

# Chapter 2

## Regulatory Reform and Competition in the Turkish Electricity Industry

### 1 The Structure of the Electricity Industry

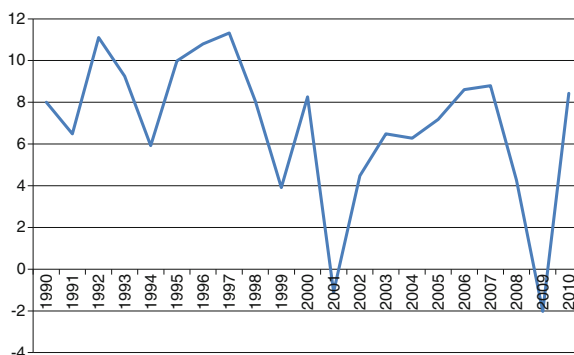
#### *1.1 Demand, Capacity, and Production*

The growth of electricity demand in Turkey has historically been high, growing at an average rate of about 7% per year between 1990 and 2010. As seen in Fig. 2.1, there have been a number of years with exceptionally low growth, namely 1999, the year of a devastating earthquake, and the years 1994, 2001, and 2008–2009, which were years of severe economic crises.

Imports and exports of electricity are negligible. As of the end of 2010, total capacity is about 50 GW. The composition of total capacity according to fuel type is given in Table 2.1. The table shows a steady increase in the share of natural gas from less than 15% in the early 1990s to over 35% by 2010. This expansion occurred at the expense of coal, fuel oil, but especially hydro. Replacing coal and fuel oil with gas helps with reducing emissions but displacing hydro may negate such benefits.

An important part of the increase in gas-fired plants is accounted by new plants built by the private sector. The evolution of generation capacity by legal status is given in Table 2.2. In the Table EÜAŞ is the state owned Electricity Generation Corporation (Elektrik Üretim A.Ş.). The term “concession companies” refers to enterprises that had generation and distribution concessions and were taken over by EÜAŞ in 2003. The table shows that the share of private sector plants, comprising autoproducers, production companies and companies holding transfer of operating rights (TOR) contracts, has increased from about 19% in 2000 to almost 51% in 2010. The item “production companies” includes both independent power producers (IPPs) and companies with build operate transfer (BOT) or build operate (BO) contracts. As discussed below, the competitive implications of these two classes of generators are of course quite different, since BO and BOT contracts entailed take-or-pay clauses shielding these plants from any type of commercial

**Fig. 2.1** Growth of demand for electricity (%). *Source* TEİAŞ



**Table 2.1** Installed capacity by primary energy sources (MW)

	Coal	%	Fuel Oil	%	Natural Gas	%	Other	%	Total Thermal	%	Hydro	%	Wind	%	Total	%
1990	5,206	32	1,202	7	2,210	14	918	6	9,536	58	6,764	41	0	0	16,318	100
1995	6,374	30	1,149	5	2,925	14	626	3	11,074	53	9,863	47	0	0	20,954	100
2000	6,989	26	1,261	5	7,044	26	759	3	16,053	59	11,175	41	19	0	27,264	100
2005	9,117	23	2,253	6	13,774	35	759	2	25,902	67	12,906	33	20	0	38,844	100
2010	11,950	24	1,549	3	18,420	37	358	1	32,279	65	15,831	32	1,320	3	49,524	100

*Source* TEİAŞ

**Table 2.2** Installed capacity by legal status (MW)

	1990	1995	2000	2005	2010
EÜAŞ (1)	14,729	15,574	17,968	20,431	20,368
%	90	88	66	53	41
Affiliated Partnerships of EÜAŞ		3,284	3,284	2,154	3,834
%		19	12	6	8
Concessionary companies	378	716	610		
%	2	4	2		
Autoproducers	1,194	1,345	2,996	4,062	3,143
%	7	8	11	10	6
Transfer of operation rights (TOR)			330	650	650
%			1	2	1
Production companies	16	35	1,985	10,797	21,265
%	0	0	7	28	43
Mobile power plants			91	750	263
%			0	2	1
Turkey	16,318	17,670	27,264	38,844	49,524
%	100	100	100	100	100

*Note* Production Companies include BO, BOT and IPP plants

*Source* TEİAŞ

(1) Including generators in the privatization programme

**Table 2.3** Generation by legal status 2010

	GWh	%
EÜAŞ	79,258	38
EÜAŞ affiliated partnerships	16,274	8
Production companies	98,904	47
Autoproducers	12,447	6
TOR	4,324	2
Total	211,208	100

*Note* Production companies include BOT, BO and IPP plants.  
*Source* TEİAŞ

**Table 2.4** Generation by primary energy source 2010

	GWh	%
Coal	55,046	26.1
Fuel oil, diesel naphtha	2,180	1.0
Gas	98,144	46.5
Renewables and waste	458	0.2
Total thermal	155,828	73.8
Hydroelectric	51,796	24.5
Geothermal and wind	3,585	1.7
Total	211,208	100.0

*Source* TEİAŞ

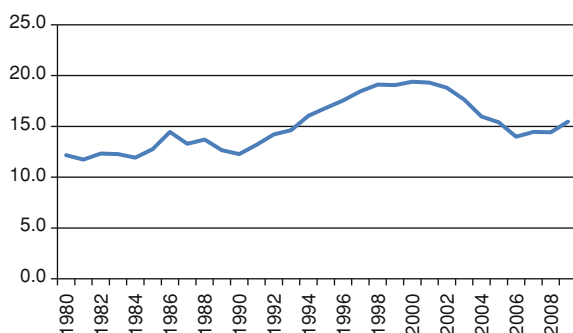
risk including competition. The private competitive segment of the market consists of IPPs, autoproducers, and autoproducer groups.<sup>1</sup> The share of IPPs has also increased over time. In 2005, total capacity of IPPs was about 2.2 GW, less than 6% of total capacity in the industry. By 2010, an additional 10 GW of capacity was added by IPPs, raising their share to about 25% of total capacity.

As of 2010, total electricity production in Turkey reached about 211 thousand GWh (Table 2.3). The share of EÜAŞ and its partnerships<sup>2</sup> in total generation was about 46% and that of the private sector was about 54%. However, the share of independent power producers was 19% and the share of autoproducers was nearly 6% (Camadan 2011). The share of gas-fired plants in total generation is about 47% and that of hydroelectric plants is about 25% (Table 2.4).

<sup>1</sup> Autoproducers are established primarily to consume the electricity they generate by themselves. According to the Energy Market Law, they have the right to sell 20% of the electricity they produce to the market. Under exceptional circumstances the Board of the regulatory authority may increase this ratio. The ratio has been set at 40% by the Board in December 2011. However, any sale in excess of the ratio set by the Board would require a generator's license. An autoproducer group is similar, except that it generates electricity not only for itself but for its affiliates. In what follows the term autoproducer will be used to refer to both autoproducers and autoproducer groups.

<sup>2</sup> EÜAŞ affiliated partnerships are companies where EÜAŞ' ownership share is above 50%.

**Fig. 2.2** Transmission and distribution losses as a share of total consumption (%).  
Source TEİAŞ



## 1.2 The Problem of Distribution Losses

An important issue that any reform effort had to face was the problem of losses and theft. There are two sets of data provided on technical and “non-technical losses” in Turkey.<sup>3</sup> Figure 2.2 shows the ratio of total (transmission and distribution) losses as a percentage of total consumption in Turkey, as reported by the Turkish Electricity Transmission Corporation (Türkiye Elektrik İletim A.Ş., TEİAŞ). The loss ratio increased between 12 and 15% in the early 1990s to a high of over 19% by the year 2000. It has since declined to around 15% by 2009.

The second source of data on losses, the Turkish Electricity Distribution Company (Türkiye Elektrik Dağıtım A.Ş., TEDAŞ), reports technical losses and theft as the difference between total energy purchased by TEDAŞ and total energy sold. Figure 2.3 shows distribution of losses as a percentage of total energy purchased according to TEDAŞ data. The ratio has reached a peak at 21.6% in 2000, declined until 2008 to 14.4% but has increased again, reaching 18.6% in 2010. The TEDAŞ data are different from those provided by TEİAŞ the overall trend seems similar; however, TEDAŞ reports larger increases in 2009.<sup>4</sup>

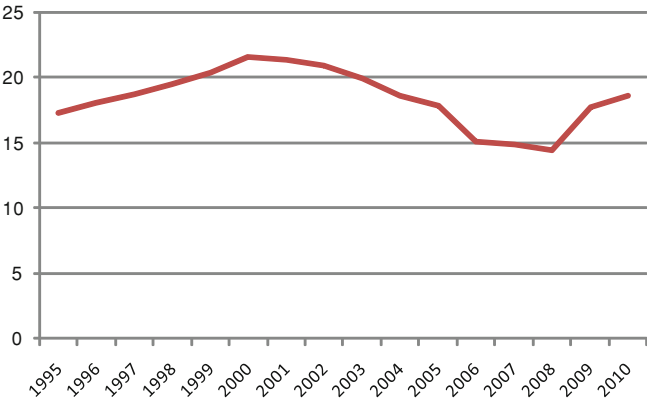
Compared to international averages these ratios are extremely high. As shown in Fig. 2.4, as of 2008 the average ratio of transmission and distribution losses to total supply was less than 7% among OECD countries and 8.5% in the world. Among OECD countries Turkey has the highest loss ratio after Mexico.

The distribution of losses across regions is highly uneven. In 2009, the ratio of losses to total consumption in two distribution regions of Eastern Anatolia was above 50% (Table 2.5).<sup>5</sup> Istanbul had the second highest level of losses in terms of absolute

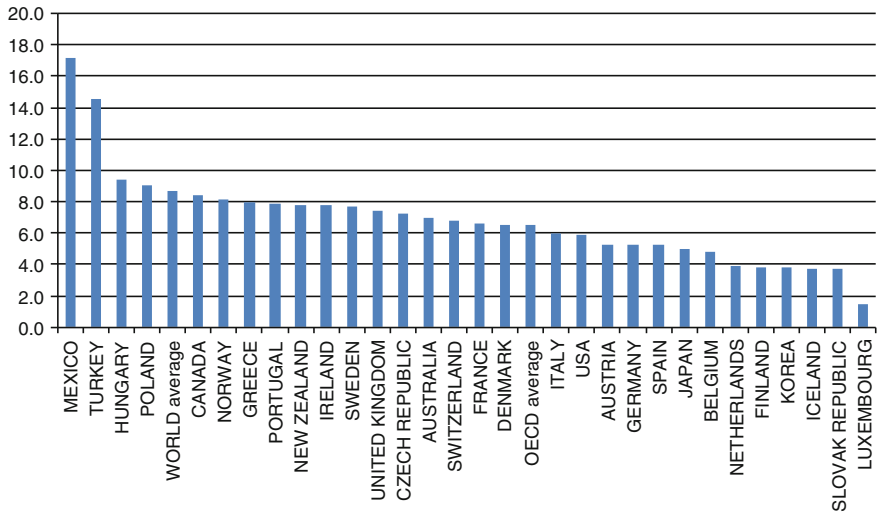
<sup>3</sup> The term “non-technical losses” most often refers to theft of electricity. Hence “theft” and “non-technical losses” will be used interchangeably. The term “losses”, when used alone, refers to the sum of technical and non-technical losses.

<sup>4</sup> As of December 2011, TEİAŞ loss data for 2010 were not available.

<sup>5</sup> The provincial composition of regional distribution companies is provided in Table 2.7 below.



**Fig. 2.3** Distribution losses (percentage of energy purchases by TEDAŞ). *Source* TEDAŞ Annual Report 2010



**Fig. 2.4** Transmission and distribution losses among OECD countries (2008) *Source* OECD, as reported by TEİİAŞ

quantities. The increase in the loss ratio in the 1990s probably reflects both an overall breakdown of governance Turkey experienced during the 1990s as well as insufficient investment. The fact that loss ratios were highest in provinces that have suffered most from violence associated with the Kurdish problem also suggests the presence of deeply rooted social factors. There is anecdotal evidence that theft is also high in shanty towns in some urban centers (most notably in Istanbul) and that in some cases industrialists engage in large amounts of theft in areas where law enforcement is weak.

**Table 2.5** Distribution losses across distribution regions (2009)

	Ratio to total purchases (%)		MWh
DİCLE EDAŞ	73.01	DİCLE EDAŞ	11 337 581
VANGÖLÜ EDAŞ	55.57	BOĞAZİÇİ EDAŞ (Istanbul West)	1 975 682
ARAS EDAŞ	27.70	VANGÖLÜ EDAŞ	1 626 976
FIRAT EDAŞ	13.63	TOROSLAR EDAŞ	1 316 381
ÇORUH EDAŞ	11.51	GEDİZ EDAŞ	1 032 424
YEŞİLIRMAK EDAŞ	10.63	AYEDAŞ (Istanbul East)	693 489
BOĞAZİÇİ EDAŞ (Istanbul West)	9.68	ARAS EDAŞ	655 366
AKDENİZ EDAŞ	9.18	ULUDAĞ EDAŞ	654 357
MERAM EDAŞ	8.54	AKDENİZ EDAŞ	599 040
TOROSLAR EDAŞ	8.30	MERAM EDAŞ	520 595
ÇAMLIBEL EDAŞ	7.71	YEŞİLIRMAK EDAŞ	481 844
GEDİZ EDAŞ	7.67	TRAKYA EDAŞ	396 108
AYEDAŞ (Istanbul East)	7.48	FIRAT EDAŞ	320 788
GÖKSU EDAŞ	6.93	OSMANGAZİ EDAŞ	313 725
TRAKYA EDAŞ	6.41	ÇORUH EDAŞ	298 543
OSMANGAZİ EDAŞ	6.08	GÖKSU EDAŞ	266 195
ULUDAĞ EDAŞ	5.59	ÇAMLIBEL EDAŞ	179 407

Source TEDAŞ Statistics 2009

## 2 Historical Background and the Road to Reform

As in many other countries, the main player in the electricity industry in Turkey was a vertically integrated publicly owned enterprise, the Türkiye Elektrik Kurumu (Turkish Electricity Authority, TEK). TEK was established in 1970 with the purpose of uniting activities related to the supply of electricity under a single integrated publicly owned entity.<sup>6</sup> In 1993, TEK was separated into two corporatized entities, the Turkish Electricity Generation and Transmission Company (TEAŞ) and the Turkish Electricity Distribution Company (TEDAŞ).

