create shortages in the morning hours by bidding in an under-production position. This will guarantee higher electricity prices in the peak hours when the production plant trader can bid in the full-capacity position with high prices at the same time. A trader described the importance of EÜAŞ's actions as follows: "In the musical chair game, EÜAŞ always gets to sit on that chair and all other players circle around it; those who correctly forecast EÜAŞ's production regime for the next day manage to win the game."[70]

[69] This has been experienced only once due to a crisis in the NG supply from Russia, which resulted in BOTAŞ's inability to supply NG to electricity plants, as it gave priority to household heating, resulting in large-scale electricity shortages.

[70] "Sandalye kapmacada EÜAŞ hep o sandalyeye oturuyor ve diğer oyuncular onun etrafında dönüyor; EÜAŞ'ın ertesi günkü üretim stratejisini doğru öngörenler oyunu kazanıyor."

The communication tool for acquiring the required information to forecast EÜAŞ's actions mainly consists of the personal communications that form the trade networks. The trading actors employ information-gathering persons whose job it is to hand-deliver official correspondence to official market actors, while at the same time forming personal relations built upon everyday conversations about politics, children, cars, and "*iş*, *güç*," meaning everyday business activities. These information-gatherers are also the market faces of these institutions; they mingle with market actors at conferences and meetings where they conduct short conversations on daily issues and the electricity market itself. For example, a high-ranking executive working for the Çalık Energy Yeşilırmak Distribution Company operates as an information-gatherer, as per my own observations, for electricity market policy-making at a high level, as he engages in intense conversations with officials from EMRA, the ministry, EÜAŞ, TETAŞ, and TEİAŞ as well as other competitors at meetings and conferences. He personally knows all those in managerial positions at official corporations and the executives of the private actors operating in the market. He has told me that "information is the most crucial asset in my job, and you can find this best in personal conversations."[71] It is important to note here that this case does not mean that economic sociology suffices for explaining the market as composed of personal relations, but it reveals that personal and social relations are indeed part of the market and that they enframe market networks and market actors' positions, as opposed to the impersonal conception of the economy in the neo-classical economic approach.

The trading strategy illustrates that the marginal cost of each production plant determines the trader's position in the system. While the plants based on coal and

[71] "Benim işimde en kıymetli şey bilgi ve onun en iyisini de muhabbetlerde bulabilirsiniz."

renewable primary resources as well as nuclear plants are utilized as base-load plants, given that they work for nearly twenty-four hours, NG plants emerge as peak-load plants. Lastly, fuel oil, asphalt, naphtha, and other plants with very high marginal cost are informally identified in the market as emergency-load plants, because their utilization happens only if there is a real shortage. Accordingly, the price level is above the marginal cost of all other regular plants. Otherwise, the owners of these emergency-load plants may refuse to produce with the justification that they can purchase substantially cheaper electricity from the spot market when compared to their production costs. Table 3 summarizes the characteristics of these different electricity production plants based on my research findings.

Table 3: Characteristics of Electricity Production Plants Based on their Primary Resources

Production Plant Type	Marginal Production Cost	Resource / Technology Dependency on Import	Emission Cost	Flexibility of Production	Volume Volatility	First Installation Cost (USD/kw)
Natural gas	High	High	Medium	High	None	800-1,200
Coal	Low	Medium	High	Low	Medium	1,500-1,800
HPP	None (only water usage fees)	Low	None	Low (high only for reservoir types)	High	1,800-2,200
Wind	None	Medium	None	None	Very high	1,800-2,200
Nuclear	Low	Very high	Medium	None	None	3,000-3,500
Solar	None	High	None	Low	Low	2,500-3,000
Naphtha, fuel oil, asphalt	Very high	Very high	Medium	High	None	1,500-1,800

It must be noted at this point that the vast majority of the production company employees I interviewed or observed execute asset-backed trading, through which

they avoid market risks. They usually follow the trade strategy of hedging their existing asset risks and maximizing their profit accordingly. The production companies plan their actions mainly based on the specifications of their assets (production plants) and their price expectation, rather than by considering the arbitrage possibilities in the spot market. An executive from a production company confessed:

> My risk is nothing compared to the distribution companies' risks; their cost of non-delivery is a real cost because it's their primary job, whereas my cost is only the cost of a missed opportunity if I do not get to produce that day due to miscalculations in the day-ahead market.

Retail sale, wholesale, and distribution companies, however, have very different motives and trading strategies. Their strategy is first to create profitable market transactions by searching for possibilities of arbitrage and even speculating to achieve this ultimate aim. The fulfillment of commitments is secondary for these companies because daily losses do not constitute a problem for them; they loose and profit in substantial amounts during the day. The aim is to profit ultimately from searching for, and even constructing, favorable market transactions. The general inner organization structure of the trader companies reflects their trading strategies as well. Their organization can be summarized in terms of three offices: the back, middle, and front office. While the back office handles the invoicing, accounting and cash flow management, the middle office is concerned with documentation, credit risk management, limit/trade management, demand analysis and forecasting, risk management, trade optimization, and general planning. Finally, the front offices are responsible for executing the trading activities, sales/purchase bids and transactions, daily and hourly position management, financial guarantee management and directing the middle office to arrange the financial guarantees required for the considered bids.

When I observed the bidding procedure of the trader working for a wholesale electricity company, the inputs to the bid decision were remarkably different from those of the production company trader. However, the bidding structure and the utilized calculative practices are roughly the same, since the day-ahead market and its screen creates conditions for such bidding only. For the sales company trader, the consideration is not only fulfilling their supply/sales commitments to the distribution companies and eligible industrial consumers, but also creating the highest profit from all of its transactions. The sales companies cannot risk failed delivery particularly to distribution companies, since they have substantial shares in the market. As a result, they are open to severe market risks if they do not execute at least medium-term bilateral agreements, because they do not have their own production facilities and will have to purchase the committed amount, regardless of how high the price is fixed in the market. Therefore, they have to bid accordingly. At the same time, they can take advantage of great profit opportunities, because they can collect electricity from the spot market (the day-ahead market) when prices fall, without any bilateral agreements tying their hands.

Another important condition evaluated by the sales company traders is the portfolio optimization, meaning whether they can adjust the load of their customer per hour. If the customer portfolio is dominated by household consumption, then the consumption is expected to increase during peak hours, compelling the trader to purchase from peak power plants such as NG plants with higher marginal costs and prices. If the customer portfolio is dominated by industrial consumption, then consumption is expected to occur at similar levels throughout the day, enabling the trader to conclude bilateral agreements or low-cost day-ahead market transactions with base-load plants (such as coal-based power plants). Additionally, industrial

consumers can adjust their work load if given the opportunity of a lower price. Accordingly, traders call industrial consumers “golden.” Even though their profit margin is lower on paper, they do not push the trader into high risks by accepting no or diminished supply during peak hours, and the trader can procure the required electricity for these consumers during the lowest-cost hours. Thus, the customer profile emerges as a very important hidden cost or profit opportunity for the sales company when trading in the electricity spot market. Having evaluated all these factors—the percentage of the adjustable load, the availability of a medium-term bilateral agreement, and its total commitments to distribution companies and eligible consumers—the trader construct his bids, by entering the price intervals and lots of electricity to be purchased (10 lots = 1 MW) in each time interval.

Another bid type in the day-ahead market consists of the block bids that are provided for a certain period, not a certain hour. Mainly coal-based production companies prefer these bids, because they operate must-run plants that should always work at least at half capacity in order to keep the boiler hot; when it is cooled down, reheating is extremely costly. The blocks that may be subject to such bids are predetermined by the market operator, or the bidders may define their own timely interval on the condition of including at least four hours with a maximum limit of submitting five such block bids in the day-ahead market. For example, for coal-based power plants, the marginal costs differ in range between 45 and 55 TL/MWh when they run continuously over eight to twelve hours; but if the plant stops after certain hours before reaching eight to twelve hours, this marginal cost is doubled and sometimes even tripled. Accordingly, these plants enter block bids, such as bids for 45 to 55 TL/MWh for eight hours of continuous supply, or 110 to 150 TL/MWh for zero to eight hours of supply.

The last bidding type can be identified as flexible bids. There is very little, if any application of flexible bids in the market, since I could not find any record of such bids. Neither did my interviews with traders and market analysts turn up results. Flexible bids are independent of a certain time interval or peak/day/night difference. The essence of the bid is that it works as a hypothetical statement from a production actor—"if the price goes above x, I can generate electricity for an amount of a regardless of time interval"—or from a supply actor—"if the price falls above y, I can purchase electricity for an amount of b regardless of time interval." However, as stated, this is not an accepted and exercised bidding form in the Turkish electricity market.

The market exchange price, as the most crucial outcome in the market, is fixed by the market operator which lists all the bids for sales and purchases, until the equilibrium is reached. Since the bids are collected for an interval, but not for specific points, the supply and demand curves do not emerge as linear, but in the form of a zigzag. PMUM defines the equilibrium as intersection of demand and supply. If the demand and supply curves do not intersect at any point, then the market operator decreases the demand manually and fixes the price accordingly. Additionally, due to the zigzag nature of the sales and purchase offer curves, there may be more than one equilibrium. In such cases, the market operator fixes the price as the average value of these equilibriums; this mechanism is called interpolation.

The criterion for equilibrium in the market is to balance the electricity amounts. At the fixed price, the same amount of MW should be willingly supplied by the sellers and purchased by the buyers. Even though PMUM does not reveal the amount of the bids and their details, a hypothetical example can illustrate the price fixation procedure. For example; when the price is 0 TL, all the purchasers would

like to purchase, but no production company would be willing to produce and sell. This would be the same up to 45 TL, the approximate marginal cost for coal mines. Following the hypothetical example, a certain amount of sellers may be willing to sell over 45 TL, but it would not be sufficient to satisfy the MW demands of the purchasers, because, according to a PMUM employee, Turkey's coal-based electricity production can satisfy only 30 to 50 percent of the total daily electricity demand (the electricity generated by coal-based plants is sufficient only during night hours). When the price exceeds 70 TL, then wind and hydroelectric plants would be willing to produce and sell. During night and even day hours, the combination of coal, wind, and hydroelectric plants prove sufficient, because the day price is fixed between 70 and 90 TL for most transactions, as I could observe and as PMUM employees also stated. This then means that, if the price is fixed, the MW of the purchase bids and the sales bids are identical at that price level.

In some instances, since the bid prices are entered at intervals and not in exact numbers, the purchase-bid MW and the sales-bid MW can get balanced at two different prices. Following this example and considering the MW reached, equilibrium occurs at the levels of both 70 and 90 TL. In these instances, the market operator applies interpolation and fixes the price as the average of these points, 80 TL in our example. During peak hours, on the other hand, the prices are double or triple of the day prices due to the very high demand from household consumption. For example, as per the latest available official Electricity Market Report issued by EMRA, the monthly average prices realized between 85.56 and 155.47 TL/MWh in 2011, whereas the peak hour prices ranged between 120 and 550 TL/MWh.[72]

[72] EMRA, *Electricity Market Report, 2011*.

After the day-ahead market closes, the market moves from period (T-1) to period T, the day of physical production, trading, delivery, and consumption, as well as the working of the balancing power market. The main objective of the balancing power market is to keep the entire electricity market in balance. In order to ensure technical and market balance, the electricity energy frequency should be kept stable at fifty Hertz by interfering with instant imbalances. The day-ahead market plans and organizes the electricity exchange for the coming day and establishes an initial balance. However, when the exchange day comes, there can be technical imbalances from both production and demand sides; the production facility may not be able to work at the anticipated capacity due to technical malfunctions, or the distribution companies may underestimate the household demand and experience a need for additional electricity. MYTM monitors and manages these imbalances instantly, as they emerge, through the balancing power market.

Balancing units—that is, production facilities that can over- and under-load on very short notice—are compelled to participate in the balancing power market, even though they may not participate in the day-ahead market. They report their over- and under-production capacities and relative price offers to the system for the next day on an hourly basis. All the participants in the bids have to accept the condition that they must start generating within fifteen minutes after they receive the instruction to over-load. Private sector companies are very much interested in acting as balancing units because of the very high prices paid to these plants when they are requested to over-load and because they will have the chance to receive payment without producing when they receive the instruction to under-load.

For example, the executive of a private production and wholesale company informed me that they are now working on an NG plant primarily aimed to serve as a

balancing unit under TEİAŞ. The company is working to establish the plant with a peak-type motor because NG plants with peak-type motors are the best candidates for balancing units, since they can reach top-load within five minutes only. However, certain production companies hesitate about the benefits of acting as a balance unit, because they argue that constant over-loading and under-loading may have long-term detrimental effects on the plant motors. A private production company executive informed me that, even though profit may be high, first they would have to wait for the peak-type motor technologies to prove themselves over other plants, and that they could only take the risk following such proof.

The daily working of the real-time balancing power market starts at 14:00, when the market participants report their offers for over- and under-load, following the fixation of the price on the day-ahead market. The balancing units enter their hourly bids until 16:00. After 16:00, the system operator reviews the day-ahead market production and purchase bids, the over- and under-load bids and requests clarification or revision/correction, if necessary. The system operator, then, lists the over- and under-load price offers for each region in terms of price level and constructs the secondary capacity required for fulfilling these offers. When the real-time production and consumption starts, the market operator monitors the general balance of the market in order to detect imbalances and to interfere with the aim to rebalance with over- or under-load instructions. When the balancing units receive these instructions, they begin to work within fifteen minutes so that system balance is re-established.

The rules for over-load offers require that they must be reported on fifteen load levels; the price difference between the first and fifteenth level cannot exceed 20 percent; on each level they should equal or be higher than the previous level; the

minimum offer amount is 10 MW; and the price level should be higher than the day-ahead market price fixed for that particular hour. As for the under-load offers, they must be reported on fifteen load levels as well; the price difference between the first and fifteenth level cannot exceed 20 percent; the minimum offer amount is 10 MW; in contrast to over-load offer rules, they should equal or be lower than the previous level; and the price level should be lower than the day-ahead market price fixed for that particular hour. The instructions are labeled "0" if production and consumption are in balance in real time; "1" if there is a constraint in the system that could be balanced by over- or under-load; and "2" if there is a need for secondary reserves for the coming day.

The price fixation procedures for the over- and under-load instructions are similarly defined under the regulations, but with one major difference. If the system direction signals an energy surplus imbalance, then the under-load offers are listed from highest to lowest until these offers add up in terms of the MW amount required for balancing the system. The latest included offer's price is fixed as the price. However, if the system direction signals an energy deficiency imbalance, then the over-load offers are listed from lowest to highest until these offers add up in terms of MW amount required for balancing the system. In the over-load mechanism, the price is not fixed based on the latest included offer's price; each bidder pays according to their bid. Since these plants have received the amount of unproduced electricity from the day-ahead market, they return a certain amount of their income to the system for not producing. In most instances, there can be both over- and under-load instructions given to different balancing units in the same hour, since the intervention must happen in very short time intervals. However, over- or under-load instructions raise the operational and individual actor risk by increasing the number

of market transactions. In these instances, the offers that have received instructions coded either “1” or “2” are grouped as over- and under-load instructions. In the final stage of this mechanism, these imbalances are added up and reveal the net system imbalance in MW, which is utilized for the fixation of price.

In order to better illustrate this mechanism with a hypothetical example, one may imagine a situation where the system needs 800 MW of over-load in order to rebalance an energy deficiency. In this case, the realized offers are listed from minimum to maximum price: (a) 110 TL for 50 MW, (b) 115 TL for 200 MW, (c) 120 TL for 150 MW, (d) 125 TL for 100 MW, (e) 130 TL for 200 MW, and (f) 140 TL for 100 MW. The MW are added up from the lowest offer until 800 MW is reached; then they are added from offer (a) to (f), and the price is realized as the price of offer (f), that is 140 TL, and all actors get paid accordingly. However, when the system experiences an energy surplus imbalance, then the under-load offers are added up from maximum to minimum, and each realized offer pays according to their offer value. This is because, while the over-load market is a “margin market” (like the day-ahead market), the under-load market is a “pay as bid” market.

It is important to note here that the real-time balancing power market is mainly built on the subjective decisions of the market operator. The over- and under-load instructions are neither given to the balancing plant with minimum cost, nor to the plant with maximum technical potency or fastest reaction potential. Furthermore, when coupling this subjectivity with the lacking transparency of the procedure, the legitimacy of the balancing power market and its outcomes, such as price, becomes very controversial. TEİAŞ executives and employees legitimize the outcomes of the real-time balancing power market as the ultimately most important mechanism that

maintains balance in the market, without which the cost of imbalances would be extremely high, so high that any other cost would be favorable.

As if they had agreed on it beforehand, all the executives I interviewed gave the example of wind plants with volatile production and claimed that their costs to the electricity market were tremendous as a whole. They reported that the offers were reviewed via objective criteria, such as transmission system constraints, the technical constraints of the balancing units, the past performance of the balancing units, the amount of the required electricity over-load, the national security of supply, and the quality of the energy supplied. But when I asked how they evaluated the quality of the electricity generated in NG plant a in comparison to NG plant b, or how a particular plant with an electricity output below 1 percent of the total output could be linked to security of supply, they consistently answered that only experienced market experts could know and evaluate these.

The executives emphasized that these instructions and their justifications were announced to the market players via the market management system. However, there are two important points that need to be raised here: firstly, only results are announced to the market players, but not the decision-making processes as to why a particular plant is chosen; secondly, the announcement is made only to market players but not to the end-users who are the ultimate financiers of the electricity market.

Furthermore, the traders and market analysts raised concerns about the patronage relationships at play in the real-time balancing market. An owner of an NG plant complained:

> I have the same type of natural gas plant, the same, and I am sure that my offers are favorable as well, so why are all the over-load and under-load instructions received by Adularya? Only because they go along with the right people.

Consequently, even though the volume of the real-time balancing market is minor, high price levels and the lack of transparency in the decision-making process creates problems of legitimacy for these prices. Moreover, the utilization of expertise discourse works not only for the exclusion of certain actors from these market encounters, but also for the legitimation of the subjectivity as well as the lacking transparency of market activities and outcomes.

Following the planning and realization of market transactions in the day-ahead and real-time balancing power markets, the system operator calculates the imbalances and the market players' debts and liens. In the day-ahead market, when a market player ends the day with surplus energy (a positive imbalance), the market management system (TEİAŞ in practice) purchases this energy from the minimum day-ahead electricity price. When a market player ends a day with an energy deficiency (negative imbalance), then the market management system procures this deficient electricity on behalf of the actor for the maximum day-ahead electricity price. The daily market settlement debts are paid to the system or to the producing company the next day, before 17:00. The system aims to increase the daily cost of imbalances for the trading companies and to provide an incentive to these players to better calculate their demand and production expectations. At the end of the day, the trading companies pass these costs on to the distribution companies by means of increased bidding prices, and the distribution companies pass their costs on to the end-users by refusing to give discounts on the invoices for eligible customers in the long run. Consequently, the imbalances are financed by the consumers through indirect processes.

In the real-time balancing power market, the calculation of the over- and under-load transactions are also conducted on daily basis, but can only be calculated

and settled after the fifteenth day of the next month, because daily real-time counter information is required for this calculation. Accordingly, the collection of debts happens only after the fifteenth day of the next month. The balancing units that receive over-load instruction are paid by the system, whereas the balancing units that receive under-load instruction become indebted to the system, because they receive the day-ahead market price for the non-produced electricity and become indebted for an amount that is less than this price, as per regulations. Thus, even though they become indebted to the system, at the end of the day they profit in terms of both price and payment due period. They receive the price for electricity not produced on the transaction day, whereas they pay a small amount to the system twenty to forty-five days after the transaction day.

The settlements under YEKDEM are more direct and more clearly defined in the regulations, when compared to the spot market balancing and settlement mechanisms. In the new Renewable Energy Market Law (2010), the incentive price for each primary resource is defined, and each producer receives payment in accordance with the defined subsidy. The everyday working of YEKDEM's mechanism starts at 09:00, when the renewable electricity production plants report their anticipated generation to MYTM. MYTM uses this information to calculate the regional and national YEKDEM generation per hour. As a third step, at 11:00 PMUM presents this generation in the day-ahead market independent of price, and trading occurs. The settlement, however, can only be executed in the month following the transaction, when the exact production output within the YEKDEM mechanism is reported, along with the unlicensed electricity generation amount reported by the distribution companies.

PMUM conducts the settlement calculations based on these market data and announces the results to the market players via the market management system under its own control. The renewable electricity producers, which are entitled to YEKDEM support, issue their invoices accordingly and collect the invoice value within seven days from the distribution company or from the market operator PMUM, based on whether the producer is licensed or unlicensed.

Table 4: "Schedule 1" of the Provision of the Law on Amendments on the Law on the Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy (no. 6094), dated 29 December 2010.

Type of Production Facility based on Renewable Energy Resources	Subsidy Prices (USD Cent/KWh)
Hydroelectric production facility	7,3
Wind power based production facility	7,3
Geothermal power based production facility	10,5
Biomass based production facility (including landfill gas)	13,3
Solar power based production facility	13,3

Table 5: Summarized Integration of "Schedule 1" and "Schedule 2" of the Provision of the Law on Amendments on the Law on the Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy (no. 6094), dated 29 December 2010.

Type of Production Facility based on Renewable Energy Resources	Maximum Subsidiary Prices when Schedule 1 and Schedule 2 are Integrated (USD Cent/KWh)
Hydroelectric production facility	9,6
Wind power based production facility	11
Geothermal power based production facility	13,2
Biomass based production facility (including landfill gas)	18,9
Solar power based production facility – utilizing photovoltaic technology	20
Solar power based production facility – utilizing intensified solar technology	22,5

Finally, after all the balancing and settlement has been executed by PMUM, including the YEKDEM settlement, there remains one final settlement operation—that is, the zero balance settlement. Since TEİAŞ is a public institution that in principle desires no profit, the total monetary output after these transactions, regardless of whether it is negative and positive, is distributed among the market players according to their withdrawal from the system in terms of balancing transactions. The logic is to distribute both losses and profits to the market players based on their past market actions. However, the market players and especially the market analysts are very much disturbed by the zero balance settlement based on the justification that the zero balance settlement calculation is not transparent and even more controversial than the decision-making process of over-load instructions.

The components of the calculation purportedly include the costs of over- and under-load instructions, system purchases, system sales, and real-time counter information. However, the over- and under-load instructions already lack transparency and are controversial. Furthermore, all the market actors know that the counter information is not received correctly or on time. As a result, the zero balance settlement emerges as a non-transparent and illegitimate cost/profit imposed on the market players.

The financial guarantee system is an important market component that deserves particular emphasis. The majority of the market actors object to this application, citing the justification that there are many corporations in the bilateral market willing to trade without financial guarantees. Further they argue that these agreements should be reflected in the day-ahead and balancing power markets, if both parties' willingness is expressed to the market operator. However, the market operator insists that all the players should present financial guarantees in accordance

with the scope of their trade. The market operator's insistence was reinforced when nine distribution companies filed bankruptcy, preceding the market crisis on 13 February 2012, when the electricity price unexpectedly rose to the upper limit of 2,000 TL/MWh due to the NG shortage caused by Russia. This put a substantial financial burden on the market operator, which was eventually distributed to the market players under the zero balance settlement application. Many distribution companies still voice their discontent about this particular instance and the zero balance settlement mechanism. Therefore, the market operator firmly insists on the requirement of financial guarantees that can be liquidated in case of market actors' bankruptcies and non-fulfillment of payments.

In order to financially safeguard the transactions on the day-ahead market and the real-time balancing power market, the market operator collects financial guarantees from each market player, mainly in the form of bank guarantee letters and cash guarantees. The market operator reviews each player's bids in the day-ahead market and reports the required bank guarantee letter amount on the same day, after at 14:30, to the market actor and the Central Settlement Bank, which in turn collects the financial guarantees on a daily basis.

The minimum guarantee requirements are defined by the regulations as 200,000 TL for wholesale companies, 200,000 TL for retail sale companies, 200,000 TL for production companies over a capacity of 1,000 MW, 10,000 TL for production companies under a capacity of 50 MW, and MW x 200 TL for production companies that have a production capacity between 50 and 1,000 MW. The cash guarantee percentage has to amount to between 50 and 100 percent of the total guarantee to be presented to the Central Settlement Bank, whereas the maximum bank guarantee letter amount has to total 25 percent. Other accepted financial

guarantees include foreign currency (0.90 guarantee value), treasury bonds (0.95 guarantee value), and state bonds (0.80 guarantee value).

The required financial guarantee is calculated by first adding up the commitments of the market player in the day-ahead and the balancing power market. Secondly, this amount is compared with the minimum guarantee requirement set for this market player by the regulations. Finally, the guarantee is fixed to the amount, whichever is higher. For example, if a production company with a 450-MW capacity bids in the day-ahead market for an amount of 23,000 TL and in the balancing power market for an amount of 15,000 TL, then first these amounts are added up, to 38,000 TL. However, because the minimum guarantee requirement for the production companies is MW x 200 TL, the minimum requirement for this company is 450 MW x 200 TL = 90,000 TL. In this situation, the required financial guarantee amount totals 90,000 TL. If this company bids for 75,000 TL in the day-ahead market and for 30,000 TL in the balancing power market, the minimum financial guarantee requirement would be 75,000 TL + 30,000 TL = 105,000 TL. The second component of the calculation is the risk multiplier. For minimum and average risk players, the risk multiplier is one, whereas for more financially risky players the multiplier can exceed one. In practice, the risk multiplier is accepted as one, unless the market player has substantial measurable risks or bankruptcy experience known to all market actors.

The market players collect the bank guarantee letters as per TEİAŞ requirements (the amount can be collected by more than one letter from more than one bank) and submit them to the market operator on the day of transaction, until 10:30. The market operator informs the Central Settlement Bank, Takasbank, about

the receipt of the bank guarantee letters.[73] In the meantime, until 11:00, the market players submit their alternate financial guarantees directly to Takasbank, which in turn informs the market operator of the total financial guarantees submitted by each market player. Until 11:30, the submitted financial guarantees are evaluated in terms of the total guarantees that must be submitted according to the market operator's calculation. Finally, if the financial guarantees prove sufficient, the bids are taken into market consideration after 11:30.

The day-ahead and balancing power market mechanisms employ advance payment applications for market transactions. The advance payments in the day-ahead mechanism are calculated and paid daily, while they are calculated daily but paid monthly in the real-time balancing market. The daily advance payment mechanism commences at 14:00, with the announcement of the day-ahead market prices and transactions. The daily advance payment notification is delivered to the market players and to Takasbank by the market operator at 14:30. The market participants are obliged to pay the reported advance payment amount until 15:00, within half an hour, and the market operator is to pay the advance payment amount until 17:00. If payments have not been received until 15:00, the interest rate defined in the regulation as the interest rates for the delayed collection of public claims applies to the market players' debts to the market operator as well as to the other market players. On the fourteenth day of the month, the final settlement information is announced to the market players. The market players issue their invoices between the fifteenth and twenty-third day of the month by deducting the realized advance payments. The private sector invoice addressees have six and the market operator

[73] Due to the name change of the bank's largest shareholder from "Istanbul Stock Exchange (ISE)" to "Borsa İstanbul Inc.," Takasbank's name "ISE Settlement and Custody Bank Inc." was changed to ''Istanbul Settlement and Custody Bank Inc.—Takasbank'' as of 11 April 2013.

seven days to pay these invoices. In case of a delayed payment, the interest rate defined in the regulation applies to the final invoices as well.

One subgroup in the electricity spot markets can be identified as import and export activities. Since 2010, Turkey has initiated the synchronization project with the European Network of Transmission System Operators for Electricity (ENTSO-E). Based on the success of the initial minimum load tests, parallel operation test processes, and non-commercial exchange transactions, Turkey entered the international electricity market via ENTSO-E in June 2011. The full synchronization is planned to occur by the end of 2014. Currently, the Turkish electricity market has limited export transactions with Greece, Syria, Bulgaria, and Azerbaijan and relatively greater import transactions with Bulgaria, Greece, Azerbaijan, Georgia, and Iran. The import and export activities with Greece and Bulgaria are open to market actors holding relevant licenses (production license or trade license) under ENTSO-E system; whereas the transactions with Syria, Azerbaijan, Georgia, and Iran are solely conducted by TETAS. The electricity transmission line capacity reserved for international trade is 400 MW for import and 300 MW for export, of which usually 35 percent are utilized for Greece and 65 percent for Bulgaria, due to higher electricity prices in Greece.[74] ENTSO-E constantly monitors the energy flows every month, and this capacity can be increased based on bilateral monthly calculations approved by ENTSO-E.[75]

Import transactions mainly happen with Bulgaria, since Bulgarian electricity is cheaper. Furthermore, the counterparty financial risk in Greece is substantially

[74] Ümit Büyükdağlı from TEİAŞ, "ENTSO-E Integration of Turkey, Commercial Applications of Europe and Neighboring Countries, TEIAS Capacity Auction Tools."

[75] TEİAŞ, notice on the Net Transfer Capacities of Existing Interconnection Transmission Lines, 5 April 2013, www.teias.gov.tr/Dosyalar/NetTransferKapasiteleri.doc. Retrieved 8 May 2013.

higher when compared to Bulgaria, due to the financial crisis in Greece since 2011. The international trade market with Greece lacks an independent agency that provides financial guarantees to the market players. This may increase Greek electricity cost even further, which is already higher than the Bulgarian one. In spite of both export and import fees on Bulgarian electricity, the total cost is still lower than for Greece. Turkey has established international transmission lines with Armenia, Georgia, Iraq, Iran, Syria, and Azerbaijan as well; however, these transmission lines are not open to participation of private market actors as of 2013.

In 2012, the total import amounted to 5,826.67 GWh (a 29.9-percent increase from 2011), whereas the total export was 2,953.58 GWh (a 18.9-percent decrease from 2011). The statistics show that the three percent of the total electricity consumption was met by imported electricity.[76] The electricity import reached its peak with 741.2 GWh in December; whereas the minimum import was observed in April, as 310.7 GWh. The terms of trade in the import/export activities are not favorable for Turkey in most transactions. As per EMRA's latest available official market report, only in the months of October, November and December 2011 the export prices (3.03 € on average) were higher than the import prices (1.16 € on average). Especially in the summer months, the terms of trade in the transactions were extremely unfavorable for Turkey. For example, the average export price was at 0.09 €/MWh in August, while the average import price was 6.83 €/MWh.[77]

In order to provide more up-to-date information, I have included Figure 2 from the presentation that Ümit Büyükdağlı, a TEİAŞ employee working on international transmission lines, prepared for the 2013 International Energy and

[76] TEİAŞ, *Monthly Distribution of Turkey's Gross Electricity Generation by Imports-Exports and Gross Demand (1999-2012).*

[77] EMRA, *Electricity Market Report, 2011*.

Environment Fair in April 2013. The figure does not contain information about the commercial terms of trade and the realized prices. However, its information illustrates that the trade volume continues to be higher with Bulgaria than with Greece, and that Turkey continues to be the net importer in this trade relationship.

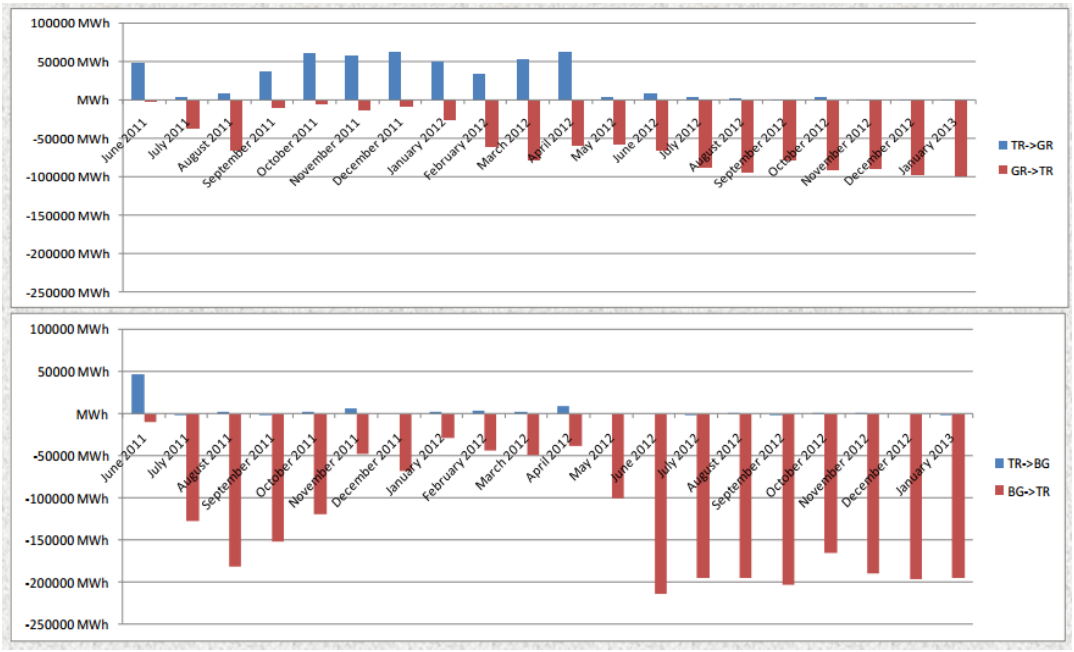


Figure 2: Turkey's monthly electricity import and export output between June 2011 and January 2013.

The daily import/export mechanism is conducted via the TEİAŞ Capacity Auction Tool, an online tool similar to the day-ahead and balancing power market screens where the only difference is that the bidders bid first for transmission line capacity, and second for the electricity price if they can win the bid for the transmission capacity. The prerequisite to participate in the capacity auction is to hold an electricity wholesale or production license. Theoretically, 140 trading companies

have the right to participate in this trade according to TEİAŞ's records,[78] (Moreover, the regulations grant every production license holder the right to export electricity under the condition that they construct their own transmission line). In practice, approximately fifty companies participate on a monthly basis.

TEİAŞ and its counterpart transmission operators from Bulgaria and Greece determine the capacity amounts to be allocated to import/export activities on a monthly basis. The market players first bid for the allocation of a certain amount of electricity transmission capacity. The bids are accepted on a monthly basis and separately for Bulgaria and Greece. If the trading company is allocated a certain amount of transmission capacity, it can conduct daily import and export activities with the market players in that country, because, unlike the capacity bids, the export/import bids are submitted on a daily basis according to hourly specifications. When the market players bid for and are allocated a given amount of transmission capacity but cannot utilize this capacity—for example, due to unexpectedly high import prices, or an unexpected fall in the anticipated demand—then they can transfer this capacity (partially or totally) to another market player holding an electricity wholesale license.

