

**TURKISH ELECTRICITY TRANSMISSION CORPORATION
RESEARCH PLANNING AND COORDINATION DEPARTMENT**

**TURKISH ELECTRICAL ENERGY
10-YEAR GENERATION CAPACITY PROJECTION
(2008 – 2017)**

JULY 2008

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I. INTRODUCTION

This report has been prepared by Turkish Electricity Transmission Corporation (TEİAŞ) according to the authorization on preparing 10-Year Generation Capacity Projection and submitting for approval of Energy Market Regulatory Authority (EPDK) within the framework of the Electricity Market Law (EPK) No: 4628 and the Grid Code to guide the market participants by using demand projections estimated by Ministry of Energy and Natural Resources (ETKB).

Electricity demand forecasts to be used for Generation Capacity Projection should be estimated by distribution companies. But, since the demand projections have not been completed yet by distribution companies, according to the temporary article of the Grid Code, Base Demand and Low Demand series which are occurred from the study results on May 2008 of MAED Model used by Ministry of Energy and Natural Resources (ETKB) are used in this study.

The study period for the Generation Capacity Projection is 10 years and it covers the period from 2008 to 2017. Supply-Demand Balance in terms of capacity and energy and based on two demand series is calculated by considering existing power plants, projects which are currently under construction and new projects granted by licence foresighted to be in operation between years 2008 and 2013 which are prepared as two different scenarios (Scenario 1 and Scenario 2) according to “the Progress Reports of January 2008” by EPDK. Related data to the project (average) and firm values for the next 10 years are obtained from Electricity Generation Corporation (EÜAŞ), Turkish Electricity Trade and Contracting Corporation (TETAŞ) and General Directorate of State Hydraulic Works (DSİ) for existing and under construction thermal power plants and hydro power plants. Data for new projects granted by licence by end of December 2007 are get from EPDK and these data have been updated according to “the Progress Report of January 2008” published by EPDK. While calculating generation capacities, average generating values of hydro power plants under normal hydrologic conditions and firm generating values of hydro power plants under dry hydro conditions are considered separately and Supply-Demand Balances together with energy reserves are calculated for both demand series (Case 1 and Case 2) and for both scenarios prepared by EPDK and related to the new projects foresighted to be in operation in this period (Scenario 1 and Scenario 2), and then results are submitted in this report as Result I-A, Result I-B and Result II-A, Result II-B.

In the report, it is investigated how to meet both demand series according to:

- Existing plants,
- Existing plants - under construction state owned plants
- Existing plants - under construction state owned plants - licensed of private sector plants as of December 2007 and expected to be commissioned on planned dates and prepared as two different scenarios in accordance with “the Progress Reports of January 2008”.
- Existing plants - under construction state owned plants - licensed of private sector plants which are expected to be in service on planned dates - new additional capacities.

as of the end of 2007 for Turkish Electricity System.

New additional capacities classified as Hydro, Thermal and Renewables are quoted from the Generation Expansion Planning Report carried out by TEİAŞ on behalf of ETKB and published on the official web site of TEİAŞ in November 2004.

In this capacity projection study covering the period 2008-2017, it is analyzed how to meet the demand safely, i.e. with a suitable reserve, by taking into account existing plants, under construction plants, licenced projects which are expected to be in service on planned date and new

additional capacity. In the study, generating amounts of these power plants are considered as Average and Firm generating capacities.

In this study, the covering of demand according to average and firm generating amounts is calculated by taking into account maintenance, being out of service, hydrological conditions and rehabilitation of power plants in the system. While calculating generating capacity amount it is also assumed that there will be no deficit on fuel supply.

In this report, assumptions are the most important data which require to be examined before the results of the study and necessitate the results to be evaluated accordingly.

II. DEMAND

In this section, electricity consumption development for the last decade (1998-2007), peak load development in the same period, typical daily load curves for the year 2007, comparison of actual consumption values with forecasts and demand projections of peak loads and electricity consumptions carried out by ETKB for the next 10 years (2008-2017) are submitted.