In the 1980s and 1990s, there were several attempts to attract private capital to the electricity industry. These efforts can partly be explained by the significant

<sup>6</sup> The only exceptions were municipally-owned transmission and distribution facilities and three regional concession companies. The municipal facilities later came under TEK's control in 1982.

transformation in the overall economic policy regime that took place in the 1980s. In the post World War II era in Turkey was engaged in a policy regime often labeled import substitution industrialization (ISI) in the economic development literature. This policy regime was characterized by heavy involvement of the state in economic activities, in particular widespread government ownership of enterprises in critical industries, such as energy, telecommunications, petrochemicals, iron, and steel. The state also played a critical role in the allocation of financial resources especially through stateowned banks. A major balance of payments crisis in the second half of the 1970s (and a military coup in 1980) marked the end of the ISI regime. The 1980s witnessed massive liberalization of domestic markets, international trade, and finance. In this new market-oriented regime privatization was seen as a means of eliminating what was perceived to be widespread inefficiencies in the public sector. In addition, there was a strong public finance reason for privatization: throughout the 1990s Turkey experienced high public deficits and mounting public debt. Forecasting high growth in electricity demand, and high investment requirements to build the necessary generation capacity, Turkish governments wanted to reduce the burden on the public budget by attracting private investment to the industry.

An important attempt to privatize TEK through sale of ownership rights was undertaken in 1994 through Law 3974. This was struck down by the Constitutional Court. The Court decision was generally perceived to determine the boundaries of privatization policies until an amendment to the Constitution in 1999. The Court was concerned about foreign ownership in a strategic industry and about the fact that the law did not envisage any remedies to prevent monopolization or cartelization. It also objected to the law's attempt to characterize contracts engaging the private sector in the electricity industry as governed by private rather than public law. The Court stated that electricity was a public service and therefore private sector provision was regulated under public law and had to be organized as a concession under the judicial review of the Council of State (Danıştay).<sup>7</sup>

The attitude of the Constitutional Court was widely regarded as barring privatization models that entailed transfer of ownership rights over state-owned electricity assets. In the 1980s and 1990s, attempts to engage the private sector took the form of designing investment schemes such as BOT, BO, and transfer of operating rights (TOR) contracts. The first law that established a legal framework for private sector participation in the electricity industry was enacted in 1984 (Law No. 3096). This law introduced two types of contracts: BOT contracts for new generation facilities and TOR for existing generation and distribution facilities. A BOT was a concession through which a company would build and operate a generation plant for 99 years (later reduced to 49 years) and then transfer the plant to the state at no cost. A TOR was a lease-like arrangement under which the private company would operate and,

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<sup>7</sup> For the various constitutional and legal problems with private participation in the electricity industry in Turkey see Gülen (1998); Bilgiç et al. (1999); Çetin and Oğuz (2007); Ulusoy and Oğuz (2007) and Atıyas and Oder (2007).

where necessary, rehabilitate a government-owned facility for a specified period of time. The attractiveness of the BOT projects was enhanced in 1994 through Law No. 3996, which provided tax exemptions and authorized the treasury to grant guarantees. In 1997, the BO model was introduced through Law No. 4283. Investments under the BO model were also eligible for treasury guarantees.

An important feature of these generation contracts was purchase agreements between the private company and TEAŞ or TEDAŞ that included take-or-pay clauses that committed the buyer to purchase a specified amount of electricity at prespecified prices or price formulas over duration of 15–30 years. In the end, the amount of generation capacity built under these contracts has been limited (about 4,000 MW started operating between 1997 and 2004, see Atiyas 2006, p. 75). However, these contracts have been quite controversial, for several reasons: first, some contracts (especially some BOT contracts awarded under law 3996) were awarded without a competitive procedure. Rather, contracts were awarded on the basis of bids collected from preselected companies (Çakarel and House 2005, p 7). Second, tariffs under the contracts were heavily front loaded to allow for early recovery of costs. Hence, especially during the early years of the contracts, electricity purchased by the state was expensive. Third, there have been allegations in reports prepared by the Turkish High Court of Accounts, as well as other official audit bodies that there have been irregularities in the design and implementation of these contracts (Atiyas 2006). At the least, it is believed that the state did not negotiate these contracts sufficiently rigorously, and obtained poor bargains: the government has retained most of the commercial risks, while providing the private sector with substantial rewards, especially in the form of treasury provided guarantees to cover critical commercial take-or-pay payment obligations, such as minimum electricity generation levels and minimum quantities of gas in power station gas purchase contracts, at associated predetermined prices in US dollars over the life of the contracts. On the other hand, project owners contend that the high initial prices were a reflection of Turkey's high international risk rating which translated into a high cost of capital for these debt financed energy generation projects.

There were other problems as well. Attempts by successive governments to treat these contracts as governed by private law were turned down, as abovementioned, by the interpretation of the Constitutional Court which meant that private sector provision had to be organized as a concession. This, in turn meant that contracts were to be reviewed by the Council of State (Danıştay) which could be a lengthy process. Also, concessions did not have recourse to international arbitration. These issues were finally resolved through a constitutional amendment in 1999 which stated that public services can be provided by private investors under private law contracts as long this is specified in law (Atiyas and Oder 2007; Ulusoy and Oğuz 2007).

Finally, fiscal implications of the contracts eventually raised serious concerns. The contingent liabilities created by the treasury guarantees provided to the contracts added further strain to the rapidly deteriorating public finances of the 1990s. As part of a general stabilization program that was put together with the support of the IMF, by the early 2000s Turkey had pledged to end treasury guarantees in future contracts.



In hindsight, a more structural problem with the BOT and BO contracts was that they did not contribute to the development of competitive electricity markets in Turkey, and indeed, neither were they intended to. The take-or-pay clauses meant that generators did not need to compete *in* the market and all commercial risk was transferred to the state. To the extent, that contracts were awarded through a tender procedure (and in some cases they were not) private investors competed *for* the market, and the fixed price nature of the contracts implied that generators did have incentives to minimize costs. However, there were no mechanisms that would ensure that any cost savings would eventually be passed on to consumers. In any case, when a more competitive model was adopted for the electricity industry in the 2000s, the BOT and BO contracts became stranded costs.

The controversy around these contracts created another important implication for the future: the energy bureaucracy became extremely averse to concluding contracts with the private sector, and as discussed below, this aversion did influence the evolution of the competitive model that was launched in the 2000s. Further, the fiscal problems of the 1990s and the role of electricity contracts in it made the fiscal gatekeepers of the state, namely the Ministry of Finance and the Treasury, extremely cautious about the fiscal implications of any state involvement in the participation of the private sector in the electricity industry.

Dissatisfaction with the BOT–BO model of private participation in electricity had already led the bureaucracy to search for more competitive models of electricity supply. A stabilization program supported by the IMF and the World Bank became instrumental in pursuing a more fundamental restructuring of the electricity industry through the adoption of the electricity market law (EML, Law No. 4628) in 2001. EML envisaged a competitive market, liberalization of both supply and demand and the creation of an independent regulatory authority.

### 3 Market Structure and Regulation Under the EML

The EML provided a fairly broad and detailed framework for the organization of markets and activities in the electricity industry.<sup>8</sup> First, it established a new regulatory authority, the Electricity Market Regulatory Authority (Elektrik Piyasası Düzenleme Kurumu, EPDK) as the regulator of electricity markets with wide powers to issue secondary legislation. After the enactment of Gas Market Law in 2001 and Petroleum Market Law in 2003, the EPDK was also given authority over the natural gas and oil industries. Its name was also changed to Energy Market Regulatory Authority (Enerji Piyasası Düzenleme Kurumu, EPDK).

The EML describes the EPDK as an “independent, administratively, and financially autonomous public institution”. It is governed by its own board which

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<sup>8</sup> For reviews of the regulatory environment in electricity see Atiyas and Dutz (2005); Güney (2006); Atiyas (2006); Hepbaşlı (2005); Erdoğan (2007); Ulusoy and Oğuz (2007).

consists of nine members and a president, appointed for 6 years by the Council of Ministers. The Board members cannot hold jobs in the industry for 2 years after their term in office is completed. The decisions of the Board of the EPDK can be appealed at the Council of State, or Danıştay.

The main functions of the ETKB with respect to the electricity industry include implementing the licensing regime, preparing and implementing secondary legislation for the electricity and gas (and later oil) markets, regulating distribution and transmission activities and the provision of retail services to noneligible consumers, monitoring compliance and imposing penalties and fines in cases of noncompliance.

Under the new regime, public assets were legally unbundled into separate public companies: TEAŞ was separated into EÜAŞ, the Electricity Generation Corporation, TEİAŞ, the Turkish Electricity Transmission Corporation, and TETAŞ, Turkish Electricity Trading and Contracting Corporation, a wholesale trading company. It was envisaged that assets owned by EÜAŞ and TEDAŞ would be privatized. Transmission activities, on the other hand, would remain under public ownership. The primary task of TETAŞ was to take over all energy sale and purchase agreement of TEDAŞ and TEAŞ, including energy purchase and sales agreements entered into under BOT, BO, and TOR contracts and also export and import contracts. Also, initially EÜAŞ would sell all the electricity it has generated to TETAŞ. The idea was that the relatively expensive electricity purchased through BOT, BO, and TOR contacts would be balanced by what was perceived to be relatively cheap electricity purchased from EÜAŞ and the electricity would be sold under a uniform price to TEDAŞ. Hence essentially, TETAŞ would work under an average cost pricing scheme.

The market model envisaged by the EML consisted of two fundamental components: a market for bilateral contracts and a balancing mechanism to ensure real-time equality between supply and demand. The balancing market would be run by the National Load Dispatch Center (Milli Yük Tevzi Merkezi, MYTM) established in TEİAŞ and accounts among participants would be settled by the Market Financial Reconciliation Center (Piyasa Mali Uzlaştırma Merkezi, PMUM). The EML did not mention a spot market and the balancing mechanism became truly operational only in 2006. This delay in the establishment of the balancing market had important implications for private investment, an issue discussed further below.

The market model adopted in the EML seems to have been inspired by the New Electricity Trading Arrangement (NETA) of England and Wales which was also launched in 2001. NETA was preceded by the Pool, which was a centralized and mandatory market for wholesale trade in electricity. The NETA relied on bilateral contracts and a balancing mechanism to equate demand with supply in realtime. The Pool was faulted for a number of problems, including giving rise to excessive market power by the participating generators.<sup>9</sup> The Turkish policy

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<sup>9</sup> It seems the California crisis played a role in this choice as well. The California model also had an exchange similar to the Pool, and there were strong indications that exercise of market power played a significant role in the development of the crisis.

makers seem to have been impressed by these criticisms and opted for a more decentralized arrangement.<sup>10</sup>

The EML provided for a wide variety of activities, including generation, wholesale trade, transmission, distribution, and retail supply. Entry into any of these activities required obtaining a license, which would be granted by EPDK presumably to any investor that met the conditions in the law. Hence the supply side was liberalized through a licensing regime.

Generation would be carried out by EÜAŞ, private generators who have obtained a generation license, autoproducers and autoproducer groups who generate electricity for their own use, but can sell surplus electricity in the market. Distribution companies would be able to engage in retail supply as well, provided they obtained a retail license.

The demand side was liberalized as well: every year EPDK would determine a threshold level of consumption, such that consumers with annual consumption exceeding that level would be designated as “eligible consumers” and would have the freedom to choose their own suppliers. A question that arises in this context, and one with important implications for the development of bilateral contracts, is whether eligible consumers would be able to purchase electricity from the retail arms of distribution companies. The EML stated that “In cases where there are consumers unable to purchase electricity and/or capacity from another supplier in the region served by any distribution company, then such distribution company is obliged to obtain a retail sale license, and engage in electricity sales to such consumers on a retail basis and/or provided retail sale services.” In practice, eligible consumers have been able to choose distribution companies as their suppliers.

The EML has a number of provisions designed to facilitate the development of competition:

- The EML required that the holder of a distribution or transmission license to provide nondiscriminatory system access and use of system rights to all real persons and legal entities. Further, the terms of such access were to be regulated by EPDK.
- The EML introduced accounting separation, that is, operators which have more than one license or more than one plant had to keep different accounts for the different activities or plants. This remedy would facilitate the determination of regulated tariffs.
- Generation companies could enter into affiliate relationships with distribution companies without having controlling power over them.
- The EML stated that total market share of generation facilities operated by a particular private sector generation company and its affiliates could not exceed 20% of total installed capacity in Turkey in the preceding year.
- In the original version of the EML, distribution companies were allowed to operate generation facilities but the amount of the annual electricity generated by

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<sup>10</sup> There were academics and experts in the UK who were not uncritical of the transition from Pool to NETA. See for example, Helm (2003) and Newbery (2005).

**Table 2.6** Regulated tariffs

Activity	Regulated Price/Charge	Method
Transmission	Connection Charge	Project based
	System operation price	Revenue cap
	System use price	Revenue Cap
	Market Management Price	Revenue Cap
Distribution	Connection Charge	Project based and Standard Connection Charge
	Use of System Price	Revenue cap
Retail	Retail Sale Service Price	Revenue Cap
	Retail Sale Price	Price Cap
	Average Loss and Theft Price Cap	Price Cap
Wholesale (TETAS)	Average Wholesale Price	Cost based

Source EPDK; The Electricity Market Tariff Regulation and associated communiqués

them could not exceed 20% of the total electricity consumption in the region. Later this upper limit was removed through an amendment to the EML, apparently to increase the attractiveness of the distribution assets for privatization.