It is important to note here that, even though Turkey is located on the unfavorable side of the table in terms of the import/export balance statistics, the international electricity trade presents possibilities of arbitration for individual market actors. For example, although the daily prices for imported electricity may not always be advantageous, the traders can catch arbitrage potentials by exploiting the intra-day (hourly) price differences. Especially during peak hours, the traders

[78] TEİAŞ, Capacity Auction Tool, https://tcat.teias.gov.tr. Retrieved 22 May 2013.

admit that they search for cheap electricity especially from Bulgaria. One trader explained:

> In the peak hours the producers automatically raise their prices, even though there is not much consumption due to unexpected weather conditions or something else. So if you do not have long-term bilateral agreements with production plants that are new and in need of stable financing, you are doomed during the peak hours. But sometimes, especially in Bulgaria, you can find really cheap electricity during these hours. Particularly when it is raining there, but not here. I know this happens once in a month, or two months. But when it does, we make substantial profits. We not only fulfill our commitments with cheap electricity, but we sell the surplus on the market and the real profit is there. It is somehow like a treasure hunt, each month you enter the capacity auctions and pay their costs and sometimes you do not use these capacities for months, but still you continue to pay for them and wait because you think the treasure may be somewhere in there.

This opportunity will expand when the transmission line connection between Turkey and Georgia will be activated. This is because the peak hydroelectricity season in Georgia corresponds to July and August, the months that witness the highest electricity demand together with limited hydroelectricity generation due to drought. As a result, there will emerge not only hourly, but also daily or monthly arbitrage potential for wholesale electricity traders. It should be noted that the domestic electricity market is open to arbitrage possibilities as well. The increasing share of volatile production plants (wind plants and HPPs) creates arbitrage potential for wholesale electricity traders. For example, a trader may conclude bilateral agreements and make transactions in the day-ahead market for a total output that is over the plants' supply commitment. Then, this extra output can be used as a tool of arbitrage, either by supplying it to the market to create imbalances, or it can be translated into profit in the a case wind levels fall below the anticipated level and in case the price increases to very high levels in the day-ahead market.

One trader's expressions illustrate the ways in which the disciplinary discourses of economics enframe and shape the calculative mechanisms as well as

the actions of the market actors. The trader used the word "automatically" for explaining the behavior of market actors at certain time intervals and conditions, indicating a disciplining process that the market actors undergo as they conduct their everyday market interactions. The actors learn and adopt certain calculating behaviors that they present and exercise in a similar way. These actors are not instructed by a certain market actor to manifest similar behaviors and market positions; yet, they are enframed, shaped, and reformed by the disciplinary discourse of economics and by information technologies such as the standardized and imposed bidding types. Consequently, market actors manifest similar bidding practices, which one market actor defines as "automatic."

Fatih Kölmek, an Energy Expert with EMRA, announced in his talk at the Regional Black Sea Regulatory Workshop in May 2010 that Turkey was conducting studies for the EIJLLPST (Egypt, Jordan, Syria, Turkey, Iraq, Libya, Lebanon, and Palestine) Project, which aims at establishing an international transmission line between these countries and consolidating international electricity trading. This project has not been accomplished as of February 2014, but Kölmek announced at the 2013 International Energy and Environment Fair that the project will soon yield substantive results. If it was indeed realized, not only would Turkey's goal of becoming an energy hub be consolidated, but also the conditions for arbitrage would be extended.

The regulatory framework of the Turkish electricity market also enables the speculation of market actors, because the market structure not only allows the market players to hold positions in the long term, but also to reposition themselves in short periods, due to the fact that the major trade volume occurs in the spot market. Speculation can be defined as holding a market position based on market information

not known to all market actors. For example, one trader told me of a successful speculation he had concluded in June 2012. In May 2012, he had learned "out of the air" that two very large production plants were expected to undergo maintenance during that summer. This was not expected, because in order to prevent the occurrence of very high electricity prices, the maintenance work is usually performed in the spring months, before the peak seasons of summer or winter.

Considering the general market conditions and the anticipation of very high electricity prices in June, the company decided to put emphasis on import mechanisms and planned to purchase relatively cheap energy from Bulgaria to sell it on the Turkish market. Accordingly, the company entered the capacity auction in Bulgaria with a very high price, which did clear the market and other low-price bids. The capacity bid was 22.32 €, the highest bid ever entered in the TEİAŞ Capacity Auction Tool. Other offers were within the standard 5-10 €/MWh range. They calculated that the capacity fee would amount to 22.32 €, the electricity cost around 38 €, the Bulgarian export fee 17 €, and 1.5-2 € of additional operational costs—amounting to a total turnkey electricity cost of 79 €/MWh. This price is actually very high for average conditions of June, or even July and August. However, when the time came, the electricity price on 20 June 2012, the first day of the plants' maintenance, reached more than 220 TL/MWh, whereas the imported Bulgarian electricity was purchased at 81.62 €/MWh including all total costs (the €/TL exchange rate on 20 June 2012 was 2.27, equaling 185.28 TL). The company sold this output into the system for 220 TL, profiting substantially. Even though the trader confessed that they had expected prices over 280 TL and even though he considered the speculation as only partially successful, he also admitted that they profited from this speculation, just not as much as they had planned.

One should remember at this point that this transaction, like every other import transaction, required the management or hedging of the currency risk along with the counterparty risk, because the €/TL parity is not stable and has witnessed increases of more than 5 percent within one day in recent records. The production companies, and particularly the production plant types dependent on foreign sources either for their construction or maintenance, operate under this currency risk as well. For example, solar and wind plants are very much dependent on foreign technology, and consequently these companies are compelled to invest in €, but are paid either in USD within the Renewable Energy Support Mechanism, or in TL if they sell their electricity output on the spot markets.

NG plants, however, are dependent on foreign resources, both for their construction and maintenance. Their construction costs are relatively low when compared to wind and solar plants, but they are still under the USD/TL risk, with their investment being in USD and collection in TL. Yet, their major currency risk regards the primary resource risk, which is continuous as long as the plant operates. The currency of the international NG trade is not publicly announced, as discussed above; however, the market players observe that the NG prices have the tendency to move with the USD. Momentary currency fluctuations are compensated by BOTAŞ, but reflected eventually on the consumers' end, including industrial consumers and households, either directly by means of price increases or indirectly by financing the losses of BOTAŞ that are socialized. An executive with an NG-based electricity plant explained that "it is like a baby pacifier, BOTAŞ first gives the pacifier and makes everyone happy, but then you wake up to see that everything has reached the same level with small but repeated price increases."[79]

[79] "Tıpkı bir emzik gibi, BOTAS önce emziği verir ve herkesi mutlu eder; ama uyanınca görürsünüz ki her şey aslında küçük küçük sürekli zamlarla aynı yere gelmiş."

As of 2014, the spot market in Turkey is on the edge of a major transformation, with the envisioned establishment of EPİAŞ by the 2013 EML (no. 6446). The Turkish electricity market was initially established with the balancing and planning markets, which were then followed by the introduction of the spot market. The next step thereafter was defined by Minister Yıldız as the establishment of the financial markets. The Turkish electricity market is currently between the second and third steps. The transitional steps outlined in the new EML are as follows: the identification of the financial market principles and establishment of required license types, the standardization of possible forward contracts and financial tools, the determination of settlement mechanism, operation fees, and responsibilities of the relevant institutions, and finally creating the principles and procedures of market monitoring and auditing.

In the third step, Exchange İstanbul (*Borsa İstanbul*) will be in charge of the financial derivative markets for electricity, while EPİAŞ will be in charge of the day-ahead, the intra-day, and the settlement markets, and TEİAŞ will be in charge of the balancing power and ancillary services markets. Takasbank will continue to play its role as the financial guarantee and market cash flow manager. Takasbank's role in the new structure is to ensure the market optimization, risk management, standardization, and transparency of the market by following all transactions financially.

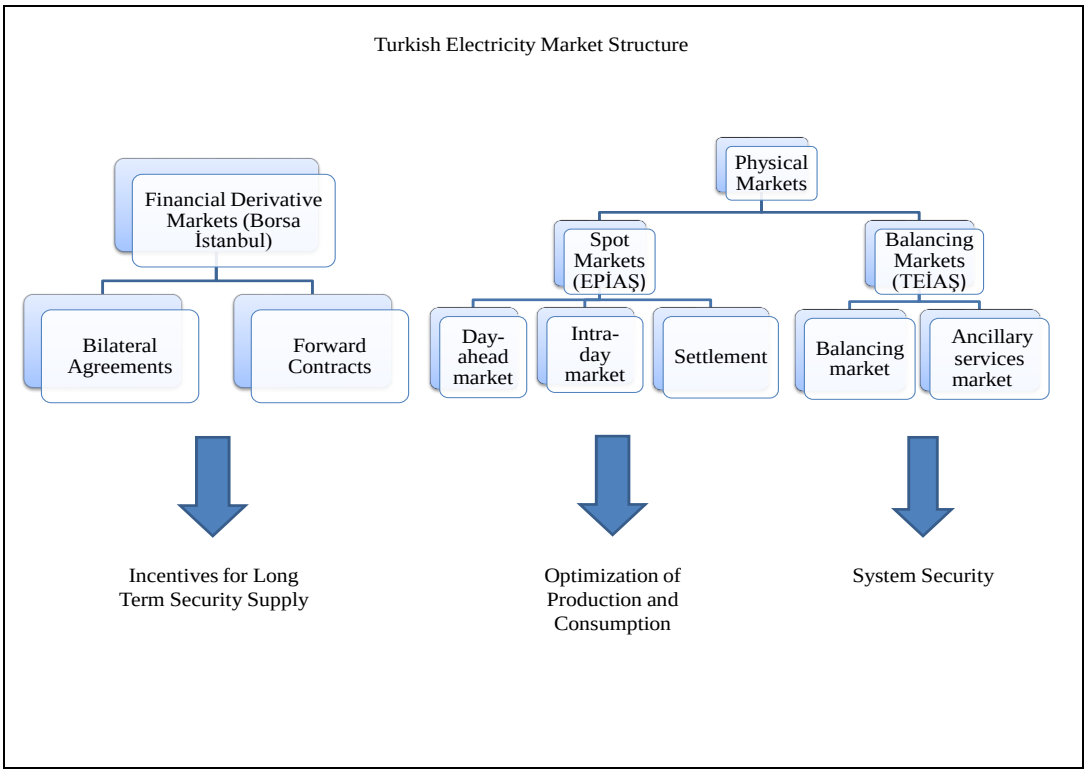


Figure 3: The Turkish electricity market's structure

The change is major, because it marks the entrance of a new market operating actor, namely EPİAŞ, which is also new in kind. As per the regulations, private and public companies will be partners in this new market operator. Even though not explicitly stated in the regulations, the public partner of EPİAŞ is expected to be TEİAŞ, due to its experience as market operator since the establishment of the spot markets. Market operation is defined as a new market activity that can be conducted by acquiring the necessary licenses and by forming partnerships with different market actors that will eventually constitute the central market operating authority. New actors and actor types will change the dynamics of the market as well.

The law aims at establishing a balanced market mechanism in which each actor will be in charge of different market mechanisms. These mechanisms intend to balance each other by providing proper market planning, physical delivery and

settlement information. The Ministry of Energy and Natural Resources foresees the market cycle to be established with the new EML as in Figure 4. Accordingly, Takasbank is still central to market information and settlement.

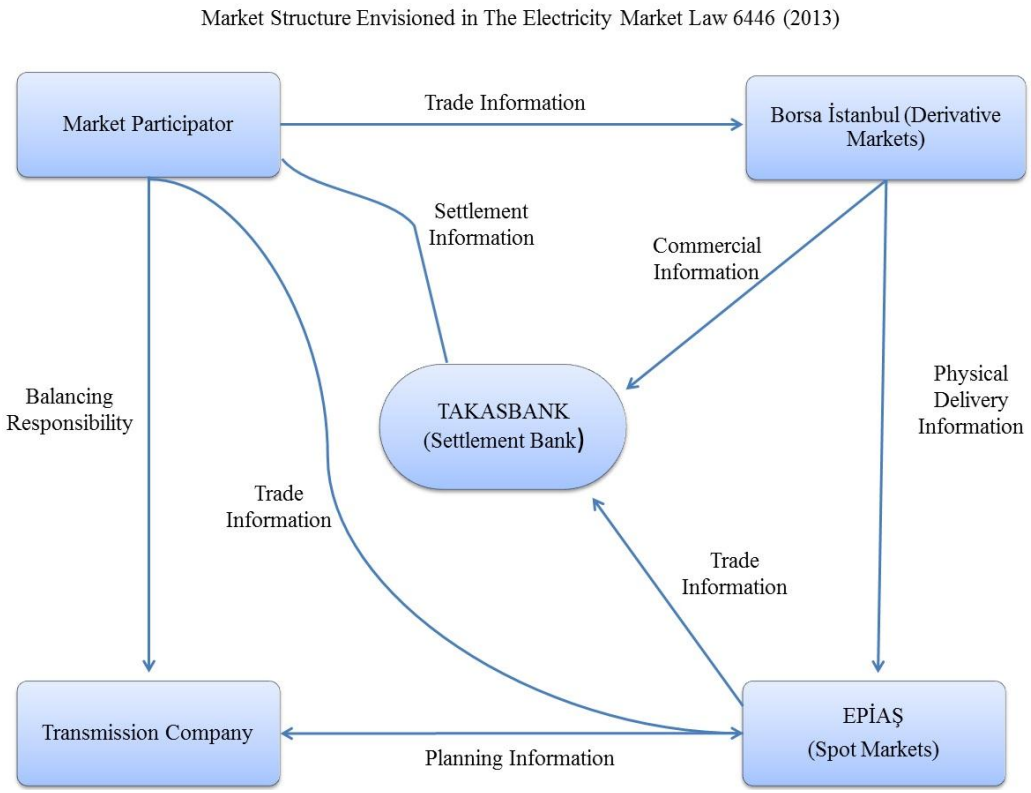


Figure 4: Market structure envisioned in Electricity Market Law 6446 (2013)

The increased emphasis on market information is problematic, because acquiring timely and correct market information is not feasible in Turkey due to delayed and incomplete meter reading data reported by the distribution companies. Furthermore, this market cycle excludes the OTC electricity trading mechanism, which currently approaches 20 percent of the total trade volume in the Turkish electricity market. The bilateral agreements defined by Exchange İstanbul are entirely different, as they concern long-term financial forward contracts. The OTC trade mechanism, as a physical market, works based on short-term and medium-term bilateral trade

agreements. Consequently, this envisioned market cycle introduces additional implications for electricity market actors, excluded trade forms, unclear trading components (such as the acquisition of market information or the calculation of settlements), and trading mechanisms promoted by imposing a certain theoretical market form at the expense of existing alternative forms.

The details of the envisioned market structure and the roles of EPİAŞ have not been publicly announced by the market-making or -regulating authorities. Only certain details received explanation in the fifteen-minute answer-and-question session held by Abdülkadir Ongun, the Head of the Department of Supply Security of the Ministry of Energy and Natural Resources, at a conference held right after the codification of the new EML.[80] Ongun made the following statement:

> In the new structure, EPİAŞ will be responsible not only for electricity trade, but also for the settlement of imbalances in PMUM. And this is, in fact, a little complicated. Initially, EPİAŞ will be responsible for making settlement calculations. It will acquire the necessary information from Takasbank. Takasbank will also be responsible for the management of financial guarantee and cash flows. But as you may have noticed, there is a multi-manager system here, which will be refused by Takasbank at the end of the day. But I think this would be wrong; because in order to settle the imbalances, the required thing is the electricity meter information, which is irrelevant to Takasbank. Consequently, EPİAŞ must also in principle be the settler of imbalances.

However, these must be considered as Ongun's personal comments, and not as official statements by the ministry.

The non-transparency of EPİAŞ's partnership details further contributes to a particular marketization of electricity in Turkey. Since the inner organization and structure of EPİAŞ has not yet been officially announced, the market actors are very much interested not only in becoming partners with EPİAŞ, but also in the partnership procedure. The partnership application procedure has not yet been revealed to the market actors. A substantial number of market actors has raised

[80] International Energy and Environment Conference and Fair, 24-26 April 2013.

concerns that EPİAŞ will once again be a "government club." The executive of a company operating in the renewable electricity sector stated:

> I know that, no matter what I do, I cannot be a partner of EPİAŞ. Because, first, I am in the renewable business that the government in fact does not support so as to convince people more easily that nuclear [power] is necessary. Secondly, it is not only publicly known that I do not have personal links with the government and EMRA officials, but I simply do not support the government and I have the courage to talk about this in electricity market circles. Wait and see, I am telling you today [16 May 2013] that the partners of EPİAŞ will be Çalık Holding [its CEO is the son-in-law of Prime Minister Recep Tayyip Erdoğan], Limak Holding [which publicly supports the government], Ciner Holding [which also participates in the media sector with a pro-government television channel], and maybe Polat Holding, Turcas Energy, and Sabancı Holding, since they are effective in the Turkish industry as a whole [because they participate in other sectors such as automotive and construction, which are the locomotive of Turkish industry].

EMRA, the ministry and certain market players cherish the establishment of EPİAŞ and focus on other aspects, mainly concerning the general investment conditions and possible macro-economic outcomes of EPİAŞ. Hasan Köktaş, the President of EMRA between January 2008 and January 2014, stated that EPİAŞ's most important task would be to realize stable and reference quality prices in order to attract the attention of foreign investors; decreasing market volatility would, in turn, develop the whole Turkish economy by means of the trigger effect of the energy sector as an important input for industries. He recognized that price forecasting was currently impossible in the Turkish electricity market, but claimed that EPİAŞ would be the solution to this problem and supply the forward curve required to fuel investments. According to Köktaş, only predictability would make these investments internationally "bankable," since banks should approve investment projects before financing them in order to guarantee the return of their credits.

Moreover, he claimed that the establishment of EPİAŞ would contribute to the integration of new financial tools on the electricity market and the possibility for the public offering of company shares, which would enable them to collect financial

resources for further investments, in turn further developing the Turkish economy. Following Köktaş's argument, EPİAŞ would provide the market framework through which the intra-day market could be established, like the day-ahead market, which would transform the balancing settlement market into a full intra-day market. (The intra-day market is being configured in terms of technical software and required regulations; it is expected that the transition would be fully completed within the course of 2014).

Nihat Özdemir, the Chairman of the Limak Holding, supports Hasan Köktaş, stating that the most important result of the new EML is the establishment of EPİAŞ and the opening up of the path for derivate electricity markets. He claims that EPİAŞ will be of central importance for attracting foreign investors and for protecting the current investment spirit which has boosted the Turkish economy over the last five years. He reminds that another important contribution by EPİAŞ will consist of the internationalization of the Turkish electricity market and its actors; this is very important if Turkey desires to receive foreign investment, because, according to Özdemir, foreign companies would search and form partnerships with local firms when they enter a country for the first time. This is also why, according to him, the largest shareholder of EPİAŞ should be from the private sector, for the "sake of the Turkish electricity sector and the Turkish economy."[81] Following Özdemir's the argument:

> In order to establish a completely free and liberal competitive market where foreign investors would pit themselves against each other to invest in the Turkish electricity market, it is very important that the public authorities support well-grounded market actors via EPİAŞ. Because only in this way will the investors not be subjected to non-market risks such as political risks, along with the usual market-risks.

[81] "Türkiye elektrik piyasası ve ekonomisinin iyiliği için."

I should emphasize here that this phrase is indeed very ironic, because the market actor here requests a completely free yet at the same time publicly supported electricity market. This makes visible the ways in which market actors utilize contradictory discourses in order to legitimize their preferred outcomes. Here, Özdemir desires a completely free market in which the actors would compete with each other on equal terms; yet, at the same time they would request support as a well-grounded company, as opposed to other competitors. This contradiction demonstrates the ways in which each market comment or claim about the general market dynamics not only reflects how these work according to that actor, but also a vision of how the market should work in order to generate the outcomes desired by that particular actor.

Selehattin Hakman, the Head of the Energy Group within the Sabancı Holding, has emphasized the importance of price signaling, but also criticizes the ongoing market-making processes:

> Regardless of foreign or national investment, the most important thing for an investor to enter safely into a market or a particular market is to be able to foresee the timeline in which the investment will pay itself off. For this, however, you need to know at least with a five-percent discrepancy your return in monetary amounts. And for this, you need to know what will be the unit price range of the good in which you will invest, at least in the medium-run. This is what I expect from EPİAŞ, and what everyone says will be established by EPİAŞ, but I did not see any concrete map for how this will be achieved.

Hakman is correct in his criticism of the lack of clarification regarding the ways in which EPİAŞ will achieve its generally defined goals. Even though the regulatory framework has been announced and even though regulatory actors emphasize this accomplishment at every occasion, the roles of the institutions, the short-term map, the inner organizational and managerial structure, and the medium-term mile-stones to reach the ultimate goal of a "completely liberal and competitive market that

signals the medium-term reference price" have not been communicated to either public actors or market players. Moreover, Hakman emphasized the importance of including all market actors in EPİAŞ either directly, or by forming coalitions. For a better functioning of EPİAŞ and to prevent it from turning into a club containing a few powerful market actors, all market actors from the production, supply, distribution, trade, and consumption sectors as well as all other actors affected by EPİAŞ should be included directly in the partnership structure and indirectly in the decision-making structure, through delegations and managerial boards.

An executive from the Energy Traders Association raised concerns about the lacking transparency of this process:

> I must say that we are at a distance to EMRA in this study, and I really hope that we can overcome this aloofness, because the Turkish electricity market can only be developed by a system in which everyone's voice is heard. BOTAŞ, as the single authority in the natural gas market, should also be a partner with EPİAŞ, because the electricity market cannot be envisioned without taking into consideration the dynamics of the natural gas market. We are talking about long-term stability and price forecasting, we are talking about forward contracts. It should not be forgotten that market trust can flourish and market volume can reach desired levels only if the market indexes are reliable.

Batu Aksoy, the Chief Executive Officer of Turcas Energy, has raised objections to the new system as a whole, claiming that the electricity market can only flourish as desired, if the state completely exits from the market. He emphasized that the Turkish electricity market has to be analyzed with the help of macro-economic tools if one is to understand that the liberal electricity market can only be an outcome of a fully liberalized Turkish economy. It is indeed true that analyzing the Turkish electricity market through a macro-economic lens would lead to this conclusion, but, as illustrated in the theoretical chapter above, this would not lead to a comprehensive understanding of the Turkish electricity market in terms of market-making dynamics. Instead of taking the liberalization processes for granted, questioning the processes

of liberalization and the respective market-making mechanisms, as they are under scrutiny in this thesis, is of crucial importance if we are to understand the construction and maintenance of the market.

For example, Batu Aksoy, requesting the state not to intervene in the electricity trading and price making mechanisms based on the rationale that the supply and demand would eventually determine a fair price, later argued that "cost-based pricing" was a good incentive to attract foreign investment. However, he failed to notice the contradiction in these two requests from his own theoretical perspective. If a price were determined by the so-called supply and demand (which is very problematic especially in the electricity market where supply is extremely volatile and changes even hourly), then it cannot be determined by a cost analysis which by nature requires a supervisory public authority involved in trading and price-making.

These claims are not specific to Aksoy. The majority of private sector company executives asks for a "free, liberal electricity market," while at the same time requesting the extension of subsidies or tax exemptions. These claims and their justifications, in turn, further contribute to the establishment and consolidation of a hybrid electricity market structure that lacks transparency and clear information. The market is always under transformation and never clearly defined by the law or regulatory authorities. Ahmet Ocak, the Head of EMRA's Electricity Department, announced at the 2013 International Energy and Environment Conference and Fair that "even I, as the head of the department, do not understand what the day-ahead or the intra-day [market] is, but I do not mind very much, because it will change again anyway."[82] The contradictory claims of the market actors consolidate this hybrid and complicated system, which not only accrues profit to certain actors, but also prevents

[82] "Ben bile, departman başı olarak gün öncesi neydi gün içi neydi tam anlamıyorum, ama çok da takılmıyorum çünkü gene değişecek."

the establishment of a transparent, clearly defined, participatory electricity market in Turkey.

To conclude this section on the first and most prevalent trading mechanism in the Turkish electricity market, the power exchange or pool trade mechanism, one must be reminded that EPİAŞ may very well accomplish its goals of establishing a free and competitive electricity market and eventually develop the Turkish economy due to lower electricity prices. However, these goals, their implications for the market actors (including the consumers as the ultimate financiers of this market), and EPİAŞ's partnerships and decision-making processes need to be analyzed and announced publicly. Since the final delivery of the traded commodity relies on the transmission system holder, which in Turkey is in the hands of the public sector, the public will continue to act at least as a settler in the Turkish electricity market. Thus, the law and the secondary legislation should provide clear limits and responsibilities for these activities in order to prevent gaps where the responsibilities and rights of market actors are blurred. While the regulatory actors make continuous reference to establishing free competitive markets, developing the Turkish economy, and increasing the gross national product, there is no reference to an accountable, transparent, and participatory market open to public. Electricity is still traded behind closed doors, and as the Head of EMRA's Electricity Department warns, "electricity is the making of devil, don't get too close or you can get shocked before you understand what is happening."[83]

The second major trading mechanism in the Turkish electricity market—OTC trading—refers to the bilateral agreements that are not subject to direct regulation by EMRA or TEİAŞ. These agreements are usually in standard and very brief form,

[83] "Elektrik şeytan işidir, çok yanaşma yoksa ne olduğunu anlamadan çarpılırsın."

since they are concluded mainly by the same actors in reference to past credibility and contract fulfillment. (Of the eight OTC contracts from three different companies I have reviewed, seven were nearly identical in their general terms and conditions.) In these bilateral agreements, parties agree on conditions such as price, amount, peak or twenty-four-hour supply, delivery terms and date, contract maturity, price reference (some contract prices change based on the official tariff determined by EMRA, whereas others are fixed), the financial guarantee mechanism (usually bank guarantee letters in the amount equaling the two-month invoice value, and the direct debiting system), contract extermination, exit terms, sanctions, and whether the stamp duty will be paid. The contracts usually refer to block trade; they are based on twenty four hours, peak, super-peak, off-peak, and day/night electricity supply, usually the short term (one to seven days), although a few contracts are for the medium term (one to six months). Certain international trading companies that enter the Turkish electricity market, such as Statkraft Enerji A.S., have worked to integrate the standard energy trading agreement form of the European Federation of Energy Traders (EFET) in 2010, but the Turkish electricity market actors did not accept it. However, with the establishment of EPİAŞ and its goal of attracting foreign energy companies to the Turkish electricity market, it is expected that EFET's standard contracts will be gradually integrated in the Turkish electricity market as well.

These bilateral agreements are kept confidential not only from competitors, but most of the time from the entire market, due to the stamp duty issue. As per the regulations, these contracts are not exempt from stamp duty, as opposed to the electricity interactions that occur in the spot market. Consequently, OTC contracts are not notarized and the market actors keep them confidential; if these contracts were revealed during a tax audit, the contract parties may face charges of tax

evasion. As a result, the terms of trade in these agreements and the identity of the most important traders are kept confidential.

The interviews reveal that the terms of trade in the bilateral agreements work in favor of the producer in the majority of cases. The main reason behind this is that the wholesale supply companies and retail sale companies are open to the ultimate risk of non-delivery, while the production companies are only under the risk of non-selling or facing opportunity costs because they know exactly the level of their marginal costs and thus do not sell under their costs, unless they willingly do so. Sale companies, however, do not have information about the price levels for the coming days and are open to the risk of having to pay very high prices for electricity during peak hours, higher than their committed delivery price. Since the sales company cannot purchase reserve electricity and save this output for peak hours (due to the impossibility of storing electricity), they are in higher need of securing their market positions. The production companies, on the other hand, enter the market with substantial investment loans that must be paid on a regular basis, and this can be guaranteed only by medium- or long-term bilateral agreements. As a result, bilateral agreements are not solely dominated by the production companies, but they are in favor of the production companies due to the above-mentioned market dynamics arising primarily from the nature of electricity.

Since OTC contracts are neither monitored by EMRA or TEİAŞ, nor mediated by a stock market in between, the credit risk of these agreements is borne by the contract parties themselves. There is no guarantee or enforcement mechanism particular to these contracts. The risk in the day-ahead market, for example, is managed by the market operator TEİAŞ. However, the OTC trade mechanism allows the market players to distribute and even hedge their market risks over longer terms

than the day-ahead market. Especially the distribution and supply companies that hold commitments for the supply of certain amounts of electricity can distribute a proportion of their delivery commitment risk by making OTC contracts that ensure medium-term electricity supply for a predetermined and fixed price.

The legal regulatory framework introduces additional costs and respective financial risks for OTC contract parties. The major impediment to the OTC trade mechanism is the stamp duty imposed on these contracts. As analyzed in the previous section on the interplay between legal regulations and market establishment, the imposition of stamp duty on the OTC trade mechanism not only decreases the appeal of these contracts by introducing additional costs, but also introduces substantial financial risks in terms of their enforcement, because more than 90 percent of them are not notarized. A trader confessed:

> None of our contracts are notarized; because we know all the market players and who can be trusted, why would we pay for legal enforcement that usually does not work at all? Besides, we usually trade with the same companies; it is a continuous business, no one would risk their market position and reputation over a contract.

Demonstrably, the OTC trade mechanism is heavily built on market trust. The acceptance of trust as a financial mechanism further contributes to the hybrid structure of the electricity market. Since the majority of the OTC contracts cannot be legalized, market actors concluding such contracts complain about the lack of liquidity and financial tools for this trading mechanism. In conclusion, the trade volume of this mechanism is unknown due to the issues arising from a lack of transparency and the stamp duty; it is disorganized and small-scale. Of the fourteen market trader and analysts I interviewed, all claimed that OTC trade volume is approximately 20 percent.

As discussed in the second chapter of this thesis, market actors do not always accept the regulatory limits without resistance and manifest acts of negotiation and counter-performance. The trader companies lobby for the exemption of OTC contracts from the stamp duty, and the Head of EMRA's Electricity Department, Ahmet Ocak, announced at the 2013 Energy and Environment Fair and Conference that EMRA would support the necessary regulatory framework for developing OTC markets, including providing exemptions on stamp duty. Furthermore, EDF—an Energy Trader and Broker company operating in Belgium primarily in the OTC electricity market—directly infiltrated the Turkish electricity market in 2013, whereas EnBw—an Energy Trader and Broker company operating in Germany—and EON—an Energy Trader and Broker company operating in the UK—formed alliances with Turkish companies (EnBw with Borusan Holding, and EON with EnerjiSa) and indirectly infiltrated the Turkish electricity market. A market analyst specialized in the EU and Turkish electricity markets explained to me that brokers, in principle, create a platform on which buyers and sellers encounter each other; they act as intermediary without holding a position of their own, but by providing market data and analysis. Even though it is open to debate whether broker companies hold positions of their own, or whether they create arbitrage and market manipulation, one may legitimately expect that the OTC trade volume would increase if the regulatory impediments are overcome and that financial institutions would further infiltrate the trade with their own profit aims.

The third trade mechanism on the Turkish electricity market consists of the OTC swap contracts and contracts for differences, which refer to the forward contracts concluded between two parties for the delivery of a determined amount of electricity at a predetermined price on a predetermined date and time interval. The

exchanged good is the average price anticipation for each hour of the particular month. Examples of these contracts can be found in the European electricity market, in Belgium, France, Netherlands, Germany, UK, and Spain, while I have never observed a market actor utilizing this trade mechanism in Turkey. An electricity trade analyst working as consultant for electricity trade and supply companies agreed, stating that:

> There are rumors saying that electricity forward contracts are being done in VOB [*Vadeli İşlem ve Opsiyon Borsası*, Turkish Derivatives Exchange], but I have never seen one and honestly I don't believe that it is true. For forward contracts to work, you need a real liberal market and corresponding market depth, but we must admit that our electricity market is not there yet. We must have banks that finance and support such contracts, but we don't, and the banks do not have the appetite either. But if they did, and if market depth would increase with additional financial instruments and potentials for credit, risk management opportunities would increase and maybe market players would conclude such contracts. But personally, I do not recommend to any of my clients to enter into electricity forward contracts in Turkey.

An executive of the Energy Traders Association stated that the forward contracts could not work in this system, due to financial guarantee problems, problems with physical delivery terms arising from electricity's special delivery requirements, and a lack of underlying indexes, signals, and market-operating mechanisms. He concluded that, in order for forward contract and derivative markets to work in Turkey, first the spot markets must reach maturity. He reminded that in the Turkish electricity spot market (the day-ahead market) prices cannot be forecast even for the next day, so that forward markets naturally would not work in the Turkish context. Even though not stated explicitly, the market actor recognizes the ways in which the particularity of a commodity may shape its trading possibilities.

The fourth and last trade mechanism in the Turkish electricity market, which is even more remote than the OTC swap and forward contracts, consists of the financial derivate mechanisms. The major difference between OTC swap and

forward contracts and the OTC forward contracts is the absence of counterparty and the introduction of proliferated trade forms available for different market actors. However, the derivative trade mechanisms are only at the stage of regulation, and their implementation is expected to commence only after 2015.

One large-scale, yet silent market actor is the publicly owned TETAŞ. Even though the market has been undergoing reforms and liberalization efforts for a long time, TETAŞ remains under public control and ownership as of 2013. TETAŞ does not execute a high number of transactions, but high-volume transactions in terms of the electricity output of production facilities publicly owned by EÜAŞ. Until 1 September 2006, TETAŞ traded 80 to 85 percent of the total electricity production in Turkey. Following the liberalization efforts, TETAŞ's share in the market was minimized to thirty four percent as of 31 December 2012. However, it is expected that by 2013 TETAŞ will become the buyer of 68.6 billion kWh from EÜAŞ and its affiliates, corresponding to a market share of 50.1 percent. Moreover, the Law on the Installation Maintenance and Energy Sale of the Nuclear Power Substation (no. 5710), dated 21 November 2007, appointed TETAŞ as buyer of the 4,800 MW generated by the nuclear power plants for fifteen years. TETAŞ will purchase 70 percent of the electricity generated in the first and second production units of the plant and 30 percent of the electricity generated in the third and fourth production units, at an average weighted price of 12.35 US Cent/kWh.[84]

In addition to its role as a market trader, TETAŞ works as market settler operating the price equalization mechanism that is designed to equalize the different intra-regional price differences stemming from differences in costs and electricity losses. Within this scope, each month EMRA decides on the amounts to be

[84] Speech given by Halil İbrahim Gök, the Energy Sales Department Manager of TETAŞ, at the 19th International Energy and Environment Conference and Fair, 26 April 2013.

transferred to and from each regional actor. TETAŞ, then, collects these compensation charges from the supporting regions' distribution companies and pays that amount to the supported regions' distribution companies. TETAŞ is an international actor in the regional electricity market as well: it engages in direct import and export activities with Georgia, the Autonomous Republic of Nakhchivan, the Autonomous Republic of Adjara, Greece, Bulgaria, Syria, and Turkmenistan. The commercial details of these activities are kept confidential, emerging as another opaque market sphere.