In addition, the EML also stated that in the context of privatization activities, foreign real persons and legal entities engaged in the market activities cannot have a market share that will enable them with a control power in the electricity generation, transmission, and distribution sectors. Presumably, this was intended to address the concerns of the Constitutional Court regarding foreign ownership.

The EML identified tariffs that would be regulated by EPDK. These were stated as: transmission tariffs, distribution tariffs, connection and use of system tariffs, retail tariffs for noneligible consumers, and the tariffs of TETAŞ. Eligible consumers would also be subjected to regulated tariffs until such consumers would choose their own suppliers through bilateral agreements. Tariffs for bilateral agreements, including those of eligible consumers at the retail level would be freely determined. The details of tariff regulations have evolved somewhat over-time. Table 2.6 provides a summary of the regulated tariffs and the methodologies used in regulation as of December 2011.

Distribution and transmission connection charges are intended to cover the costs (connection assets and costs incurred in their construction) incurred when users connect to the grid. Users of the distribution system are also subjected to a standard connection charge that depends on connection capacity and distance. Tariffs for transmission services entail three additional components, all regulated through revenue caps: use of transmission system tariffs, transmission system operation tariffs, and market management tariffs. Use of transmission system tariffs are designed to cover the investment, operation, and maintenance costs of the network. These are calculated on a regional basis and separately for consumers and producers.<sup>11</sup> The system transmission operation tariff captures the costs of services provided by the National Load Dispatch Center and fixed costs associated with ancillary services. These prices are uniform across all regions. The Market Management Tariff reflects the costs of operating the Market Financial Settlement Center. All of these components are regulated through revenue caps. The retail sale price applied to noneligible consumers reflects the average cost of energy purchased by retail companies plus a gross profit margin cap. The retail service sale price is intended to cover costs associated with provision of retail services and is also regulated through a revenue cap. Retail prices for eligible consumers are not regulated. Finally, the TETAŞ wholesale price is intended to cover average costs of wholesale electricity procured by TETAŞ and to ensure TETAŞ financial viability.

In general, regulated tariffs are proposed by the respective institutions and approved by EPDK. Proposals for the subsequent year have to be presented before the end of October in the current year and EPDK is expected to approve them by December 31 of the current year. EPDK may choose not to approve the tariffs and request revisions.

The presence of technical losses and theft, especially in the distribution system, represented a complicating factor faced by the new model. As described above, the ratio of losses varied highly across regions. With liberalization, it was expected that prices would closely reflect costs, and this would have meant large variations in electricity prices across regions. The law also attempted to provide instruments that would potentially be used to protect consumers from the asymmetries that could be generated by these high and variable distribution losses. It stated that “in cases where consumers in certain regions and/or in line with certain objectives need to be supported, such subsidy shall be provided in the form direct cash refunds to consumers without affecting the prices”. The authority to design such subsidies was given to the Council of Ministers.

In hindsight, it can be said that the EML had a number of behavioral and structural measures in anticipation of significant competition problems similar to those that emerged, for example, in the European Union (EU). The structural measures included elements of vertical as well as horizontal separation, whereas the most important behavioral remedy was the provision for regulated third party

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<sup>11</sup> As of December 2011, 14 regions have been defined for the purposes of transmission system use prices.

access. It may be useful to compare these provisions with those that existed in the European Union (EU). In 2001, electricity markets in the EU were still under the regime of the so-called 1st liberalization package, the main component of which was the electricity directive (Directive concerning common rules for the internal market in electricity, 96/92/EC). This directive liberalized electricity generation, but allowed member states to choose between an authorization procedure, similar to the option chosen in Turkey and a tendering procedure, whereby it would be up to the state to decide where and when a generation plant should be installed. Hence, Turkey had chosen a more market oriented and decentralized liberalization path. Regarding access, the directive allowed for both regulated *and* negotiated third party access, the latter undoubtedly a less competitive option given the high bargaining power of vertically integrated incumbent operators. Hence, regarding access Turkey had chosen an option that protected entrants relative to incumbents. Significantly, while the EU directive did require accounting separation, it did not contain any structural measures for further vertical unbundling of transmission assets. Again, the EML was more procompetitive than the European directive at the time. It was not until the adoption of the 2nd liberalization package in 2003 that the EU took significant steps regarding both access and unbundling.

It would also be useful to compare the Turkish model against a benchmark distilled through the worldwide restructuring experience over the last three decades. The key components of such a benchmark “textbook” model is provided by Joskow (2008) as follows: (1) privatization to increase incentives, prevent politization and end soft budget constraints, (2) vertical separation of competitive segments from naturally monopolistic segments, (3) horizontal restructuring to establish a minimum number of players to ensure a minimum degree of competition, (4) creation of voluntary wholesale public spot energy and operating reserve markets, (5) establish rules to ensure efficient access to the transmission network, (6) unbundling of retail tariffs, (7) in cases where competition in retail markets are seen unlikely to develop, ensure that distribution companies are suppliers of last resort, (8) creation of independent regulatory agencies, and (9) design and implementation of a transition mechanism. The Turkish model as reflected in the EML seems to cover most of these components except for two items: the first is the voluntary wholesale spot energy market and the second is the transition mechanism. The implications of the absence of a wholesale market will be discussed below. Regarding the transition mechanism, while the general characteristics of the target market model seems to have been clear, the strategy to get there would only be clarified after the passage of three more years, by the publication of a strategy document (SD) in 2004.

## 4 Implementation Strategy

The most important step in the restructuring of the industry was the privatization of generation and distribution assets. As indicated above, transmission assets would remain under public ownership. The EML mentioned privatization but did

not provide a time table. A time table for the next steps of the implementation of the EML, as well as an outline of the general strategy, was introduced through a “Strategy Document” (SD)<sup>12</sup> issued in March 2004.

The SD reiterated the central role of privatization in the restructuring of the electricity industry. Moreover, the SD stated that privatization would start with distribution assets and then proceed to generation assets. The stated reason for this sequencing was the hope that successful privatization of distribution companies would create credible contractual counterparts for existing and new entrant generation and wholesale companies.<sup>13</sup> It is generally believed that if distribution companies remained under state ownership, they would continue to be badly managed. Moreover, civil servants acting managers would be unwilling to sign contracts with the private sector, especially given the public suspicion about the BOT, BO, and TOR contracts signed under the previous regime. In addition, it seems policy makers thought it would be difficult for public sector managers to resolve the loss theft problem in the distribution segment and that the private sector would have had an easier time.

In the mean time generation assets would be grouped into portfolio generation companies (excluding some hydro generation assets, which would continue to sell their output to TETAŞ). The basic principles to be followed in the creation of portfolio companies were attaining financial feasibility and preventing market power. The privatization of generation plants would start after significant progress in the privatization of distribution companies.

These priorities reflected in the SD deserve a few comments: first, the central role given to privatization process in the restructuring strategy in practice meant that competition obtained a secondary role. After all, it is generally believed that ultimately it is competition that is expected to generate efficiency gains and higher consumer welfare over the long run, not a transfer of ownership. While privatization may encourage efficiency gains by making profit maximization the primary objective of enterprises, without competition such efficiency gains do not translate into higher consumer welfare. Clearly, the possibility of injecting and increasing competition is much higher in generation, nil in distribution and limited in retail supply. Given these considerations, many alternative strategies could have been designed. For example, one alternative strategy that emphasized competition could have started with the creation of portfolio companies, appointment of professional managers with the mandate to run their companies as independent profit maximizers, soon to be followed by their privatization. In the meantime, new competent management could have been appointed to distribution companies and eventually they could be privatized as well. The fact that the Turkish strategy did not follow this route is possibly explained by several factors. There was a general pessimism

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<sup>12</sup> Decision No. 2004/3 of the High Planning Council, Official Gazette 17.3.2004.

<sup>13</sup> According to Price Waterhouse Coopers (2008) “Metering and billing problems coupled with loss & theft ratios much higher than the OECD median constituted the main imperatives behind the policy decision to grant a priority to the distribution segment” (p 17).

about the degree to which state-owned companies could be reformed and their efficiencies increased. Second, the government had its eye on potentially high revenues that could be raised through the sale of monopoly rights. As discussed further below, it seems generation of revenues for the public coffers has been an overriding objective of the restructuring process in the electricity industry.

As part of the transition period, the SD stipulated that several types of transitional or vesting contracts will be implemented. These included:

- Transitional contracts between TETAŞ and EÜAŞ hydroelectric plants. Some hydro plants will not be included in the generation portfolio companies and they will continue to sell their output to TETAŞ as long as it is deemed necessary to achieve an average TETAŞ sales price that reflects the expected market price. The idea was to use hydro plants to lower market prices in cases where they were deemed too high.
- Transitional contracts between TETAŞ and the distribution companies. Electricity purchased by TETAŞ from EÜAŞ and existing contracts will be distributed among distribution companies.
- Transitional purchase and sale contracts between distribution companies and generation groups. It was envisaged that these contracts would last at most 5 years, to be replaced by market based contracts. In effect they have been renewed at the end of the 5 years.
- Distribution companies would make agreements with suppliers for an amount covering at least 85% of estimated consumption of noneligible consumers.

Regarding distribution, Turkey was divided into 21 distribution regions, and a regional distribution company was created for each region (Table 2.7). Licenses for distribution activities would be at most for 49 years. Since the restructuring strategy depended crucially on the privatization of distribution assets, the SD included steps that were perceived to reduce uncertainties and increase the attractiveness of these assets to potential investors. Tariffs would be specified on a multiannual basis and the first tariff application period would be 5 years.

The SD also introduced a significant departure from the EML in the handling of interregional differences in distribution costs. Instead of direct subsidies to consumers, the SD stipulated that a “price-equalization scheme” would be introduced for a transitional period that ends in 2010. This meant that cross subsidies from low-loss regions would be used to finance losses in high-loss regions. As this required new legislation, Law No. 5496 introduced an amendment to EML and gave the EPDK the authority to design the equalization scheme. It is generally believed that the main reason for this change is the unwillingness of the Ministry of Finance and the Treasury to create any additional burdens to the budget. Relying on cross subsidies instead precludes direct support from the public budget.

Additional measures were intended, apparently with the objective of making distribution assets more attractive to potential buyers. Originally the SD stated that the threshold for eligible consumers would be set at 7.8 GWh until 2009, in effect limiting the extent of retail competition. However, this was not adhered to and the threshold for eligible consumers has been reduced along a faster schedule down to



**Table 2.7** Distribution regions

Region No.	Distribution Companies	Provinces
1	Dicle Elektrik Dağıtım A.Ş.	Diyarbakır, Şanlıurfa, Mardin, Batman, Siirt Şırnak
2	Vangölü Elektrik Dağıtım A.Ş.	Bitlis, Hakkari, Muş, Van
3	Aras Elektrik A.Ş.	Erzurum, Ağrı, Ardahan, Bayburt, Erzincan, Iğdır, Kars
4	Çoruh Elektrik Dağıtım A.Ş.	Trabzon, Artvin, Giresun, Gümüşhane, Rize
5	Fırat Elektrik Dağıtım A.Ş.	Elazığ, Bingöl, Malatya, Tunceli
6	Çamlıbel Elektrik Dağıtım A.Ş.	Sivas, Tokat, Yozgat
7	Toroslar Elektrik Dağıtım A.Ş.	Adana, Gaziantep, Hatay, Mersin, Osmaniye, Kilis
8	Meram Elektrik Dağıtım A.Ş.	Kırşehir, Nevşehir, Niğde, Aksaray, Konya, Karaman.
9	Başkent Elektrik A.Ş.	Ankara, Kırıkkale, Zonguldak, Bartın, Karabük, Çankırı, Kastamonu
10	Akdeniz Elektrik A.Ş.	Antalya, Burdur, Isparta
11	Gediz Elektrik Dağıtım A.Ş.	İzmir, Manisa
12	Uludağ Elektrik Dağıtım A.Ş.	Balıkesir, Bursa, Çanakkale, Yalova
13	Trakya Elektrik Dağıtım A.Ş.	Edirne, Kırklareli, Tekirdağ.
14	İstanbul Anadolu Yakası Elektrik Dağıtım A.Ş. (AYEDAŞ)	İstanbul Anatolian Side
15	Sakarya Elektrik Dağıtım A.Ş.	Sakarya, Bolu, Düzce, Kocaeli
16	Osmangazi Elektrik Dağıtım A.Ş.	Eskişehir, Afyon, Bilecik, Kütahya, Uşak
17	Boğaziçi Elektrik Dağıtım A.Ş. (BEDAŞ)	İstanbul European Side
18	Kayseri Elektrik Dağıtım A.Ş.	Kayseri
19	Menderes Elektrik Dağıtım A.Ş.	Aydın, Denizli, Muğla
20	Göksu Elektrik Dağıtım A.Ş.	Adıyaman, Kahramanmaraş
21	Yeşilirmak Elektrik Dağıtım A.Ş.	Samsun, Amasya, Çorum, Ordu, Sinop

Source Privatization Authority

30 MWh by end of 2011. Finally, as discussed before, restrictions on the extent to which distribution companies can integrate backwards into generation were lifted through Law No. 5398.

The SD provided clear deadlines for the different components of the strategy. Privatization of all distribution companies was to be completed by 2006; as of December 2011 they have still not been completed. The privatization of generation portfolio companies was to have started by July 2006 and as of December 2011 there have been no significant privatizations of generation assets.