All the exchange mechanisms and dynamics discussed in this section are reflected in the final consumer invoices, either directly or directly. However, there are also non-market costs that are reflected in the end-user invoices, even though they are not relevant to the electricity transactions or even to the electricity market itself. The most controversial and irrelevant of these costs is the contribution margin of the Turkish Radio and Television Corporation (TRT), which forced its way into the end-user consumer's invoices.

Minister Yıldız has justified this forcible contribution margin by pointing to the objectivity requirement of TRT as the national channel. Accordingly, since it is a national channel, it must be financed publicly in order to protect its objectivity. However, TRT's objectivity is very controversial. The majority of market actors, and all the consumers that I have interviewed for this thesis, claim that the TRT acts as a government channel. Secondly, the relevance of this financing is inappropriate, because the electricity sector and the media sector are two completely different sectors that should not be tied via imposed fees. Furthermore, as Fahrettin Arman, the Head of the Hydroelectric Plants Industry Businessmen Association, reminded, TRT is not the only national channel, as there are many other national channels that

do not receive support. According to him, it is not only irrelevant, but also illegitimate to force electricity end-users, who may never watch TRT, to support it financially.

Mehmet Ali Susam, a Member of Parliament from the Republican People's Party, opposes not only the TRT contribution margin, but also other additional fees and funds imposed on end-user invoices. He criticizes the new EML for being insufficient in answering the market actors' needs in that it focuses only on overcoming the obstacles faced by distribution companies. According to him, this is a result of the non-transparent and exclusionary law-making process:

> We have made propositions such as to remove the TRT contribution fee and the meter reading fee when the law was being discussed in the assembly commissions. However, such propositions did not even get debated. This law is made solely for overcoming the problems faced by the newly established distribution companies, not for meeting the expectations of the market. We have requested the electricity losses to be paid from the state budget. But still the regular, paying citizens will take the burden of the consumer who does not pay for electricity. There was not even one single debate on the monitoring of electricity losses.

The issue of electricity losses cannot be analyzed without surveying sociopolitical electricity losses as well, which primarily occur in the Kurdish-populated cities of Turkey. A Kurdish consumer explained:

> TRT for me is the speaker of the government, and this situation is not particular to the current government of the Justice and Development Party, but to all the past governments. All the years when Kurdish people were tortured and killed by the state itself, there was not a single news item about us. OK, one can say that it is better now, and we get to live under the same umbrella to an extent, under the same state; but no one can make me accept that TRT is an objective channel, and I would never pay this fee.

Thus, the TRT contribution margin consolidates and deepens the sociopolitical electricity losses related to Turkey's Kurdish Question. It shall be emphasized that these legitimate opposition manifests the ways in which, in certain instances, the

market directly finances the political authority and its voice, the most vivid example of which is the TRT contribution margin.

There are also other costs imposed on end-user invoices. Even though these costs are related to the operation of the electricity market, they are as controversial as the support for TRT or the electricity losses. These costs include the retail sale service fee (RSS), distribution fee (DF), transmission fee (TF), electricity meter reading fee (EMRF), electricity energy fund (EEF), municipal consumption tax (MCT), and value added tax (VAT). The RSS refers to the costs of sales services, invoicing, customer services, and other retail sale services that EMRA calculates separately for consumer groups and/or the voltage level, either as fixed, or changing according to consumption. It was defined as 0.45 TL in July 2013, as a fixed fee. The DF refers to the costs of distribution system investments, maintenance and operation, also determined by EMRA as per current legislation. It is defined as 2.33 *kuruş*/kWh for households, 2.26 *kuruş*/kWh for commercial consumers, and 0.86-1.82 k*uruş*/kWh for industrial consumers, depending on their consumption voltage.

The TF covers the maintenance and operation costs of the transmission system executed by TEİAŞ. The unit price is determined by EMRA as 0.72 *kuruş*/kWh for all tariff and consumer types. EMRF refers to the meter reading costs and is defined by EMRA for 2013 as 0.45 TL per each metering, for all tariff and consumer types. EEF refers to the electricity market maintenance and development costs and applies in the form of 1 percent of the electricity usage. The TRT contribution fee has been determined by the Council of Ministers' decision as 2 percent of the electricity usage value. The MCT is imposed on end-users without any reference to the electricity market; neither does EMRA explain the reasons behind this fee, which as amounts to 5 percent of the electricity usage.

Finally, even though not separately shown on the invoices, the electricity loss fee has been determined as 4.52 *kuruş*/kWh for households, 4.71 kuruş/kWh for commercial consumers, and 2.50-3.93 *kuruş*/kWh for industrial consumers depending on their consumption, included in the electricity usage value. There is one implicit, yet very important, fact concerning the inclusion of electricity losses in invoices. Since the electricity loss fee is not indicated separately, the electricity usage value includes the imposed cost of electricity losses. Other fees and taxes are then calculated from this electricity usage value (except for the fixed fees), and this further contributes to the overcharging of consumers. Considering that EMRA has set the daily single price tariff for household electricity as 24.89 *kuruş*/kWh in July 2013, this number represents an average price for households. In this representative case, 4.52 *kuruş*/kWh constitutes an 18.16-percent increase in a household electricity invoice.[85]

When I interviewed an employee working in EMRA's Tariffs Directorate (who requested confidentiality), he explained the justifications for these fees, funds, and taxes: The registration fee is for the costs of storing and handling the information of all consumers. The distribution fee concerns the costs of the network operated by the distribution companies. The transmission fee is for the cost of rehabilitating depreciated transmission lines. The electricity meter reading fee concerns the cost of meter reading service conducted by the distribution companies. The electricity energy fund is collected in order to cover for the costs of the Ministry of Energy and Natural Resources for developing the energy market. The municipal consumption tax is a necessity of regulation. Finally, the eighteen percent value added tax is imposed

[85] EMRA's decision on National Tariffs, 26 June 2013, www.epdk.gov.tr. Retrieved 21 July 2013.

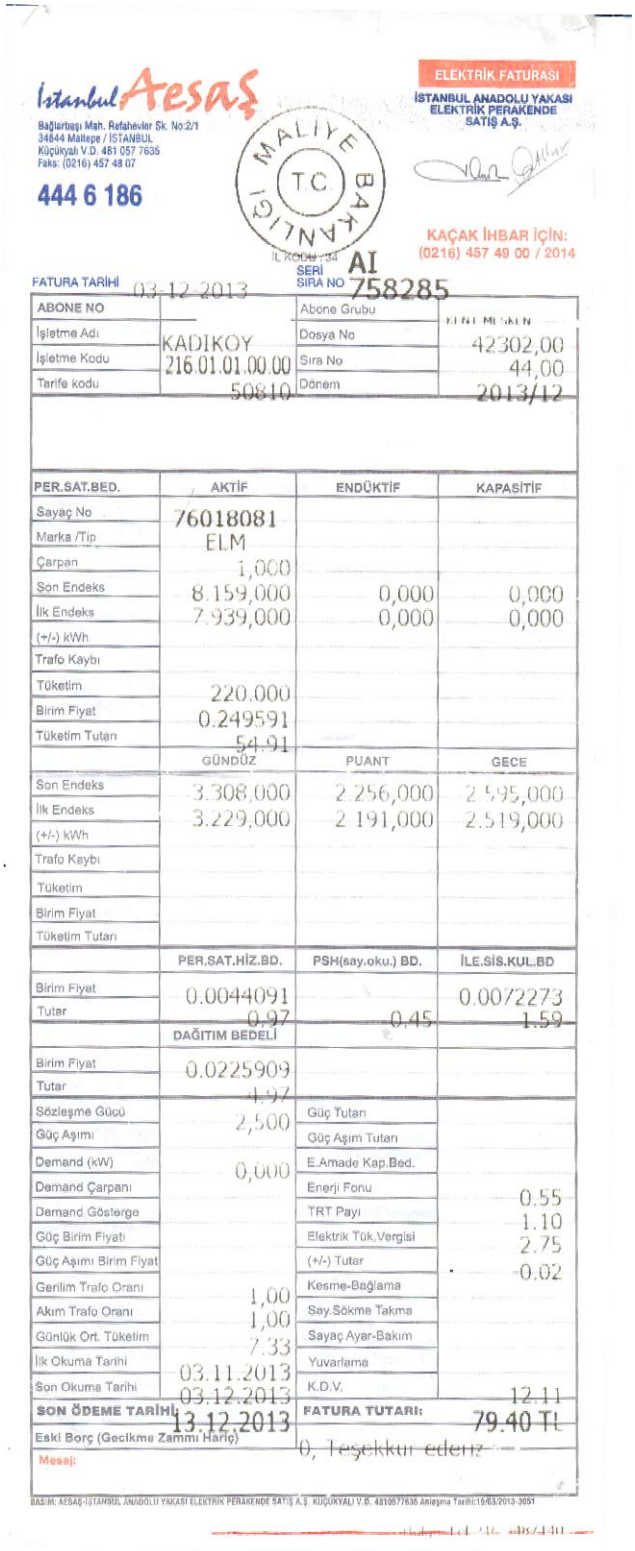
on all commodity invoices in Turkey as per the current legislation (except in the food sector in which the value added tax is between 0 and 8 percent).

Although not indicated separately in the invoices, electricity losses are still compensated by the end-users, and this value is included in the electricity energy cost of the invoices, as the electricity usage value. EMRA explains that this calculation is based on the electricity loss target (as defined by EMRA) and the expected electricity consumption in each region, and that it is imposed on the end-users accordingly. However, these calculations are not transparent, and end-users in fact do not know the exact amount that they pay for electricity losses.

The reflection of these fees, funds, and taxes in the end-user invoices are as complex as the procedure. In order to better demonstrate this complexity, I will analyze a household invoice in term of the shares of these additional costs. I have chosen a household invoice for detailed analysis, because, although industrial and commercial consumers are increasingly producing their own electricity or purchasing from the distribution and retail sale companies, the majority of households continues to purchase their electricity based on EMRA's tariffs.

An urban household electricity invoice from December 2013 demonstrates not only the integration of fees, funds, and charges, but also the complicated enframing of electricity invoices. The total amount of the invoice is 79.40 TL, which equals approximately 40 USD at the time of the payment due date. The first step in the pricing system is the calculation of consumed amount of electricity in each time interval of 06:00-17:00 (day), 17:00-22:00 (peak period), and 22:00-06:00 (night). The electricity price differs for each period, and thus consumption is calculated separately for each period. In this invoice, day consumption amounts to 3,308.000-3,229.000 = 79,000 kWh; peak consumption to 2,256.000-2,191.000 = 65.000 kWh;

and night consumption to 2,595.000-2,519.000 = 76.000 kWh. This amounts to a consumption of 220.000 kWh for the entire month between 3 November and 3 December 2013. The consumption values are measured by means of an electrical counter, compulsorily installed for each household as per the regulation. The type (in this case, a household) and the registration number of the electricity counter are indicated on the invoice as well.



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444 6 186

MALİYE BAKANLIĞI T.C. İL KODU :34

ELEKTRİK FATURASI
İSTANBUL ANADOLU YAKASI ELEKTRİK PERAKENDE SATIŞ A.Ş.

KAÇAK İHBAR İÇİN: (0216) 457 49 00 / 2014

SERİ AI
SIRA NO 758285

FATURA TARİHİ 03-12-2013

ABONE NO		Abone Grubu	ELNT MESKEN
İşletme Adı	KADIKOY	Dosya No	42302,00
İşletme Kodu	216.01.01.00.00	Sıra No	44,00
Tarife kodu	50810	Dönem	2013/12

PER.SAT.BED.	AKTİF	ENDÜKTİF	KAPASİTİF
Sayaç No	76018081		
Marka /Tip	ELM		
Çarpan	1,000		
Son Endeks	8.159,000	0,000	0,000
İlk Endeks	7.939,000	0,000	0,000
(+/-) kWh			
Trafo Kaybı			
Tüketim	220.000		
Birim Fiyat	0.249591		
Tüketim Tutarı	54.91		

	GÜNDÜZ	PUANT	GECE
Son Endeks	3.308,000	2.256,000	2.595,000
İlk Endeks	3.229,000	2.191,000	2.519,000
(+/-) kWh			
Trafo Kaybı			
Tüketim			
Birim Fiyat			
Tüketim Tutarı			

	PER.SAT.HİZ.BD.	PSH(say.oku.) BD.	İLE.SİS.KUL.BD
Birim Fiyat	0.0044091		0.0072273
Tutar	0.97	0.45	1.59

DAĞITIM BEDELİ			
Birim Fiyat	0.0225909		
Tutar	4.97		
Sözleşme Gücü	2,500	Güç Tutarı	
Güç Aşımı		Güç Aşım Tutarı	
Demand (kW)	0,000	E.Amade Kap.Bed.	
Demand Çarpanı		Enerji Fonu	0.55
Demand Gösterge		TRT Payı	1.10
Güç Birim Fiyatı		Elektrik Tük.Vergisi	2.75
Güç Aşımı Birim Fiyat		(+/-) Tutar	-0.02
Gerilim Trafo Oranı	1,00	Kesme-Bağlama	
Akım Trafo Oranı	1,00	Say.Sökme Takma	
Günlük Ort. Tüketim	7.33	Sayaç Ayar-Bakım	
İlk Okuma Tarihi	03.11.2013	Yuvarlama	
Son Okuma Tarihi	03.12.2013	K.D.V.	12.11
SON ÖDEME TARİHİ:	13.12.2013	FATURA TUTARI:	79.40 TL
Eski Borç (Gecikme Zammı Hariç)		0, Teşekkür ederiz	
Mesaj:			

BASIM: AESAŞ-İSTANBUL ANADOLU YAKASI ELEKTRİK PERAKENDE SATIŞ A.Ş. KÜÇÜKYALI V.D. 4810577635 Anlaşma Tarihi:19/03/2013-3051

Figure 5: Sample household electricity invoice.

As a second step, the consumption amount is used to calculate the average weighted price, 0.249591 TL/kWh in this invoice. It is worth emphasizing that this calculation

is not visible on the invoice; the consumer cannot learn the electricity price for different time periods, even though this information is public and issued by EMRA with each price change. However, reaching this information requires a computer and internet access, or a daily review of the official newspaper, which includes all official and court decisions made on the previous day. As a result, the majority of consumers is not informed about the exact period-base prices, which may affect their electricity consumption habits. The invoice only indicates the average weighted price, calculated by the invoice formula. In the next step, the average weighted price, 0.249591 TL/kWh, is multiplied by the total monthly electricity consumption, 220.000 kWh, in order to reach the electricity usage value, here 54.91 TL.

Although the electricity usage cost totals 54.91 TL, the invoice claims 79.40 TL from the household consumer, which calls for an analysis of the imposed additional fees, funds and taxes. The first indicated fee is the retail sale service fee, calculated according to the total electricity consumption in kWh (0.0044091 TL/kWh, equaling 220.000 x 0.0044091 TL/kWh = 0.97 TL). The second fee is the electricity meter reading fee, a fixed tariff determined as 0.45 TL for urban household consumers. The third column shows the transmission system usage fee, calculated according to the total electricity consumption in kWh (0.0072273 TL/kWh, equaling 220.000 x 0.0072273 TL/kWh = 1.59 TL). The calculation of the distribution fee can then be found below the retail sale service fee. The distribution fee is calculated according to the electricity consumption amount and equals 220.000 x 0.0225909 TL/kWh = 4.97 TL in this invoice. It shall be emphasized that the distribution fee constitutes 6.3 percent of the total invoice amount, marking it as the highest fee.

Then follow the additional funds and taxes imposed on the electricity invoices. This urban household invoice indicates that 0.55 TL is imposed as electricity fund; 1.10 TL as TRT fund; and 2.75 TL as electricity consumption tax. However, electricity consumption tax is not the only tax here. In addition to all these fees and funds, the value added tax is imposed as well. It should be noted that value added tax is imposed on every invoice issued in the Turkish economy, with the exception of food or housing. However, the most crucial aspect in this case is that tax is not calculated over the consumption amount (that is, 54.91 TL), but over the amount that includes all initial fees, funds, and taxes (67.29 TL). Consequently, consumers are not only subjected to double taxation (electricity consumption tax value is also included in the VAT calculation), but also forced to pay tax over funds irrelevant to their electricity consumption, such as the TRT fund. As a result, the total percentage of fees, fund, and taxes totals as much as 30.81 percent of the total invoice amount (24.49 TL for a 79.40 TL invoice), substantially higher than the standard value added tax of 18 percent. Furthermore, the invoice does not indicate the real value over which value added tax is calculated, which equals 67.29 TL (instead of 54.91 TL, the electricity usage cost). As a result, consumers must conduct detailed reviews and calculations to notice that they are excessively taxed, and even double-taxed.

Before concluding this section, I should emphasize that all of these additional funds, fees, and taxes are presented in a very complicated invoicing format, which requires market interest and knowledge in order to understand and interpret. This, in turn, consolidates the electricity market's image as a complicated market requiring expertise knowledge and especially excludes household consumers from the

marketization processes, because consumers are usually not informed or concerned enough.

The Distribution of Electricity

The generated and traded energy is delivered to the users by the distribution sector. All the producers, regardless of whether they are private or public, licensed or unlicensed, or autoproducer-cum-industrial estates, inject their electricity output into the transmission system, where this energy is then exported or traded within the TEİAŞ-supervised electricity markets by private wholesale trading companies, retail sale companies, and producers. Thereafter, this traded electricity is distributed to eligible and non-eligible consumers according to the market transactions and consumer demands.

The distribution sector constituted the first privatized sector in the Turkish electricity market. The Prime Ministry's Privatization Administration executed the privatization procedure of the electricity distribution regions which together form the electricity market distribution sector. The process was initiated with the first EML (2001), and the framework was further defined by the Electricity Energy Reform and Privatization Strategy Paper. The application of the privatization process and the transfers, however, began only after 2010. Turkey was first divided into 21 distribution regions made available for privatization. Until the end of 2012, thirteen regions were completely privatized, distribution contracts were transferred, and private companies started to conduct distribution activities. The privatization of all the distribution regions, including the remaining eight regions, was then completed in October 2013.

In line with the privatization procedure, the distribution companies submitted their bids which were then evaluated for their compliance to the bid specifications and price level. The bids were submitted through a sealed tender procedure, and only the winner was announced publicly. This winner, then, had to submit bank guarantee letters and complete contract transfers in order to gain the rights to that particular region, based on the rationale of market safety and stability. However, many bids had to be repeated because the winners were unable to submit the required financial guarantees and to reach a conclusion about the form of the contracts. Thus, even though the legal framework for this privatization process was established in 2001, the process could only be finalized as of October 2013.

With the privatization of electricity distribution, the state not only relieved itself of the financial burden of the distribution activities, but also of the problematic issue of electricity losses over the long term. In terms of finances, Selehattin Hakman, the Head of Sabancı Holding's Energy Group, claimed that investments in the electricity distribution sector could only accrue a profit after ten years. As a result, the privatization of the electricity sector lifts a substantial financial burden from the public sector. In terms of electricity loss, according to TEİAŞ, the 2012 electricity loss totaled 15.3 percent (comprised of 2.6 percent transmission loss and 12.7 percent distribution loss),[86] while it had been 14.6 percent in 2011 (comprised of 1.9 percent transmission loss and 12.7 percent distribution loss).

However, these statistics are not representative of the remarkable regional differences. For example, according to Minister Yıldız, when excluding the region of Dicle (with the cities of Diyarbakır, Mardin, Siirt, Şanlıurfa, Batman, and Şırnak, the population of which consists of a Kurdish majority) from the statistics, the electricity

[86] TEİAŞ, *Annual Development of Electricity Generation: Consumption and Losses in Turkey, 1984-2012*.

loss percentage in Turkey would be lower than in European countries. It should be noted that this imbalance and the extremely high electricity losses in that region are closely linked to Turkey's long-term regional policies. When I visited Diyarbakır to research the reasons behind these extreme losses and conducted interviews, out of my twenty interviewees twelve replied that they refused to pay their electricity bill because the state had never worked to serve them and because electricity should be a public good by nature; four interviewees stated economic reasons; and four refused to reply. Minister Yıldız has acknowledged the political grounds of the electricity losses as well:

> Right now [24 April 2013], Turkey's electricity loss percentage is 9.4 percent, lower than in Europe, but only if we disregard the losses in the regions of Dicle and Van. The resolution process we are undergoing and the establishment of peace in this area will reflect themselves in the electricity bills.[87]

Before the privatization of the distribution sector, the compensation of these losses was presented explicitly in the end-user invoices, which attracted substantial reaction and opposition from consumers who were compelled to pay additional charges as a result of the state's inability to prevent these electricity losses. The state no longer faces these oppositions, because now the distribution sector has been privatized along with the loss responsibility. Currently, electricity losses are not explicitly presented in the consumer invoices. However, these losses will be compensated by the end-users until 31 December 2015. This is because, according to the 2013 EML, the electricity losses will be reflected in the end- user electricity bills. In an interview with an EMRA official, I questioned the reason why electricity losses are still compensated by end-users, without making this compensation explicit in their invoices. The EMRA official, who requested confidentiality, explained:

[87] "Barış gelirse kaçak elektrik de biter [Electricity losses would end if peace came]," *Enerji Günlüğü*, http://www.enerjigunlugu.net. Retrieved 8 April 2013.

> For us [Turkish citizens], the state is the father, so whatever comes from state, we comply with it, even though we complain and do not agree; however, a private company is different. People already believe that these companies are given by way of *peşkeş* [as a favor to private companies due to their close economic and personal relations with government or public officials]. If they see the electricity loss fee in their bills, then they would simply refuse to pay. And no private company would enter this system, if they did not have a guarantee for losses, at least for the first few years.

Consequently, this creates the (incorrect) image that losses are no longer compensated by the consumers, by granting distribution companies the right to remove the electricity loss share from the end-user invoices. Moreover, the debate on the reward mechanism (distribution companies are rewarded when they decrease electricity loss in their region) contributes to a picture in which electricity losses are not compensated by the consumers. For example, Minister Yıldız proudly announced in his speech at the 19th International Energy and Environment Fair and Conference that, if the distribution companies realized an electricity loss statistics below the anticipated numbers (the criteria are not clear yet, however), then they would be rewarded. He did not comment on the losses still charged to consumers, and there was not a single debate on this issue at the conference, the major event involving the Turkish electricity market.

The interviewees from the distribution sector, however, raised criticisms not only about the compensation of the losses, but also about the commercial and regulatory impediments they face, which are equally passed on to the consumers as high electricity prices. The chairman of one of the established distribution companies stated:

> The issue of pricing is the most problematic aspect in the distribution sector. Even though the distribution sector is privatized, EMRA is still dominant in price determination, which is based on cost, and it will continue to be so until the third phase in the distribution sector reform will be established in 2016 [the first phase consisted of regulation, the second phase of complete privatization, and the third phase has been defined as complete liberalization]. The tariffs are still determined and imposed by EMRA, and the only freedom

> of the distribution sector is to provide discounts on these tariffs to eligible consumers. However, they are not completely free in this regard, either, because at the end of the day the revenue limit system rips off the profit above a certain point determined by EMRA. Since the costs are not the same in each region, EMRA applies cost-based pricing. Yet, this is a huge impediment for an efficient market, and particularly unfavorable for the consumers, because if a company can reflect all its costs in the price, why would it work to diminish costs and see a fall in its prices? Either way, we get the same profit, so what is the incentive to decrease costs?

As a solution, he proposes that EMRA should set a sales price for distribution companies and that the companies able to finalize their costs below this level should profit, while those companies that cannot should lose. However, at the end of the day, "this would be a huge incentive for companies to decrease costs, and the electricity sales price can only fall with this formula, otherwise these companies would work with high costs and the electricity price would remain high."[88]

Concerning the issue of electricity losses, he claimed that the only way to reduce electricity losses would be to hold distribution companies financially responsible. In this way, distribution companies would be forced to invest into the required electronic counters and other detection systems, if they desired to profit from that particular region. As I was surprised to hear these claims from a private distribution company holder, I believe that his comments and suggestion regarding the market are legitimate indeed. However, it should be noted that this chairman was the only interviewee from the distribution sector that made such suggestions, especially concerning the issue of electricity losses. Therefore, his comments cannot be generalized as prevalent opinion in the distribution sector.

Taken together, the interviews I conducted with employees in the distribution sector reveal that competing claims, different discourses and standpoints emerge in a single sector with similar financial interests. One may therefore conclude that there

[88] "Bu dağıtım şirketlerinin maliyetlerini kısmaları için çok büyük bir teşvik olur ve fiyatlar ancak bu şekilde düşebilir; çünkü diğer türlü bu şirketler yüksek maliyetlerle çalışmaya devam eder ve elektrik fiyatları da yüksek kalır."

always coexist dominant claims and resistance, not only from actors with opposed interests—such as a consumer and a distribution company, for which one's higher profit would mean the other's higher cost—but also from actors operating within the same market position. Correspondingly, each market should be examined in reference to the different forms of agency and actors that are in constant creation, negotiation and recreation of the market.

The distribution sector's secondary role, as the market information supplier, needs to be emphasized and elaborated further, along with its primary role of distributing electricity. Since the control and daily operation of electricity counters are now the responsibility of the distribution companies, they emerge as the holder of information regarding the daily electricity consumption in their region. As discussed above, settlement is one very important component of the electricity market, and the most important component of market settlement calculation is the counter values supplied by the distributor companies. Nezir Ay, the Head of the Electricity Markets Operations Department of the Turkish Electricity Transmission Company, emphasized the importance of accurate and timely market information for a healthy evaluation and operation of the electricity market. He argued that most of the distribution companies are unable to supply accurate daily counter information, and this results not only in inaccurate market settlement transactions due to late access to required information, but also in the inability to access general market information such as the exact number of eligible consumers. Consequently, certain settlement transactions have to be performed again and again, creating a transactional burden on the market operation system. Affirming the previous interviewee's claim, he stated that distribution companies should establish automated electronic counters that

would provide timely and accurate market data about the exact amount of electricity consumed in each region.

Another role of the distribution companies consists of integrating non-licensed electricity producers into the system. The potential non-licensed electricity producers present their submission to the distribution company holding the distribution license of the respective region. The submission is then evaluated by EMRA and the relevant authorities—for example, additional grants from the State Hydraulic Works may be required, if the plant is utilizing hydro sources—and if approved, the non-licensed electricity generator requests a connection to the transmission system. This operation is also the responsibility of the distribution company. Moreover, non-licensed electricity producers collect their money from the distribution company. As a result, the distribution company conducts direct daily activities with small-scale producers and contributes to the entrance of different forms of actors into the market.

The changing character of these distribution companies, as primary market actors, together with their roles, needs to receive analysis. Based on the 2013 EML, distribution companies are now defined as electricity network operators only. Before the law, the distribution license included the right to trade in spot markets as well as to execute bilateral electricity exchange agreements. However, trading activities are now defined separately under the supply license, whereas distribution activities are defined under the distribution license. Batu Aksoy, Chief Executive Officer of Turcas Energy, supported this regulatory arrangement, claiming that, considering it together with the establishment of EPİAŞ and financial derivative markets, the distribution companies should return to their original task of network operation. Yet, this regulatory arrangement does not fully reflect the daily practices of the market,

because the distribution companies have formed supply companies and acquired the requisite licenses, which enable them to continue their participation in the spot and OTC markets.

The distribution sector is of further crucial importance, as it is the only point that directly interfaces with the consumers. Zafer Benli, the Deputy Undersecretary of the Ministry of Energy and Natural Resources, stated:

> Consumers are not mainly concerned about who generated the electricity, who transmitted or sold it in the wholesale markets. They only care whether the lights go on when the light switch is hit, or whether the machines in their factory receive electricity for a reasonable bill. Thus, their first criterion is accessibility and continuous supply, and secondly legitimate price. Ten years ago a five-hour power cut was easily tolerated by the consumers, because their addressee for complaints was the state itself. However, now one-hour power cuts cannot be tolerated by the consumers. A market that has been transferred from the state to the private sector cannot be independent of state perception. The state is the untouchable, the giver and taker without discussion for the Turkish people. However, the private distribution company is not. Thus, the distribution companies shall also invest heavily, not only into continuous supply management, but also into customer relations, and it must learn customer perception management.

The consumer perception of the state, as the father, emerges as a recurring and dominant discourse in the marketization of electricity. Hence, the privatization of the electricity market sectors has altered this perception in the consumer's current relations with the market actors. It is also important to emphasize that the distribution sector is indeed the sole bridge to the consumers. Consequently, even though the sector is privatized in terms of finance, it is regulated under strict EMRA control based on the rationale of customer protection. Hasan Alma, of EMRA's Department of Electricity, announced in his speech at the 2013 International Energy and Environmental Fair and Conference that electricity distribution is like a monopoly system when considered within a region where competition is almost non-existent. Therefore, EMRA will no longer take sides with the private investors, but with the consumers.

EMRA issued the Regulation on the Service Standards for Electricity Distribution and Electricity Retail Sales, which gives it the right to monitor and apply monetary sanctions as defined in the new EML of 2013 to distribution companies. According to the new EML, in the first year of its application inspections only concerned customer complaints; however, after 2013 the distribution companies will fall under full monitoring and inspection by EMRA. Following these observations, one may conclude that the distribution sector's everyday market operation continues to remain under public influence and that the general working of the sector is hybrid, as opposed to privatized.

The Consumption of Electricity

The life cycle of electricity is completed when it is consumed. The consumption of electricity requires technical knowledge and equipment, as one cannot consume electricity like a bottle of milk purchased from the market. Direct encounter with electricity may result in serious injuries and even instant death. Through automatic switches, residual current control systems, circuit breakers and relays, electricity is tamed and transformed into a suitable form, which can then be utilized by industries and residences. Thus, even though we utilize electricity by turning on a television set, the consumption of the electricity, similar to its production, requires specialized knowledge and technological equipment for us to experience it every day. As a result, it becomes once more visible that, due to its nature, electricity is a very particular commodity that needs to be produced, distributed, and also consumed under very controlled conditions and with the aid of special equipment and expert

knowledge. This renders its market very much open to expertise claims and disciplinary discourses.

It is important to remember that electricity is utilized for many uses other than household consumption and industrial utilization, for many everyday activities such as transportation, communication, and heating. Thus, the consumption stage of electricity not only means the end cycle in the commodity's life, but it also marks the execution of major everyday activities in industrialized societies.

The consumption of electricity is an internalized everyday activity, which is rarely recognized or even questioned by end-users. This, in turn, creates the effect that we do not consider continuous electricity supply as a success, but we take it for granted. It is a basic necessity to conduct our everyday lives. This perception, coupled with the conditions of the generation and transmission of electricity, gives extensive market power to production, transmission, and distribution agents. An interruption in the electricity supply would result in a total disruption of the consumers' everyday activities. This market power, however, creates a power asymmetry, which leaves very little market power and few paths of resistance to the consumer.

Electricity consumption has increased every year for the past three decades, with the exception of the years 2001 and 2009, which witnessed a major economic crisis. The increase in consumption level amounted to between 3.70 and 13.90 percent between 1984 and 2012. In 2001, there was a decrease of (-) 1.20 percent and in 2009 of (-) 3.10 percent. As per the official consumption statistics provided by TEİAŞ, electricity consumption in Turkey increased from 186.099,50 GWh to 194.923,40 GWh, in 2012, marking an increase of 4.7 percent.[89] Considering the

[89] TEİAŞ, *Annual Development of Electricity Generation: Consumption and Losses in Turkey (1984-2012).*

particular form of the marketization process, with its emphasis on increasing electricity demand and production, together with the increasing investments in the Turkish economy as a whole, I expect that electricity consumption will continue to increase in the medium and long term, unless Turkey experiences another major economic crisis.

The current Turkish electricity market regulation defines two types of consumers: eligible and non-eligible. According to the EMRA's meeting decision on Electricity Market Eligible Consumer Regulation: Article 10, dated 24 January 2013, the consumers with an annual electricity consumption over 5,000 kWh qualify as eligible consumers and are free to choose their suppliers by mutual contracts (equals approximately to 150 TL invoice per month). These contracts, seven of which I have reviewed for this thesis, provide 1- to 8-percent discounts from the national tariff. According to Minister Yıldız, this limit corresponds to the fact that 62 percent of consumers qualify as eligible consumers. Since the distribution companies fail to supply accurate data on the exact amount of electricity consumed, this statistics is a prediction. However, Nezir Ay, the Head of the Electricity Markets Operations Department at the Turkish Electricity Transmission Company, has stated that only 22 percent of consumers are exercising their right of eligibility by concluding bilateral contracts with suppliers. Subsequent to the application of the last-resort supplier regulation, which requires that eligible consumers purchasing from the regional distribution company are charged higher than the national tariff, it is expected that more than 90 percent of eligible consumers will exercise their rights.[90]

Non-licensed electricity producers, which have been discussed in detail in the section on electricity production, are also consumers of electricity and should be

[90] Speech given by Taner Yıldız, Minister of Energy and Natural Resources, at the 19th International Energy and Environment Fair and Conference, 24 April 2013.

included as agents of both consumption and production of electricity. These systems are not necessarily isolated systems established only for meeting the demand of the household/commercial enterprise that has built the generation plant. Even though these generators cannot conclude sales contracts with consumers or sell their electricity output on the organized wholesale markets, based on the rationale of "generate your own electricity," they inject their surplus electricity output to the transmission system and pull energy from the system when their electricity generation is not sufficient to meet their consumption due to low levels of wind or daylight. Therefore, since these producers engage in everyday transactions with the market, they should be identified as active generation and consumption actors.

Another fact generally dismissed by the majority of market actors regards the non-consumed electricity and how it is utilized. The non-consumed electricity's cycle is completed when it is returned to its origins, to the land, because due to the nature of electricity as a commodity, it cannot be stored in scales for later use. This fact not only gives market power to the producers and distributors of electricity, but also requires careful planning on behalf of TEİAŞ, because at the end of the day it is impossible to determine the producer of the non-consumed electricity and to charge the relevant producer. This value emerges as an unrealized potential and a corresponding burden on the Turkish electricity market.

An ironic fact about the electricity market is that, even though the consumers are the financiers and the ultimate reason for its establishment, the consumer' voice is almost completely absent from the market arena. Minister Yıldız defines consumers as the "right-holders of electricity itself,"[91] and electricity as a "citizen right." Following this logic, he defines the ministry's main role as that of an

[91] "Elektriğin hak sahipleri."

intermediary and a share distributor between the citizens and the private sector. However, when it comes to market operation and decision-making processes, the consumers disappear. For example, Hasan Köktaş, former President of EMRA, stated that each regulation amendment would be discussed with the private sector, and that EMRA would expect their participation as market actors at every conference and meeting he attends. However, he has extended no invitation to the consumers. Nail Opak, the Chairman of the Independent Industrialists and Businessmen's Association, believes that the only way for consumers to enter the market debate is to create an organized voice for themselves; otherwise, individual consumer voices disappear within the dominant voice of other actors from the regulation, production, sales, and distribution sectors.

The voices of the consumers are heard occasionally, primarily when it comes to environmental concerns. However, in most instances consumers raise their voices not primarily about consumer rights, but as concerned citizens or locals of the particular area where the environmental damage occurs. Consumer identity emerges only as a secondary and indirect aspect, in the concerns of consumers who refuse to consume the electricity produced in a particular plant or region. However, since Turkey does not have an electricity identification system where consumers can choose the primary recourse of the electricity they consume, consumers basically do not have the practical right to refuse this electricity, and as a result they do not have the market power to back up their concerns and claims. Due to the nature of electricity and the current transmission system built upon its materiality, consumers cannot exercise their primary right of non-consumption and, therefore, have very little market power. This in turn results in the absence of consumer voices in the market-making arena.

Market actors operating in the production and regulatory sections rarely ever take into serious consideration any environmental criticism; in most instances, they discredit these criticisms by defining them as an attitude of blind objection to the electricity market itself. For example, Mahmut Mücahit Fındıklı, the President of the Industry, Commerce, Energy, Natural Resources, Information and Technology Commission at the Turkish Grand National Assembly, began his speech at the 2013 International Energy and Environment Fair and Conference by stating the importance of environmental concerns, but then proceeded with the following words:

> The criticisms tell us that we should not use natural gas because it is import, we should not use wind energy because the birds die, we should not use nuclear energy because it will be a disaster. These criticisms target the industry itself, and they have no meaning at all. We are now living in the era of technology; it is possible to have a system in which energy embraces nature.

However, he gave no explanation about the ways in which the energy would embrace nature and which technological system exactly would make that possible.

Minister Yıldız, in a speech at the same conference, exhibited a very similar perspective on environmental concerns. He initially emphasized the importance of establishing and operating an electricity market, not at the expense of, but in correlation with nature. However, he then continued:

> We, the entire Turkish population, breathe every day and consume oxygen from nature; however, nature can tolerate this. Thus, at the end of the day, what is important is whether nature can tolerate what is being done. We will build a market in which nature is protected, but at the same time utilized by humans.

Similar to Fındıklı, he did not provide an analysis or even brief explanation about whether nature could tolerate the most debated nuclear electricity plant, and on which ground or findings.

It bears note that these replies to environmental criticism work on an assumed and pre-legitimized asymmetry between humans and non-humans. Nature is defined

as a servant to humans, which are *ex facto* defined as superior. This internalized asymmetry contributes to the legitimation of damages made to nature, since nature is humans' servant, who should be protected only enough to serve humans in the future. Ahmet Çalık, the Chairman of Çalık Holding, depicts the Japanese experience with nuclear power plant explosions and its long-term damaging effects on nature and people in the following way (in his speech in 2013 International Energy and Environmental Fair and Conference): "Yes, there has been an accident in Japan, but accidents can happen everywhere. Japan made a mistake and shut down nuclear [power], but I personally hope that they will reopen, otherwise the electricity prices would increase very much [in Japan]."[92] According to this dominant market actor in the Turkish electricity market, profit is superior not only to nature, but also to human lives. The asymmetrical relationship in the electricity market is constructed and maintained by these disciplinary claims, in order to position profit and economic gains at the top of the list of priorities, human lives in the middle, and nature as their servant at the bottom.

Another method frequently utilized to delegitimize environmental criticisms works by identifying the criticisms as originating from some interest group that incites people with false claims, in order to target the Turkish industry and economy as a whole. The logic is to illustrate that the criticisms are not raised by the public, but by sinister groups who want to prevent the development of the Turkish electricity market, thus discrediting these criticisms through the rhetoric of public opinion. It should be noted that this method often occurs in Turkey's domestic politics as well. For example, the anti-government protests in June 2013 were discredited by the government as the work of foreign sinister interest groups who aim to prevent

[92] "Evet, Japonya'da bir kaza oldu ama kazalar her yerde olabilir. Japonya hata yaptı ve nükleeri kapadı, ama ben umarım ki yakın zamanda tekrar açarlar çünkü aksi halde elektrik fiyatları çok yüksek olur."

Turkey's development. This similarity is not a mere coincidence, but an indicator that this discourse enframes markets and politics simultaneously. Fahrettin Arman, the Head of the Hydroelectric Plants Industry Businessmen Association, for example, replied to the environmental criticisms with the following words:

> We act with the greatest care when it comes to nature; however, we still face severe opposition. We cannot stop these organized movements and the incorrect thoughts of the public. But I must say that the substance of the issue is not about the public, but about the sinister third parties that instigate and organize the public; otherwise, you should know that these are not the thoughts or concerns of the public.

A research associate from Dokuz Eylül University has claimed that the nuclear plant poses a threat of DNA changes in plants and even humans in its surrounding area. He has drawn attention to the fact that the details of the project, especially in terms of the expected levels of contamination, have not been announced publicly and he could not acquire this information, in spite of the many requests he made to EMRA and the Ministry of Energy and Natural Resources. He also complained that he could not gain access to any representative from the ministry, EMRA or the Turkish Grand National Assembly Commissions to discuss his environmental concerns. He could only ask the minister a question at a conference, and the minister only replied that he went to France to visit a nuclear power plant and ate fish that was raised in the lake near the plant, concluding that France had nothing on Turkey and that Turkey could achieve the same, too.

This dialogue marks another delegitimizing discourse. The minister, the head of EMRA, and two of the private investors who are expected to participate in either the construction or operation of the nuclear power plant legitimize the potential environmental effects of the nuclear plants by pointing to the fact that many European countries have power plants and that Turkey would not ask for permission to do the same. Halil Alış, the General Manager of EÜAŞ, boldly stated that "the

countries that polluted the world's air in the past, such as China, India, and USA, are now trying to impose useless advice to us, but we will not fall into this trap."[93] The authorities aim to discredit criticisms against nuclear plants as the voices of evil-minded foreign powers, by turning them into an issue of international politics, in which Turkey proves its independence. Altogether, these discourses and claims work to establish and maintain a particular form of market in which environmentally based resistance is excluded, by delegitimizing these criticisms via disciplinary discourses and political rhetoric.

It would be unjust to claim that all market actors in the production and regulation sectors participate in this rhetoric. Certain actors prioritize or at least acknowledge the environmental effects of the electricity marketization and try to reconcile environmental concerns with the evident need for electricity production. Erol Kaya, the Head of the Environment Commission of the Grand National Assembly of Turkey, has criticized the dominant mentality in the Turkish electricity market as being profit-driven and ignorant towards nature, in his speech in Energy and Environment Fair and Conference in April 2013. Adnan Polat, the Chairman of Polat Holding and a private investor operating in the wind energy generation industry, has stated that, even as a renewable form, wind plants attract much environmental criticism, arguing that the solution would be to communicate with the representatives of these groups. He criticized certain environmental groups for not conducting enough research and creating an opposition without a clear agenda. However, instead of marginalizing these movements, he asks for a dialogue and requests from environmental critics to address the production company in order to reconcile environmental concerns with investment opportunities.

[93] "Geçmişte dünyanın havasını kirleten Çin, Hindistan, Amerika gibi ülkeler şimdi bize akıl satmaya çalışıyor ama biz bu tuzağa düşmeyiz."

Sırrı Uyanık, the General Manager of İSKEN Energy which operates in the coal-based electricity production sector, has pointed to another phenomenon, claiming that the opposition to electricity plants is emerging as a market in itself. As a solution he proposes to apply strict environmental rules to electricity plants and to require each of them to provide Environmental Review Reports based on international standards. He stated that, "as the regulatory authority relaxes the environmental requirements for the private sector […] the public is legitimately getting more reactionary, and not only the environment damaging plants, but all the generation plants are publicly accused of harming the environment, which is simply very unjust to us."[94]

The consumption stage further demonstrates the importance of electricity's particular nature and agency in enframing the marketization of electricity and the position of the market actors. Since electricity has to be produced simultaneously with its consumption need due to impossibility of storage, and since physical delivery can only be done via a single transmission system where different electricity forms are standardized, consumers have very little market power. The main reasons are that the consumers need continuous electricity for their everyday activities and that they do not have the right of non-consuming electricity produced under market and environmental conditions they oppose. As a result, even though the consumers are the ultimate financiers of the entire market, they are excluded not only from the marketization process in terms of law- and regulation-making, but also from the everyday workings of the markets and the realization of a price which they have to pay every month.

[94] "Düzenleyici kurum çevresel kısıtlamaları gevşettikçe […] halk da haklı olarak daha tepkisel oluyor, hem de sadece çevreyi kirleten değil tüm santrallere karşı çevreyi kirletme suçları geliyor ki bu bizim için en basitinden büyük bir haksızlık."

Further Analysis: Research Findings and Theoretical Analysis

Before concluding this chapter, further analysis shall be presented of the main market actors, the calculative mechanisms of actors, market transactions, the dominant trade forms, different action forms and agents, the interplay between the law and the market, the utilization of disciplinary knowledge forms for shaping and maintaining the market, the price realization mechanism, the importance of politics and lobbying, and market network formation. I will put special emphasis on situating these findings within the theoretical literature of market studies.

The most important determinant in the construction, establishment, maintenance, and consolidation of the above dynamics, and consequently the Turkish electricity market, is the particularity of the commodity, especially the impossibility of storing it and its dependence on nature, leading to imbalances. Firstly, electricity has long been conceptualized as a public good, because it is integral to Turkish citizens' everyday and commercial activities; it was conceived not as a commodity, but as a service to be supplied by the state at cost value. This conception was reinforced by the Turkish Constitution, which states that electricity production, transmission, and distribution are public services, because these activities are qualified as stable and continuous services for meeting the public demand as a whole.[95] Thus, the marketization of electricity first required the commodification of electricity, by undermining its conception as a public good and by emphasizing electricity's role as an industrial input fuelling the Turkish economy. Otherwise,

[95] Supreme Constitutional Court, decision no. E. 994/43, K. 994/42-2, dated 9 December 1994.

private companies would refrain from investing in the newly liberalizing electricity market.

Based on electricity's re-conceptualization as an input into industry, in order to ensure Turkey's growing electricity demand to be met and the growth of its economy guaranteed, electricity and its market needed investments. Minister Yıldız is now mainly concerned with "ensuring the development of the Turkish economy by supporting private investors with due profit that will attract them to the market"[96]—he repeats this point as each and every conference or meeting he attends. The transformation of electricity from a public good into an input into the Turkish economy was achieved by carving out an economized space for it through marketization processes and dominant discourses. Only in this way, electricity could be objectified, reproduced, and transformed to qualify as "economic," profits in the electricity market could be legitimized and the privatization of the sector maintained.

I should emphasize that electricity is and has been an input to industry, but not only that. It is true that electricity has a trigger effect on the Turkish economy in general, because a low electricity price means low production costs for domestic industries, which will render them internationally competitive. However, electricity is also an end product needed for conducting everyday commercial and non-commercial activities. The dominant discourse in the Turkish electricity marketization process, however, dismisses these characteristics of electricity in order to wipe out the past dominant conception of electricity as a public good and to establish it as a mere input to industry that needs to be generated without questioning the consumers' desire to develop this particular kind of Turkish market and corresponding Turkish economy.

[96] "Özel sektörü piyasaya çekecek makul kar payları sunarak Türkiye ekonomisinin gelişmesini sağlamak."

The most crucial impediment to the next steps of marketization stem again from the particular nature of electricity—that is, the inability to standardize electricity completely due to varying marginal costs, technical characteristics, production conditions, and nature-based primary resources of electricity. Even though electricity is standardized after it has been injected into the transmission system in terms of quality, the inability to standardize its generation conditions creates high price levels and corresponding volatile prices. As demonstrated in this thesis, each electricity production is different in terms of these characteristics as well as their output. Consequently, it becomes impossible to standardize a product that has a marginal cost between 40 and 160 TL, with 400-percent volatility.

Furthermore, electricity, and particularly Turkish electricity, is the most volatile commodity in the world in terms of its price within one week or even day. For example, on 13 February 2012 the electricity price reached 2,000 TL/MWh at 10:00, whereas it had been 125 TL/MWh six hours earlier. Although one may counter that this day was exceptional in that it experienced the highest electricity prices in the spot market's history, the usual daily workings of the market and the prices also manifest extreme volatility. For instance, the electricity price amounted to between 0 and 30TL/kWh between 03:00 and 06:00, while they fluctuated between 160 and 400 TL/kWh (excluding February 2012 as exceptional case) in 2012, according to PMUM records. The reasons behind this price volatility and the realization of prices as 0 TL during dawn hours result from electricity's impossibility of storage. A trader told me that "the price would be interesting in terms of volatility in this market only if it multiplies itself by ten within an hour of the same day."[97] Electricity should be consumed and produced at the exact same time due to its

[97] "Bu piyasada fiyatın dengesizlik açısından enteresan olması için aynı gün bir saatte on katına çıkması lazım."

characteristics, and this particularity structures the most important market outcome, the price, as hourly volatile and as outside the control of the market players in most instances (as it happened on 13 February 2012).

It should be emphasized once again that the commodity in the Turkish electricity market is standardized in terms of quality once it is injected to the transmission system. Ironically, once it is standardized; it is completely standard and uniform. A producer cannot claim that their commodity is superior to that of other suppliers and influence the price outcome of the market transaction. Furthermore, since electricity cannot be stored for future sale, it is simultaneously produced and consumed. Thus, the market positions analyzed in this thesis and the available bidding types, both of which are informed by the particular nature of the commodity, are crucial analytical tools for the realization of electricity market prices. In order to identify and examine the price-making mechanisms in the Turkish electricity market, I have discussed here the general conditional possibilities that the legal framework sets for the market actors, relative power asymmetries and the respective market positions of market the actors, the bidding types and trade mechanisms available to market actors, production costs and conditions, and the calculative mechanisms used by market actors.

Price realization in the Turkish electricity market is a hybrid process on two main levels, where many components and actors encounter different agency and calculative forms. The first level consists of the price realization in the day-ahead market (the electricity spot market) and OTC trading. This level constructs an intermediary price that is not directly reflected in the price paid by end-users. The second level is the end-user price that is either in the form of tariffs imposed on non-eligible consumers, or in the form of bilateral agreements executed between retail

sale/distribution companies and eligible consumers that receive a discount from the national tariff. As illustrated in this thesis, electricity itself is the most important actor in the price realization mechanism.

Electricity's nature not only determines the price intervals of the sellers' bids, as each production plant has different marginal costs, which are reflected in the bid intervals, but also the power asymmetries between the trading parties. The requirement of simultaneous production and consumption creates commitment and monetary risk for the buyers. The wholesale companies and the distribution companies are restricted by delivery commitments to their customers. For producers, however, this requirement poses only an opportunity cost risk in the form of an unrealized trade position. Furthermore, the producer still has the chance to produce and sell through the balancing power market mechanism. Consequently, the seller (the production agent) enters the transaction having the upper hand over the buyer (the wholesale and retail sale companies) and therefore structures a seller's market.

In the OTC market, the price is realized by means of bilateral negotiation and fixed as an outcome of this negotiation, which is not transparent and, contrary to its name, under the counter for the majority of transactions. This renders the outcome a borderline price that is both within and outside market transaction mechanisms. OTC is indeed a legally defined electricity trading mechanism; however, the imposition of the stamp duty forces the contract parties to conduct their transactions under the counter, without legalizing and therefore publicly announcing them. The price levels in this market are known only to insiders, because the non-legalized contracts are illegal due to the law and because the involved parties keep these contracts confidential in order to avoid fines. This non-legalization creates not only legal, but also market risks due to the absence of financial guarantees in the non-ratified

contracts. Consequently, the price is a borderline price, a price uncoordinated between non-market and organized market mechanisms, known exactly only to the insiders, and without sound financial guarantees. Yet, the majority of market actors still conduct business within this mechanism.

Electricity's nature bestows major bargaining power on the producer with respect to the terms of trade in OTC transactions. Here, the buyer's only chance is to play competing offers against each other. A trader trading nearly 5 percent of the total electricity production in Turkey stated:

> We are having negotiations with more than one company at the same time for the same day's electricity and determine the seller at the last minute as to whoever is giving the greatest discount; we sometimes cancel the executed contracts and switch the seller as well. I know that it is not ethical, but we need to earn money.

The no-cost cancellation of OTCs stems from the fact that most OTC contracts never get notarized, thus legalized, due to avoidance of the stamp duty, and this gives the right of cancellation to powerful market actors without having to face the costs. This creates further imbalances in the market. It should be recalled that another trader whom I interviewed and quoted earlier in this chapter explained that the OTC trade mechanism is based on trust, because no one would risk their market reputation by cancelling an unfavorable contract; as a result, non-legalization would not pose any problems for them. However, this specific market actor who trades nearly 5 percent of the total electricity production in Turkey has created such favorable conditions for itself based on market volume that these conditions provide him with the market power to cancel executed contracts without any concerns for his company's reputation. This, in turn, illustrates that, even though the regulatory framework determines the calculative mechanisms of the market actors, their particular market positions and volume can serve to re-negotiate the existing conditional possibilities.

In the spot market, there exists an entirely different process. All the sellers and buyers submit their bids to PMUM, PMUM as market operator fixes the price where the supplied and demanded MW amounts match each other. If this balance occurs with two different prices—and this happens because the system requires interval bidding—then the price is fixed as the average value by interpolation. However, since none of the bids are publicly announced and since the price fixation calculation is not transparent, the legitimacy of these mid-level prices is controversial and the market players have difficulty understanding and explaining the fixation of prices in the exchange market. A trader working in an influential production company with high market transaction volumes confessed that "prices come and go, then the bids are finished and done, and the price is announced; well, the calculations do not match most of the time."[98] Another trader working for an electricity trading company told me that "the end day profit or loss in the day-ahead market depends on luck. My job is to manage the market parameters; but if you ask me whether the parameters hold, well, frankly they usually do not."[99] The confused traders, however, find solace in the grand market rule of the price being determined by supply and demand. The trader continued:

> It is because everything depends on supply and demand, and it is very difficult to forecast the supply and demand for each hour of the day. Moreover, for example, if a power plant breaks down for the day even for two hours, or if a new plant gets integrated into the system, then the prices are messed up for the whole day and sometimes for the whole week.

However, he did not argue that the assumed demand and price are never linear or clearly analyzable in the Turkish electricity market; this is due to the specification of

[98] "Fiyatlar geliyor gidiyor, teklifler oluyor bitiyor ve sonra ortaya bir fiyat çıkıyor; fiyat ise çoğu zaman hesapları tutmuyor."

[99] "Günün sonunda gün öncesi piyasasında kar ya da zarar etmek şansa bağlı. Benim işim parametreleri yönetmek, ama bana parametreler tutuyor mu diye sorarsan, açıkçası genelde tutmuyor."

assets on the supply side and the hourly changing nature of the demand irrelevant of measureable factors.

On the intermediary level, the price is fixed by the market operator (PMUM under TEİAŞ), as opposed to other prices which are partially negotiated (only in bilateral agreements) and imposed on the parties engaged in this transaction. The price is partially negotiated and in fact imposed on the market players, especially in the spot market, because the players can only bid by interval and the price is fixed and imposed upon all parties by the market operator. In this mechanism, the buyer/seller cannot plan and act for an exact percentage of profit; the exact price and profit are always imposed. Market planning can only be exercised for determining the electricity bid price level as higher or lower in the day-ahead market, which poses the threat of non-transaction at the end of the day. Consequently, the price emerges as an outcome of the struggle between agencies trying to impose their own price over that of the others. While actors from the production side are bidding to keep the electricity prices higher, the wholesale and retail sale electricity trading actors bid for the lowest prices to maximize their profit.

The price fixed in the spot market can legitimately be identified as a fragmented hourly price, which is the actual coordinated price composed of hourly fragmented bids and eventually fixed by the market coordinator TEİAŞ. It is bidden and fixed on an hourly basis, and the actual price is realized as an hourly fragmented price by means of which market actors will finalize their market transactions the following day. These actual fragmented hourly prices serve for the calculation of the daily average price for electricity and compose the summary price, which is not an actual but a signatory price that provides signals for the daily electricity prices. The summary price may not reflect the hourly actual prices in all cases. For example, on a

very fluctuating day the electricity price during a peak hour may be ten times higher than the price fixed for the preceding hours. In this case, this fluctuation may construct an average summary price, while during the peak hours the price may be substantially higher than anticipated or when compared to the previous days. As a result, the summary price is not an actual price, but only a signatory price; the fragmented hourly price, the outcome of the spot market, is an actual price based on which the market transactions of the following day will be realized.

The end-user prices, namely the consumer prices, however, are second-level final prices. They can be identified as either tariff prices or direct negotiated prices. As discussed in this chapter, the conditions are different for eligible and non-eligible consumers. These are defined according to the annual consumption threshold of 5,000 kWh (equaling an electricity invoice of about 150 TL per month). Non-eligible consumers are compelled to purchase their electricity from the distribution company that holds the license for that particular area, and the terms of trade are strictly defined by the tariff mechanism. Consequently, the non-eligible consumption price is a tariff price, officially defined and imposed on these consumers. The regulatory framework defines expanded trading possibilities for eligible consumers. Eligible consumers can either purchase their electricity from a licensed distribution company at tariff prices, or engage in direct negotiation with distribution companies for discounted prices. The latter are called direct negotiated price, because they are fixed through direct negotiation between the consumer and the supply company. Both the direct negotiated price and the tariff prices are actual prices based on which electricity transactions are realized between market actors.

To summarize, there are three main prices in the Turkish electricity market. The first price can be identified as borderline price, which results from the OTC

contracts that are discretely negotiated between market actors but not ratified due to the stamp duty issue, marking it a price between non-market and market mechanisms, and within the first level price making. The borderline price is an actual, but not guaranteed price: it is actual, because it will be realized together with the transaction, but not guaranteed because one of the parties may withdraw from the agreement without any sanctions or may not fulfill contractual responsibilities without facing official sanctions.

The second major price is the fragmented hourly price, the price fixed in the spot market. It is fixed hourly, because the electricity price changes on an hourly basis due to its unpredictable nature and the requirement of simultaneous production and consumption. Consequently, the market price is fragmented into hours for it to be realized. The fragmented hourly price is an actual and guaranteed price, because it is coordinated and fixed by an official authority that requires financial guarantees for the realization of market transactions. The parties cannot withdraw from their bids without facing sanctions. Not fulfilling contractual responsibilities, such as delivery or payment, may result in legal enforcement. Hence, the fragmented hourly price realized in the Turkish electricity spot market is a coordinated, guaranteed, and actual price. The fragmented hourly price is then used to calculate the summary price, which constitutes a derivative of the fragmented hourly price indicating the average price levels of the market. The summary price is not an actual price; it is only a reflector of the average market prices and utilized as a signal in reviewing the Turkish electricity market. Both the fragmented hourly price and the summary price get realized in the first level price making.

The third and last major price is the consumer price, the price paid by the end-users of the Turkish electricity market. The consumer price is composed of two

different prices applicable to the two different consumer types defined by the legal framework. The price realized in the transaction between the end-users and the regional distribution company is identified as tariff price, whereas the price realized as the outcome of the negotiation between the eligible consumer and the supply company is named the direct negotiated price. Both of the consumer prices are actual and guaranteed, because they are either directly enforced by tariffs, or they have enforcement power via legalized written contracts executed between the eligible consumer and the supply company.

Based on these findings, the present thesis concludes that the price in the electricity market is highly hybrid and not transparent in that it is fixed without the active participation of the real financier of the market, the end-user. The role of the consumer in this process is indirect and very limited, as it is reflected only in the decisions of the retail sale companies concerning their consumer portfolio (industrial versus household). On the other side of the coin, the production and sales company traders work to catch market arbitrage possibilities and the best positions to attain the highest possible profit from the established intermediary spot market.

The hybrid characteristic of the electricity market realization mechanism both enframes and is enframed by the market actors as well. The majority of the market actors make reference to the ultimate aim of establishing a free liberal electricity market, while they continue to request tax exemptions and subsidies that, from the desired neo-liberal economic perspective, by definition qualify as intervention in the market. Furthermore, even the official market-making authorities emphasize their pioneering work in liberalizing the market, they act in favor of granting these subsidies. A department head at EMRA, who requested confidentiality, has confessed that “we also want to withdraw and let the market work, but if we remove

the subsidies over one night, the situation would not be manageable in terms of politics."[100] This expression illustrates not only the conflicting interests of market actors as they are reflected in the utilization of contradicting discourses, but also the intertwined nature of domestic politics and the electricity market. It reveals that free market rhetoric needs to be maintained and regulated in order to exist. Furthermore, it gives evidence that there is no economy without electricity and no politics without economy within the current marketization process.

The regulatory authorities do not recognize these subsidies as intervention in the market, but legitimize them with the rationale of the public good. However, this legitimation is based on contradictory dominant discourses—even though the rationale is the public good, consumers pay for these subsidies—and this further consolidates the hybrid structure of the market. For example, Minister Yıldız is the most pioneering promoter of the liberal electricity market, while at the same time stating that subsidies cannot be withheld according to the justification of electricity as a public good. The electricity market interacts with other markets on special terms with the same justification. For example, electricity is provided for approximately 10 *kuruş*/kWh to the iron and steel industries, defined as sectors critical for the Turkish economy. A trader, however, stated that, "even though no major market actors talks about it so as not to disrupt the liberal free image of the market, this iron and steel industry price is one of the things that disrupt the market most."[101]

The nature of electricity enframes its delivery conditions as well. When purchasing a more conventional item, for example a computer, the delivery terms are discussed during the purchase agreement. The parties determine each party's

[100] "Biz de geri çekilmek ve piyasayı işleyişine bırakmak istiyoruz, ama teşvikleri bir günde kaldırırsak durum politik açıdan başa çıkılamaz bir hal alır."

[101] "Her ne kadar liberal serbest piyasa imajını bozmamak için kimse bundan bahsetmese de, demir çelik endüstrisi fiyatı piyasayı en çok bozan şeylerden biri."

physical and financial responsibilities in the delivery. The seller may deliver, but charge the buyer for this, or the seller may deliver at their own cost, the buyer may arrange for transportation and charge the seller, or the buyer may realize transportation at their own cost. The parties settle the purchase agreement in either one of these responsibility matrices. However, even though the law defines the physical delivery in the Turkish electricity market to be under the responsibility of TEİAŞ, the financial responsibility is distributed to all the market actors, in such as way that this distribution is non-transparent and unclear. The end-consumers are charged according to their consumption under the transmission fee in their invoices. The production, distribution, and sale companies are also charged in proportion to their market activities. However, TEİAŞ neither accounts for this distribution, nor provides information on the exact fee collected from each market actor group and on each actor group's share in the financial responsibility. The market actors have very limited options for resisting this particular distribution, because electricity can only be delivered under a unified transmission system, which requires the integration of a third party as mediator and settler.

The market players employ certain calculative practices as they operate within the Turkish electricity market, and these are enframed by the available market tools and devices in the particular marketization of electricity. For example, the trading screen in the day-ahead market and its rules shape the realm of possibilities for the calculative forms and actions of the market actors. The day-ahead market enables interval bidding only, forcing the market players to indicate a price interval between A and B during which they would be willing to buy/purchase a given amount of electricity. However, the buyer/seller may be willing to buy/sell more if the price level is much closer to B than to A. Yet, the market screen does not provide

any alternative to interval bidding, forcing the traders to think and act within the available market tools and devices.

Licenses are also central market devices that enframe the actions of the market agencies. The licenses have standard forms for each field—production, distribution, wholesale, and so on—and determine the scope and limits of a market actor's activities in kind, volume, and specification, because the system does not permit any market operation without the acquisition of the necessary license. For example, a distribution license determines the duration and particular region of the distribution activity to be conducted by the market actor. This, in turn, shapes the actors' planning and calculation forms, since the actor cannot realize their optimal plan but must fit it into the existing market device—that is, the license. The licenses further define the ways in which prices are set, the conditions for cancellation, the dispute resolution mechanism, that terms and conditions that would invalidate the license, and the like, which altogether channel the action forms of the market actors.

The tariff mechanism also operates as a market tool. It is used either as a price fixation tool for non-eligible consumers, or as a reference point from which the discount is to be applied in contracts between eligible consumers and retail sale/distribution companies. A particular form of tariff, the newly introduced last-resort tariff, is an influential market tool that indirectly forces end-users to enter the newly establishing electricity market and to consolidate the envisioned marketization of electricity. The last-resort tariff not only introduces higher prices for eligible consumers who do not execute bilateral contracts with distribution companies, but also forces these actors to stay in this arrangement, as cancelling a bilateral contract and returning to the national tariff would translate into a 15-percent increase in electricity bills. The last-resort tariff mechanism, in turn, gives the upper hand to the

distribution companies in their negotiations with the consumers and further enframes the market transactions between these market actors.

The tariff-making procedure is non-transparent and hybrid, similar to the marketization processes of electricity. EMRA fixes the tariffs after receiving comments from the involved institutions, such as TEİAŞ, according to the regulations. However, EMRA does not account for any tariff fixation or amendment. Thus, it further contributes to the non-transparency of the marketization process. A trader working for a distribution company stated:

> Well, if anyone knows how the tariffs are made and can tell me, I will kiss that person on the forehead. A friend of mine, working in the EMRA tariff department, he told me that he doesn't know either. He tells that the prices come from TEİAŞ to the EMRA board, then undergo a small adjustment which he thinks is done only to show that EMRA is the decision-making authority, and sometimes even the prices are taken up for comment by the Prime Minister.

Market friends (one of which is mentioned in the above interview), shared market information, and shared positions constitute the basis of the trade networks in the Turkish electricity market. Information flow is central to market-making and market analysis; however, there is no official and public information flow in the Turkish electricity market, which in turn results in the building of trade networks based on personal relations and informal market information. The general manager of an electricity production plant claimed that "the electricity sector is the leader of information pollution within all other sectors."[102] The non-transparent marketization process is further consolidated through the lack of publicly available market information flow, especially in terms of everyday market transactions. In these instances, the absence of market information technologies acts as a market device in itself. It not only shapes the calculative mechanisms of the market actors, by forcing

[102] "Elektrik piyasası bilgi kirliliği konusunda tüm sektörler arasında birinci sırada."

them to decide and act upon extremely limited information, but it also shapes the market network formation processes, by channeling the market actors to form personal relations with other traders to acquire market information.

Financial subsidies, in the form of tax exemptions or contribution fees, are also influential in establishing a particular form of market where certain market actors are officially favored and thus more powerful. For example, production companies are granted substantial financial subsidies that further reinforce their market power and position. Since market players and end-users criticize these subsidies, given that private investors are already financially capable companies, the regulatory authorities legitimize the subsidies with the rhetoric of national security of supply—a rhetoric frequently utilized at energy conferences and meetings, as illustrated above.

It bears emphasizing that electricity's major particularity, the impossibility to store it, draws a particular form of market in which certain actors are *de facto* more powerful than others, not only in terms of price fixation, but also regarding market formation and restructuring. As demonstrated above, the producers, in this formula, emerge as the dominant actors in the Turkish electricity market. Since the disappearance of one certain actor can result in increased electricity prices and even in the collapse of the entire market system, the producers, who are very much aware of their market power, use this to structure favorable market outcomes. A major example is the grand power cut of 1 July 2006, initiated by Cengiz Holding, a production company refusing to produce for the electricity price levels at that time. Cengiz Holding cut down electricity production from the afternoon of 1 July until the early morning hours of the following day. The back-up substations were dissatisfied with the electricity price as well and refused to inject back-up electricity into the

system. This blackout and the determined resistance of the electricity companies eventually forced EMRA and TEİAŞ to commence the implementation of the temporary balancing and settlement regulation in August 2006.[103] As a result, a small number of production companies proved powerful enough to initiate a change in the market regulations and corresponding market structure.

The market actors use emotional politics along with various forms of rhetoric and disciplinary discourses. The coal-based electricity production companies, for example, emphasize the labor-intense character of their plants, and their executives request support for their enterprise, "for the devoted laborers." Disciplinary discourses, however, are a dominant tool in the marketization of electricity and can be observed in nearly all of the interviews and public speeches given by the market actors. The regulatory and public authorities often give reference to macro-economic statistics and the increasing per capita consumption levels in order to legitimize obvious government support to private, and especially newly privatized (and newly indebted) distribution companies. Yet, they do not acknowledge the reflections of market reforms on the end-users, as the eventual financier of the market. The dominant utilization of the discipline of macro-economics enables these actors to legitimately perform and maintain a particular form of electricity market in which only the interests of certain actors are considered.

In order to legitimize the non-transparent components of the market and the non-disclosure of crucial market information, market actors often turn to disciplinary discourses, especially in the form of expertise claims. For example, the instruction-giving procedure in the real-time balancing market receives legitimization by claiming that expertise knowledge is necessary to understand and conduct this

[103] Elektrik Mühendisleri Odası [Association of Electric Engineers], *From Darkness (1 July 2006) to Price Increases (1 July 2008)*, press statement dated 30 June 2008.

procedure and that this expertise is held by the decision-makers. The Head of EMRA's Electricity Department, Ahmet Ocak, reinforces this discourse in his public speeches in the form of confessions such as the following: "I am the department head, but even I do not understand the day-ahead market, the intra-day market, the balancing market, etcetera."[104]

The expertise discourse shapes the inner structure of the market companies along with the general marketization process itself. The traders of the sales companies are generally treated as "untouchable" and never subject to an internal audit. Since the spot market structure in the Turkish electricity market is non-transparent and requires expertise market knowledge to conclude transactions, the traders do not feel the need to account for their risk-taking positions and market transactions. One trader said:

> We are a corporate company at the end of the day; when the procurement department is to buy a needle, it goes through the approval of five different departments as part of the purchasing procedure of the company. However, I get to trade over 150 million USD in one year, all of which qualify as purchase in their nature, but no one asks me to account for my transactions, because no one in the auditing department has the knowledge to interpret these transactions. Furthermore, the spot market is an instant market where you may have to change your position five times a day. If I would wait for approvals, it could cost us missed opportunities.