## 5 Developments and Issues Under the New Regime

### 5.1 Progress with Privatization

#### 5.1.1 The Privatization Model for Electricity Distribution

While privatization was to play a crucial role in the strategy for restructuring the electricity industry, implementation has been significantly delayed. The SD had stated that “the main target will be to privatize all distribution companies/regions until 31 December 2006.” The privatization of only three regions (Başkent, Sakarya and Ayedaş) was launched in 2006 with the intention of completing them by March 2007. However, these tenders were cancelled just before the tender date.

Among the official reasons put forward by the authorities was the completion of the infrastructure works to take above ground middle voltage (MV) lines to underground (Price Waterhouse Coopers 2008).

One important reason for the delay was the search for the appropriate legal form of ownership of the distribution assets. While some authorities preferred a model that transferred the ownership of the assets to private parties, others preferred a model whereby ownership would be retained by the state and private parties would be granted rights to operate the assets. In the end, with the nudge of a recommendation delivered by the Council of State, it was decided that privatization would not entail the transfer of ownership rights, and instead the TOR backed share sale model (“TSS model”) was adopted.

The model was as follows: first, the Privatization Authority (PA, Özelleştirme İdaresi Başkanlığı) established a distribution company in each of the distribution regions established in the SD. In the Kayseri region (region no. 18), the distribution company was already partially private and had obtained operating rights in 1990. That company had its contract renewed and granted a license in 2009. Two additional companies, Menderes and Göksu were granted operating rights in the context of Law No. 3096 and were handed over to private companies outside the privatization program. Hence out of the 21 regional companies there were 18 left to be privatized.

Each of these distribution companies signed a TOR agreement with TEDAŞ and each obtained a distribution license and a retail sales license, as well as vesting contracts with EÜAŞ and TETAŞ.<sup>14</sup> The TOR was such that all of the existing assets as well as new assets to be created after the privatization would remain under the ownership of TEDAŞ. The investor would purchase the shares of the company that would own the rights to operate all distribution and related assets (such as buildings, vehicles, and machine parks) as well electricity distribution and retail licenses in the region. While there would be other companies in the region with retail licenses, the distribution company would be the only operator that holds a distribution license. The privatization would transfer 100% of the share of the company to the purchasing investor.

### 5.1.2 Tariffs Structures for Distribution and Retail Companies

The tariff structures under which the distribution companies would operate were determined as follows: the period 2006–2010 was identified as the “transition period”<sup>15</sup> at the end of which tariffs would become fully cost based. Because of delays in privatization, the transition period was later extended until the end of 2012.<sup>16</sup> During the transition period tariffs would entail various types of

<sup>14</sup> The following is drawn from Privatization Authority (2009).

<sup>15</sup> Through Law No. 5496, Article 6.

<sup>16</sup> As per Law No. 5784 enacted in 2008.

crosssubsidies across regions as well as consumer groups, through the application of a price equalization scheme. As a result, there was a single national tariff structure uniform across regions but differentiated according to consumer groups. The price equalization scheme was adopted to prevent large variations in technical losses and theft across regions (see Table 2.5) from resulting in large variations in end-user tariffs. As mentioned above, the EML had envisaged the use of direct income transfers to consumers to compensate for regional disparities in costs associated with losses and thefts, but the SD (and later Law No. 5496 adopted in 2006) introduced instead a price equalization scheme that entailed a cross subsidy mechanism. Accordingly, the application of a national tariff would generate surpluses and deficits for each distribution company, depending on their specific costs, especially theft, and losses. These surpluses and deficits would be cleared through financial transfers across regions. The cross subsidies and the price equalization scheme are supposed to be terminated by the end of the transition period.

The end-user tariffs and revenue requirements of the distribution companies for the duration of the transition period were already determined prior to privatization. Interestingly, while EML gave EPDK the exclusive authority to regulate tariffs, through an amendment to the Law introduced in 2006 EPDK was required to approve, without changes, tariff offers made by TEDAŞ for the “first implementation period” (i.e., 2006–2010).<sup>17</sup> Hence, effectively EPDK did not have the opportunity to scrutinize the tariff offers presented by TEDAŞ.

Revenue requirements cover projected expenses for distribution and retail services and provide an allowance for target level technical and “non-technical losses” (i.e., theft). As per the EML and the Electricity Market Tariff Regulation the end-user tariff is unbundled into four components: retail sales, retail services, distribution, and transmission. Since 2011, a component capturing the cost of technical and nontechnical losses has been unbundled as well. The retail sales tariff contained a price cap reflecting the cost of energy purchased by the distribution company. Retail services and distribution components have “revenue caps” that cover operating expenses and investment requirements related to distribution and retail services. Transmission tariffs are determined on a cost-plus basis.

The national tariffs approved for the first implementation period are given in Table 2.8. The following revisions could be made to these tariffs: (1) the revenue caps for 2006–2010 were to be adjusted for inflation through the Electricity Market Index announced by EPDK (or through the Consumer Price Index until the Electricity Market Index was available). Further, revenue caps are guaranteed irrespective of consumption levels; and (2) a pass-through mechanism was instituted according to which distribution company could reflect changes in its energy costs to the retail price cap. In fact in July 2008, the High Planning Council, adopted a “Cost-Based Pricing Mechanism” to be instituted by state-owned enterprises in the energy sector. According to this mechanism retail electricity tariffs set for the transition

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<sup>17</sup> Article 6 of Law No. 5496 enacted in 2006, adding provisional article 9 to the EML.

**Table 2.8** Transition period national tariffs (Turkish Kuruş)

	2006	2007	2008	2009	2010
Industrial MV	11.63	11.52	11.40	11.30	11.19
Industrial LV	11.63	11.63	11.63	11.63	11.63
Commercial	14.75	14.50	14.15	13.87	13.62
Residential	12.40	12.40	12.64	12.89	13.14
Agricultural irrigation	11.19	11.19	11.19	11.19	11.19
Lighting	11.97	12.00	12.04	12.07	12.10

Source Privatization Authority (2009)

period are to be adjusted every 3 months. Hence, actual tariffs have been higher than those depicted in Table 2.8 because of, for example, increases in gas prices.

The tariff structure was based on the logic of incentive regulation. Tariffs were based on specific theft and loss targets for each distribution company. Any improvements beyond target loss ratios could be appropriated by the company, hence the tariff structure entailed strong incentives to cut losses and thefts. There were additional sources of savings. In the construction of the regulated retail tariff, part of the energy purchases by the distribution company were priced through various reference prices. Hence, “The investor is allowed to retain the savings achieved through procuring energy at a lower cost than the regulated reference price.” (Privatization Authority 2009, p 10). Further, “the investor is allowed to retain excess value derived from outperforming the predetermined operational improvement targets approved by the Regulator” (ibid.)<sup>18</sup>

The extension of the transition period until the end of 2012 meant that the price equalization scheme and the energy sales agreements (see Sect. 5.1.4) were extended until the end of 2012 as well. In March 2010, the EPDK announced that for the purposes of regulation of tariffs, the “second implementation period” is determined as the period between January 1, 2011 and December 31, 2015. This time the procedure leading to the determination of tariffs for the second implementation period was managed by the EPDK. The second implementation period includes some aggressive targets. One of the important targets is to reduce national theft and losses to 10.3%. As shown in Table 2.9, for some distribution regions this means very substantial reductions in theft and losses (for example, from 46–22% for Vangölü and 60–30% for Dicle). Since regulated tariffs are determined on the basis of these targets, failure to reach the targets will mean financial losses.

An important issue that arises in this regard is the future of cross subsidies. For the time being, the termination of the transition period at the end of 2012 means that cross subsidies will be terminated and cross reflective tariffs will be implemented. However, variations in costs due to differences in loss ratios are still

<sup>18</sup> The teaser for the privatization prepared by the Privatization Authority (2009) argued that “at each distribution company, substantial operational efficiency improvement is achievable through optimizing core business processes, such as billing and collections, arranging and redesigning work flows, enabling effective coordination between divisions, improving information systems, and infrastructure and optimizing personnel productivity.”

**Table 2.9** Loss targets for distribution companies for the second implementation period

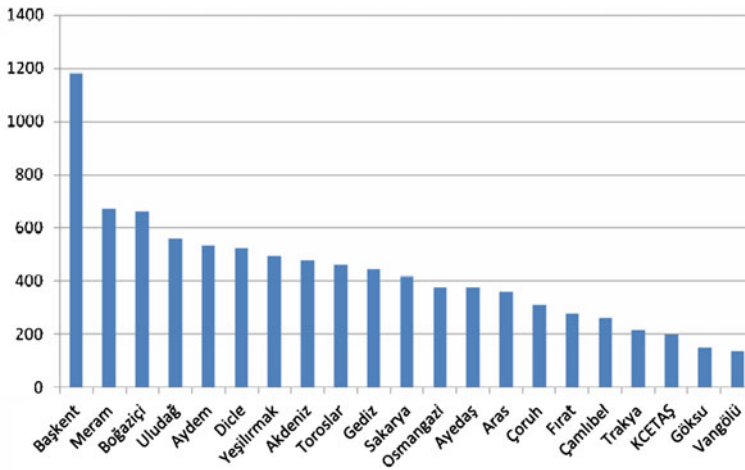
	2011	2012	2013	2014	2015
Akdeniz	8.86	8.45	8.05	8.02	8.02
Aras	22.92	19.04	17.62	16.30	15.08
AYDEM	9.80	9.34	8.90	8.49	8.09
AYEDAŞ	7.12	6.79	6.61	6.61	6.61
Başkent	8.46	8.07	7.88	7.88	7.88
Boğaziçi	9.12	8.69	8.28	7.90	7.57
Çamlıbel	7.72	7.36	7.02	6.92	6.92
Çoruh	10.90	10.39	10.15	10.15	10.15
Dicle	60.96	50.63	42.06	34.93	29.01
Fırat	12.59	11.65	11.11	10.59	10.09
Gediz	8.48	8.08	7.70	7.34	7.00
Göksu	10.03	10.03	10.03	10.03	10.03
Kayseri	10.01	10.01	10.01	10.01	10.01
Meram	8.59	8.28	8.28	8.28	8.28
Osmangazi	7.21	7.21	7.21	7.21	7.21
Sakarya	7.66	7.31	6.96	6.64	6.33
Toroslar	9.38	8.94	8.52	8.12	7.74
Trakya	7.70	7.70	7.70	7.70	7.70
Uludağ	6.96	6.90	6.90	6.90	6.90
Vangölü	46.15	38.33	31.84	26.45	21.97
Yeşilirmak	10.35	9.87	9.41	8.97	8.78

Source EPDK (2010)

substantial. Since it is unlikely that these differences in costs will be borne by consumers, it is expected that either some sort of support for consumers in high cost regions will be developed or the application of national tariff will be extended.

### 5.1.3 Investment Requirements

The investor that purchases the distribution company would also bear responsibility to undertake necessary investments. In fact, having private investors finance the required distribution system and network improvements and expansions and thereby remove the burden of such investments away from the state budget was identified as a key objective of privatization (Privatization Authority 2009, p 6). The costs of these investments are to be recovered through tariffs. Any portion of investments that is not recovered through tariffs will be paid by TEDAŞ to the



**Fig. 2.5** Distribution investments for 2011–2015 (million TL). *Source* EPDK (2010)

investor on the expiration or termination of the contract. The investment program and expenditures of the distribution companies are to be monitored by EPDK.

One indicator for the need for investments in the distribution system is the extent of outages experienced by businesses. According to the results of surveys carried by the World Bank, Turkish firms experience on average 4.1 power outages per month (World Bank Group 2009). This is more than twice the number of outages experienced in the EU-10 countries.

Investment requirements for the first implementation period (2006–2010) were already determined and their costs included in the end-user tariffs. In effect, for the period 2006–2009 actual investments in the distribution system (3.5 billion TL) was higher than originally committed (2.5 billion TL). For the second implementation period, a total of about 9 billion TL of investments have been approved by the EPDK. Figure 2.5 shows the distribution of investment plans across regions.

After the transition period, distribution companies will prepare annual investment plans and present them to EPDK for approval. EPDK is also authorized to monitor the implementation of investment plans.

#### 5.1.4 Vested Contracts for Distribution Companies

According to the SD, during the transition period distribution companies are to procure 85% of their estimated regional demand for electricity by noneligible consumers from TETAŞ and portfolio generation companies created out of EÜAŞ assets. Each distribution company has therefore been given Energy Sales Agreements (ESA) with TETAŞ and portfolio companies, which will remain valid until the end of 2012, the extended deadline for the transition period.