The traders legitimize their sometimes costly, high-risk-taking positions as a necessity of the market and do not feel the need to account for their actions, because the auditors would not understand these transactions due to their lack of expert market knowledge.

There are also acts of counter-performation in the Turkish electricity marketization process. The competition rules and the 2013 EML require that an actor's trade volume cannot exceed 20 percent of the total trade volume of the

[104] "Departmanın başıyım ama ben bile gün öncesi, gün içi, dengeleme, vesaire nedir anlamıyorum."

preceding year. However, the dominant market actors at risk of exceeding this limit found companies under different names and with different ownership structures, so that these can eventually act together and overrule this regulation in practice. Moreover, consumers who refuse to pay for electricity with the justification that it is and should be a public good exercise a counter-performation to the marketization of electricity by reversing the commodification tool. Yet, as theorized by McKenzie, the system utilizes monitoring devices such as counters and meters that work to detect illegal electricity consumption and therefore alter counter-performation acts. Calculability is a very important component of marketization in the electricity market. This is because, although the commodified service/good cannot get fully standardized due to its natural attributes, the measurability/calculability makes electricity not only a component in the profit calculations, but also something that can be analyzed, commented upon, and channeled with the tools of the discipline of economics. Furthermore, once it is made calculable, its statistical values can be utilized within the legitimizing rhetoric of general economic development indicators.

The marketization process not only shapes the conditional possibilities of the market actors and enframes their everyday market encounters, but it also transforms the inner organization of market companies. An executive from Doğan Holding put this in the following words:

> You can notice the new mentality of the market as being for profit only. When I first entered the electricity sector sixteen years ago, it was crowded with technical people and engineers. But now it is crowded with financial analysts, traders, and brokers, not only in our company but in the whole sector in general.

In addition to the inner organization of market companies, the marketization process standardizes, enframes, and transforms the roles of the existing actors, while at the same time integrating new actors into the existing market activities.

The marketization process further transforms the market by constructing and employing certain market actors, the most important being EMRA, a supervisory, auditory, and regulatory authority with administrative and financial autonomy. EMRA contributes to the establishment of the regulatory framework by preparing the secondary legislation that regulates the everyday maintenance of the market. Additionally, EMRA audits the market actors to determine whether they operate within the outlined framework. TEİAŞ is the second-most important market actor that maintains the market by conducting everyday market transactions and fixing market outcomes, such as the price in the spot market. It interferes with the production sector through over- and under-production instructions as the market balancer, executes the realization of everyday market transactions as the market operator, monitors the delivery of market transactions as the sole holder of transmission assets, and fixes the system imbalances as the market settler.

The 2013 EML not only consolidated the positions of these market actors, but simultaneously integrated new actors or transformed existing actors by enframing them in a revised regulatory framework. Although I have discussed these new actors and their corresponding roles in the first section of this chapter, further analysis is needed concerning the ways in which the everyday market actors interact with the marketization process in general.

In the sphere of electricity production, new production actors are integrated into the system in accordance with the major aim of the Turkish electricity marketization process—that is, to increase electricity production in Turkey as central input for the development of the entire economy. In addition to EÜAŞ, EÜAŞ affiliates, autoproducers, private generation companies, and unlicensed electricity producers with a capacity of up to 500 kW; organized industrial estates, unlicensed

emergency groups and generation facilities, and unlicensed electricity producers with a capacity of up to 1 MW (1,000 kW) are integrated into the electricity market with the new EML. The transmission actor, however, remained the same, in accordance with the long-term plans of the Turkish electricity marketization process. These plans aim to keep the electricity transmission sector under public ownership, as it is the only actor that has access to the market delivery information as an important input in balancing instructions and final market settlements. Correspondingly, the transmission network operator remains under TEİAŞ. The only amendment in the law, in terms of transmission activities, regards the allocation of direct transmission lines between the production plant and the consumer. According to the new EML, the production company may establish private transmission lines between its production facility and its consumers with TEİAŞ's approval.

Opportunities for electricity exchange activities and trading actors have been extended by the new EML. Production companies are now authorized to sell both electricity capacity and electricity energy other than their own capacity or production. Furthermore, they have been granted the right to sell this capacity or energy directly to consumers, by establishing direct transmission lines regardless of the eligibility clause. The 2013 EML has integrated new sales actors by introducing new license types. Wholesale and retail sale license holders are authorized to conclude market transactions, along with the producer companies, TETAŞ, and distribution companies. The main motivation behind such an arrangement is to consolidate the marketization of electricity by introducing actors crucial to the establishment of the desired liberal financial electricity markets.

TETAŞ remains a dominant trader in the new EML. However, new market actors are now granted the right to act within the action sphere of TETAŞ. Before the

2013 EML, TETAŞ was the only market actor that could engage in import/export activities. As of 2013, newly introduced supply companies, TEİAŞ, and the production companies can conduct import and export activities along with TETAŞ. This amendment not only reinforces the official support granted to electricity production companies as the indirect driving force of the Turkish economy, but it also contributes to the liberal conception of the Turkish electricity market, by disrupting the monopoly of TEİAŞ in import/export activities.

Distribution activities were conducted by TEDAŞ, TEDAŞ affiliates and private companies until 2013. However, as of 2013 private distribution companies are defined as the only market actors authorized to conduct electricity distribution activities within their region. The consumers, however, remain the least emphasized market actors in the new EML. They are defined either as eligible/non-eligible consumers, or as unlicensed producers, while the secondary legislation on tariffs continues to classify consumption actors mainly as household, industry, public institution, and commercial consumers.

EMRA continues to be the supervising, monitoring, auditing, and regulating actor, with the exception on the auditing of distribution companies, an authority transferred to the Ministry of Energy and Natural Resources with the new law. The market operator, however, has been entirely replaced with the integration of a new actor that is also new in its kind. While the market operator (and settler) consisted of PMUM under TEİAŞ, it has been replaced by a new actor, namely EPİAŞ. As per the regulations, EPİAŞ will not be under any public institution or corporation, but will be formed with the participation of public and private market actors. The ultimate aim of EPİAŞ is to reinforce the effect of a liberalizing Turkish electricity market, which the new law defines as the intra-day market, where the private sector

is attracted to the system with the promise of becoming market operators. It should be noted here that, as partners to the market-operating and -settling actor, private sector actors will gain greater opportunities for enframing, renegotiating, and transforming the marketization process. This will proliferate also individual market actors, especially in the form of market operational and managerial actors within private sector companies. Yet, problems of accountability in the market will further increase with this partnership structure, because the private market actors will consist of the executors, operators, and settlers of their own market transactions at the same time. This hybrid market operation and settlement arrangement, coupled with the partnership structure of EPİAŞ, will further contribute to the hybrid character of the electricity marketization process.

Neither the Ministry of Energy and Natural Resources nor EMRA shall be assumed to constitute uniform actors; rather, they are actors in terms of regulation only. The ministry is more concerned with the construction and consolidation of major defined goals, such as the establishment of a liberal market and ensuring the national security of electricity supply, whereas EMRA is mostly concerned with regulating, supervising, and auditing the workings of the everyday electricity market in accordance with the defined goals. However, these public authorities occasionally engage in power struggles while fulfilling their duties. EMRA officials accuse the ministry of being political and issuing laws relevant to the electricity market without due consultation with EMRA and other market actors, while ministry officials consider EMRA a mere applicator of their decisions. This tension is visible not only in the interviews I conducted, but also at the energy conferences and meetings where EMRA and ministry officials implicitly criticize each other. This clash between the two major regulators of the electricity market illustrates the power struggles between

the two major public bodies over establishing their dominance on the electricity market, by claiming their own expertise to be superior over the other's.

Based on this analysis of the establishment, reinforcement, and transformation of the market actors within the legal framework of the Turkish electricity market, the market regulations emerge as contextual infrastructures that establish the conditions under which the market actors operate, and also as marketization technologies that perform, reproduce, develop, transform, channel, and maintain the market. The Law on Respecting the Authorization of Institutions other than TEK in the Generation, Transmission, Distribution and Trade of Electricity (no. 3096), dated 19 November 1984, transformed the electricity market by opening it up to the private sector for the first time. In 2001, the EML (no. 4628) once again transformed the electricity market, by imposing a separation on the market institutions, as well as by introducing actors new in type and position. With the introduction of EMRA, the law not only added a new actor to the market, but also redefined the positions and roles of the already existing ones. The state's role has been reduced to regulation only, further diminishing the conception of electricity as public good. Moreover, market operation was introduced as a new duty to be undertaken by the new market actor EMRA.

More importantly, the separation of public institutions marked the initial utilization of the standardization mechanism in market-making. In order to qualify these public institutions as "economic," they were transformed and reconstructed in accordance with the processes of marketization. This was a long-term project: the first reform law separated the market actors, framed, and transformed them to establish the desired marketization. Finally, the 2013 EML further transformed and maintained the marketization of electricity, by legally enframing the market and

determining the conditions under which market actors would encounter each other to form market outcomes.

The regulatory space and law-making processes make visible the interconnected nature of economy and politics, as well as the importance of lobbying in enframing, transforming, and maintaining the Turkish electricity marketization process. This is because the political forces constitute the law-makers in the Turkish political system, and these forces construct a certain legal framework for the electricity market, as opposed to other alternatives. Consequently, the law-makers also emerge as market-makers. The example of the exclusion of the OTC trading mechanism illustrates this interconnected nature and the market-making acts of the political forces in the electricity market. By imposing the stamp duty tax on the OTC trade mechanism, which is more stable and medium-term as opposed to the spot markets that force the market players to operate within non-transparent factors and unknown, high risks, the political authority has shaped the realm of possibilities for market encounters and the electricity market in general.

I should emphasize that the indirect exclusion of the OTC trading mechanism means the implicit support of the spot market. As discussed above, the spot market is extremely volatile and vulnerable to everyday market factors, such as the entrance or exit of a system actor or even hourly weather changes. The promotion of the spot market and the corresponding dominance of this mechanism render the Turkish electricity market unstable and open to enormous profits as well as losses. As one trader described:

> The risk manager of the company should tie my hands with certain trade strategies, or I would follow the high-risk transactions for the higher profit margins that will translate into a bonus for me. After all, Turkey has the highest prices in the electricity spot market; it works based on the appetite of the traders. The maximum open position for me [the amount of committed electricity not guaranteed by a medium-term bilateral trade agreement before

> entering the spot market] should be 15 percent, but usually I enter with 70 to 80 percent. We have faced some huge losses, but we also profit a lot. If the risk manager tied my hands better, maybe we would not be profiting with such margins, but we sure would not see all those huge losses either. Please do not judge me, but I get a bonus from the profits and only a scolding for the losses; the system tells me to act in this way while trading.

The dominance of high-risk trading mechanisms in the electricity market channels the trading companies (wholesale or retail-sale suppliers) to participate in the electricity production sector as a guaranteed stock that may be used in case the trader is unexpectedly caught at high spot prices in an open position. This demonstrates that there is an intra-industry trigger effect for the electricity market as well. For example, the executive of a high-volume sales company argued that, in order to fulfill their sales commitments, they are heavily investing in the electricity production sector so as to constitute a base-load that will serve as a trading safeguard, especially for the peak hours when prices may exceed market expectations. Similarly, production companies are increasingly investing in the electricity sales sector so as to increase their profits from their production, by collecting the profit margin of the wholesale trading companies as well. The establishment of such safeguard production plants or trading companies requires substantial investment levels and corresponding capital, which can be secured by the already financially powerful market actors. This, in turn, makes a few powerful market actors dominant in all segments of the Turkish electricity market, further diminishing the bargaining power of other medium- and small-scale market actors as well as of consumers.

The controversial legislation procedure, especially concerning OTCs, further illustrates the ways in which the political authorities may construct a regulatory framework contrasting the needs of everyday market players and against these actors' lobbying activities. An officer working in the Department of Supply Security at the Ministry of Energy and Natural Resources told me that he had written the

clauses on the stamp duty exemption of OTCs into the law and that he had worked very hard for the stamp duty exemption of OTCs as a legitimate electricity market trade form. However, the assembly commission revised the draft to exclude OTCs from the stamp duty exemption. Nezir Ay, the Head of the Electricity Markets Operations Department at the Turkish Electricity Transmission Company, as the manager of everyday market operations, confessed that even he could not understand why OTCs were excluded, because OTCs are necessary for the workings of EPİAŞ in the first place. His statements indicated that even the head of the Turkish electricity market operator had been excluded from law-making processes. Furthermore, one trader told me that they could conduct only market lobbying, while those conducting political lobbying had already won. Furthermore, he remarked that the exclusion of OTCs and the corresponding support for the spot market will continue to favor those who win from the hourly instability of the spot market.

Crucially, the law does not merely impose restrictions and define what can or cannot be done in the market. It transforms, maintains, and enframes the market by defining the conditions under which a certain marketization process is imposed over others. For example, the indirect exclusion of the OTC electricity trading mechanism did not result in nullifying or notarizing these contracts, but in the execution of un-notarized OTC electricity contracts that remain unregistered. This absence of notarization has further contributed to the non-transparency of the marketization process. This then contributes to the consolidation of a market where market information is accessible only to insiders, basically remaining confidential.

Another example of the ways in which law shapes the marketization of electricity in terms of environmental concerns can be found in the “grace period” application in the 2013 EML. Accordingly, private investors are granted a grace

period that allows the private production sector's market actors to disregard environmental requirements until 2018, so that they are able to operate their plants at any environmental cost. Both environmental and public good concerns are overruled in support of the private sector, in order to establish the envisioned marketization of electricity. This prioritization, however, works to reinforce the dominant discourse on the importance of increased electricity production at all costs, for the eventual sake of the Turkish economy.

The Renewable Electricity Law (2005) was issued with a substantial delay; yet, the secondary legislation that would make the law applicable experienced an even greater delay and has serious deficiencies for the development of a renewable electricity market. The law and all of its secondary legislation were amended by a new law in 2010, its supplementary secondary legislation issued only in 2011. The repeated delays in the issuance and execution of the required regulatory framework for renewable electricity production enframed the prospects for establishing a renewable sector for the marketization of electricity. This particular enframing transformed this process, causing the dominance of conventional electricity production through limiting opportunities for wind and solar electricity production. Eventually, this particular marketization of electricity provided the legitimating ground for the controversial nuclear plant. As Minister Yıldız put it, "The current and planned electricity production projects are insufficient for meeting the growing electricity demand, so we must install the nuclear plant if we desire to keep up the development of the Turkish economy."[105] However, there is no explanation as to the reasons why the planned solar, wind, or HPP projects cannot meet these volumes in a country with optimal environmental resources for such plants. As a result, the self-

[105] "Mevcut ve planlanan elektrik üretim projeleri büyüyen elektrik talebini karşılamada yetersiz; o yüzden eğer Türk ekonomisinin gelişmesini devam ettirmek istiyorsak nükleer santrali yapmalıyız."

fulfilling prophecy becomes reality. The regulatory framework limits the conditional possibilities for renewable electricity plants, while their insufficient utilization is presented as a reason for establishing more conventional electricity production plants.

In conclusion, this chapter has demonstrated the ways in which the marketization process contributes not only to making of the electricity market in terms of power relations in the exchange of electricity, but also to the recoding and transformation of the concepts of the market, economic, social, political, the individual, and nature. As the marketization process undermines the conception of electricity as public good and emphasizes that of electricity as industrial input by means of dominant discourses, the individual's relation to nature is redefined, since sun, wind, and water are now defined first as primary resources for electricity plants, and not as vital resources. Furthermore, as the conception of electricity as public good is undermined along with its social implications, the notions of the political and the social are redefined: the political constitutes the authority that will ensure the development of the Turkish economy, by fueling the electricity market, and the social disappears in the marketization process, which lacks any reference to the distribution of the alleged economic development. The notion of the economic, in turn, becomes a macro-indicator only represented by measurable numbers in terms of development percentages, and not as daily exchange relations and their outcomes that affect all the parties involved.

My research and analysis have presented the constitution, reproduction, development, transformation, objectification and maintenance of markets with respect to their multiple forms of action, networks, and agencies, including the agency of electricity itself. I have examined in detail the utilized market tools,

devices, and calculative practices of agencies. Furthermore, this study has illustrated that licenses, tariffs, laws, and exchange market screens are utilized as market devices and market tools in order to establish and maintain a particular form of electricity market. The regulatory framework has been identified as major device in the marketization of electricity, which enframes the conditional possibilities for market actors and the marketization of electricity in general.

Finally, I have analyzed the most important market outcome, price, making visible the ways in which a certain price, as opposed to other alternatives, is only partially negotiated and eventually imposed on the various parties engaged in the transaction. In most of the cases the price is not even negotiated in the Turkish electricity market, but imposed especially on the end-users via tariff tools, either directly or by using the tariffs as discount references. Only the spot market prices are subject to partial negotiation, yet still imposed on the market players by the market operator, which executes this calculation without any transparency and independent of both buyer and seller. As a result, the multi-level price analysis in this thesis has demonstrated that the price in the Turkish electricity market is not only hybrid, but fixed in a non-transparent manner and imposed on various levels.

My analysis has further illustrated how markets can be defined as sociotechnical agencements, articulating and examining the three characteristics of these agencements in detail. Firstly, the change of the conception of electricity as public good and the corresponding establishment of its market have demonstrated the ways in which markets organize the conception, production and circulation of goods. Secondly, the law, market devices such as licenses, the discourse on security of supply, texts and narratives of market actors from all market stages, and the importance of technical knowledge due to the nature of the commodity altogether

illuminate the rules, conventions, technical devices, logistical infrastructures, texts, discourses, and narratives, and technical and scientific knowledge deployed by the market. Finally, the inclusion of the private sector and the exclusion of civil society organizations and environmental concerns from the law-making procedure, as well as the exclusion of major consumption segments from the tariff-making procedure demonstrate how markets delimit and construct a sphere of confrontation and power struggles that extends via contradictory definitions and valuations of goods, as well as via agents that oppose each other in the market until the terms of the transaction are determined. With the performative, theoretical and practical tools and practices of marketization, these forces together constitute, establish, enframe, maintain, renegotiate, consolidate, transform, and finally perform the current Turkish electricity market.

CHAPTER 4

CONCLUSION

The present thesis was primarily motivated by the question of how the marketization of electricity in Turkey has been established and maintained in terms of the political power dynamics. As a study of power and market-making motivated by this question, it has explored the power dynamics behind the making of the electricity market and in doing so included the following aspects: the commodification, standardization, objectification, and transformation of electricity from public good to industrial input; the multiplicity of agencies; the utilization of disciplinary discourses, self-fulfilling prophecies, logical infrastructures, narratives, expertise market knowledge and market devices; price realization mechanism; the transformation of the notions of the social, economic, political, individual, and nature; the particular enframed forms of market encounters; law as a major market-making device; counter-performation acts; diverse calculative forms of market actors that are enframed by the marketization process; market networks; the Turkish historical context, politics and lobbying (in the law-making processes relevant to the electricity market); and the power struggles aiming at manipulating the market dynamics in order to consolidate a certain form of electricity market. This research is expected to contribute to the literature by mapping the power dynamics operating within these marketization processes, particularly with an emphasis on the active agency of the commodity under marketization.

The thesis has demonstrated that the most important determinant in the construction, establishment, maintenance, and consolidation of the above dynamics,

and consequently the Turkish electricity market, is the active agency of the commodity itself, stemming from its particular nature. This particularity is also the most important determinant in the marketization process of electricity, beginning with the initial marketization steps. The impossibility to store whole scale electricity, the need for simultaneous production and consumption, the different marginal costs of the same amount of electricity due to different primary resources (each having different implications for its exchange), its conception as a public good, the requirement of expertise knowledge for electricity production and utilization, and its volatility in terms of production conditions enframe the marketization of electricity, which in turn reflects itself in the making as well as the outcomes of the market. My analysis has illustrated how the initiation of this marketization began with deconstructing electricity as a public good and reconstructing it as an input into the Turkish economy, by carving out an economized space for it. Only in this way could electricity be objectified, reproduced, and transformed to qualify as "economic." Correspondingly, profits from the electricity market could be legitimized, the privatization of the sector accelerated, and the existing market relations established.

The particular nature of electricity and its particular reflection in its market have manifested themselves in the obstacles hindering the marketization process. The major impediment in the marketization of electricity consists of the impossibility to standardize electricity completely, due to differing marginal costs, technical characteristics, production conditions, and nature-based primary resources. The impossibility of standardizing electricity completely, together with the impossibility of storing it in large scales, contributes to the establishment of the price as hybrid and unpredictable. Since electricity has to be consumed and produced at the exact same

time, this particularity structures the most important market outcome, price, as hourly volatile and outside the control of the market players in most instances.

The thesis has demonstrated that price realization in the electricity market is a hybrid process on two main levels where many components and actors encounter different agency and calculative forms. The first level is the price realization in the day-ahead market and OTC trading. This is an intermediary price not directly reflected onto the price paid by the end-users. The second level, however, is the end-user price, either in the form of tariffs imposed on non-eligible consumers, or in bilateral agreements executed between retail sale/distribution companies and eligible consumers that receive a discount from the national tariff. The agency of electricity is central in enframing the calculative agencies of actors, their bidding practices, and the terms of trade within the market as well. Different marginal costs of different electricity plant types reflect themselves in interval bidding, while the requirement of simultaneous production and consumption creates both commitment and monetary risks for the buyers, but only opportunity costs for the sellers. This, in turn, constructs the electricity market as a seller's market where the final consumer becomes invisible.

This analysis has further revealed that the price in the electricity market is partially negotiated, highly hybrid, fixed in a non-transparent manner, and imposed on the market players and the various parties engaged in the transaction. This manifests the dominant non-transparent and hybrid form of the marketization process and the established Turkish electricity market. I have also introduced a new conception of price with its own terminology and theoretical as well as methodological tools of analysis. The hybrid and multi-level price mechanism in the Turkish electricity market can be mapped in reference to borderline price,

fragmented hourly price, summary price, consumer price, tariff price, and direct negotiated price, all of which I have analyzed in respect to their negotiation forms, fixation mechanisms, and particularities.

The borderline price is an uncoordinated price between non-market and organized market mechanisms, known exactly only to insiders, and without steady financial guarantees. The fragmented hourly price refers to the actual coordinated price realized in the spot market, which is composed of hourly fragmented bids and fixed by the market coordinator. The summary price, on the other hand, is not an actual but a signatory price that provides signals for the daily electricity prices in the spot market and may not reflect the actual prices in all cases. The borderline price, the fragmented hourly price, and the summary price are all constructed through the first-level price realization mechanism. The end-user prices, however, are constructed at the second level; they are actual prices and can be defined as either tariff price or direct negotiated price. The tariff price is fixed by the market regulatory authority and imposed on non-eligible consumers in the market, whereas the direct negotiated price constitutes the outcome of the negotiation between an eligible consumer and the supply company.

This thesis has further demonstrated that the price realization mechanism in the Turkish electricity market reflects not only the marketization of electricity, but also the ways in which disciplinary discourses enframe the market and contribute to its major outcomes, such as price. The analysis has revealed that the free market rhetoric, as it is supported by the dominant actors in the market and defended with arguments based on the neo-classical economic school, does not work as freely as depicted. On the contrary, its freedom must be maintained on an everyday basis: hyper-regulation is a must for a market to be free. This can be traced in this research

and seen in the interviews: the majority of the market actors claim to defend the free market while at the same time requesting tax exemptions or subsidies that qualify as intervention in the free working of the market according to the neo-liberal economic perspective. Eventually, the price, as a major market outcome, is reflective of this rhetoric and its maintenance conditions; it is enframed by the actions of dominant market actors and the commodity, as well as via strictly imposed market regulations that define the calculative practices and bidding procedures of the actors.

The calculative practices of the market actors are enframed by the available market tools and devices in the particular marketization of electricity in Turkey. The trading screen in the day-ahead market and its rules shape the realm of possibilities for the calculative forms and actions of the market actors. The rule of interval bidding defines the calculative practices of market actors as interval-based, not based on accurate price. This enframing, in turn, contributes to the elusiveness of the commodity reference price, which is central for the long-term financing of the market. The license mechanisms also make for influential market tools. Licenses consist of standard forms for each market stage and determine the scope and limits of a market actor's activities in type, volume, and specification. This shapes the planning and calculation forms of the actors. Tariffs, however, serve as reference prices through which market actors negotiate their transactions. The hybrid and non-transparent fixing of tariffs by the regulatory authority further consolidates the hybrid and non-transparent price in the Turkish electricity market.

The absence of publicly available market information can be identified as another market tool that reinforces the non-transparent character of the Turkish electricity market. This device shapes the calculative mechanisms of market actors, by forcing them to decide and act based on extremely limited information, and

enframes the market network formation processes by channeling market actors to form personal relations with other traders to acquire market information. The present thesis has demonstrated that financial subsidies are utilized as market tools as well, contributing to the establishment of a particular form of market in which certain market actors are officially favored.

Analyzing the establishment, reinforcement, and transformation of the market actors in terms of the legal framework, I have revealed that the regulatory framework in the Turkish electricity market operates both as a contextual infrastructure that establishes the conditions under which the market actors operate and as a marketization technology that performs, reproduces, develops, transforms, channels, and maintains the market. The regulatory space and the law making-processes further manifest the interconnectedness between economy and politics, as well as the importance of lobbying for enframing, transforming, and maintaining the Turkish electricity marketization process. This is mainly due to the overlap between the political forces and the law-makers that shape the realm of possibilities for market encounters which in turn establish a certain marketization of electricity.

I should emphasize that the law does not merely impose restrictions and define what can or cannot be done in the market. It transforms, maintains, and enframes the market through defining the conditions under which a certain marketization process is imposed, as opposed to other processes. This thesis has presented the ways in which law enframes the market, by defining the trading forms of the market. The exclusion of OTC trading from the tax exemption mechanism provided for other trading forms has translated into an implicit support for the spot market and contributed to the non-transparency of the market due to the limited number of notarized OTC contracts. I have further demonstrated that the law is

utilized as a market-making tool to transform the market by constructing and employing certain market actors in each of the market stages from production to consumption. When the law introduces a new actor to the electricity market, it does not only integrate a new actor to the market, but also redefines the positions and roles of the existing ones, while at the same time enframing them via a particular form of marketization. The regulatory framework defines the supervisory, auditory, regulatory authority of the market, as well as the market operator in charge of everyday electricity market transactions. The introduction of EPİAŞ, a liberal organization within which the private sector can hold partnerships but is still managed by public officials, as the market operator contributes to the liberal rhetoric of the dominant market actors, while simultaneously demonstrating the free market's need for regulation as a precondition.

Finally, the regulatory framework sets the conditional possibilities for the different primary resource based electricity plants as well. The repeated delays in the establishment of the required regulatory framework for renewable electricity production determined the prospects for establishing a marketization of renewable electricity in Turkey, contributing to the dominance of conventional electricity production through limiting the conditional possibilities for wind and solar electricity production. Consequently, this particular enframing of the Turkish electricity market resulted in a low percentage of renewable electricity plants in the Turkish electricity production and provided the legitimating ground for the establishment of a controversial nuclear power plant.

This analysis has demonstrated how the marketization of electricity has constructed not only the notion of the electricity market in terms of power relations in the exchange of electricity, but also how it has recoded and transformed notions of

the market, the economic, social, political, and the conceptualization of individual and nature. As the marketization processes undermine the conception of electricity as public good and emphasize that as industrial input by means of the dominant discourses, the individual's relation to nature is redefined since sun, the wind, and water are now first and foremost defined as primary resources of electricity plants, rather than as vital resources of livelihood. Furthermore, as the social conception of electricity is undermined along with its conception as public good, the notion of the political and social is redefined: the political constitutes the authority that will ensure the development of the Turkish economy by fueling the electricity market, while the notion of the social increasingly disappears in the marketization process that lacks any reference to the distribution of the alleged economic development or equal access to the supplied electricity. The notion of the economic, in turn, is redefined as a macro-indicator only represented by the measurable numbers of development percentages, and not as the daily exchange relations that affect every party involved. Together these analyses have demonstrated that that there is no economy without electricity, and no politics without economics within the current marketization of electricity in Turkey.

I have further elucidated the ways in which the markets can be defined as sociotechnical agencements. The three characteristics of these agencements have been articulated and analyzed in detail: firstly, I have discussed the ways in which markets organize the conception, production and circulation of goods, especially in the context of the changing conception of electricity as public good and the corresponding establishment of its market. Secondly, I have traced the rules, conventions, technical devices, logistical infrastructures, texts, discourses, and narratives, technical and scientific knowledge that are deployed by the market,

through market devices such as laws and licenses, the discourse on security of supply, texts and narratives of market actors from all market stages, and the emphasis on the importance of technical knowledge due to the nature of the commodity. Finally, the third characteristic of sociotechnical agencements reveal the ways in which markets delimit and construct a sphere of confrontation and power struggles that extends via the contradictory definitions and valuations of goods, as well as via agents that oppose each other in the market until the terms of transaction are determined. This characteristic is detected in the inclusion of the private sector and the exclusion of civil society organizations and environmental concerns from the law-making procedure, in the exclusion of major consumption segments from the tariff-making procedure, and in the electricity price realization mechanisms. Building upon these analyses, the thesis has demonstrated that these forces together constitute, establish, enframe, maintain, renegotiate, consolidate, transform, and finally perform the Turkish electricity market in its existing arrangement, by means of legitimating self-fulfilling prophecies, market devices, rhetoric, narratives, logistical infrastructures and disciplinary discourses. Particularly the expertise discourse is frequently utilized in order to consolidate an expertise market conception in which only experts are capable of participation.

The methodological pluralism of the actor-network theory has enabled this research to investigate the distributed forms of action and agency simultaneously. This particular theoretical and methodological mapping of the market not only incorporates the proliferated dynamics of market-making overlooked by existing studies, but it also provides new points of analysis for articulating and explaining market conditions. The incorporation of power dynamics and distributed forms of agency have the potential to elevate the existing descriptive literature on the

efficiency of electricity market conditions and on problems of long-term stable supply to an explanatory framework that provides insights into the everyday working of the electricity markets.

It should be emphasized that the implications of this research go beyond proposing an alternative theoretical framework for investigating processes of market-making. As a suitable region for all forms of electricity production, Turkey serves as a productive field of analysis in terms of market scale and proliferation. Moreover, the importation of major inputs of electricity production, such as natural gas, has implications for international relations so as to ensure the long-term stable supply required by the specificity of the electricity market. However, the implications of the marketization of electricity for domestic (as opposed to international) relations are constitute the main points of focus, due to practical limitations and, more importantly, due to the fact that the electricity market is mainly local and partially regional based on its particular commodity. The international perspective of electricity, especially in regard to the international developments on the energy markets (such as the significant discovery of shale gas), can be integrated into studies of the Turkish electricity market for further research.

For the long-term trajectory of the Turkish electricity marketization, I expect that the electricity production capacity will increase as consumption grows and as new investments are encouraged with better conditions. Accordingly, it is expected that the Turkish electricity market will receive substantial foreign and national investment that will eventually increase the total electricity production capacity in Turkey and proliferate market actors and encounters. The role of Turkey in the regional electricity market will increase as Turkey pursues its goal of establishing itself as the region's energy hub, a goal already consolidated by the marketization

process. Concerns about the environment and efforts towards establishing carbon emission markets will be dismissed in the short and medium term, because environmental concerns are wiped away with the sole emphasis of the Turkish electricity market's role for the development of the Turkish economy, which is essentially tied up to a production increase. Whether the particular nature of the marketization process, with its sole emphasis on increased production and dismissed social and environmental concerns, will improve Turkish citizens' daily encounters with electricity constitutes a problem that remains to be observed in the coming years.

APPENDIX A: Original Texts of Translated Quotations

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Chapter 3, pp. 98;

Translated English text:
To ensure the development of a financially sound and transparent electricity market that will operate in a competitive environment under provisions of civil law and the delivery of sufficient, good-quality, low-cost and environment-friendly electricity to consumers and to ensure the autonomous regulation and supervision of this market.

Original Turkish text:
Bu Kanunun amacı; elektriğin yeterli, kaliteli, sürekli, düşük maliyetli ve çevreyle uyumlu bir şekilde tüketicilerin kullanımına sunulması için, rekabet ortamında özel hukuk hükümlerine göre faaliyet gösterebilecek, mali açıdan güçlü, istikrarlı ve şeffaf bir elektrik enerjisi piyasasının oluşturulması ve bu piyasada bağımsız bir düzenleme ve denetimin sağlanmasıdır.

Chapter 3, pp. 98;

Translated English text:
Covers the generation, transmission, distribution, wholesale retailing and retailing services, import, and export of electricity; the rights and obligations of all real persons and legal entities directly involved in these activities; the establishment of the Energy Market Regulatory Authority and the determination of the operating principles of this authority; and the methods to be employed for the privatization of electricity generation and distribution assets.

Original Turkish text:
Bu Kanun; elektrik üretimi, iletimi, dağıtımı, toptan satışı, perakende satışı, perakende satış hizmeti, ithalat ve ihracatı ile bu faaliyetlerle ilişkili tüm gerçek ve tüzel kişilerin hak ve yükümlülüklerini, Elektrik Piyasası Düzenleme Kurumunun kurulması ile çalışma usul ve esaslarını ve elektrik üretim ve dağıtım varlıklarının özelleştirilmesinde izlenecek usulü kapsar.

Chapter 3, pp. 110;

Translated English text:
To ensure the development of a financially sound and transparent electricity market *operating* [as opposed to the phrase "that will operate," used in the 2001 EML; emphasis mine] in a competitive environment under the provisions of civil law, and the delivery of sufficient, good-quality, low-cost and environment-friendly electricity to consumers and to guarantee the exercise of autonomous regulation and supervision of this market.