**Table 2.10** Privatization of distribution companies—status as of December 2011

Company	Date of Tender	Privatization High Council Decision	Date of Transfer of Operating Rights	Data date	Consumption (billed, MWh)	No. Subscribers	Purchase price (USD)
Başkent	01.07.2008	19.09.2008/57	28.01.2009	2008	11,161,478	3,078,870	1,225,000,000
Sakarya	01.07.2008	19.09.2008/58	11.02.2009	2008	8,760,455	1,307,982	600,000,000
Meram	25.09.2008	30.04.2009/16	30.10.2009	2008	5,858,905	1,530,509	440,000,000
Aras*	25.09.2008	-	-	2008	1,655,806	725,151	128,500,000
Osmangazi	06.11.2009	22.04.2010/16	31.05.2010	2009	4,846,186	1,311,267	485,000,000
Yeşilirmak	06.11.2009	07.06.2010/35	29.12.2010	2009	4,049,650	1,521,182	441,500,000
Çoruh	06.11.2009	07.06.2010/36	30.09.2010	2009	2,295,105	1,017,555	227,000,000
Çamlıbel	18.02.2010	26.07.2010/57	31.08.2010	2009	2,146,351	746,002	258,500,000
Vangözü	18.02.2010	01.11.2010/93	-	2009	1,300,787	408,620	100,100,000
Fırat	18.02.2010	01.10.2010/86	31.12.2010	2009	2,032,633	680,237	230,250,000
Uludağ	18.02.2010	24.06.2010/42	31.08.2010	2009	11,049,990	2,388,421	940,000,000
Boğaziçi	09.08.2010	11.04.2011/26	-	2009	18,434,621	3,954,871	2,990,000,000
Gediz **	09.08.2010	11.04.2011/28	-	2009	12,436,056	2,389,838	1,920,000,000
Trakya	09.08.2010	11.04.2011/29	-	2009	5,780,809	792,766	622,000,000
Dicle	09.08.2010	11.04.2011/27	-	2009	4,190,977	1,100,754	228,000,000
Ayedaş	07.12.2010	11.04.2011/31	-	2009	8,582,325	2,242,140	1,813,000,000
Toroslar	07.12.2010	11.04.2011/32	-	2009	14,538,958	2,742,119	2,075,000,000
Akdeniz	07.12.2010	11.04.2011/30	-	2009	5,927,658	1,550,026	1,165,000,000

\* Tender cancelled by the Council of State

\*\* Purchaser failed to carry out commitments

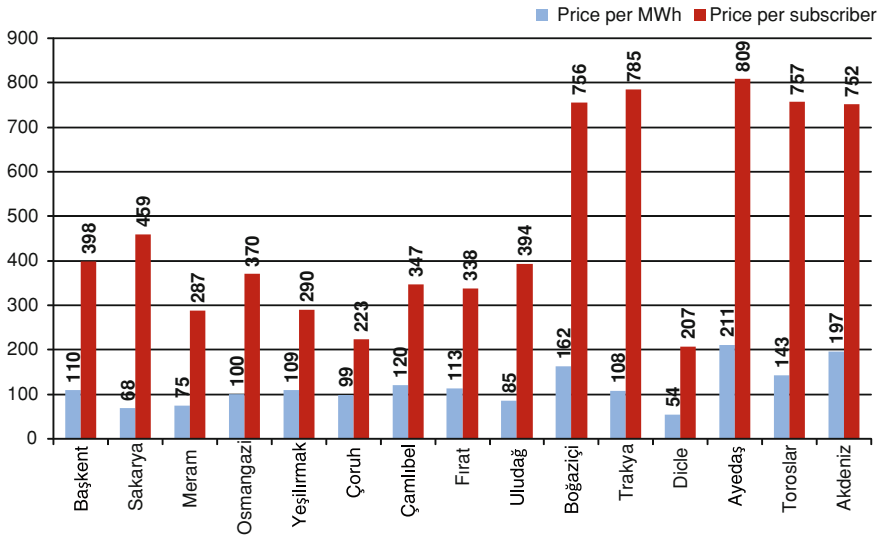
Source Kurna (2011) and authors' compilation

### 5.1.5 Outcomes of Privatization of Electricity Distribution

The privatization of distribution companies finally started to take place in 2008. The current situation is summarized in Table 2.10. The privatizations whose tenders took place in 2008 and 2009 were completed with the exception of Aras, whose tender was cancelled by the Council of State. The operating rights of these companies were transferred in the year following the tenders. However, Privatizations of 2010 were problematic. In many cases the parties who won the tender failed to put together the necessary financing or called off the purchase altogether. In such cases the Privatization Authority negotiates with the second or third highest bidders. As of December 2011, this process was still going on. The purchase prices depicted in Table 2.10 refer to prices offered by the highest bidder; actual prices that are realized as highest bidders are eliminated will likely be lower.<sup>19</sup> In the case of Gediz, there were only two bidders to start with. When they abdicated, the tender had to be cancelled.

Figure 2.6 provides some crude measures on the dispersion of prices offered during the tenders. Top offers are scaled by number of subscribers and annual

<sup>19</sup> It turns out the bids of the top three bidders are not that far apart, except for Bedaş, where the two top bids (1.813 and 1.812 billion USD, respectively) were substantially higher than the third and fourth highest bids (1.459 and 1.321 billion USD, respectively).



**Fig. 2.6** Highest bids per subscriber and MWh (USD). *Source* Table 2.11

consumption levels. Average bids per subscriber are especially high in Boğaziçi, Ayedaş, Toroslar, Trakya, and Akdeniz. This reflects the fact that consumptions per subscriber is high in these regions. Still, there are quite high variations in price per MWh, ranging from a low of \$50–70 in Dicle and Sakarya to \$211 in Ayedaş. There have been worries that in some cases the heat of competition has led investors to offer excessively high prices during privatization tenders, raising concerns about the financial viability of the companies.<sup>20</sup>

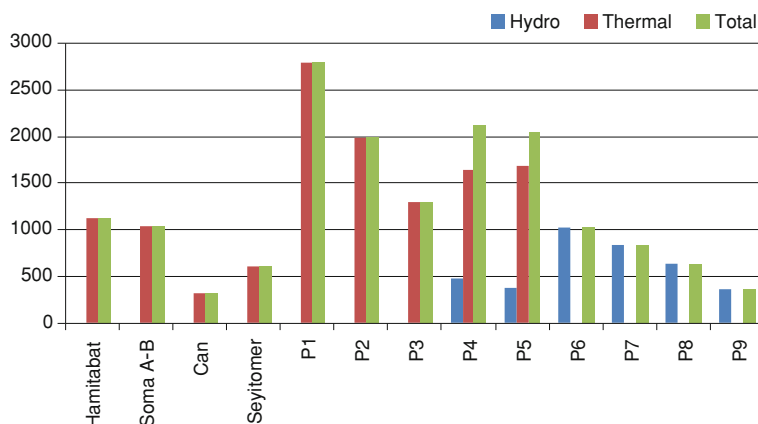
### 5.1.6 Privatization of Generation Companies

Preparations for the privatization of generation companies are under way. As of December 2011, a number of generation plants have already been privatized. ADÜAŞ (141 MW) was privatized in 2008. In 2009 tender process for 52 run-of-river hydroelectric plants have been started; these have been completed by 2011. The prices realized in these tenders have been quite high, creating worries about financial problems in the future (Deloitte 2010).

It has been decided that four plants will be privatized individually. In addition, 9 portfolio companies will be created. The capacities of the companies to be

<sup>20</sup> In reference to data presented in Fig. 2.7, note, again, that the privatization process for Boğaziçi, Trakya, Dicle, Ayedaş, Toroslar, Akdeniz, Vangölü have not been completed and the data may change.





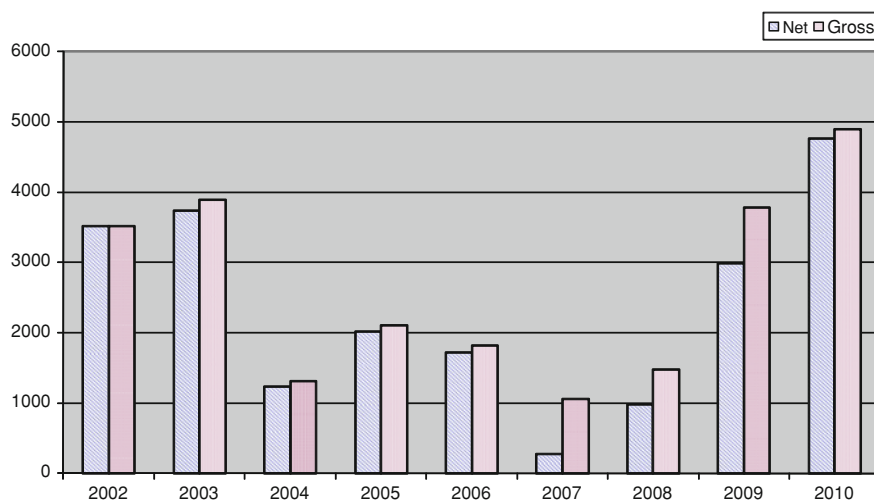
**Fig. 2.7** Installed capacities of generation portfolios scheduled for privatization. *Source* Deloitte (2010)

privatized range between 320 MW and 2,795 MW. The companies to be privatized are listed in Fig. 2.7.

### 5.1.7 Privatization: An Assessment

To summarize, then, 10 years after the adoption of the EML and 7 years after the publication of the SD, the privatization of distribution companies, which was the crucial step in the restructuring strategy, has still not been completed. Since, most potential efficiency gains from restructuring were contingent on progress with privatization, harvesting such efficiency gains has also been postponed. Delays in privatization have meant that so far progress with the development of competition has been limited.

Another important characteristic of the privatization process in electricity is that it has been revenue driven. The whole strategy of privatization has been to sell the assets to whoever is willing to pay the highest price. In the case of distribution assets, the price investors are willing to pay depend very closely on their expectations about the path of future regulated prices, which are not completely exogenous. One problem that may arise when auctions are designed in this way is that they may attract not necessarily the most efficient investor but rather investors who are more confident that they may influence the regulatory process. Another concern is that, irrespective of the particular characteristics of the investors, high prices paid for obtaining the assets may translate into higher tariffs for consumers ex-post despite declarations by the regulatory authority to the contrary. Hence higher prices may represent simply a form of taxation. In this regard, as discussed in detail in Chapter 3 the authorities have been more innovative in the privatization of gas distribution companies where they



**Fig. 2.8** New additions to capacity (MW). *Source* TEİAŞ

have attempted to select not investors willing to pay the highest price, but investors who were willing to provide services and undertake investments at lowest cost.

So far, the main benefit of the privatization process has been fiscal in nature. Given the nature of tariff regulation, one should expect significant improvements in losses and theft in the future. It remains to be seen the extent to which efficiency gains resulting from reductions in losses and theft are going to be translated into higher consumer welfare.

## 5.2 Private Investment Response

During the early years of the new regime the investment response of the private sector was extremely weak. Figure 2.8 shows a measure of investments, namely new additions to capacity. “Net” additions are calculated by subtracting from gross additions retirements of existing capacity or revisions to declared capacity. The EML was adopted in 2001, the new capacity that appears in 2002 and 2003 was mostly natural gas plants that were started to be built before the adoption of the law.<sup>21</sup> The figure shows that additions to capacity were very low until 2009, even though there was general expectation of rapid growth in demand. In fact, it is generally accepted that were it not for the crisis of 2008–2009, which reduced the growth of demand for electricity significantly during those years (see Fig. 2.1),

<sup>21</sup> Many of these plants are small auto-producers; there were some IPP and BO plants as well. Plants that were of more significant size were gas-fired and there was one plant based on imported coal.

Turkey was going to face significant capacity shortages and possibly blackouts by 2009 (Atiyas and Ferer 2007). This lack of investment response led the authorities to take additional precautions for resource adequacy (see Sect. 5.7). A closer look into the dynamics behind the lack of investment response is worthwhile.

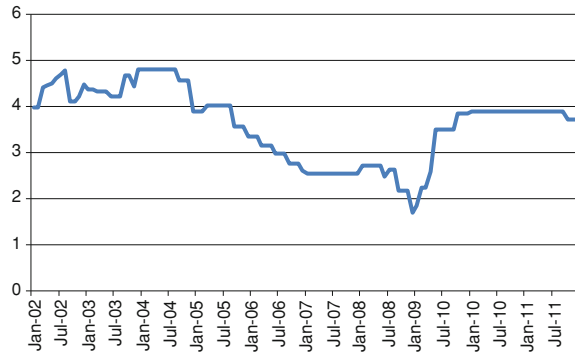
There were several reasons for the poor investment response. A significant delay in the privatization of distribution companies was one important reason. As mentioned above, the whole point of the specific sequencing adopted by the restructuring strategy (privatize distribution first and generation later) was to ensure that generators would face credible buyers. It was hoped that once under private management distribution companies would be willing to develop bilateral contracts with generators, and thereby encourage new entry. It was also hoped that such bilateral contracts would help new entrants in obtaining external finance. Public managers were not willing to develop contracts with private generators. The bad publicity of previous experience with BOT and BO contracts possibly had a hindering effect.

However, a more important problem had to do with distortions in or indeed absence of price signals that would provide incentives for new investments. Until the balancing market was launched in 2006, all the prices in the system were administratively determined. TETAŞ purchased power from EÜAŞ and from plants under existing BO and BOT contracts and determined a wholesale price on the basis of average costs. TEDAŞ bought electricity on the basis of that price and sold electricity basically at a price that presumably covered costs including losses.

In a market system, the price of electricity would be determined by the marginal cost of the marginal plant. In an environment of impending scarcity, one would expect that some (especially peak) prices would start to rise, providing signals for additional investment. In the Turkish case, these signals were absent until 2006.

Lack of prices that reflect the scarcity value of power even in the short run has created problems for existing private generators as well. Private generators in the market (autoproducers, autoproducer groups, and independent power producers) were competing with TEDAŞ for the patronage of eligible consumers and selling at a discount of 10–15%. Most private producers ran gas-fired plants. Starting in mid-2004 prices of natural gas supplied by BOTAŞ started to increase. At the same time, the government was unwilling to increase TEDAŞ retail prices. In fact, between June 2004 and August 2006 BOTAŞ gas prices increased by almost 60% while TEDAŞ retail prices remained constant. The consequence was that autoproducers and independent power plants were faced with a severe margin squeeze. This is captured in Fig. 2.9 which plots the ratio of retail TEDAŞ prices (tariffs for industrial consumers) to BOTAŞ gas prices for eligible consumers. The figure shows that while in 2002–2004 the TEDAŞ retail price was about 4–5 times the BOTAŞ gas price, toward the end of 2006 it was less than three times higher. Everything else constant, this implies a significant drop in the margins of private producers. Private producers complained that some prices determined by government agencies (such as those of power produced by EÜAŞ hydro-plants) were superficially low, reflecting a desire by the government to prevent increases in regulated retail prices. In 2006, the margin squeeze led some producers to

**Fig. 2.9** Ratio of TEDAŞ retail prices to gas cost.  
Source BOTAS, TEDAŞ

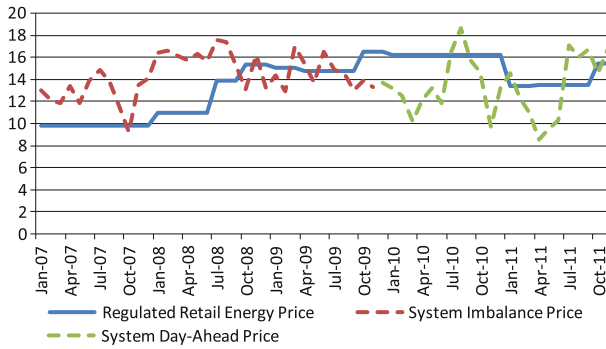


announce that they may start closing loss-making plants down. In the summer of 2006 there was a blackout that affected 13 provinces in Western Anatolia and the Aegean Coast. Finally, the balancing market was launched in August 2006. The balancing market produced prices that better reflected the scarcity prices of marginal generation capacity. As a result, most generators cancelled their bilateral contracts and started to sell to the balancing market. Note that as shown in Fig. 2.9 that ratio of regulated retail prices to gas prices continued to decline well into 2009, but this further decline became irrelevant for private electricity producers thanks to the availability of the balancing market.