Original Turkish text:
Bu Kanunun amacı; elektriğin yeterli, kaliteli, sürekli, düşük maliyetli ve çevreyle uyumlu bir şekilde tüketicilerin kullanımına sunulması için, rekabet ortamında özel hukuk hükümlerine göre faaliyet *gösteren*, mali açıdan güçlü, istikrarlı ve şeffaf bir

elektrik enerjisi piyasasının oluşturulması ve bu piyasada bağımsız bir düzenleme ve denetimin yapılmasının sağlanmasıdır.

Chapter 3, pp. 124;

Translated English text:
The doors are open to few investors only, and these people are already having dinners together, or they have close personal relations. But others, including my company, see the law or regulation drafts only after they are issued, and our comment is requested half-heartedly, without being taken into consideration. What is even more ironic is that the minister talks at conferences to the public that they request all of our participation, and we are put into a position to make a comment knowing that it will never be integrated into the law-making process. This is all about creating the image of a democratic process, whereas in reality it is only a theater on stage. The back stage, however, is a whole different story which I never get to see.

Original Turkish text:
Kapılar sadece birkaç yatırımcıya açık ve bu kişiler zaten birlikle yiyen içen, görüşen eden kişiler. Ama diğerler, ki benim firmam da bunlara dahil, kanunları ya da düzenlemeleri ancak çıktıktan sonra görüyor. Bizim yorumumuz yarım ağızla isteniyor, dikkate alınmıyor. Daha da manidar olan bir şey var. Konferanslarda Bakan çıkıyor bizim katılımımızı istiyor ve biz de hiç dikkate alınmayacağını bile bile bir yorum yapmak zorunda kalıyoruz. Bunların hepsi demokratik piyasa süreç imajı yaratmak için. Ama gerçekte bunlar tiyatro oyunu. Arka sahne ise benim hiç göremediğim bambaşka bir hikaye.

Chapter 3, pp. 127;

Translated English text:
In the new market system, we will let the private sector live, but also make them feel that we are always watching them; however, please do not let this mentality intimidate you, we are well aware that the collapse of the sector would mean our own collapse, too.

Original Turkish text:
Yeni piyasa sisteminde özel sektörü yaşatacağız, ama aynı zamanda onları sürekli izlediğimizi de hissettireceğiz. Ama lütfen bu mentalite size korkutmasın, sektörün çöküşünün bizim de çöküşümüz olacağının farkındayız.

Chapter 3, pp. 127;

Translated English text:
Independent organizations such as EMRA or EPİAŞ are organizations that are not much favored by the long-term political authorities. The members are assigned to their positions, but after a certain while they cannot meet the political authority's expectations. Especially when they were appointed for a second time, they became even more dysfunctional. I have observed in my career that such organization-like

corporations are never favored by long-ruling political authorities. And I also believe that giving these organizations the right to law-making processes is basically authority abuse.

Original Turkish text:
Enerji Piyasası Düzenleme Kurumu ya da EPIAS gibi bağımsız kuruluşlar politik otorite tarafından pek sevilmezler. Üyeler bazı pozisyonlara atanırlar, ama bir süre sonra bu kişiler politik otoritenin beklentilerini karşılayamazlar. Özellikle ikinci kez bu pozisyonlara seçildiklerinde daha da işlevsiz hale gelirler. Kariyerim boyunca bu tip organizasyonvari kuruluşların uzun sureli politik otoriteler tarafından sevilmediğini gördüm. Ve bence bu organizasyonlara kanun yapma süreçlerine katılım hakkı verildiğinde bu açık bir otorite suistimali oluyor.

Chapter 3, pp. 128;

Translated English text:
When a turbine of the plant was disabled due to a technical disturbance, we opened a tender for the rehabilitation of the turbine, but no company was interested due to the heavy bureaucratic requirements of the tender. The technical requirements could only be met by foreign companies; they are already the initial builders of the plant, but none of them would comply with the bureaucratic requirements. In the end, we could not stand watching the daily damage it caused the national economy and directly made a contract with a foreign company for a total amount of 37 million €. The daily cost of this non-working turbine was 1 million TL a day, equaling nearly 420,000 € at the time, redeeming itself within only three months. But I must say that I fear that something may happen to me with bribery allegations. This turbine remained switched off for almost a year, equaling a loss of 365 million TL. According to the law, no one can ask me to account for these losses, but I may be guilty of rehabilitating the turbine by direct contract, even if this contract saves the Turkish economy a lot of money. Sometimes you need to subtly by-pass the law, if you really want to do something for this sector and this country. Believe me, as a bureaucrat, I am more troubled with by bureaucracy than anyone else.

Original Turkish text:
Santralin bir tribünü teknik arıza yaptığında tamiri için bir ihale açtık; ama çok sıkı bürokratik gereklilikler yüzünden kimse ihaleye girmedi. Teknik yeterlilikler sadece santrali ilk yapan yabancı firma ya da bu tip yabancı firmalar tarafından sağlayanabiliyordu fakat onlar da bizim bürokratik kurallara uymaya yanaşmıyordu. Sonunda, bu arızanın üke ekonomisine verdiği zararı izlemeye daha fazla tahammül edemedik ve yabancı bir firmayla doğrudan kontrat yoluyla işi otuz yedi milyon Euro'ya verdik. Bu tribünün bir günlük çalışmama maliyeti yaklaşık bir milyon TL'ydi. Bu da zamanın kuruyla yaklaşık 420.000 Euro yapıyordu. Yani yatırım kendini üç ayda amorti ediyordu. Ama söylemem lazım, başıma herhangi bir yolsuzluk suçlaması gelir mi diye korkuyorum. Bu tribün yaklaşık bir yıl kapalı kaldı ve yaklaşık 365 milyon TL zarara sebep oldu. Kanuna gore, bana kimse kaybedilen bu paraları soramaz, ama ben bu tribünü direk kontrat ile yaptırdığım için suçlamalarla karşılaşabilirim, bu kontrat Türk ekonomisine birsürü para kazandırsa da. Bu sektör ve ülke için bir şey yapmak istiyorsanız, bazen kanunun yanından

dolaşmanız gerekiyor. İnanın bir bürokrat olarak bürokrasiyle en çok benim başım dertte.

Chapter 3, pp. 143;

Translated English text:
Whether we like it or not, even though we would like to exclude natural gas in the generation of electricity, we must admit that natural gas will continue to play an important role in electricity generation, and thus the realization of the electricity price, in Turkey for a very long time.

Original Turkish text:
Beğensek de beğenmesek de, elektrik üretiminde doğalgazı tamamen devreden çıkarmak istesek de, doğalgazın elektrik piyasasında ve dolayısıyla elektrik fiyatında çok uzun bir süre daha çok önemli bir rol oynayacağını kabul etmeliyiz.

Chapter 3, pp. 151;

Translated English text:
The only way to bring nature back into the picture is to speak to people's hearts, because their minds are driven by profit. Turkey might fall into poverty, if we cannot keep the rich satisfied, and they continue to conceive of nature as an input into their industry, although it should mean life to us.

Original Turkish text:
Resme doğayı tekrardan entegre etmenin tek yolu insanların kalplerine konuşmak çünkü akıllar ticari karda. Eğer zengini tatmin edemezsek ve doğayı hayat olarak algılamak yerine kendi endüstrilerine bir girdi olarak görmeye devam ederlerse, Türkiye yoksulluğa düşebilir.

Chapter 3, pp. 156;

Translated English text:
We have the money, we have the know-how, and we have the best wind; however, the license mechanism is not working properly, and the relevant bureaucracy is working so as to make serious investors loose time. For example, there are certain limited periods within which you can submit license applications, once in five years, and I cannot understand the reason why.

Original Turkish text:
Paramız var, bilgimiz var, rüzgarın en iyisi bizde; ama lisans mekanizması düzgün işlemiyor ve ilgili bürokrasi sadece ciddi yatırımcıya zaman kaybettirmek için çalışıyor. Mesela lisans başvurularını sadece belirli bir zamanda yapabiliyosun, beş yılda bir defa ve ben bunun sebebini anlayamıyorum.

Chapter 3, pp. 161;

Translated English text:
If we provide more subsidies to solar and wind instead of natural gas resources, then it would mean a capital transfer to these investors which according to my political views would simply mean an injustice. It would also increase expenditures on solar technology that is usually imported. The investors shall earn money, but not too much, just a reasonable margin. This is a state policy above political parties, but could only be established under the rule of the Justice and Development Party.

Original Turkish text:
Eğer doğalgaz yerine güneş ve rüzgar enerjisine daha fazla teşvik verirsek bu bazı yatırımcılara sermaye transferi yapılması demek olacak ve bu benim politik görüşlerime göre adaletsizlik demektir. Ayrıca bu genellikle ithal olan güneş enerjisi teknolojisine daha fazla para harcamak demek olacak. Yatırımcılar para kazanmalı ama çok fazla değil, sadece makul bir pay. Bu partiler üstü bir devlet politikasıdır, ama sadece Adalet ve Kalkınma Partisi yönetiminde başarılabilmiştir.

Chapter 3, pp. 166;

Translated English text:
In two and a half months in 2013, we have achieved privatization revenues of 5.7 billion USD, which is higher than the target that was set for us. This means not only an input into the Turkish economy, but also easing the burden on state-owned EÜAŞ in regard to power plants that are in need of constant repair and maintenance.

Original Turkish text:
2013'ün iki buçuk ayında toplam 5.7 milyar dolar özelleştirme geliri elde ettik. Bu bize konulan hedefin üzerinde. Bu hem Türkiye ekonomisine katkı oluyor hem de aynı zamanda EUAS'ı sürekli tamir ve bakım gerektiren santrallerin yükünden hafifletmek anlamına da geliyor.

Chapter 3, pp. 166;

Translated English text:
Hamitabat has approximately 85 million USD in cash in a bank, 50 million USD receivables from the distribution companies in the short term, and 30 million USD worth of gasoline in its warehouse. Also, its vast land and agricultural land is very valuable. Considering these, Hamitabat's privatization price is illegitimate.

Original Turkish text:
Hamitabat'ın bankada yaklaşık seksen beş milyon doları var, dağıtım şirketlerinden kısa vadeli eli milyon dolar alacağı var ve deposunda da otuz milyon dolarlık gazı var. Ayrıca tarıma uygun büyük arazisi de çok değerli. Bunları düşündüğümüzde, Hamitabat'ın özelleştirme fiyatı meşru değildir.

Chapter 3, pp. 171;

Translated English text:
I personally very much support the unlicensed electricity generation system, because the electricity is produced and consumed in the same place without getting injected into the transmission system. Because when it is injected into the system, it not only becomes a burden on the transmission system and on us as its regulatory authority, but it also results in electricity losses as the distance between the producing and the consuming area increases.

Original Turkish text:
Ben şahsen lisanssız elektrik üretim sistemini çok destekliyorum çünkü elektrik aynı yerde üretilip tüketilmiş oluyor ve iletim sistemine enjekte olmuyor. Çünkü iletim sistemine girdiğinde bu hem iletim sistemi üzerinde ve düzenleyici kurum olarak bizim üzerimizde bir baskı oluşturuyor, hem de üretim ve tüketim yerleri arasındaki mesafeden doğan elektrik kayıpları oluyor.

Chapter 3, pp. 189;

Translated English text:
My risk is nothing compared to the distribution companies' risks; their cost of non-delivery is a real cost because it's their primary job, whereas my cost is only the cost of a missed opportunity if I do not get to produce that day due to miscalculations in the day-ahead market.

Original Turkish text:
Dağıtım şirketleri yanında benim riskim hiçbir şey, onların dağıtım yapamaması gerçek maliyet çünkü bu onların asıl işi. Ama ben gün öncesi piyasaa hesap hatası yaparsam maliyetim sadece fırsat maliyeti olur.

Chapter 3, pp. 198;

Translated English text:
I have the same type of natural gas plant, the same, and I am sure that my offers are favorable as well, so why are all the over-load and under-load instructions received by Adularya? Only because they go along with the right people.

Original Turkish text:
Bende de aynı tip doğalgaz santrali var, aynısı, ve eminim tekliflerim de iyi; peki o zaman neden tüm yük-al yük-at talimatları Adularya'ya gidiyor? Çünkü onlar doğru insanlarla iyi anlaşıyorlar da o yüzden.

Chapter 3, pp. 210;

Translated English text:
In the peak hours the producers automatically raise their prices, even though there is not much consumption due to unexpected weather conditions or something else. So if

you do not have long-term bilateral agreements with production plants that are new and in need of stable financing, you are doomed during the peak hours. But sometimes, especially in Bulgaria, you can find really cheap electricity during these hours. Particularly when it is raining there, but not here. I know this happens once in a month, or two months. But when it does, we make substantial profits. We not only fulfill our commitments with cheap electricity, but we sell the surplus on the market and the real profit is there. It is somehow like a treasure hunt, each month you enter the capacity auctions and pay their costs and sometimes you do not use these capacities for months, but still you continue to pay for them and wait because you think the treasure may be somewhere in there.

Original Turkish text:
Puant saatlerde tüm üreticiler beklenmedik hava koşuluna falan bağlı tüketim artışı olmasa da fiyatlarını yükseltirler. O yüzden eğer bu saatler için yeni ve finansman ihtiyacı olan üreticililerle doğrudan ikili anlaşman yoksa yandın. Ama bazen bu saatlerde çok ucuz elektrik bulabilirsin, özellikle Bulgaristan'dan. Özellikle de orda yağıp burda yağmazken. Biliyorum bu ancak bir iki ayda bir olur. Ama olduğunda da, çok ciddi kar yapıyoruz. Hem taahhütlerimizi ucuz elektrikten karşılamış oluyoruz hem de fazlayı piyasada satıyoruz ve işte asıl kar da burda oluyor. Hazine avı gibi bir şey, her ay kapasite ihalelerine giriyorsun ve paraları ödüyorsun ve bazen bu kapasiteleri aylarca kullanmıyorsun ama ödemeye devam edip bekliyorsun çünkü hazinenin oralarda bir yerde olduğunu düşünüyorsun.

Chapter 3, pp. 217;

Translated English text:
In the new structure, EPİAŞ will be responsible not only for electricity trade, but also for the settlement of imbalances in PMUM. And this is, in fact, a little complicated. Initially, EPİAŞ will be responsible for making settlement calculations. It will acquire the necessary information from Takasbank. Takasbank will also be responsible for the management of financial guarantee and cash flows. But as you may have noticed, there is a multi-manager system here, which will be refused by Takasbank at the end of the day. But I think this would be wrong; because in order to settle the imbalances, the required thing is the electricity meter information, which is irrelevant to Takasbank. Consequently, EPİAŞ must also in principle be the settler of imbalances.

Original Turkish text:
Yeni yapıda, EPIAS hem elektrik ticaretinden hem de dengesizliklerin PMUM'da dengelenmesinden sorumlu olacak. Ve bu aslında biraz karmaşık. İlk aşamada EPIAS dengesizlik hesaplamalarını yapmaktan sorumlu olacak. Gerekli bilgileri Takasbank'tan alacak. Takasbank aynı zamanda finansal garanti ve nakit akışlarının yönetilmesinden sorumlu olacak. Ama fark etmiş olabilirsiniz, burda bir çoklu yönetim sistemi var ve bu günün sonunda Takasbank tarafından reddedilecektir. Ama bence bu yanlış olur çünkü dengesizliklerin dengelenmesi için gerekli bilgi olan sayaç bilgilerinin Takasbank ile hiçbir ilgisi yok. Bu yüzden prensipte EPIAS dengesizliklerin dengeleyicisi de olmalıdır.

Chapter 3, pp. 218;

Translated English text:
I know that, no matter what I do, I cannot be a partner of EPİAŞ. Because, first, I am in the renewable business that the government in fact does not support so as to convince people more easily that nuclear [power] is necessary. Secondly, it is not only publicly known that I do not have personal links with the government and EMRA officials, but I simply do not support the government and I have the courage to talk about this in electricity market circles. Wait and see, I am telling you today [16 May 2013] that the partners of EPİAŞ will be Çalık Holding [its CEO is the son-in-law of Prime Minister Recep Tayyip Erdoğan], Limak Holding [which publicly supports the government], Ciner Holding [which also participates in the media sector with a pro-government television channel], and maybe Polat Holding, Turcas Energy, and Sabancı Holding, since they are effective in the Turkish industry as a whole [because they participate in other sectors such as automotive and construction, which are the locomotive of Turkish industry].

Original Turkish text:
Biliyorum ki ne yaparsam yapayım EPIAS'ın ortağı olamayacağım. Çünkü öncelikle ben hukümetin nükleerin gerekli olduğuna insanları inandırmak için aslında desteklemediği yenilenebilir işindeyim. İkincisi de benim hukümet ya da EPDK (EMRA) ile yakın ilişkilerimin olmadığı herkes tarafından bilinmesinden öte, ben hukümeti desteklemediğimi piyasa çevrelerinde konuşacak cesareti de gösteriyorum. Bekle ve gör, bugünden söylüyorum, EPIAS'ın ortakları Çalık Holding, Limak Holding, Ciner Holding ve belki Polat Holding, Turcas Enerji ve Sabanci Holding olur, şayet onlar Türkiye endüstrisinin genelinde etkili firmalar.

Chapter 3, pp. 219;

Translated English text:
In order to establish a completely free and liberal competitive market where foreign investors would pit themselves against each other to invest in the Turkish electricity market, it is very important that the public authorities support well-grounded market actors via EPİAŞ. Because only in this way will the investors not be subjected to non-market risks such as political risks, along with the usual market-risks.

Original Turkish text:
Kamu otoritelerinin yabancıların yatırım yapmak için birbiriyle yarışacağı tam özgür ve liberal rekabetçi bir piyasayı oluşturmak için sağlam piyasa aktörlerini EPIAS üzerinden desteklemesi çok önemli. Çünkü ancak bu şekilde yatırımcılar piyasa risklerinin yanında politik riskler gibi piyasa dışı risklere maruz kalmazlar.

Chapter 3, pp. 220;

Translated English text:
Regardless of foreign or national investment, the most important thing for an investor to enter safely into a market or a particular market is to be able to foresee the

timeline in which the investment will pay itself off. For this, however, you need to know at least with a five-percent discrepancy your return in monetary amounts. And for this, you need to know what will be the unit price range of the good in which you will invest, at least in the medium-run. This is what I expect from EPİAŞ, and what everyone says will be established by EPİAŞ, but I did not see any concrete map for how this will be achieved.

Original Turkish text:
Yerli ya da yabancı farketmez, bir yatırımcının bir piyasaya girmesi için en önemli şey yatırımına dönüş alacağı zaman çizelgesini görembilmek. Fakat bunun için en azından yüzde 5 oynamayla da olsa, parasal geri dönüşü hesaplayabilmen lazım. Ve bunun içinde en azından orta vadede yatırım yapacağın ürünün birim satış fiyatını bilmen lazım. İşte ben EPIAS'tan beklentim bu ve herkesin yapıcağını söylediği şey de bu; ama ben buna nasıl ulaşılacağı konusunda net bir harita göremiyorum.

Chapter 3, pp. 221;

Translated English text:
I must say that we are at a distance to EMRA in this study, and I really hope that we can overcome this aloofness, because the Turkish electricity market can only be developed by a system in which everyone's voice is heard. BOTAŞ, as the single authority in the natural gas market, should also be a partner with EPİAŞ, because the electricity market cannot be envisioned without taking into consideration the dynamics of the natural gas market. We are talking about long-term stability and price forecasting, we are talking about forward contracts. It should not be forgotten that market trust can flourish and market volume can reach desired levels only if the market indexes are reliable.

Original Turkish text:
Bu çalışmada EPDK (EMRA) ile biraz uzak olduğumuzu söylemem lazım ve gerçekten bu uzaklığı yenmemizi umuyorum çünkü Türkiye elektrik piyasası sadece herkesin sesinin duyulduğu bir sistem ile geliştirilebilir. Doğalgaz piyasasının tekel otoritesi BOTAS da EPIAS'ın ortağı olmalı çünkü elektrik piyasası doğalgaz piyasası dinamikleri hesaba katılmadan hayal edilemez. Uzun dönemli istikrar ve fiyat öngörümünden bahsediyoruz, vadeli kontratlardan bahsediyoruz. Unutulmamalı ki, ancak piyasa indeksleri güvenilir ise piyasa güveni oluşur ve piyasa hacmi istenen seviyelere ulaşır.

Chapter 3, pp. 226;

Translated English text:
None of our contracts are notarized; because we know all the market players and who can be trusted, why would we pay for legal enforcement that usually does not work at all? Besides, we usually trade with the same companies; it is a continuous business, no one would risk their market position and reputation over a contract.

Original Turkish text:

Bizim hiçbir kontratımız noterden onaylı değil, çünkü tüm piyasa oyuncularını ve kimin güvenilir olduğunu biliyoruz; neden genelde hiç işe yaramayan yasal yaptırım için para ödeyelim ki? Ayrıca, biz genelde aynı firmalarla ticaret yapıyoruz, bu devamlı bir iş, kimse bir kontrat için piyasa pozisyonunu ve itibarını riske atmaz.

Chapter 3, pp. 228

Translated English text:
There are rumors saying that electricity forward contracts are being done in VOB [*Vadeli İşlem ve Opsiyon Borsası*, Turkish Derivatives Exchange], but I have never seen one and honestly I don't believe that it is true. For forward contracts to work, you need a real liberal market and corresponding market depth, but we must admit that our electricity market is not there yet. We must have banks that finance and support such contracts, but we don't, and the banks do not have the appetite either. But if they did, and if market depth would increase with additional financial instruments and potentials for credit, risk management opportunities would increase and maybe market players would conclude such contracts. But personally, I do not recommend to any of my clients to enter into electricity forward contracts in Turkey.

Original Turkish text:
VOB'da elektrik vadeli kontratları yapıldığına dair söylentiler var ama ben hiç görmedim ve dürüst olmak gerekirse bunun doğru olduğunu da düşünmüyorum. Vadeli kontratların işlemesi için gerçek bir liberal piyasaya ve buna denk gelen piyasa derinliğine ihtiyac var; fakat kabul edelim bizim elektrik piyasamız daha o noktada değil. Bu kontratları finanse edip destekleyecek bankalarımızın olması lazım ama yok ve bunun için herhangi bir iştahları da yok. Ama eğer olsaydı belki piyasa derinliği bu finansal enstrümanlar ve kredi fırsatları ile artardı , risk yönetim imkanları artardı ve belki piyasa oyuncuları bu tip kontratlar yapardı. Ama ben kişisel olarak hiçbir müşterime Türkiye'de vadeli elektrik kontratlarına girmesini önermiyorum.

Chapter 3, pp. 231;

Translated English text:
We have made propositions such as to remove the TRT contribution fee and the meter reading fee when the law was being discussed in the assembly commissions. However, such propositions did not even get debated. This law is made solely for overcoming the problems faced by the newly established distribution companies, not for meeting the expectations of the market. We have requested the electricity losses to be paid from the state budget. But still the regular, paying citizens will take the burden of the consumer who does not pay for electricity. There was not even one single debate on the monitoring of electricity losses.

Original Turkish text:
Kanun piyasa komisyonlarında tartışılırken bir TRT katkı payı ve sayaç okuma bedellerinin kaldırılması tekliflerinde bulunduk. Fakat bu teklifler tartışılmadı bile. Bu kanun sadece yeni kurulan dağıtım şirketlerinin yaşadığı problemleri çözmek için yapıldı, piyasa beklentilerini karşılamak için değil. Elektrik kaçaklarının devlet

bütçesinden ödenmesini istedik. Ama yine, düzenli ödeme yapan vatandaş ödemeyen tüketicinin yükünü üstlenmiş olacak. Elektrik kaçaklarının denetlenmesi için tek bir tartışma bile yapılmadı.

Chapter 3, pp. 231;

Translated English text:
TRT for me is the speaker of the government, and this situation is not particular to the current government of the Justice and Development Party, but to all the past governments. All the years when Kurdish people were tortured and killed by the state itself, there was not a single news item about us. OK, one can say that it is better now, and we get to live under the same umbrella to an extent, under the same state; but no one can make me accept that TRT is an objective channel, and I would never pay this fee.

Original Turkish text:
TRT benim için hukümetin sözcüsü ve bu durum AK Parti'ye (Adalet ve Kalkınma Partisi) özgü bir durum değil, tüm geçmiş hukümetler için de geçerli. Onca yıl Kürtler bizzat devlet tarafından işkence group öldürülürken bizimle ilgili tek bir haber bile yoktu. Tamam şu an durumlar daha iyi diyebiliriz, aynı şemsiye altında aynı devlet altında yaşıyoruz diyebiliriz; ama hiçkimse bana TRT'nin tarafsız bir kanal olduğunu kabul ettiremez ve bu ücreti asla ödemem.

Chapter 3, pp. 241;

Translated English text:
Right now [24 April 2013], Turkey's electricity loss percentage is 9.4 percent, lower than in Europe, but only if we disregard the losses in the regions of Dicle and Van. The resolution process we are undergoing and the establishment of peace in this area will reflect themselves in the electricity bills.

Original Turkish text:
Şu anda Türkiye'deki elektrik kaçağı yüzde 9.4, Avrupa'dan düşük, ama eğer Dicle ve Van bölgelerini hesaba katmazsak. İçinde bulunduğumuz çözüm süreci ve bölgede barışın sağlanması elektrik faturalarına da yansıyacak. Oradaki insanımız özünde iyi, ama terör organizasyonu onlara ödemeyin diyor.

Chapter 3, pp. 242;

Translated English text:
For us [Turkish citizens], the state is the father, so whatever comes from state, we comply with it, even though we complain and do not agree; however, a private company is different. People already believe that these companies are given by way of *peşkeş* [as a favor to private companies due to their close economic and personal relations with government or public officials]. If they see the electricity loss fee in their bills, then they would simply refuse to pay. And no private company would

enter this system, if they did not have a guarantee for losses, at least for the first few years.

Original Turkish text:
Bizim için devlet babadır, devlet ne gelse katılmasak da şikayet etsek de uyarız; ama özel bir şirket böyle değil. İnsanlar zaten bu şirketlerin peşkeş çekildiğini düşünüyor. Bir de faturalarında kaçak bedelini görürlerse ödemeyi direkt reddederler. Ve hiçbir özel şirket bu kayıpların en azından ilk yıllar için garantisini almadan bu sisteme girmez.

Chapter 3, pp. 242;

Translated English text:
The issue of pricing is the most problematic aspect in the distribution sector. Even though the distribution sector is privatized, EMRA is still dominant in price determination, which is based on cost, and it will continue to be so until the third phase in the distribution sector reform will be established in 2016 [the first phase consisted of regulation, the second phase of complete privatization, and the third phase has been defined as complete liberalization]. The tariffs are still determined and imposed by EMRA, and the only freedom of the distribution sector is to provide discounts on these tariffs to eligible consumers. However, they are not completely free in this regard, either, because at the end of the day the revenue limit system rips off the profit above a certain point determined by EMRA. Since the costs are not the same in each region, EMRA applies cost-based pricing. Yet, this is a huge impediment for an efficient market, and particularly unfavorable for the consumers, because if a company can reflect all its costs in the price, why would it work to diminish costs and see a fall in its prices? Either way, we get the same profit, so what is the incentive to decrease costs?

Original Turkish text:
Dağıtım sektöründe en sorunlu konu fiyatlandırma. Dağıtım sektörü özelleştirilmiş olsa da EPDK (EMRA) hala fiyat belirlemede çok etkili ve 2016'da özelleştirmede üçüncü faza geçise kadar da böyle olmaya devam edecek. Tarifeler hala EPDK tarafından belirlenip empoze ediliyor ve dağıtım sektörünün tek insitiyatif hakkı serbest tüketicilere bu tarifeler üzerinden iskonto vermek. Ama bu noktada da tamamen özgür değiller çünkü günün sonunda gelir sınırlandırma sistemi EPDK'nın belirlediğinin üzerindeki karı alıp götürüyor. Her bölgedeki maliyetler aynı olmadığı için EPDK maliyet bazlı fiyatlandırma yapıyor. Fakat etkili bir piyasa oluşmasının önünde bu çok büyük bir engel ve özellikle tüketiciler için kötü bir durum çünkü eğer bir firma tüm maliyetlerini fiyata yansıtabiliyorsa neden maliyetlerini düşürüp fiyatların aşağı inmesini istesin ki? Her durumda, biz aynı karı alıyoruz, burada maliyeti düşürmek için teşvik nedir?

Chapter 3, pp. 246;

Translated English text:
Consumers are not mainly concerned about who generated the electricity, who transmitted or sold it in the wholesale markets. They only care whether the lights go

on when the light switch is hit, or whether the machines in their factory receive electricity for a reasonable bill. Thus, their first criterion is accessibility and continuous supply, and secondly legitimate price. Ten years ago a five-hour power cut was easily tolerated by the consumers, because their addressee for complaints was the state itself. However, now one-hour power cuts cannot be tolerated by the consumers. A market that has been transferred from the state to the private sector cannot be independent of state perception. The state is the untouchable, the giver and taker without discussion for the Turkish people. However, the private distribution company is not. Thus, the distribution companies shall also invest heavily, not only into continuous supply management, but also into customer relations, and it must learn customer perception management.

Original Turkish text:
Tüketiciler elektriği kimin ürettiği, kimin ilettiği, piyasalarda kimin sattığıyla pek ilgilenmez. Onlar sadece makul bir fautura karşılığında ışığı açtıklarında lambalar yanıyor mu yanmıyor mu ya da fabrikalarındaki makineler çalışıyor mu çalışmıyor mu buna bakarlar. O yüzden birinci kriter ulaşılabilirlikle devamlı tedarik ve ikinci olarak makul fiyat. On yıl once beş saatlik bir elektrik kesintisi tüketiciler tarafından kolaylıkla tolere ediliyordu çünkü muhattab devletin kendisiydi. Şimdi ise bir saatlik kesinti bile tolere edilmiyor. Devletten özel sektöre geçen bir sektör devlet algısından bağımsız olamaz. Devlet Türkler için dokunulmaz, tartışmasız olarak verir ve alır. Fakat özel dağıtım şirketi böyle değil. Bu yüzden de dağıtım şirketleri sadece sürekli tedarik değil aynı zamanda müşteri ilişkileri ve müşteri algı yönetimine de çok ciddi yatırım yapmalılar.

Chapter 3, pp. 252;

Translated English text:
The criticisms tell us that we should not use natural gas because it is import, we should not use wind energy because the birds die, we should not use nuclear energy because it will be a disaster. These criticisms target the industry itself, and they have no meaning at all. We are now living in the era of technology; it is possible to have a system in which energy embraces nature.

Original Turkish text:
Eleştirenler bize doğalgazı kullanmayın ithal, rüzgar enerjisini kullanmayın kuşlar ölüyor, nükleer enerjisini kullanmayın felaket olur diyor. Bu eleştiriler tüm endüstriyi hedef alıyor ve hiçbir anlamı yok. Artık teknoloji çağında yaşıyoruz, enerjinin doğayı kucakladığı bir sistem mümkün.

Chapter 3, pp. 252;

Translated English text:
We, the entire Turkish population, breathe every day and consume oxygen from nature; however, nature can tolerate this. Thus, at the end of the day, what is important is whether nature can tolerate what is being done. We will build a market in which nature is protected, but at the same time utilized by humans.

Original Turkish text:
Biz tüm Türkiye nüfusu olarak her gün nefes alıp oksijen tüketiyoruz ama doğa bunu tolere edebiliyor. Yani günün sonunda önemli olan yapılanı doğanın tolere edip edemeyeceği. Doğanın korunduğu ama insanlar tarafından değer yaratmak için kullanıldığı bir piyasa kuracağız.

Chapter 3, pp. 254;

Translated English text:
We act with the greatest care when it comes to nature; however, we still face severe opposition. We cannot stop these organized movements and the incorrect thoughts of the public. But I must say that the substance of the issue is not about the public, but about the sinister third parties that instigate and organize the public; otherwise, you should know that these are not the thoughts or concerns of the public.

Original Turkish text:
Mesele doğaya geldiğinde biz azami dikkatle davranıyoruz ama yine de çok ciddi tepkiler alıyoruz. Böyle organize hareketleri ve haklın hatalı düşüncelerini durduramıyoruz. Ama bu konunun özünün halkla ilgili olmadığını söyemem lazım, konu halkı kandırıp organize eden kötü niyetli kişi ve kuruluşlar; aksi halde bunların halkın düşünce ya da endişeleri olmadığını bilin.

Chapter 3, pp. 262;

Translated English text:
We are having negotiations with more than one company at the same time for the same day's electricity and determine the seller at the last minute as to whoever is giving the greatest discount; we sometimes cancel the executed contracts and switch the seller as well. I know that it is not ethical, but we need to earn money.

Original Turkish text:
Aynı günde aynı günün elektriği için birden fazla firmayla pazarlığı götürüyoruz ve satıcıyı son dakikada en çok iskontoyu veren üzerinden belirliyoruz. Bazen yapılan kontratları iptal edip satıcıyı değiştiriyoruz. Bunun etik olmadığını biliyorum ama bizim de para kazanmamız lazım.

Chapter 3, pp. 263;

Translated English text:
It is because everything depends on supply and demand, and it is very difficult to forecast the supply and demand for each hour of the day. Moreover, for example, if a power plant breaks down for the day even for two hours, or if a new plant gets integrated into the system, then the prices are messed up for the whole day and sometimes for the whole week.

Original Turkish text:
Her şey arz ve talep olduğu için, ve bu arz ve talebi günün her saati için tahmin etmek çok zor. Üstelik örneğin eğer bir santral günün diyelim iki saati arıza verdi ya

da yeni bir santral sisteme enjekte oldu, fiyatlar bütün gün ve hatta bütün bir hafta altüst oluyor.

Chapter 3, pp. 271;

Translated English text:
Well, if anyone knows how the tariffs are made and can tell me, I will kiss that person on the forehead. A friend of mine, working in the EMRA tariff department, he told me that he doesn't know either. He tells that the prices come from TEİAŞ to the EMRA board, then undergo a small adjustment which he thinks is done only to show that EMRA is the decision-making authority, and sometimes even the prices are taken up for comment by the Prime Minister.

Original Turkish text:
Valla eğer tarifelerin nasıl belirlendiğini bilen ve bana anlatabilecek biri varsa, onu alnının orta yerinden öpeceğim. EPDK (EMRA) tarifeler dairesinde çalışan bir arkadaşım var soruyorum o da bilmiyor. Diyor ki fiyatlar TEIAS'tan EPDK'ya geliyormuş, sonra sırf EPDK'nin asıl kararı veren otoriye olduğunu göstermek için küçük bir ayarlama oluyormuş ve hatta bazen fiyatlar başbakanın görüşüne sunuluyormuş.

Chapter 3, pp. 274;

Translated English text:
We are a corporate company at the end of the day; when the procurement department is to buy a needle, it goes through the approval of five different departments as part of the purchasing procedure of the company. However, I get to trade over 150 million USD in one year, all of which qualify as purchase in their nature, but no one asks me to account for my transactions, because no one in the auditing department has the knowledge to interpret these transactions. Furthermore, the spot market is an instant market where you may have to change your position five times a day. If I would wait for approvals, it could cost us missed opportunities.

Original Turkish text:
Sonuçta biz kurumsal bir firmayız, satınalma departmanı bir iğne alacak olsa, firma prosedürü gereği beş ayrı departmanın onayından geçer. Ama ben yılda yüz elli milyon doların üzerinde ticaret yapıyorum, ki bu da doğal olarak satışa girer ama kimse bana işlemlerimi gelip sormuyor çünkü denetim departmanlarındaki kimsenin benim yaptığım ticaret işlemlerini denetleyecek bilgisi yok. Ayrıca, spot piyasası anlık bir piyasa, günde beş kere pozisyon değiştiriyıruz. Eğer onay bekleseydim bu bize birçok kaçırılmış fırsata mal olurdu.

Chapter 3, pp. 275;

Translated English text:
You can notice the new mentality of the market as being for profit only. When I first entered the electricity sector sixteen years ago, it was crowded with technical people

and engineers. But now it is crowded with financial analysts, traders, and brokers, not only in our company but in the whole sector in general.

Original Turkish text:
Piyasanın yeni kafa yapısının sadece kar güdümlü olduğunu siz de fark edebilirsiniz. On altı yıl önce ilk defa elektrik sektörüne girdiğimde mühendisler ve teknik insanlarla doluydu. Ama şimdi sadece bizim firmada değil genel olarak tüm sektörde her yer finansal analistler ve brokerlarla dolu.

Chapter 3, pp. 281;

Translated English text:
The risk manager of the company should tie my hands with certain trade strategies, or I would follow the high-risk transactions for the higher profit margins that will translate into a bonus for me. After all, Turkey has the highest prices in the electricity spot market; it works based on the appetite of the traders. The maximum open position for me [the amount of committed electricity not guaranteed by a medium-term bilateral trade agreement before entering the spot market] should be 15 percent, but usually I enter with 70 to 80 percent. We have faced some huge losses, but we also profit a lot. If the risk manager tied my hands better, maybe we would not be profiting with such margins, but we sure would not see all those huge losses either. Please do not judge me, but I get a bonus from the profits and only a scolding for the losses; the system tells me to act in this way while trading.

Original Turkish text:
Firmanın risk yöneticisi benim ellerimi bazı ticaret stratejileri ile bağlamalı yoksa ben benim için bonus anlamına gelen yüksek kar marjı olan ama riskli işlemlere yönelirim. Sonuçta elektrik piyasasında en yüksek fiyatlar Türkiye'de, insanın iştahını kabartıyor. Benim için maksimum açık pozisyon en fazla yüzde onbeş olmalı fakat ben çocğu zaman yüzde yetmiş-seksen arası giriyorum. Çok ciddi kayıplar yaşadık ama çok da kar ettik. Eğer risk yöneticisi benim ellerimi daha iyi bağlamış olsaydı belki bu kadar iyi karlar görmezdik ama o kayıpları kesinlikle görmezdik. Lütfen beni yargılama, karlardan bonus zararlardan sadece azar görüyorum, ticaret yaparken böyle olmalı sistem söylüyor.

APPENDIX B: List of Interviews

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26 Semi-Structured Interviews:

Assist. Prof. Harun Kılıç, Beykent University, Faculty of Law
Electricity trade analyst, requested confidentiality for name and affiliation
Selahattin Hakman, the Head of Energy Group of Sabancı Holding
Non-eligible consumer, requested confidentiality for name
The general manager of an electricity production company, requested confidentiality for name and affiliation
Representative of Greenpeace, requested confidentiality for name
Eligible consumer, requested confidentiality for name
Electricity trader, requested confidentiality for name and affiliation
Sırrı Uyanık, the General Manager of İskan Energy
Fahrettin Arman, Chairman of Hydroelectric Power Industry and Businessmen's' Association
Osman Özberk, the Vice Chairman of SolarTürk
Head of a company operating in renewable electricity generation sector, requested confidentiality for name and affiliation
Member of the Unlicensed Electricity Generation Association, requested confidentiality for name
Research Assistant from 9 Eylül University, requested confidentiality for name
Adnan Polat, the Chairman of Polat Holding
Executive of private company operating in generation, supply, and distribution sectors, requested confidentiality for name and affiliation
Electricity market analyst and trader, requested confidentiality for name and affiliation
Nihat Özdemir, the Chairman of Limak Holding
Head of Trade of a private production company, requested confidentiality for name and affiliation
Hasan Köktaş, the Head of EMRA between January 2008 and January 2014
Executive of Energy Traders' Association
Muharrem Yılmaz, the Chairman of Turkish Industrialists' and Businessmen's' Association
Erinç Kısa, Member of GENSED
Ateş Uğurel, Founding Member of GENSED
Executive of a Distribution Company, requested confidentiality for name and affiliation
Erdal Alkış, the Head of Icon Wind Energy Corporation

12 Non-Structured Interviews:

Taner Yıldız, Minister of Energy and Natural Resources
Zafer Benli, the Deputy Undersecretary in the Ministry of Energy and Natural Resources
Halil Alış, the General Manager of EÜAŞ
Fatih Birol, the Chief Economist of International Energy Agency
Abdülkadir Ongun, the Head of the Department of Supply Security of the Ministry of Energy and Natural Resources

Ahmet Ocak, the Head of Electricity Department of EMRA
Executive of Yeşilırmak Distribution Company, requested confidentiality for name
Nezir Ay, Head of Electricity Markets Operations Department of TEİAŞ
Mehmet Ali Susam, Member of Parliament from Republican People's Party
Nail Opak, the Chairman of Independent Industrialists 'and Businessmen's' Association
Ceyhun Saldanlı, the Chairman of Aydem Electricity Distribution Company
Batu Aksoy, the Chief Executive Officer of Turcas Energy

REFERENCES

Ackermann, T., Andersson, G. & Soder, L. (2001). Distributed generation: a definition. *Electric Power Systems Research*, *57*(3), 195-204.

Akay, D. & Atak, M. (2007). Grey prediction with rolling mechanism for electricity demand forecasting of Turkey. *Energy*, *32*(9), 1670-1675.

Akdad, S. A. & Guler, O. (2010). Evaluation of wind energy investment interest and electricity generation cost analysis for Turkey. *Applied Energy*, *87*(8), 2574-2580.

Akkemik, K. A. (2009). Cost function estimates, scale economies and technological progress in the Turkish electricity generation sector. *Energy Policy*, *37*(1), 204-213.

Akkemik, K. A. & Oguz, F. (2011). Regulation, efficiency and equilibrium: A general equilibrium analysis of liberalization in the Turkish electricity market. *Energy*, *36*(5), 3282-3292.

Akpinar, A., Komurcu, M. I., Kankal, M., Ozolcer, I. H. & Kaygusuz, K. (2008). Energy situation and renewables in Turkey and environmental effects of energy use. *Renewable and Sustainable Energy Reviews*, *12*(8), 2013-2039.

Alboyaci, B. & Dursun, B. (2008). Electricity restructuring in Turkey and the share of wind energy production. *Renewable Energy*, *33*(11), 2499-2505.

Altinay, G. & Karagol, E. (2005). Electricity consumption and economic growth: evidence from Turkey. *Energy Economics*, *27*(6), 849-856.

Alvey, T., Goodwin, D., Ma, X., Streiffert, D. & Sun, D. (1998). A security-constrained bid-clearing system for the New Zealand wholesale electricity market. *Power Systems, IEEE Transactions on*, *13*(2), 340-346.

Amundsen, E. S. & Bergman, L. (2003). The deregulated electricity markets in Norway and Sweden: a tentative assessment. In *Competition in European Electricity Markets: A Cross-Country Comparison*, edited by Jean-Michel Glachant and Dominique Finon, 110-32. Elward Elgar Publishing Limited.

Andersson, B. & Bergman, L. (1995). Market structure and the price of electricity: An ex ante analysis of the deregulated Swedish electricity market. *The Energy Journal, 2*, 97-110.

Appadurai, A. (Ed.). (1988). *The social life of things: commodities in cultural perspective*. Cambridge University Press.

Ardoin, P. J. & Grady, D. (2006). The politics of electricity restructuring across the American states: Power failure and policy failure. *State & Local Government Review*, 165-175.

Ari, I. & Aydinalp Koksal, M. (2011). Carbon dioxide emission from the Turkish electricity sector and its mitigation options. *Energy Policy*, *39*(10), 6120-6135.

Atiyas, I. & Dutz, M. (2003). Competition and regulatory reform in the Turkish electricity industry. In *Prepared for presentation at the Conference on EU Accession, Turkey*, 10-11.

Austin, J. L. (1975). *How to do things with words*. Harvard University Press.

Bahce, S. & Taymaz, E. (2008). The impact of electricity market liberalization in Turkey:"Free consumer" and distributional monopoly cases. *Energy Economics*, *30*(4), 1603-1624.

Bagdadioglu, N., Waddams Price, C. M. & Weyman-Jones, T. G. (1996). Efficiency and ownership in electricity distribution: a non-parametric model of the Turkish experience. *Energy Economics, 18*(1), 1-23.

Bagdadioglu, N., Basaran, A. & Price, C. (2007). Potential impact of electricity reforms on Turkish households. Retrieved 14 September 2013, from Social Science Research Network.

Bagdadioglu, N. & Odyakmaz, N. (2009). Turkish electricity reform. *Utilities Policy*, *17*(1), 144-152.

Balassa, B. (1986). Toward renewed economic growth in Latin America. *The International Executive*, *28*(3), 29-31.

Balat, M. (2005). Use of biomass sources for energy in Turkey and a view to biomass potential. *Biomass and Bioenergy*, *29*(1), 32-41.

Balat, M. (2008). Potential importance of hydrogen as a future solution to environmental and transportation problems. *International Journal of Hydrogen Energy*, *33*(15), 4013-4029.

Balat, M. (2009). Electricity consumption and economic growth in Turkey: a case study. *Energy Sources, Part B, 4*(2), 155-165.

Balat, M. (2010). Security of energy supply in Turkey: Challenges and solutions. *Energy Conversion and Management*, *51*(10), 1998-2011.

Baldick, R. (2002). Electricity market equilibrium models: The effect of parametrization. *Power Systems, IEEE Transactions on*, *17*(4), 1170-1176.

Baris, K. & Kucukali, S. (2012). Availibility of renewable energy sources in Turkey: Current situation, potential, government policies and the EU perspective. *Energy Policy, 42*, 377-391.

Beckert, J. (2009). *Beyond the market: the social foundations of economic efficiency*. Princeton University Press.

Beckert, J. (2010). How do fields change? The interrelations of institutions, networks, and cognition in the dynamics of markets. *Organization Studies*, *31*(5), 605-627.

Beckert, J. & Aspers, P. (Eds.). (2011). *The worth of goods: valuation and pricing in the economy*. Oxford University Press.

Bell, G. & Callon, M. (1994). Techno-economic networks and science and technology policy. *STI Review*, *14*, 67-126.

Belshaw, C. S. (1965). *Traditional exchange and modern markets* (Vol. 274). Prentice-Hall.

Beunza, D. & Stark, D. (2004). Tools of the trade: the socio-technology of arbitrage in a Wall Street trading room. *Industrial and corporate change*, *13*(2), 369-400.

Beunza, D., Hardie, I. & MacKenzie, D. (2006). A price is a social thing: Towards a material sociology of arbitrage. *Organization Studies*, *27*(5), 721-745.

Beunza, D. & Stark, D. (2012). From dissonance to resonance: cognitive interdependence in quantitative finance. *Economy and society*, *41*(3), 383-417.

Berktay, A., Demirbas, A., Kocak, S. & Nas, B. (2004). Electrical energy prices and losses respect to Turkish social-economic situations. *Energy, Exploration & Exploitation*, *22*(3), 195-206.

Bilen, K., Ozyurt, O., Bakirci, K., Karsli, S., Erdogan, S., Yilmaz, M. & Comakli, O. (2008). Energy production, consumption, and environmental pollution for sustainable development: a case study in Turkey. *Renewable and Sustainable Energy Reviews*, *12*(6), 1529-1561.

Bjerksund, P., Rasmussen, H. & Stensland, G. (2010). Valuation and risk management in the Norwegian electricity market. In *Energy, natural resources and environmental economics*, edited by Panos M. Pardalos,167-185. Springer.

Bjorndal, M. & Jornsten, K. (2001). Zonal pricing in a deregulated electricity market. *Energy Journal*, *22*(1), 51-74.

Block, F. (2010). The future of economics, new circuits for capital, and re-envisioning the relation of state and market. *Research in the Sociology of Organizations*, *30*, 379-388.

Boltanski, L. & Thévenot, L. (2006). *On justification: economies of worth*. Princeton University Press.

Bonardi, J. P., Holburn, G. L. & Bergh, R. G. V. (2006). Nonmarket strategy performance: Evidence from US electric utilities. *Academy of Management Journal*, *49*(6), 1209-1228.

Borenstein, S., Bushnell, J. B., Knittel, C. R. & Wolfram, C (2008). Inefficiencies

and market power in financial arbitrage: A study of California's electricity markets. *The Journal of Industrial Economics*, 56(2), 347-378.

Borenstein, S., Bushnell, J. & Knittel, C. R. (1999). Market power in electricity markets: beyond concentration measures. *Energy Journal, 20*, 65-88.

Botterud, A., Kristiansen, T. & Ilic, M. D. (2010). The relationship between spot and futures prices in the Nord Pool electricity market. *Energy Economics, 32*(5), 967-978.

Bower, J. & Bunn, D. (2001). Experimental analysis of the efficiency of uniform-price versus discriminatory auctions in the England and Wales electricity market. *Journal of Economic Dynamics and Control*, *25*(3), 561-592.

Boyer, R. (2011). Are there laws of motion of capitalism? *Socio-Economic Review*, *9*(1), 59-81.

Branston, J. R., Sugden, R., Valdez, P. & Wilson, J. R. (2006). Generating participation and democracy: an illustration from electricity reform in Mexico. *International Review of Applied Economics, 20*(1), 47-68.

Breslau, D. (2003). Economics invents the economy: mathematics, statistics, and models in the work of Irving Fisher and Wesley Mitchell. *Theory and Society*, *32*(3), 379-411.

Brennan, D. & Melanie, J. (1998). Market power in the Australian power market. *Energy Economics*, *20*(2), 121-133.

Browne, S. T. (1646). *Pseudodoxia epidemica, or, Enquiries into very many received tenents and commonly presumed truths.* Printed by TH for Edward Dod.

Bryan, D., Martin, R., Montgomerie, J. & Williams, K. (2012). An important failure: knowledge limits and the financial crisis. *Economy and Society*, *41*(3), 299-315.

Bunn, D. W. & Martoccia, M. (2005). Unilateral and collusive market power in the electricity pool of England and Wales. *Energy Economics, 27*(2), 305-315.

Butler, J. (2010). Performative agency. *Journal of Cultural Economy, 3*(2), 147-161.

Buyukdagli, U., Turkish Electricity Transmission Cooperation. *ENTSO-E Integration of Turkey, Commercial Applications of Europe and Neighbouring Countries, TEİAŞ Capacity Auction Tools.* Retrieved 8 May 2013, from http://www.icci.com.tr/2013/sunumlar/OT21_Umit_Buyukdagli.pdf

Caliskan, K. (2003). Price realization in world markets: The prosthetic and actual worth of a bale of cotton. Paper presented at the conference *Economies at Large*.

Caliskan, K. (2007). Price as a market device: cotton trading in Izmir Mercantile Exchange. *The Sociological Review*, *55*(2), 241-260.

Caliskan, K. & Callon, M. (2009). Economization, part 1: shifting attention from the economy towards processes of economization. *Economy and Society*, *38*(3), 369-398.

Caliskan, K. & Callon, M. (2010). Economization, part 2: a research programme for the study of markets. *Economy and Society*, *39*(1), 1-32.

Callon, M., Law, J. & Rip, A. (Eds.). (1986). *Mapping the dynamics of science and technology*. Macmillan.

Callon, M. & Law, J. (2005). On qualculation, agency, and otherness. *Environment and Planning D*, *23*(5), 717.

Callon, M. & Muniesa, F. (2005). Peripheral vision economic markets as calculative collective devices. *Organization Studies*, *26*(8), 1229-1250.

Callon, M. (1998). Introduction: the embeddedness of economic markets in economics. In *Laws of the Markets*, edited by M. Callon, 1-57. Blackwell.

Callon, M. (1999). Actor-network theory: the market test. In *Actor network theory and after*, edited by J. Law and J. Hassard, 181-195. Blackwell.

Callon, M. (2009). Civilizing markets: carbon trading between in vitro and in vivo experiments. *Accounting, Organizations and Society*, *34*(3), 535-548.

Callon, M. (2010). Performativity, misfires and politics. *Journal of Cultural Economy*, *3*(2), 163-169.

Camadan, E. & Erten, I. E. (2011). An evaluation of the transitional Turkish electricity balancing and settlement market: lessons for the future. *Renewable and Sustainable Energy Reviews*, *15*(2), 1325-1334.

Campbell, J. L. (2011). The US financial crisis: lessons for theories of institutional complementarity. *Socio-Economic Review*, *9*(2), 211-234.

Canka Kilic, F. & Kaya, D. (2007). Energy production, consumption, policies, and recent developments in Turkey. *Renewable and Sustainable Energy Reviews*, *11*(6), 1312-1320.

Carruthers, B. G. (2010). Knowledge and liquidity: Institutional and cognitive foundations of the subprime crisis. *Research in the Sociology of Organizations*, *30*, 157-182.

Cavdar, I. H. (2004). A solution to remote detection of illegal electricity usage via power line communications. *Power Delivery, IEEE Transactions on*, *19*(4), 1663-1667.

Celik, A. N. (2011). Review of Turkey's current energy status: a case study for wind energy potential of Canakkale province. *Renewable and Sustainable Energy*

Reviews, *15*(6), 2743-2749.

Celiktas, M. S., Sevgili, T. & Kocar, G. (2009). A snapshot of renewable energy research in Turkey. *Renewable Energy*, *34*(6), 1479-1486.

Celiktas, M. S. & Kocar, G. (2010). From potential forecast to foresight of Turkey's renewable energy with Delphi approach. *Energy*, *35*(5), 1973-1980.

Cetin, T. & Oguz, F. (2007). The politics of regulation in the Turkish electricity market. *Energy Policy*, *35*(3), 1761-1770.

Cetin, T. & Oguz, F. (2011). *The Political Economy of Regulation in Turkey*. Springer.

Cetina, K. K. & Bruegger, U. (2002). Inhabiting technology: the global lifeform of financial markets. *Current Sociology*, *50*(3), 389-405.

Chen, Y., Lise, W., Sijm, J. & Hobbs, B. F. (2012). Greenhouse gas emissions trading in the electricity sector: model formulation and case studies. In *Handbook of CO2 in Power Systems*, edited by O. P. Zheng et al, 33-52. Springer.

Chung, C. N. (1997). Networks and governance in trade associations: AEIC and NELA in the development of the American electricity industry, 1885-1910. *International Journal of Sociology and Social Policy*, *17*(7/8), 57-110.

Cochoy, F. (2008). Calculation, qualculation, calqulation: shopping cart arithmetic, equipped cognition and the clustered consumer. *Marketing Theory*, *8*(1), 15-44.

Cook, P. J. (1986). The demand and supply of criminal opportunities. *Crime and Justice*, *7*, 1-27.

Cook, S. (1966). The obsolete "anti-market" mentality: a critique of the substantive approach to Economic Anthropology. *American Anthropologist*, *68*(2), 323-345.

Contreras, J., Espinola, R., Nogales, F. J. & Conejo, A. J. (2003). ARIMA models to predict next-day electricity prices. *Power Systems, IEEE Transactions on*, *18*(3), 1014-1020.

Crespo Cuaresma, J., Hlouskova, J., Kossmeier, S. & Obersteiner, M. (2004). Forecasting electricity spot-prices using linear univariate time-series models. *Applied Energy*, *77*(1), 87-106.

Cupples, J. (2011). Shifting networks of power in Nicaragua: relational materialisms in the consumption of privatized electricity. *Annals of the Association of American Geographers*, *101*(4), 939-948.

Czarniawska, B. (2004). On time, space, and action nets. *Organization*, *11*(6), 773-791.

Çimen, E. (2013). Güneş enerjisi yatırım yapılabilir seviyeye ulaştı [Solar energy has reached a level worth investing]. Retrieved 15 May 2013, from http://www.enerjigunlugu.net

Davies, W. & McGoey, L. (2012). Rationalities of ignorance: on financial crisis and the ambivalence of neo-liberal epistemology. *Economy and Society*, *41*(1), 64-83.

Demirbas, A. & Bakis, R. (2004). Energy from renewable sources in Turkey: status and future direction. *Energy Sources*, *26*(5), 473-484.

Demirbas, A. (2005). Potential applications of renewable energy sources, biomass combustion problems in boiler power systems and combustion related environmental issues. *Progress in Energy and Combustion Science*, *31*(2), 171-192.

Demirbas, A. (2006). Turkey's renewable energy facilities in the near future. *Energy Sources, Part A*, *28*(6), 527-536.

Deng, S. J., Johnson, B. & Sogomonian, A. (2001). Exotic electricity options and the valuation of electricity generation and transmission assets. *Decision Support Systems*, *30*(3), 383-392.

Dilaver, Z. & Hunt, L. C. (2011). Modelling and forecasting Turkish residential electricity demand. *Energy Policy*, *39*(6), 3117-3127.

DiMaggio, P. (1994). Culture and economy. In *The handbook of economic sociology*, edited by NJ Smelser and R. Swedberg, 27 - 57. Russel Sage Publications.

Dobbin, F. (2004). *The new economic sociology: a reader*. Princeton University Press.

Dobbin, F. & Jung, J. (2010). The misapplication of Mr. Michael Jensen: How agency theory brought down the economy and why it might again. *Research in the Sociology of Organizations*, *30*, 29-64.

Dobrin, L. M., Austin, P. K. & Nathan, D. (2007). Dying to be counted: the commodification of endangered languages in documentary linguistics. In *Proceedings of the Conference on Language Documentation and Linguistic Theory*, 59-68. School of Oriental and African Studies.

Doganova, L. & Karnoe, P. (2012). Controversial valuations: assembling environmental concerns and economic worth in clean-tech markets. Paper presented at the *2nd Interdisciplinary Market Studies Workshop*.

Doolin, B. & Lowe, A. (2002). To reveal is to critique: actor-network theory and critical information systems research. *Journal of Information Technology*, *17*(2), 69-78.

Dorn, N. (2012). Knowing markets: would less be more? *Economy and Society*, *41*(3), 316-334.

Dursun, B. & Alboyaci, B. (2010). The contribution of wind-hydro pumped storage systems in meeting Turkey's electric energy demand. *Renewable and Sustainable Energy Reviews*, *14*(7), 1979-1988.

Dursun, B. & Gokcol, C. (2011). The role of hydroelectric power and contribution of small hydropower plants for sustainable development in Turkey. *Renewable Energy*, *36*(4), 1227-1235.

Eberlein, B. (2000). Institutional change and continuity in German infrastructure management: the case of electricity reform. *German Politics*, *9*(3), 81-104.

Edelman, L. B. (2004). Rivers of law and contested terrain: a law and society approach to economic rationality. *Law & Society Review*, *38*(2), 181-198.

Ehrenmann, A. & Neuhoff, K. (2009). A comparison of electricity market designs in networks. *Operations Research*, *57*(2), 274-286

Eising, R. & Jabko, N. (2001). Moving targets national interests and electricity liberalization in the European Union. *Comparative Political Studies*, *34*(7), 742-767.

Ek, K. & Söderholm, P. (2008). Norms and economic motivation in the Swedish green electricity market. *Ecological Economics*, *68*(1), 169-182.

Electricity Market Law (2001), amended as *Law on the Organization and Duties of the Energy Market Regulatory Authority* (2013), no. 4628, Turkey.

Electricity Market Law (2013), no. 6446, Turkey.

Elektrik Mühendisleri Odası [Association of Electric Engineers]. (2008). *From Darkness (1 July 2006) to Price Increases (1 July 2008)*, Press Statement on 30 June 2008. Retrieved 17 January 2009, from http://www.emo.org.tr

Elektrik Mühendisleri Odası [Association of Electric Engineers]. (2008). *Gözümüz aydın, karanlık günler yakın [Good news, dark days are near]*, press statement dated 30 June 2008. Retrieved 17 January 2009, from http://www.emo.org.tr

El-Khattam, W., Bhattacharya, K., Hegazy, Y. & Salama, M. M. A. (2004). Optimal investment planning for distributed generation in a competitive electricity market. *Power Systems, IEEE Transactions on*, *19*(3), 1674-1684.

Elyachar, J. (2005). *Markets of dispossession: NGOs, economic development, and the state in Cairo*. Duke University Press.

Energy Market Regulatory Authority (2003). *Electricity market implementation paper*. Retrieved 18 February 2011, from http://www.epdk.gov.tr

Energy Market Regulatory Authority. (2010). *2009 Annual Report*. Retrieved 28 December 2011, from http://www.epdk.gov.tr

Energy Market Regulatory Authority. (2010). *Electricity Market Report*. Retrieved 28 December 2011, from http://www.epdk.gov.tr

Energy Market Regulatory Authority. (2011). *Electricity Market Report*. Retrieved 28 December 2011, from http://www.epdk.gov.tr

Energy Market Regulatory Authority. (2012). *Annual Activity Report*. Retrieved 28 January 2014, from http://www.epdk.gov.tr

Energy Market Regulatory Authority, Natural Gas Department Directory (2012). *Natural Gas Market Report.* Retrieved 10 February 2014, from http://www.epdk.org.tr

Enerji Enstitüsü [Institute of Energy]. (2013). Özelleştirmede sıra elektrik üretim santralleri [The electricity plants' turn for privatization]. Retrieved 22 March 2013, from http://enerjienstitusu.com

Enerji Günlüğü [Energy Journal]. (2013). Barış gelirse kaçak elektrik de biter [Electricity losses would end if peace came]. Retrieved 8 April 2013, from *http://www.enerjigunlugu.net*

Enerji Günlüğü [Energy Journal]. (2013). CHP'den Hamitabat tepkisi! [CHP's Hamitabat reaction!]. Retrieved 28 March 2013, from http://www.enerjigunlugu.net

Enerji Günlüğü [Energy Journal)]. (2013). Özelleştirme geliri beklentinin üstünde [Privatization revenues are over expected levels]. Retrieved 19 March 2013, from http://www.enerjigunlugu.net

Erdem, Z. B. (2010). The contribution of renewable resources in meeting Turkey's energy-related challenges. *Renewable and Sustainable Energy Reviews, 14*(9), 2710-2722.

Erdogan, F. H., Cetinkaya, S. & Dusmez Tek, E. (2008). Market liberalization process and market arrangements in Turkey. In *5th International Conference on European Electricity Markets*, 1-6. IEEE.

Erdogdu, E. (2007a). Regulatory reform in Turkish energy industry: an analysis. *Energy Policy*, *35*(2), 984-993.

Erdogdu, E. (2007b). Electricity demand analysis using cointegration and ARIMA modelling: a case study of Turkey. *Energy Policy*, *35*(2), 1129-1146.

Erdogdu, E. (2008). An expose of bioenergy and its potential and utilization in Turkey. *Energy Policy*, *36*(6), 2182-2190.

Erdogdu, E. (2009). Some thoughts on the Turkish electricity distribution industry.

Renewable and Sustainable Energy Reviews, *13*(6), 1485-1494.

Erdogdu, E. (2010). A paper on the unsettled question of Turkish electricity market: balancing and settlement system (Part I). *Applied Energy*, *87*(1), 251-258.

Erdogdu, E. (2011). An analysis of Turkish hydropower policy. *Renewable and Sustainable Energy Reviews*, *15*(1), 689-696.

Essig, M. (2009). *Edison and the electric chair: a story of light and death*. Bloomsbury.

European Wind Energy Association. (2012). *Wind in Power: 2011 European Statistics*. Retrieved 18 June 2013, from http://www.ewea.org/statistics

Fabra, N. & Toro, J. (2005). Price wars and collusion in the Spanish electricity market. *International Journal of Industrial Organization*, *23*(3), 155-181.

Filik, U. B., Gerek, O. N. & Kurban, M. (2011). A novel modeling approach for hourly forecasting of long-term electric energy demand. *Energy Conversion and Management*, *52*(1), 199-211.

Firth, R. W. (1929). *Primitive Polynesian economy*. Routledge & Kegan Paul.

Fleten, S. E. & Pettersen, E. (2005). Constructing bidding curves for a price-taking retailer in the Norwegian electricity market. *Power Systems, IEEE Transactions on*, *20*(2), 701-708.

Fligstein, N. (2002). Agreements, Disagreements and Opportunities in the "New Sociology of Markets". In *The new economic sociology: developments in an emerging field*, edited by M. F. Guillen et al., 61-78. Sage.

Fligstein, N. & Dauter, L. (2007). The sociology of markets. *Annual Review of Sociology*, *33*, 105-128.

Fligstein, N. & Goldstein, A. (2010). The anatomy of the mortgage securitization crisis. *Research in the Sociology of Organizations*, *30*, 29-70.

Foucault, M. (1980). *Power/knowledge: selected interviews and other writings*, edited by C. Gordon. Pantheon.

Foucault, M. (1997). *Ethics: subjectivity and truth*, Vol. 1. New Press.

Fouquet, R. (1998). The United Kingdom demand for renewable electricity in a liberalised market. *Energy Policy*, *26*(4), 281-293.

Fourcade, M. (2006). The construction of a global profession: The transnationalization of economics 1. *American Journal of Sociology*, *112*(1), 145-194.

Fourcade, M. (2007). Theories of markets and theories of society. *American*

Behavioral Scientist, *50*(8), 1015-1034.

Friedman, M. (1962). *Capitalism and freedom*. Chicago University Press.

Friedman, M. & Savage, L. J. (1948). The utility analysis of choices involving risk. *The Journal of Political Economy*, *56*(4), 279-304.

Galvin, R. (2009). *Modifying actor-network theory to analyse the German project of photovoltaic electrical energy generation* (No. 09-02). CSERGE working paper.

Gan, L., Eskeland, G. S. & Kolshus, H. H. (2007). Green electricity market development: Lessons from Europe and the US. *Energy Policy*, *35*(1), 144-155.

Gao, P. (2005). Using actor-network theory to analyse strategy formulation. *Information Systems Journal*, *15*(3), 255-275.

Garber, D., Hogan, W. W. & Ruff, L. (1994). An efficient electricity market: using a pool to support real competition. *The Electricity Journal*, *7*(7), 48-60.

Garcia, A. & Arbelaez, L. E. (2002). Market power analysis for the Colombian electricity market. *Energy economics*, *24*(3), 217-229.

Garud, R. & Karnøe, P. (2003). Bricolage versus breakthrough: distributed and embedded agency in technology entrepreneurship. *Research Policy*, *32*(2), 277-300.

du Gay, P. (2010). Performativities: Butler, Callon and the moment of theory. *Journal of Cultural Economy*, *3*(2), 171-179.

Giere, R. N. (2002). Discussion note: distributed cognition in epistemic cultures. *Philosophy of Science*, *69*(4), 637-644.

Glachant, J. M. (1998). England's wholesale electricity market: could this hybrid institutional arrangement be transposed to the European Union? *Utilities Policy*, *7*(2), 63-74.

Glachant, J. M. & Finon, D. (2000). Why do the European Union's electricity industries continue to differ? A new-institutional analysis. In *Institutions, Contracts and Organizations*, edited by Claude Menard, 313-334. Edward Elgar Publications.

Gokgoz, F. & Atmaca, M. E. (2012). Financial optimization in the Turkish electricity market: Markowitz's mean-variance approach. *Renewable and Sustainable Energy Reviews*, *16*(1), 357-368.

Granovetter, M. (1985). Economic action and social structure: the problem of embeddedness. *American Journal of Sociology*, 91(3), 481-510.

Granovetter, M. & McGuire, P. (1998). The making of an industry: electricity in the United States. *The law of markets*, 147-73.

Green, R. (1999). The electricity contract market in England and Wales. *The Journal of Industrial Economics*, *47*(1), 107-124.

Green, R. J. & Newbery, D. M. (1992). Competition in the British electricity spot market. *Journal of Political Economy*, 100(5), 929-953.

Guala, F. (2007). How to do things with experimental economics. In *Do economists make markets? on the performativity of economics*, edited by D. MacKenzie, F. Muniesa and L. Siu, 128-162. Princeton University Press.

Guler, O. (2009). Wind energy status in electrical energy production of Turkey. *Renewable and Sustainable Energy Reviews*, *13*(2), 473-478.

Gunerhan, G. G., Kocar, G. & Hepbasli, A. (2001). Geothermal energy utilization in Turkey. *International Journal of Energy Research*, *25*(9), 769-784.

Guyer, J. I. (2004). *Marginal gains: monetary transactions in Atlantic Africa, Vol. 1997*. University of Chicago Press.

Halicioglu, F. (2007). Residential electricity demand dynamics in Turkey. *Energy Economics*, *29*(2), 199-210.

Halperin, R. (1977). Introduction: the substantive economy in peasant societies. In *Peasant livelihood: studies in economic anthropology and cultural ecology*, edited by R. Halperin and J. Dow, 1-17. St. Martin's Press.

Hamzacebi, C. (2007). Forecasting of Turkey's net electricity energy consumption on sectoral bases. *Energy Policy*, *35*(3), 2009-2016.

Hanagasioglu,M. (1996). Wind energy in Turkey. *Renewable Energy*, *16*(1), 822–827.

Hart-Landsberg, M. & Burkett, P. (2005). *China and socialism: market reforms and class struggle*. Monthly Review.

Hayek, F. (1975). *Principles of liberal social order*. Oxford University Press.

de V. Heathcote, N. H. (1967). The early meaning of electricity: some Pseudodoxia Epidemica—I. *Annals of Science*, *23*(4), 261-275.