Besides adverse movements in prices, however, the lack of investment response by the private sector reflected a lack of regulatory credibility as well. Given especially the seeming unwillingness of the government to adjust retail prices in response to what the private sector saw as rising costs, potential investors were not sure that fair or cost-reflective prices would be available in the future once new plants came on line.

Several explanations have been advanced for the government's unwillingness to raise prices. One explanation is that the government was worried that any increase in energy prices could have hurt the disinflation program that had successfully reduced inflation from over 50% in the early 2000s to 10–12% by 2006. Another hypothesis was that the government was not willing to raise prices before the elections of 2007 for fear that it could generate a loss of votes (Sevaioğlu 2007). Needless to say, failure to adjust prices to reflect costs created financial losses and led to accumulated debt and arrears among different state-owned energy enterprises. It has been reported that by the end of 2006 total debt of state-owned energy companies to BOTAS, including interest, was about 10.6 billion TL (about 6 billion Euros), of which about 8.7 (5 billion Euros) was by EÜAŞ.<sup>22</sup> EÜAŞ, in turn, had accumulated claims on TEDAŞ, etc. It was customary to issue special laws to clean those arrears.

<sup>22</sup> The daily Referans, 21.9.2007.



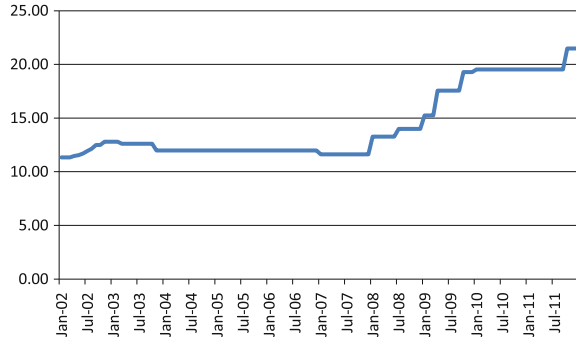
**Fig. 2.10** Regulated retail prices versus prices in the balancing market. *Source* TEİAŞ and TEDAŞ

However, the dynamics behind the lack of investment response points out to factors that go deeper than manipulation of the retail prices. Especially, during periods of relatively tight capacity (which was the case in 2005–2006) cost reflective regulated retail prices can often be lower than the marginal cost of marginal capacity. This is because regulated prices often reflect average costs of electricity purchased over plants with varying degrees of variable costs. By contrast, during periods of tight capacity, and under some sort of merit order, the marginal cost of marginal capacity would almost by definition reflect costs of more expensive plants. Hence in principle market design should be able to accommodate such situations. In other words, when there is unsatisfied demand and available capacity that can be used to meet that demand, market design should be able to ensure that such capacity is kept within the system even when it is more expensive than the average cost of inframarginal units. This is almost the definition of short-term supply security. If the expensive units could not sell to eligible consumers, then, as long as there is unsatisfied demand, they could have sold electricity to distribution companies. However, as described above, distribution companies were not willing to buy directly from private generators. If there had been a spot market, IPPs could sell to the wholesale market and distribution companies could have purchased anonymous electricity from the spot market. In the Turkish case there was no spot market either. The lesson seems to be that the institutional features of the market design at the time was so rigid that it did not allow any of these solutions. In effect when the balancing market was launched, it acted as a spot market.

In any case, Fig. 2.9 also shows that investment response has recovered after the launch of the balancing mechanism. Significant new capacity has been added in 2009 and 2010. The construction of at least some of these plants probably started after the launch of the balancing mechanism and appearance of prices significantly higher than TEDAŞ retail prices.

Figure 2.10 provides some idea about prices in the balancing markets and regulated retail prices. The “system imbalance price” and the “system day-ahead

**Fig. 2.11** TEDAŞ Industry tariffs (Kır/kWh)



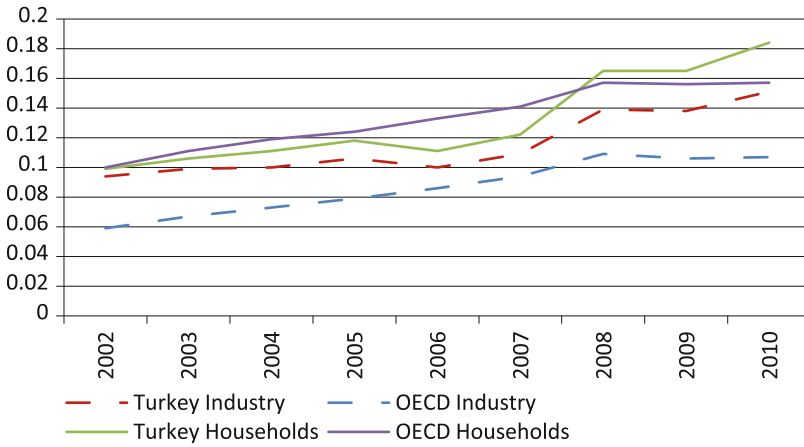
price” are prices established in the balancing market (the different names reflect the different periods in the evolution of the balancing market, see the discussion below). The regulated retail price refers to the retail price of energy provided by distribution companies before the addition of unbundled retail sale service, distribution, and transmission components. Hence this is a rough measure of the regulated price against which private generators compete. The figures show that especially in 2007 and 2008 the imbalance market has generated prices higher than regulated prices. This seems to have changed in 2010 and 2011, reflecting both the adjustments made to regulated retail prices and possibly the effect of additional capacity.

### 5.3 Tariffs

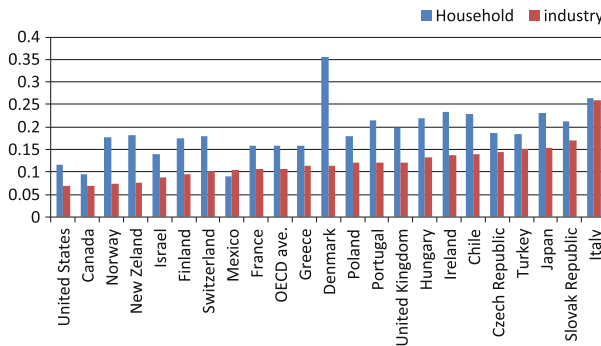
Figure 2.11 plots the national retail tariffs of distribution companies for industrial users. It shows how prices have been kept constant between 2003 and 2008 despite increases in gas costs. Electricity prices were raised by EPDK in January 2008 for the first time after almost 5 years. Prices almost doubled between 2008 and 2010.

The increase in prices after 2008 probably reflects a change in political attitude towards electricity prices, whereby political authorities must have finally realized the damage caused by keeping prices excessively low. Another important policy innovation undertaken in 2008 also reflects this change in attitude. To ensure that changes in fuel costs are reflected in tariffs, the High Planning Council accepted a cost-based pricing mechanism (CBPM) effective since July 2008.<sup>23</sup> The CBPM covers four main state economic enterprises in the energy industry (Turkish Coal Enterprises, BOTAŞ, EÜAŞ and TETAŞ) and 20 regional distribution companies. The mechanism requires BOTAŞ to adjust its tariffs on a monthly basis, whereas other companies are required to adjust their tariffs in January 1, April 1, July 1, and October 1. Accordingly, retail tariffs are also adjusted on a quarterly basis. It was hoped that such an automatic adjustment mechanism would eliminate politically induced manipulation of energy prices and add regulatory credibility to the privatization process.

<sup>23</sup> High Planning Council Decision No. 2008/T-5 dated 14.2.2008.



**Fig. 2.12** Industry and household electricity tariffs: Turkey versus OECD (USD/kWh). *Source* IEA (2011)



**Fig. 2.13** Household and Industry Electricity Prices in OECD countries (USD/kWh, 2010). *Source* IEA (2011)

Figure 2.12 provides data on the path of industry and household retail prices. Household prices in Turkey are close to (and recently a bit higher than) OECD averages whereas prices for industry are substantially higher.

Figure 2.13 shows household and industry electricity prices among members of the OECD, ranked according to industry prices. Again, Turkey has the 4th highest electricity price for industry, whereas household prices, while higher than the OECD average, is lower than a large number of countries. One should note that this situation may partly be reflecting taxes. According to the IEA (2011, p 47) tariff data are inclusive of nonrefundable taxes. In Turkey, taxes on electricity for industry are especially high (18.5%) relative to many OECD countries (only two countries have

higher taxes, Norway and Italy, and the OECD average is about 9%), whereas taxes on electricity for households (21.5% in Turkey) are close to OECD average (19.7%).<sup>24</sup>

### 5.4 Vertical Unbundling

Unbundling of transmission and distribution networks, the natural monopoly components of the electricity industry, from the potentially competitive segments of generation and retail supply is a significant component of any restructuring effort that has as its objective the creation of a competitive market. The main purpose of vertical unbundling is to prevent market foreclosure. The concern is that those who control naturally monopolistic network elements in the industry may prevent competitors in potentially competitive segments (generation and retail supply) from having nondiscriminatory access to the network. Even in cases where access tariffs are regulated, incumbent operators that control the transmission or distribution network may discriminate against competitors through non-price means. A recent sector inquiry undertaken by the European Commission has uncovered various forms of nonprice discrimination that incumbents utilize to foreclose markets to new competitors (European Commission 2007).

There are various forms of vertical unbundling. Accounting separation would require the vertically integrated entity to hold different accounts for its activities in the different segments of the industry. Legal unbundling would require activities in the different segments to be organized through separate legal entities (e.g., separate companies). This form of unbundling would still allow the separate legal entities to be owned by the same capital group or holding company. Accordingly, ownership unbundling is the strongest form of separation, whereby a capital group active in a network segment cannot have control over an entity in a different segment of the industry.

The 2009 Electricity directive of the EU<sup>25</sup> provides for different unbundling regimes for transmission and distribution networks. Regarding transmission, the original intention of the Commission was to achieve ownership unbundling both with respect to generation and retail supply. In the event, the directive ended up stipulating three different forms of unbundling, ownership unbundling being one of them.<sup>26</sup> The interesting question is whether in its current form TEİAŞ obeys the EU rules on unbundling given that both TEİAŞ and EUAŞ are state owned. European Commission's explanatory note on unbundling (2010) states that the rules on unbundling apply equally to private and public entities. It also states that two separate public bodies "should therefore be seen as two distinct persons and should be able to control generation and supply activities on the one hand and transmission activities on the other provided they are not under the common influence of another

<sup>24</sup> IEA (2011), pp 335 and 336.

<sup>25</sup> Directive 2009/72/EC 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC.

<sup>26</sup> See European Commission (2010) for an extensive discussion and clarification.



public entity in violation of the rules on ownership unbundling”. In other words, “the public bodies concerned must be truly separate”. It seems therefore that TEİAŞ can be considered to comply with ownership unbundling.

In the case of the distribution network, the EU electricity directive requires that in cases where the distribution company is part of a vertically integrated undertaking, it should be legally unbundled from other activities of the vertically integrated undertaking not related to distribution; in addition it should be “functionally unbundled” in order to ensure its independence from other activities of the vertically integrated undertaking. Functional unbundling requires “management separation”, that is, that persons responsible for the management of the distribution company do not participate in the day-day operation of other activities in the integrated structure, and that the distribution company has “effective decision rights”, for example, over the assets used in its operations. Furthermore, the distribution company is required to establish a compliance program, “which sets out measures taken to ensure that discriminatory conduct is excluded and to ensure that observance of this prohibition is adequately monitored” (European Commission 2010, p 26). The main purpose of a compliance program is to provide a formal framework for ensuring that the distribution company complies with the principle of nondiscrimination.

As already mentioned, the EML required accounting unbundling of all activities. In addition, the original version restricted distribution companies’ procurement of energy from affiliated generators to 20% of total consumption in the relevant distribution region. This restriction was removed in 2005 in an amendment to the EML.<sup>27</sup> This was largely seen as a step to increase the attractiveness of distribution companies to be privatized (Sevaioğlu 2005).

As a result of this amendment distribution companies could fully integrate into generation and retail supply, creating a seriously precarious situation with respect to competition. What changed the situation was an intervention by the Competition Authority during the privatization process. In Turkey, the privatization is regarded as a takeover and the Competition Board can intervene in the privatization process in two instances: first, under specific circumstances (such as if the entity to be privatized has market share above 20%) then an advance notification needs to be provided to the Competition Board before the tender is announced to the public, so that the Board can provide its views on the proper method of structuring the sale of the privatization assets. Second, to become legally effective, the privatization transaction requires a Board approval, in particular if an advance notification was necessary.<sup>28</sup> In its opinion regarding the privatization of distribution companies the Competition Board stated that the preferred option for ensuring competition was ownership separation between

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<sup>27</sup> Law No. 5398, July 2005. An important restriction imposed on the distribution company was that the price of the electricity purchased from its subsidiary or affiliated companies could not be higher than the country average wholesale electricity price. This price is determined by EPDK and has been set equal to the average price established in the day-ahead market.