Hepbasli, A., Ozdamar, A. & Ozalp, N. (2001). Present status and potential of renewable energy sources in Turkey. *Energy Sources*, *23*(7), 631-648.

Hepbasli, A. (2003). Current status of geothermal energy applications in Turkey. *Energy Sources*, *25*(7), 667-677.

Hepbasli, A. & Ozalp, N. (2003). Development of energy efficiency and management implementation in the Turkish industrial sector. *Energy Conversion and Management*, *44*(2), 231-249.

Hepbasli, A. & Ozgener, O. (2004). A review on the development of wind energy in Turkey. *Renewable and Sustainable Energy Reviews*, *8*(3), 257-276.

Hepbasli, A. (2005). Development and restructuring of Turkey's electricity sector: a review. *Renewable and Sustainable Energy Reviews*, *9*(4), 311-343.

Hepbasli, A. (2008). A study on estimating the energetic and exergetic prices of various residential energy sources. *Energy and Buildings*, *40*(3), 308-315.

High Planning Council of Turkey.(2004). *Strategy paper concerning electricity market reform and privatization.* Retrieved 9 June 2011, from http://www.oib.gov.tr

Hockenos, P. (2013). *Germany's PV branch: the once- mighty solar industry in Germany is straining to reinvest itself.* Retrieved 28 January 2014, from http://www.boell.org

Hogan, W. W. (2002). Electricity market restructuring: reforms of reforms. *Journal of Regulatory Economics*, *21*(1), 103-132.

Holm, P. (2007), Which way is up on Callon? In *Do economists make markets? on the performativity of economics*, edited by D. MacKenzie, F. Muniesa and L. Siu, 225-242. Princeton University Press.

Holttinen, H. (2005). Optimal electricity market for wind power. *Energy Policy*, *33*(16), 2052-2063.

Hopwood, A. G. & Miller, P. (Eds.). (1994). *Accounting as social and institutional practice*, Vol. 24. Cambridge University Press.

Hortacsu, A. & Puller, S. L. (2008). Understanding strategic bidding in multi-unit auctions: a case study of the Texas electricity spot market. *The RAND Journal of Economics*, *39*(1), 86-114.

Hogselius, P. & Kaijser, A. (2010). The politics of electricity deregulation in Sweden: the art of acting on multiple arenas. *Energy Policy*, *38*(5), 2245-2254.

Jolivet, E. & Heiskanen, E. (2010). Blowing against the wind: an exploratory application of actor network theory to the analysis of local controversies and participation processes in wind energy. *Energy Policy*, *38*(11), 6746-6754.

Joseph, K. L. (2010). The politics of power: electricity reform in India. *Energy Policy*, *38*(1), 503-511.

Joskow, P. & Kahn, E. (2001). A quantitative analysis of pricing behavior in California's wholesale electricity market during summer 2000. In *Power Engineering Society Summer Meeting, 2001*, Vol. 1, 392-394). IEEE.

Kalayci, I. (2002). Elektrik piyasası: mikro ve makro ekonomik odaklı bir

yaklaşım [The electricity market: a micro and macro economic focused approach]. *İktisat İşletme ve Finans*, *17*(191), 79-96.

Kavaklioglu, K. (2011). Modeling and prediction of Turkey's electricity consumption using support vector regression. *Applied Energy*, *88*(1), 368-375.

Kaya, D. (2006). Renewable energy policies in Turkey. *Renewable and Sustainable Energy Reviews*, *10*(2), 152-163.

Kaygusuz, K. (1999). Energy situation, future developments, energy saving, and energy efficiency in Turkey. *Energy Sources*, *21*(5), 405-416.

Kaygusuz, K. (2002). Environmental impacts of energy utilisation and renewable energy policies in Turkey. *Energy Policy*, *30*(8), 689-698.

Kaygusuz, K. & Sari, A. (2003). Renewable energy potential and utilization in Turkey. *Energy Conversion and Management*, *44*(3), 459-478.

Kaygusuz, K. (2009a). Energy and environmental issues relating to greenhouse gas emissions for sustainable development in Turkey. *Renewable and Sustainable Energy Reviews*, *13*(1), 253-270.

Kaygusuz, K. (2009b). Hydropower in Turkey: the sustainable energy future. *Energy Sources, Part B*, *4*(1), 34-47.

Kaygusuz, K. (2010). Wind energy status in renewable electrical energy production in Turkey. *Renewable and Sustainable Energy Reviews*, *14*(7), 2104-2112.

Kaygusuz, K. (2011). Prospect of concentrating solar power in Turkey: the sustainable future. *Renewable and Sustainable Energy Reviews*, *15*(1), 808-814.

Keane, M. (2001). Cultural identity, internationalisation and regional diversity. *Media Development*, *48*(3), 3-7.

Kellow, A. (1996). *Transforming power: the politics of electricity planning*. Cambridge University Press.

Kjellberg, H. & Helgesson, C. F. (2007). On the nature of markets and their practices. *Marketing Theory*, *7*(2), 137-162. *Development*, *48*(3), 3-7.

Kincay, O. (2003). Thermal power plants in Turkey. *Energy sources*, *25*(2), 135-151.

Klessmann, C., Nabe, C. & Burges, K. (2008). Pros and cons of exposing renewables to electricity market risks: a comparison of the market integration approaches in Germany, Spain, and the UK. *Energy Policy*, *36*(10), 3646-3661.

Kok, K., Warmer, C., Kamphuis, R., Mellstrand, P. & Gustavsson, R. (2005). Distributed control in the electricity infrastructure. Paper presented at the *2005 International Conference on Future Power Systems*.

Kose, R. (2004). An evaluation of wind energy potential as a power generation source in Kütahya, Turkey. *Energy Conversion and Management*, *45*(11), 1631-1641.

Kucukali, S. & Baris, K. (2010). Turkey's short-term gross annual electricity demand forecast by fuzzy logic approach. *Energy Policy*, *38*(5), 2438-2445.

Kumbaroglu, G., Madlener, R. & Demirel, M. (2008). A real options evaluation model for the diffusion prospects of new renewable power generation technologies. *Energy Economics*, *30*(4), 1882-1908.

Kunneke, R. W. (2008). Institutional reform and technological practice: the case of electricity. *Industrial and Corporate Change*, *17*(2), 233-265.

Krippner, G. R. & Alvarez, A. S. (2007). Embeddedness and the intellectual projects of economic sociology. *Annual Review of Sociology*, *33*, 219-240.

Kumar David, A. & Wen, F. (2001). Market power in electricity supply. *Energy Conversion, IEEE Transactions on*, *16*(4), 352-360.

Lahire, B. (2003). From the habitus to an individual heritage of dispositions: towards a sociology at the level of the individual. *Poetics*, *31*(5), 329-355.

Langley, P. (2013). Anticipating uncertainty, reviving risk? on the stress testing of finance in crisis. *Economy and Society*, *42*(1), 51-73.

Lapavitsas, C. (2004). Commodities and gifts: why commodities represent more than market relations. *Science & Society*, 68(1), 33-56.

Larsen, E. R. & Bunn, D. W. (1999). Deregulation in electricity: understanding strategic and regulatory risk. *Journal of the Operational Research Society*, *50*(4), 337-344.

Latour, B. (1991). The impact of science studies on political philosophy. *Science, Technology & Human Values*, *16*(1), 3-19.

Latour, B. (2005). Reassembling the social-an introduction to actor-network-theory. In *Reassembling the social: an introduction to actor-network-theory*, 316. Oxford University Press.

Latour, B. & Lépinay, V. A. (2009). *The science of passionate interests: an introduction to Gabriel Tarde's economic anthropology*. Prickly Paradigm Press.

Law on Amendments on the Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy (2010), no. 6094, Turkey.

Law on Respecting Authorization to Institutions other than the TEK for Generation, Transmission, Distribution and Trade of Electricity (1984), no. 3096, Turkey.

Law on the Construction, Management and Sales of Electricity Generated in Built

Operate Systems (1997), no. 4283, Turkey.

Law on the Installation Maintenance and Energy Sale of the Nuclear Power Substation (2007), no. 5710, Turkey.

Law on the Natural Gas Market and Amending the Law on Electricity Market (2001), no. 4646, Turkey.

Law on the Utilization of Renewable Energy Resources for the Purpose of Generating Electricity (2005), no. 5436, Turkey.

Law, J. & Urry, J. (2004). Enacting the social. *Economy and Society*, *33*(3), 390-410.

Lawler, J. (1998). Marx as market socialist. In *Market socialism: the debate among socialists*, edited by H. Ticktin and J. Lawler, 23-53. Routledge.

Lee, N. & Hassard, J. (1999). Organization unbound: actor-network theory, research strategy and institutional flexibility. *Organization*, *6*(3), 391-404.

Lépinay, V. A. (2007). Parasitic formulae: the case of capital guarantee products. *The Sociological Review*, *55*(2), 261-283.

Levi-Faur, D. (1999). The governance of competition: the interplay of technology, economics, and politics in European Union electricity and telecom regimes. *Journal of Public Policy*, *19*(2), 175-207.

Levi-Faur, D. (2003). The politics of liberalisation: privatisation and regulation-for-competition in Europe's and Latin America's telecoms and electricity industries. *European Journal of Political Research*, *42*(5), 705-740.

Lin, N. (1995). Local market socialism: local corporatism in action in rural China. *Theory and Society*, *24*(3), 301-354.

Lise, W., Linderhof, V., Kuik, O., Kemfert, C., Ostling, R. & Heinzow, T. (2006). A game theoretic model of the Northwestern European electricity market: market power and the environment. *Energy Policy*, *34*(15), 2123-2136.

Liu, M. & Wu, F. F. (2007). Risk management in a competitive electricity market. *International Journal of Electrical Power & Energy Systems*, *29*(9), 690-697.

Lohmann, L. (2005). Marketing and making carbon dumps: commodification, calculation and counterfactuals in climate change mitigation. *Science as Culture*, *14*(3), 203-235.

Lora, A. T., Santos, J. M. R., Expósito, A. G., Ramos, J. L. M. & Santos, J. C. R. (2007). Electricity market price forecasting based on weighted nearest neighbors techniques. *Power Systems, IEEE Transactions on*, *22*(3), 1294-1301.

Lu, X., Dong, Z. Y. & Li, X. (2005). Electricity market price spike forecast with data mining techniques. *Electric Power Systems Research*, *73*(1), 19-29.

Maassen, A. (2009). Social science perspectives on energy transitions. *Proceedings of the ICE-Energy*, *162*(4), 161-167.

MacKenzie, D. A. (2006). *An engine, not a camera: how financial models shape markets*. MIT Press.

MacKenzie, D. A., Muniesa, F. & Siu, L. (Eds.). (2007). *Do economists make markets? on the performativity of economics*. Princeton University Press.

MacKenzie, D. (2009). Making things the same: gases, emission rights and the politics of carbon markets. *Accounting, Organizations and Society*, *34*(3), 440-455.

Madlener, R., Kumbaroglu, G. & Ediger, V. S. (2005). Modeling technology adoption as an irreversible investment under uncertainty: the case of the Turkish electricity supply industry. *Energy Economics*, *27*(1), 139-163.

Madlener, R. & Stoverink, S. (2012). Power plant investments in the Turkish electricity sector: a real options approach taking into account market liberalization. *Applied Energy*, *97*, 124-134.

Makkonen, S. & Lahdelma, R. (2001). Analysis of power pools in the deregulated energy market through simulation. *Decision Support Systems*, *30*(3), 289-301.

Mandal, P., Senjyu, T. & Funabashi, T. (2006). Neural networks approach to forecast several hour ahead electricity prices and loads in deregulated market. *Energy Conversion and Management*, *47*(15), 2128-2142.

Marshall, G. (1982). *In search of the spirit of capitalism: an essay on Max Weber's protestant ethic thesis*. Hutchinson.

Marx, K. (1961). *Das Kapital: a critique of political economy*, edited by F. Engels. Gateway Editions.

Maurer, B. (2006). The anthropology of money. *Annual Review of Anthropology*, *35*, 15-36.

Meyer, H. W. (1971). *A history of electricity and magnetism*. MIT Press.

McDonald, D. (Ed.). (2012). *Electric capitalism: recolonising Africa on the power grid*. Routledge.

McKenzie, D. (2012). Beyond baseline and follow-up: the case for more T in experiments. *Journal of Development Economics*, *99*(2), 210-221.

McGoey, L. (2012). Strategic unknowns: towards a sociology of ignorance. *Economy and Society*, *41*(1), 1-16.

McGuire, P. (1989). Instrumental class power and the origin of class-based state regulation in the US electric utility industry. *Critical Sociology*, *16*(2-3), 181-203.

McGuire, P., Granovetter, M. & Schwartz, M. (1993). Thomas Edison and the social construction of the early electricity industry in America. In *Explorations in Economic Sociology*, edited by R. Swedberg, 213-248. Russel Sage Foundation.

McNally, D. (1993). *Against the market: political economy, market socialism and the Marxist critique*. Verso.

McNeil, M. A., Letschert, V. E. & Wiel, S. (2006). Reducing the price of development: the global potential of efficiency standards in the residential electricity sector. EEDAL.

McNichol, D. (2006). *The roads that built America: the incredible story of the US Interstate System*. Sterling Publishing.

McNichol, T. (2011). *AC/DC: The savage tale of the first standards war*. Jossey-Bass.

Meeus, L., Purchala, K. & Belmans, R. (2005). Development of the internal electricity market in Europe. *The Electricity Journal*, *18*(6), 25-35.

Midttun, A. (1997). *European electricity systems in transition: a comparative analysis of policy and regulation in western Europe*. Elsevier.

Miller, D. (2005). Reply to Michel Callon. *Economic Sociology: Electronic Newsletter*, *6*(3), 3-13.

Millo, Y. & MacKenzie, D. (2009). The usefulness of inaccurate models: towards an understanding of the emergence of financial risk management. *Accounting, Organizations and Society*, *34*(5), 638-653.

Mills, E. (2005). The specter of fuel-based lighting. *Science*, *308*(5726), 1263-1264.

Mirowski, P. (2007). Markets come to bits: evolution, computation and markomata in economic science. *Journal of Economic Behavior & Organization*, *63*(2), 209-242.

Mitchell, T. (1998). Fixing the economy. *Cultural Studies*, *12*(1), 82-101.

Mitchell, T. (2011). *Carbon democracy: political power in the age of oil*. Verso.

Mizruchi, M. S. (2010). The American corporate elite and the historical roots of the financial crisis of 2008. *Research in the Sociology of Organizations*, *30*, 103-139.

Morthorst, P. E. (2000). The development of a green certificate market. *Energy Policy*, *28*(15), 1085-1094.

Muniesa, F. (2007). Market technologies and the pragmatics of prices. *Economy and Society*, *36*(3), 377-395.

Muniesa, F., Millo, Y. & Callon, M. (2007). An introduction to market devices. *The Sociological Review*, *55*(s2), 1-12.

Myers, F. R. (Ed.). (2001). *The empire of things: regimes of value and material culture*. School of American Research Press.

Nalan, C. B., Murat, O. & Nuri, O. (2009). Renewable energy market conditions and barriers in Turkey. *Renewable and Sustainable Energy Reviews*, *13*(6), 1428-1436.

Newberry, D. M. (2002). *Privatization, restructuring, and regulation of network Utilities*, Vol. 2. MIT press.

Nicolaisen, J., Petrov, V. & Tesfatsion, L. (2001). Market power and efficiency in a computational electricity market with discriminatory double-auction pricing. *Evolutionary Computation, IEEE Transactions on*, *5*(5), 504-523.

Nogales, F. J., Contreras, J., Conejo, A. J. & Espínola, R. (2002). Forecasting next-day electricity prices by time series models. *Power Systems, IEEE Transactions on*, *17*(2), 342-348.

Ogulata, R. T. (2003). Energy sector and wind energy potential in Turkey. *Renewable and Sustainable Energy Reviews*, *7*(6), 469-484.

Oguz, F. (2010). Competition by regulation in energy markets: the case of Turkey. *European Journal of Law and Economics*, *30*(1), 41-58.

Ollman, B. (1998). Market mystification in capitalist and market socialist societies. In *Market socialism: the debate among socialists*, edited by H. Ticktin and J. Lawer, 81-123. Routledge.

Ozgener, O. & Hepbasli, A. (2002). Current status and future directions of wind energy applications in Turkey. *Energy Sources*, *24*(12), 1117-1129.

Ozgur, M. A. (2008). Review of Turkey's renewable energy potential. *Renewable Energy*, *33*(11), 2345-2356.

Ozkivrak, O. (2005). Electricity restructuring in Turkey. *Energy Policy*, *33*(1), 1339-1350.

Ozturk, R. & Kincay, R. (2004). Potential of hydroelectric energy. *Energy Sources*, *26*(12), 1141-1156.

Ozturk, K. H., Yilanci, A. & Atalay, O. (2007). Past, present and future status of electricity in Turkey and the share of energy sources. *Renewable and Sustainable Energy Reviews*, *11*(2), 183-209.

Pasaoglu Kilanc, G. & Or, I. (2008). A decision support tool for the analysis of pricing, investment and regulatory processes in a decentralized electricity market. *Energy Policy*, *36*(8), 3036-3044.

Pesic, R. V. & Urge-Vorsatz, D. (2001). Restructuring of the Hungarian electricity industry. *Post-Communist Economies*, *13*(1), 85-99.

Petroleum Market Law (2003), no. 5015, Turkey.

Petroleum Pipeline Corporation. *Natural gas and purchase agreements.* Retrieved 14 July 2013, from http://www.botas.gov.tr/index.asp

Pineau, P. O. & Murto, P. (2003). An oligopolistic investment model of the Finnish electricity market. *Annals of Operations Research*, *121*(1-4), 123-148.

Pitluck, A. Z. (2011). Distributed execution in illiquid times: an alternative explanation of trading in stock markets. *Economy and Society*, *40*(1), 26-55.

Piwko, R., Osborn, D., Gramlich, R., Jordan, G., Hawkins, D. & Porter, K. (2005). Wind energy delivery issues [transmission planning and competitive electricity market operation]. *Power and Energy Magazine, IEEE*, *3*(6), 47-56.

Polanyi, K. & MacIver, R. M. (1957). *The great transformation*, Vol. 2. Beacon.

Pousinho, H. M. I., Mendes, V. M. F. & Catalão, J. P. S. (2012). Short-term electricity prices forecasting in a competitive market by a hybrid PSO–ANFIS approach. *International Journal of Electrical Power & Energy Systems*, *39*(1), 29-35.

Preda, A. (2007). The sociological approach to financial markets. *Journal of Economic Surveys*, *21*(3), 506-533.

Preda, A. (2009). Brief encounters: calculation and the interaction order of anonymous electronic markets. *Accounting, Organizations and Society*, *34*(5), 675-693.

Priestley, J. (1769). *The history and present state of electricity: with original experiments*. Printed for J. Dodsley in Pall-Mall, J. Johnson and J. Payne in Pater-noster row, and T. Cadell in the Strand.

Pryke, M. (2010). Money's eyes: the visual preparation of financial markets. *Economy and Society*, *39*(4), 427-459.

Puller, S. L. (2007). Pricing and firm conduct in California's deregulated electricity market. *The Review of Economics and Statistics*, *89*(1), 75-87.

Randolph, R. P. (2003). *Benjamin Franklin: inventor, writer, and patriot*. Rosen.

Republic of Turkey. (2013). *Agricultural Statistics.* Ankara: Turkish Statistical Institute. Retrieved 27 December 2013, from http://www.tuik.gov.tr

Republic of Turkey (2013). *Solar Energy Potential in Turkey.* Ankara: Ministry of Energy and Natural Resources, Renewable Energy General Directorate. Retrieved 12 December 2013, from *http://www.enerji.gov.tr*

Rona-Tas, A. & Hiss, S. (2010). The role of ratings in the subprime mortgage crisis: the art of corporate and the science of consumer credit rating. *Research in the Sociology of Organizations*, *30*, 115-155.

Rosenberg, N. (1998). The role of electricity in industrial development. *The Energy Journal, 2*, 7-24.

Rowley, T. J. (1997). Moving beyond dyadic ties: a network theory of stakeholder influences. *Academy of Management Review*, *22*(4), 887-910.

Rufín, C., Rangan, U. S. & Kumar, R. (2003). The changing role of the state in the electricity industry in Brazil, China, and India. *American Journal of Economics and Sociology*, *62*(4), 649-675.

Rydin, Y. (2013). Using actor–network theory to understand planning practice: exploring relationships between actants in regulating low-carbon commercial development. *Planning Theory*, *12*(1), 23-45.

Sahakian, M. D. (2010). Combining life cycle thinking with social theory: case study of compact fluorescent lamps (CFL) in the Philippines. *Sustainability*, *2*(7), 2349-2364.

Sahakian, M. D. (2011). Understanding household energy consumption patterns: when "West is Best" in Metro Manila. *Energy Policy*, *39*(2), 596-602.

Sahakian, M. D. & Steinberger, J. K. (2011). Energy reduction through a deeper understanding of household consumption. *Journal of Industrial Ecology*, *15*(1), 31-48.

Salancik, G. R., Tolbert, P., Krackhardt, D. & Andrews, S. (1995). Wanted: a good network theory of organization. *Administrative Science Quarterly*, *40*(2), 343-348.

Schneider, H. K. (1974). *Economic man: the anthropology of economics*. Free Press

Schweickart, D. (1998). Market socialism: a defense. In *Market socialism: the debate among socialists*, edited by H. Ticktin and J. Lawler, 7-22. Routledge.

Scott, J. (2000). Rational choice theory. *Understanding contemporary society: theories of the present*, edited by G. Browning, A. Halcli & F. Webster, 126-138. Sage Publications.

Sine, W. D. & David, R. J. (2003). Environmental jolts, institutional change, and the creation of entrepreneurial opportunity in the US electric power industry. *Research Policy*, *32*(2), 185-207.

Sioshansi, F. P. (2006). Electricity market reform: what have we learned? what have we gained? *The Electricity Journal*, *19*(9), 70-83.

Smart, A. (1993). Gifts, bribes, and guanxi: A reconsideration of Bourdieu's social

capital. *Cultural Anthropology*, *8*(3), 388-408.

Smelser, N. J. & Swedberg, R. (Eds.). (2010). *The handbook of economic sociology*. Princeton University Press.

Smith, A. (1937). *The wealth of nations*. Modern Library.

Skocpol, T. & Amenta, E. (1986). States and social policies. *Annual Review of Sociology*, 12, 131-157.

Spees, K. & Lave, L. B. (2007). Demand response and electricity market efficiency. *The Electricity Journal*, *20*(3), 69-85.

Son, Y. S., Baldick, R., Lee, K. H. & Siddiqi, S. (2004). Short-term electricity market auction game analysis: uniform and pay-as-bid pricing. *Power Systems, IEEE Transactions on*, *19*(4), 1990-1998.

Song, H., Liu, C. C. & Lawarrée, J. (2002). Nash equilibrium bidding strategies in a bilateral electricity market. *Power Systems, IEEE Transactions on*, *17*(1), 73-79.

Sorge, A. (2011). Financial catastrophe and its implications for socioeconomics. *Socio-Economic Review*, *9*(1), 169-186.

Soytas, U. & Sari, R. (2007). The relationship between energy and production: evidence from Turkish manufacturing industry. *Energy Economics*, *29*(6), 1151-1165.

Summerton, J. (2004). Do electrons have politics? Constructing user identities in Swedish electricity. *Science, Technology & Human Values*, *29*(4), 486-511.

Svetlova, E. (2012). On the performative power of financial models. *Economy and Society*, *41*(3), 418-434.

Syverson, C. (2004). *Market structure and productivity: a concrete example* (No. 10501). National Bureau of Economic Research.

Swedberg, R. (2004). What has been accomplished in new economic sociology and where is it heading? *European Journal of Sociology*, *45*(03), 317-330.

Swedberg, R. (2009). *Principles of economic sociology*. Princeton University Press.

Swedberg, R. (2010). The structure of confidence and the collapse of Lehman Brothers. *Research in the Sociology of Organizations*, *30*, 71-114.

Swedberg, R. (2012). The financial crisis in the US 2008–2009: losing and restoring confidence. *Socio-Economic Review*, 11(3), 501-523.

Swetnam, J. (1973). Oligopolistic prices in a free market: Antigua, Guatemala. *American Anthropologist*, *75*(5), 1504-1510.

Tatnall, A. & Lepa, J. (2003). The internet, e-commerce and older people: an actor-network approach to researching reasons for adoption and use. *Logistics Information Management*, *16*(1), 56-63.

Tchalakov, I., Hristov, I. & Mitev, T. (2011) The black hole of Bulgarian power industry (transformation of electric power sector in Bulgaria after 1989). East-West.

Thomas, N. (1991). *Entangled objects: exchange, material culture and colonialism in the Pacific*. Harvard University Press.

Ticktin, H. (1998). The problem is market socialism. In *Market socialism: the debate among socialists*, edited by H. Ticktin and J. Lawler, 55-80. Routledge.

Ticktin, H. & Lawler, J. (1998). *Market socialism: the debate among socialists*. Routledge.

Tishler, A. & Woo, C. K. (2006). Likely failure of electricity deregulation: explanation with application to Israel. *Energy*, *31*(6), 845-856.

Tor, O. B. & Shahidehpour, M. (2005, June). Electric power restructuring in Turkey. In *2005 Power Engineering Society General Meeting*, 3020-3026. IEEE.

Tor, O. B. & Shahidehpour, M. (2006). Transmission management in the aftermath of electricity restructuring in turkey. *The Electricity Journal*, *19*(7), 38-46.

Tsamenyi, M., Cullen, J. & González, J. M. G. (2006). Changes in accounting and financial information system in a Spanish electricity company: a new institutional theory analysis. *Management Accounting Research*, *17*(4), 409-432.

Tukenmez, M. & Demireli, E. (2012). Renewable energy policy in Turkey with the new legal regulations. *Renewable Energy*, *39*(1), 1-9.

Tunc, M., Camdali, U. & Parmaksizoğlu, C. (2006). Comparison of Turkey's electrical energy consumption and production with some European countries and optimization of future electrical power supply investments in Turkey. *Energy Policy*, *34*(1), 50-59.

Tunç, I. G., Turut-Asik, S. & Akbostanci, E. (2009). A decomposition analysis of CO emissions from energy use: Turkish case. *Energy Policy*, *37*(11), 4689-4699.

Turedi, N. & Demirbas, A. (2004). Strategic importance of natural gas and electricity. *Energy Sources*, *26*(14), 1379-1388.

Turkish Electricity Cooperation Law (1970), no. 1312, Turkey.

Türkiye Elektrik İletim Anonim Şirketi [Turkish Electricity Transmission Cooperation]. *Annual Development of Electricity Generation: Consumpiton and Losses in Turkey (1984-2003).* Retrieved 25 July 2011, from http://www.teias.gov.tr/eng

Türkiye Elektrik İletim Anonim Şirketi [Turkish Electricity Transmission Cooperation]. *Annual Development of Electricity Generation: Consumpiton and Losses in Turkey (1984-2006)* Retrieved 25 July 2011, from http://www.teias.gov.tr/eng

Türkiye Elektrik İletim Anonim Şirketi [Turkish Electricity Transmission Cooperation]. *Annual Development of Electricity Generation: Consumpiton and Losses in Turkey (1984-2012.)* Retrieved 02 January 2014, from http://www.teias.gov.tr/eng

Türkiye Elektrik İletim Anonim Şirketi [Turkish Electricity Transmission Cooperation]. *Annual Development of Installed Capacity and Generation in Turkey (1970- 2012).* Retrieved 12 February 2013, from http://www.teias.gov.tr/eng

Türkiye Elektrik İletim Anonim Şirketi [Turkish Electricity Transmission Cooperation]. *Annual Development of Turkey's Gross Electricity Generation, Imports/Exports and Demand (1975-2012).* Retrieved 11 February 2014, from http://www.teias.gov.tr/eng

Türkiye Elektrik İletim Anonim Şirketi [Turkish Electricity Transmission Cooperation]. *Monthly Distribution of Turkey's Gross Electricity Generation by the Imports-Exports and Gross Demand (1999-2012).* Retrieved 25 March 2014, from http://www.teias.gov.tr/eng

Türkiye Elektrik İletim Anonim Şirketi [Turkish Electricity Transmission Cooperation]. *Short history of electrical energy development in Turkey and some statistical figures.* Retrieved 25 July 2011, from http://www.teias.gov.tr/eng

Türkiye Elektrik İletim Anonim Şirketi [Turkish Electricity Transmission Cooperation]. *Report on Annual Development of Electricity Generation: Consumption and Losses in Turkey (1984-2012)*. Retrieved 28 February 2014, from http://www.teias.gov.tr/Eng/StatisticalReports.aspx

Türkiye Elektrik İletim Anonim Şirketi [Turkish Electricity Transmission Cooperation]. *Report on Annual Development of Turkey's Installed Capacity (1913-2011).* Retrieved 16 December 2012, from http://www.teias.gov.tr/Eng/StatisticalReports.aspx

Türkiye Elektrik İletim Anonim Şirketi [Turkish Electricity Transmission Cooperation]. *Annual Development of Turkey's Installed Capacity by Primary Energy Resources (1984-2012).* Retrieved 16 December 2013, from http://www.teias.gov.tr/Eng/StatisticalReports.aspx

Türkiye Elektrik İletim Anonim Şirketi – [Turkish Electricity Transmission Cooperation]. *The Distribution of Installed Capacity by Primary Energy Resources and The Electricity Utilities in Turkey.* Retrieved 16 January 2014, from http://www.teias.gov.tr/Eng/StatisticalReports.aspx

Ulutas, B. H. (2005). Determination of the appropriate energy policy for Turkey.

Energy, *30*(7), 1146-1161.

Utlu, Z. & Hepbasli, A. (2003). A study on the evaluation of energy utilization efficiency in the Turkish residential-commercial sector using energy and exergy analyses. *Energy and Buildings*, *35*(11), 1145-1153.

Uzlu, E., Akpinar, A. & Komurcu, M. I. (2011). Restructuring of Turkey's electricity market and the share of hydropower energy: The case of the Eastern Black Sea Basin. *Renewable Energy*, *36*(2), 676-688.

Vehvilainen, I. & Keppo, J. (2003). Managing electricity market price risk. *European Journal of Operational Research*, *145*(1), 136-147.

Velthuis, O. (2005). *Talking prices: symbolic meanings of prices on the market for contemporary art*. Princeton University Press.

Ventosa, M., Baillo, A., Ramos, A. & Rivier, M. (2005). Electricity market modeling trends. *Energy Policy*, *33*(7), 897-913.

Verbong, G. P. & Geels, F. W. (2010). Exploring sustainability transitions in the electricity sector with socio-technical pathways. *Technological Forecasting and Social Change*, *77*(8), 1214-1221.

Walsham, G. (1997). Actor-network theory and IS research: current status and future prospects. In *Information systems and qualitative research*, edited by A. S. Lee & J. Liebenau, 466-480. Springer.

Weidlich, A. & Veit, D. (2008). A critical survey of agent-based wholesale electricity market models. *Energy Economics*, *30*(4), 1728-1759.

Weiner, A. B. (1992). *Inalienable possessions: the paradox of keeping-while-giving*. University of California Press.

Wengle, S. A. (2012). Engineers versus managers: experts, market-making and state-building in Putin's Russia. *Economy and Society*, *41*(3), 435-467.

White, H. C. (1981). Where do markets come from? *American Journal of Sociology*, 87(3), 517-547.

Wilhite, H. (2012). A socio-cultural analysis of changing household electricity consumption in India. In *Tackling long-term global energy problems*, edited by D. Spreng et al., 97-113. Springer.

Wolak, F. A. (2003). Diagnosing the California electricity crisis. *The Electricity Journal*, *16*(7), 11-37.

Wolfram, C. D. (1999). Measuring duopoly power in the British electricity spot market. *American Economic Review*, 89(4), 805-826.

Woo, C. K., Lloyd, D. & Tishler, A. (2003). Electricity market reform failures: UK,

Norway, Alberta and California. *Energy Policy*, *31*(11), 1103-1115.

Wu, F. F., Zheng, F. L. & Wen, F. S. (2006). Transmission investment and expansion planning in a restructured electricity market. *Energy*, *31*(6), 954-966.

Yakubovich, V., Granovetter, M. & McGuire, P. (2005). Electric charges: the social construction of rate systems. *Theory and Society*, *34*(5-6), 579-612.

Yalcinoz, T. & Eminoglu, U. (2005). Short term and medium term power distribution load forecasting by neural networks. *Energy Conversion and Management*, *46*(9), 1393-1405.

Yuksek, O., Komurcu, M. I., Yuksel, I. & Kaygusuz, K. (2006). The role of hydropower in meeting Turkey's electric energy demand. *Energy Policy*, *34*(17), 3093-3103.

Yuksel, I. (2008). Global warming and renewable energy sources for sustainable development in Turkey. *Renewable Energy*, *33*(4), 802-812.

Yuksel, I. (2010). Hydropower for sustainable water and energy development. *Renewable and Sustainable Energy Reviews*, *14*(1), 462-469.

Zachmann, G. & von Hirschhausen, C. (2008). First evidence of asymmetric cost pass-through of EU emissions allowances: examining wholesale electricity prices in Germany. *Economics Letters*, *99*(3), 465-469.

Zaloom, C. (2006). *Out of the pits: traders and technology from Chicago to London*. University of Chicago Press.

Zbaracki, M. J. & Bergen, M. (2010). When truces collapse: a longitudinal study of price-adjustment routines. *Organization Science*, *21*(5), 955-972.

Zelizer, V. A. (1989). The social meaning of money: "special monies." *American Journal of Sociology*, 95(2), 342-377.

Zelizer, V. A. (2002). Intimate transactions. In *The new economic sociology: developments in an emerging field*, edited by M. F. Guillen et al., 274-300. Russel Sage Foundation.

Zelizer, V. A. (2005). Missing monies: comment on Nigel Dodd,'Reinventing monies in Europe.' *Economy and Society*, *34*(4), 584-588.

Zelizer, V. A. (2007). Ethics in the economy. *Zeitschrift für Wirtschafts-und Unternehmensethik*, *8*(1), 8-23.

Zhang, Y. & Gimeno, J. (2010). Earnings pressure and competitive behavior: Evidence from the US electricity industry. *Academy of Management Journal*, *53*(4), 743-768.