<sup>28</sup> See Atiyas (2009) for a discussion.

distribution and retail supply. Short of that, at a minimum the tender documents should state that distribution activities will be required to be legally separated from retail supply by the end of the transition period. The Board also stated that the strategy for distribution privatization has predominantly taken into consideration issues of security of supply and encouragement of foreign investments, but has insufficiently considered the institution of competition and protection of consumers. The Competition Authority did not specify any conditions regarding unbundling between distribution and generation, presumably because vertical integration was specifically allowed by the 2005 amendment to the EML.<sup>29</sup> This intervention by the Competition Authority proved effective and presently, as per an amendment to EML introduced in 2008, distribution companies are required to move any generation and retail supply activities into separate legal entities by January 1, 2013.<sup>30</sup>

While the 2008 amendment is a significant improvement, it is not clear that legal unbundling is sufficient to ensure nondiscriminatory access to the distribution network. The remedy falls short of the EU approach since it does not specify conditions for functional separation and any form of a compliance program.

## ***5.5 Development of the Wholesale Market***

### **5.5.1 Evolution of the Balancing Market**

The first version of the balancing and settlement regulation (BSR) was actually first adopted in November 2004. This was seen as a step towards a more complete wholesale market and was called “Temporary” (T-BSR). Under the T-BSR, the financial settlement of transactions implemented to maintain the physical balance of the system was carried out through bid and offer prices proposed by TETAŞ and approved by EPDK.

The balancing market started operations in August 2006, as an emergency response to a blackout that covered western Turkey. The basic principle behind the mechanism was that the results of the balancing mechanism were to be settled together with the quantities of bilateral contracts. The system worked as follows (EPDK 2010): participants prepared their daily production programs. They submitted offers for producing above (“up-regulation”) and below (“down-regulation”) their production programs. The offers were accepted by the National Load Dispatch Center (MYTM) with a view to keep the system in balance. Payments related to accepted offers and imbalances between accepted offers and actual values of energy injection and withdrawal were settled by the Market Financial Settlement Center

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<sup>29</sup> Competition Authority (2005). Competition Authority (n.d.) provides the internal report that provided the basis for the Board Decision.

<sup>30</sup> Law No. 5784 of July 2008.

(MFSC) at the end of each month. The accepted offers produced hourly system marginal prices (SMP). The system imbalance prices (SIP) were calculated as averages of the SMP for three periods: night, day, and peak. Financial settlements were carried out using the SIPs.

The workings of the balancing market were changed through the adoption of the so-called “final” Balancing and Settlement Regulation (F-BSR) in April 2009, effective since December 2009. Through this regulation, day-ahead balancing was separated from real-time balancing. Day-ahead balancing would take place in the Day-Ahead Market and real-time balancing would take place in the Balancing Power Market. The Day-Ahead Market was to be preceded by a preparatory period called Day-Ahead Planning. The Day-Ahead Market was to be launched in May 2011 and it has started operations after some delay in December 2011.

It is envisaged that most of the balancing activities are undertaken in the Day-Ahead Market and that imbalances arising in real time are dealt with in the Balancing Power Market. The planning market works as follows: the system operator presents system constraints and demand forecasts. Each market participant presents demand forecast, the daily production program, bilateral contracts, upregulation and downregulation price offers. The system operator determines System Day-Ahead Prices (SDAP), and delivers to the participants instructions to produce above or below program. Settlement for transactions in the Day-Ahead Market is done through the SDAP on an hourly basis (whereas under the F-BSR there were only three time periods).

The purpose of the Balancing Power Market is to eliminate in real time imbalances time that may arise, for example, because of unexpected changes in consumption or unexpected plant failures. Real-time balancing are activities performed by the MYTM. These activities include increase of the productions of the balancing units through acceptance of the upregulation offers; reduction of the productions of the balancing units through acceptance of the downregulation offers and thereby procurement of the tertiary reserve necessary for frequency control. In the real-time balancing markets each participant delivers a production program and price offers to produce above or below program. The SMP is determined as the highest accepted upregulation or lowest accepted downregulation bid. SMP is used for settlement of transactions in the Balancing Power Market.

An important innovation introduced with the Day-Ahead Market is more active participation by the demand side. In the Day-Ahead-Planning system, consumers had to declare consumption levels irrespective of prices. Under the Day-Ahead Market, consumers may bid schedules that are sensitive to prices; hence, the Day-Ahead Market will involve more active participation of the demand side (Deloitte 2009; Ongün 2011). Another important change introduced through the Day-Ahead Market is the possibility of market splitting and zonal pricing.<sup>31</sup> The F-BSR authorizes the system operator to undertake necessary studies to determine long term, large scale and enduring possible congestions in the transmission system,

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<sup>31</sup> See Kölmek (2011) for a discussion.

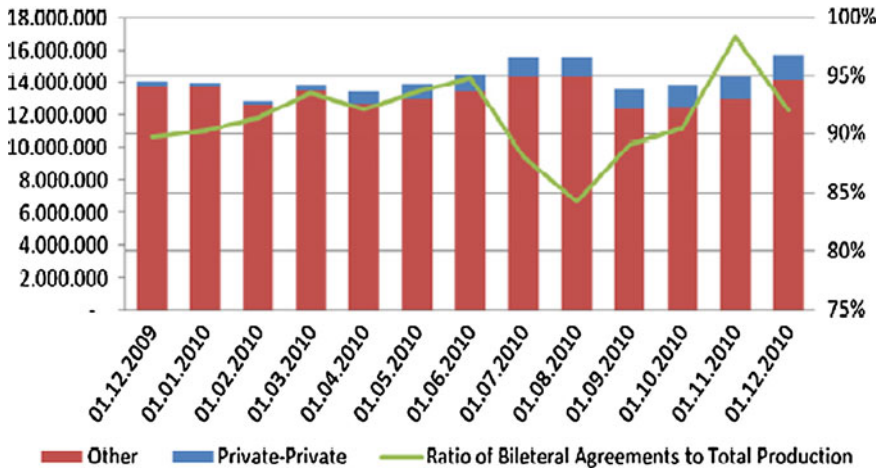


Fig. 2.14 Volume of bilateral contracts (MWh). Source EPDK (2010)

and to divide the national electricity system into trade zones. It is hoped that market splitting and zonal pricing will provide better signals for the location of generation plants and transmission investments. The regulation that will govern the implementation of zonal pricing has not been issued as of December 2011.

### 5.5.2 Evolution of the Bilateral Contracts Market

The evolution of the balancing market and improvements that have been achieved over time is a significant accomplishment of the restructuring process. It has played a crucial role in generating price signals that more closely reflect the scarcity value of electricity and in attracting private investment into the industry. At the same time, however, the balancing market started to operate as a wholesale market rather than a balancing market per-se. In response to the opening of the balancing market in August 2006, most independent power producers have terminated their bilateral contracts and have sold their electricity to the balancing market instead. Hence, while in a bilateral markets model it is expected that a small portion (say 10–15%) of electricity would be traded for balancing purposes, the balancing market in Turkey has attracted almost all electricity supplied by private competitive generators. In effect, the balancing market has been operating more like a spot market for electricity.

As a result the market for *private* bilateral contracts, say between eligible consumers and independent generators, has remained underdeveloped. Figure 2.14 shows the evolution of the bilateral contracts market in 2010. The total volume of bilateral contracts is about 14 TWh. However, only about 10% of this entails

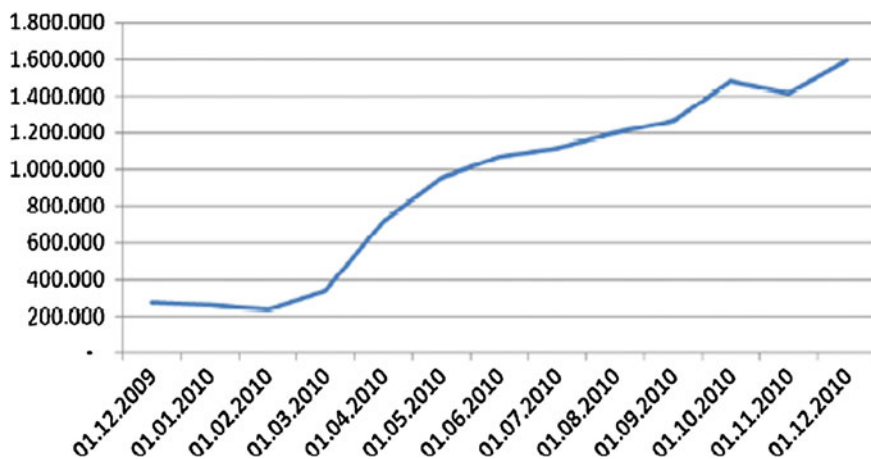


Fig. 2.15 Volume of private-to-private bilateral contracts (MWh)

contracts where both parties are private persons (see also Fig. 2.15), though this ratio is increasing. One advantage of bilateral contracts is that it provides a hedge against volatility of spot prices. One would expect that as players in the market learn about this property of bilateral contracts and as trust builds over time, the attractiveness of such contracts for independent generators and eligible consumers should increase.

## 5.6 Competition Issues

It is well known that wholesale electricity markets are especially susceptible to problems of unilateral exercise of market power, much more so than markets for other goods and services.<sup>32</sup> In most markets problems of unilateral market power are closely related to the degree of concentration. In electricity markets, the possibility of capacity constraints creates conditions, whereby a generator may be able to raise prices by reducing output or withdrawing capacity even when its market share is not high by traditional standards. Incidents where exercise of such market power has contributed to increase in prices during periods of high demand have been extensively reported in the literature. Given that the price elasticity of electricity demand is often low, higher prices often do not translate to high deadweight losses. However, price spikes do generate large redistributions of wealth among the players in electricity markets, including possibly from consumers to producers or traders. In many jurisdictions ex-post application of

<sup>32</sup> See, for example, Borenstein and Bushnell (2000); OECD (2003); Garcia and Reitzes (2007) and Wolak (2005).

competition law is not seen as a sufficient weapon against unilateral exercise of market power, if anything because investigations under competition law often take a long time. Additional remedies, often of ex-ante nature, are implemented. Such remedies range from restraints on generation behavior regarding bids or capacity actions, to transparency rules. At the very least, special effort is devoted to monitor market developments and take precautions if there are developments in the market that may facilitate unilateral exercise of market power (Garcia and Reitzes 2007).

The problem of unilateral exercise of market power has not become an issue in the Turkish context yet. However, the privatization of generation companies is going to make a significant change in the market environment. EÜAŞ has not been behaving as a profit maximizing generator. If anything, EÜAŞ assets have been used to keep electricity prices low, or to moderate their increases. With privatization, these assets are going to be managed by profit maximizing entities, with every incentive to use market power if possible. So far there have been no preparations to deal with market power issues that may arise. At the very least, either the Ministry, or EPDK or TEİAŞ should undertake periodical studies about whether transmission constraints are likely to arise in the next few years. If that is the case, then the nature of proper remedies may be discussed.

### ***5.7 Resource Adequacy***

The lack of investment response by the private sector and the blackout of 2006 has raised resource adequacy as a major concern. Law No. 5784 introduced a number of amendments to the EML to address the resource adequacy problem. The changes require the Ministry to prepare a report on electricity supply security every year. They authorize TEİAŞ to open bids to have energy plants established or to rent capacity from existing generation plants under the auxiliary service agreements to meet regional system needs. Distribution companies and suppliers which meet the demands of eligible consumers are required to inform EPDK about supply resources they are going to use to meet demand (in the case of distribution companies the reports have to cover the next 5 years). In addition, the law provided a tender mechanism to address resource adequacy issues: the council of ministers may announce a tender if energy investments are not sufficient to meet demand. If the Ministry determines that the tender process is not adequate to meet energy demand, the council of ministers may authorize EUAŞ to build electricity generation plants.

The amendment also mentions the establishment of capacity mechanisms. In fact it required the Ministry to prepare a regulation regarding procedures to be followed for the establishments of capacity mechanisms within 6 months of the publication of the law (i.e., by January 2009) but this has not been done. It seems the authorities' perceptions about the urgency of capacity mechanisms have been diminished because of the increase in private sector investments and the recession that Turkey went through in 2008–2009. Even though there were some studies undertaken for the authorities, they have not been made public.

## 5.8 Prospects for Retail Supply

By the end of 2012, distribution companies holding retail licenses will have to organize retail activities under separate legal entities. The purpose of this legal separation is to help develop competition in the retail supply market. Accordingly, the threshold for eligible consumers has been reduced continuously over time down to 30 MWh in 2011. That means that consumers representing about 75% of total consumption are eligible to choose their suppliers (Camadan 2011). The actual level of consumption of eligible consumers who have used their rights to switch suppliers to total consumption is lower, representing about 18% of total consumption in 2010 (EPDK 2010a, p 74). The degree of statutory market opening is planned to reach 100% in 2015 (Camadan 2011).

The degree to which competition in the retail supply market can develop is an issue where there is less agreement relative to other dimensions of electricity restructuring.

Table 2.11 reports one of the most widely used statistics to measure the degree of effective competition in the retail supply market, namely the ratio of customers that switch from the incumbent to new suppliers. The numbers are discouraging, even for large industrial consumers. In Great Britain, the frontrunner in market opening, the switching ratio among small business and households is less than 20%.

International experience seems to suggest that retail supply may generate higher efficiency gains when real-time pricing is possible at the retail level. This would require a more advanced technological infrastructure, including the installation of smart meters. Smart metering would make it possible for consumers to respond to fluctuations in wholesale prices. This, in turn, would create margins for new products and services that can be provided by competitive retail suppliers (Joskow 2000). In principle, retailers may provide a variety of contracts that can be selected by consumers with different degrees of potential for risk taking, ability to switch consumption over hours of the day, etc. But the challenge for retail competition remains to be the lack of interest on the part of small consumers (households and small commercial) in managing their daily use of electricity. Smart in-home devices, programmable thermostats, online management of home appliances, smart phone applications are technologies that can help, especially with younger generations. Better yet is the remote control of key appliances such as refrigerators and air conditioners by system operators but this raises privacy issues. Overall, the evidence for retail competition based on real-time pricing is weak for small consumers.

An important issue to consider in this regard is whether any regulation of retail prices should continue after full market opening. The problem is that regulated prices are often seen as an impediment to the development of competition in the retail markets.<sup>33</sup> When regulated tariffs are too low relative to spot prices, eligible

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<sup>33</sup> The Sector Inquiry of the European Commission (2007) states: "Regulated retail tariffs can have highly distortive effects and in certain cases pre-empt the creation of liberalised markets" (p 14).

**Table 2.11** Customer switching rates in the European Union (% , 2009)

	All Retail Market	Large Industry	Medium Industry	Ssmall industry and household
Austria	1.3	8.3	7.9	1.3
Belgium	6.9	NA	NA	NA
Bulgaria	0.004	37	0.008	0
Cyprus	0	0	0	0
Czech	1.5	73	22	1.5
Denmark	6.2	NA	16.5	6.1
Estonia	NA	NA	NA	0
Finland	8.1	NA	NA	NA
France	3.4	NA	NA	3.6
Germany	4.8	15.6	5.9	4.7
Great Britain	NA	NA	NA	18.4
Greece	0.03	0	5.15	0.03
Hungary	NA	NA	NA	NA
Ireland	20.5	16.8	38.53	20.39
Italy	4.5	25.7	37.3	12.2
Latvia	0.01	0	0.5	0
Lithuania	0	0	0	0
Luxembourg	0.2	3.3	0.46	0.17
Malta	0	0	0	0
Northern Ireland	0.75	3	14	10
Norway	8.1	NAP	7.9	8.1
Poland	NA	NA	NA	NA
Portugal	2.3	32.7	24.6	2.2
Romania	0.013	13.32	4.17	0.004
Slovak	0.9	NA	NA	0.88
Slovenia	1.4	0	5.7	1.4
Spain	NA	NA	NA	NA
Sweden	11.2	10	10	11.4
The Netherlands	11	NA	NA	11

Source European Commission (2010b)

consumers may prefer to remain with (the retail arms of) incumbent distribution companies which may in turn make competitive entry into the retail supply industry difficult. In fact, as reported by Camadan (2011) in the Turkish case whether such a



“supplier of last resort” will remain after market opening is not clear. Given bleak prospects for the development of retail supply for many residential consumers, the authorities will likely choose to retain a supplier of last resort for some time, and this will likely be the incumbent distribution company or its retail arm.

The position of the European Regulator’s Group for Electricity and Gas is that regulation of end-user prices should be terminated and that protection of vulnerable consumers does not require the regulation of end-user prices (ERGEG 2007). This is possibly correct, but if the prospect of retail competition is high. Hence, it seems the question of whether or how long retail price regulation should continue also is closely connected to measures that would help develop competition in the retail markets. Again, looking ahead, installation of smart meters is one potential measure that needs to be seriously considered. In addition to that, measures and services to increase consumer information and awareness are also likely to be very important.

### ***5.9 Distributional Concerns***

The development of competition, elimination of cross subsidies, reductions in illegal use and establishment of cost-reflective tariffs are all likely to have significant distributive consequences. Realignment of prices may have strongest effects on households with low incomes. Based on the 2003 Household Expenditure Survey of Turkey, Bağdadioğlu et al. (2007) show that households in the decile with the lowest income spend an average of nearly 50% of their income on electricity. For the highest income group, this ratio is about 4%. The authors recognize that the very high ratio for the lowest income group “may arise because low income households generate a significant part of their income in kind rather than money, so that any money expenditure appears as a very high proportion of (money) income.” Still, it is clear that changes in prices are likely to have a much greater impact on low income than on high-income households.

It is also likely that illegal use is more widespread among poorer households. Bağdadioğlu et al. (2007) show that a larger share of households reporting no expenditures live in provinces with high network losses, and also that amongst the lowest decile of households 50% of households reported no expenditure on electricity, while the corresponding proportion for the richest decile is only 17%. Hence, reductions in illegal use would impact disproportionately low-income households.

Another dimension of the problem has to do with rebalancing of tariffs among different consumer groups, especially among industry and households. Data from IEA (2011) reveals that the ratio of electricity tariffs for households to tariffs for industry are much lower in Turkey relative to OECD averages. At the start of the restructuring process in 2002, this ratio was 1.0 for Turkey whereas it was 2.0 on average for European OECD members and 1.7 for all OECD. By 2010 the ratio improved for Turkey somewhat, reaching a ratio of 1.2. However, it is still one of the lowest among OECD countries and significantly lower than OECD averages (1.5 for all OECD countries). Hence one should expect further increases in tariffs

paid by households relative to those paid by industry. In fact, Bağdadioğlu et al. (2007) conduct an experiment to evaluate the consequences of increasing the ratio of industry to household prices to OECD average and find that while the impact of such a change on electricity expenditures increases with income, the impact as a proportion of disposable income decreases with household income, from about 5.5% for the lowest income household to less than 1% for the richest decile. The introduction of a fixed fee, representing fixed cost of retail services, is also likely to have regressive effects.

Distributional effects of electricity restructuring often also entails considerations of access. This is less of a problem in Turkey as an overwhelming majority of households are already connected to the network. Hence, the main channel through which distributional effects are likely to register is through changes in tariffs.

All of this suggests that the restructuring process needs to be supplemented by a policy to address issues of affordability and distributional consequences. This is also important to maintain the political viability of the restructuring program, and to reduce political incentives to manipulate prices, as TEDAŞ prices were before they were adjusted after 2008. The EML was cognizant of the possible need to address these concerns, as it envisaged that in cases where support for consumers were needed, this should be carried out through direct income transfers. However, no additional work has been undertaken in this area. Affordability of energy among low-income households and likely adverse distributional consequences of restructuring represent priority areas that need to be addressed.

### ***5.10 Institutional Issues***

The performance of a regulatory regime is generally believed to depend both on the general design of the restructuring program, the quality of regulations and their implementation, and on the institutional characteristics of the way the process is governed. The history of economic governance in Turkey has not been exemplary in that regard. Even the enactment of the EML has often been criticized by various stakeholders, including the bureaucracy, for not having been prepared in a participatory manner and for having been adopted without adequate public consultation. Throughout the 1990s privatization efforts have been conducted in a manner that attempted to bypass the legislature and centralize discretionary authority in the executive in a nontransparent way and many such initiatives were cancelled by the constitutional court (Atiyas 2009). Initially, BOT projects were granted without any transparent and competitive tender mechanisms, raising concerns about favoritism. There have been improvements in the 2000s, but there are a number of issues that still need to be highlighted.

Turkey would benefit from a clearly articulated and cohesive long-term energy strategy that is the product of a participatory process that includes various shareholders such as universities, consumer groups, professional associations, and the private sector. Governmental agencies including the ETKB and EPDK have

various strategic documents but, although useful, these are bureaucratic documents that have not resulted from a stakeholder process, have not benefited from public consultation and more importantly do not present and discuss alternative options and tradeoffs. Similarly, much more effort needs to be spent on the evaluation of the impact of policies and regulations adopted. The Electricity Market Report of EPDK (2010) is an important step forward in this regard. Impact evaluations should go beyond descriptive analysis of the evolution of regulations and markets and evaluate the effect of developments on targeted outcomes. To give an example, the authorities have so far not undertaken a critical analysis of why bilateral markets have not developed as expected and why the balancing market is acting like a pool.

An important shortcoming has to do with the fact that EPDK regulations and decisions are published without justifications. Requiring regulatory authorities to provide justifications for their decisions is an important tool that improves transparency and accountability and provides a source of discipline that increases the quality of regulations. A good example in this regard is the Competition Authority: the law that founded the Competition Authority required that the decisions of its Board be published both with a justification and with a summary of the internal report that provides the analytical background to the decisions. Recently, the Information Technologies and Communication Authority, the regulatory agency overseeing electronic communications markets, has also been required to provide justifications for the decisions of its governing board.

Similarly, the exact methodologies used for the more technical aspects of the regulations are not made public. For example, the EPDK has not disclosed what sort of an approach it used to calculate the target loss ratios for the 2011–2015 period to the public. The calculations behind the determination of other key parameters in tariff regulations are also not public. Making these methodologies open to public scrutiny would represent an immense step towards transparency and accountability.

By contrast, the public consultation process especially as regards to EPDK regulations and some of the decisions of its Board seems to be working: draft regulations or decisions are published to solicit comments. However, comments provided by different parties are not disclosed. Making these comments publicly available would also enhance transparency.

Another important issue has to do with appointments to the Board of the EPDK. Regulatory credibility requires that Board members are not under political influence when they perform their duties. There is no universally agreed on methodology for appointments that would ensure such political independence. In the case of the EPDK, Board members are appointed by the Council of Ministers. Political independence of the Board may be enhanced if appointments are made in a more transparent and accountable way. For example, there may be hearings in the parliament that would give members of parliament a chance to question the candidates. The ultimate authority to appoint would still remain by the Council of Ministers, but such hearings may provide incentives to the government to make their appointments more merit based.

The government recently passed a new “decree with the force of law”<sup>34</sup> which gives ministries the authority to “inspect” the activities of regulatory authorities associated with them. While the clause does not give ministries authority to change or overturn the decisions of the regulatory authorities, or intervene in their management, it does give ministries the ability to harass agencies by subjecting them to inspections. As of December 2011, there have been no examples of exercise of such inspection authority, but the move by the government has been interpreted by the press as a step towards reducing the independence of the regulatory authorities.

## 6 Electricity Restructuring: An Assessment

The results of the Turkish experience with restructuring in the electricity industry are mixed. On the one hand, the legal environment and the organization of the industry have changed in fundamental ways. Significant progress has been achieved in establishing a balancing market that can provide much more correct signals about the scarcity price of electricity. The establishment of the balancing market was also instrumental in attracting new private investment into the industry. In that sense, to the extent that the purpose of restructuring was to relieve the state budget of the burden of electricity investments, one should admit a degree of success. In effect, compared to the 1990s, the new model has been successful in attracting private investment for distribution privatization under competitive conditions, without granting any concessions, subsidies, or government guarantees.

However, the main purpose of restructuring ought to be efficiency gains and increases in consumer welfare. The fundamental means of achieving these objectives are through the development of competition in generation. In that regard, after 11 years of the enactment of the EML and after 7 years of adoption of the SD, one has to admit that so far little has been achieved. True, in the special case of Turkey high losses and theft in the distribution system provided another important source of efficiency gains and the targets set by the EPDK for the 2011–2015 period seem quite aggressive. But that does not change the fact that these efficiency gains are significantly delayed. More importantly, the degree of competition in generation is still very modest and restricted to about a quarter of generation.

The primary reason for this delay is rooted in the fact that the driver of the restructuring process has been privatization, not competition. In addition, privatization itself was driven by the quest of maximizing privatization revenues. An alternative strategy could have been to identify competition as the main driver of the restructuring process. That would have required horizontal breakup and corporatization of generation assets, mandating them with competitive behavior and their privatization if necessary. Competition has less to do with efficiency gains in

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<sup>34</sup> A Decree with the Force of Law is basically a law that is enacted by the Council of Ministers rather than the Parliament. Such decrees are based on “authorizing laws” which have been enacted by the Parliament.

the distribution system and these could in principle be achieved under state ownership, through improvement in their management, and corporatization. The Turkish authorities must have thought that reform of public management was more difficult than privatization, but in hindsight, given the difficulties faced in and slow progress of privatization, it is not clear that this was indeed the case. The alternative strategy could have been inspired by Scandinavian countries, especially Norway and Sweden, where state ownership has been extensive but nevertheless substantial success has been achieved in developing competition.<sup>35</sup>

Looking ahead, the degree of reduction in the losses of the distribution system will provide the first true test of the Turkish model. In the meantime, competition in generation can be achieved in a faster manner if the portfolio companies currently being established are quickly corporatized, put under competent management are given a mandate to behave in an independent and competitive manner in the market. Listing these corporations in the stock exchange would result in a major improvement in transparency.

While there has been significant progress in terms of market design, there are some remaining issues that need to be addressed. Regarding resource adequacy, the authorities should undertake a study to see whether the current measures are sufficient or whether instead of burdening EÜAŞ with the task of closing the gap of reserve capacity, a capacity mechanism should be instituted instead. Even though exercise of market power has not yet posed a major problem in the restructuring process, this may potentially become an issue especially once generation assets are privatized. It would be better to examine ahead of time whether in generation and transmission conditions are likely to generate such competition problems, and take remedial action if necessary, rather than wait and act after the occurrence of incidents of exercise of market power.

Turkey is a country where distribution of income is highly unequal. Moreover, inequality of income distribution has significant regional dimensions. Hence there are large number of households who experience problems of affordability and energy poverty. This is likely to present political incentives to manipulate and distort energy prices. The current implementation of national tariffs and the regional cross subsidies it entails are good examples of inefficient outcomes that such incentives may produce. A better approach is to develop a policy that targets energy poverty and affordability issues directly.

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<sup>35</sup> See, for example, Amundsen and Bergman (2006).

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Reforming Turkish Energy Markets  
Political Economy, Regulation and Competition in the  
Search for Energy Policy  
Atiyas, I.; Cetin, T.; Gulen, G.  
2012, X, 182 p., Hardcover  
ISBN: 978-1-4614-0289-3