For demand forecasts, according to the Electricity Market Law No: 4628 and the Grid Code, since distribution companies have not prepared the demand projections yet although they are requested to prepare on a certain format; until completion of this studies, the demand series prepared from the results on May 2008 of MAED Module used by ETKB are being used in this study as done before.

II.1. Peak Load and Electricity Consumption of Turkish Electricity System Between 1998-2007

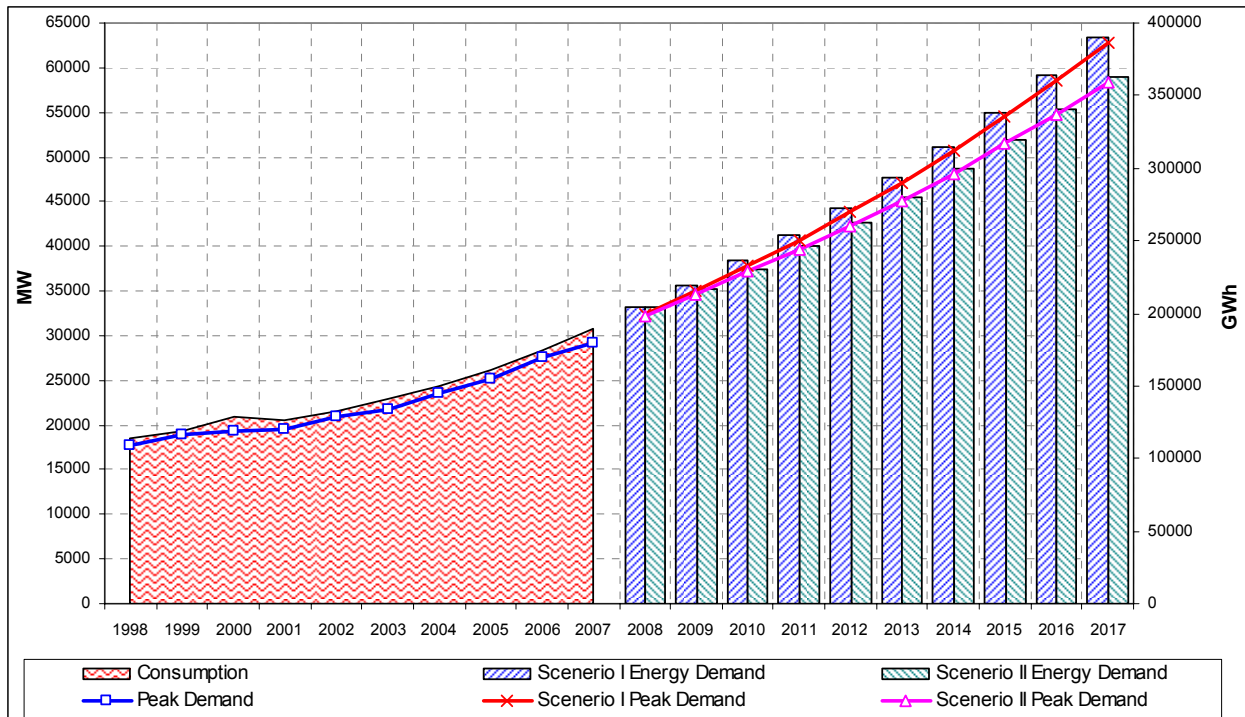
Gross electricity consumption (equal to gross generation + import – export) has reached to 174.6 TWh by annual increase of 8.6% for the year 2006, and to 190 TWh by annual increase of 8.8% for the year 2007. Net consumption is 144.1 TWh for the year 2006 and 155.1 TWh for 2007.

Table 1 and Figure 1 show instantaneous peak load and electricity consumption of Turkish Power System by years. The peak load and the minimum load are 27594 MW and 10545 MW for the year 2006 respectively. The peak load is 29249 MW and the minimum load is 11100 MW for the year 2007.

Table 1 : Peak Load and Electricity Consumption of Turkish Electricity System Between 1998–2007

	PEAK LOAD (MW)	INCREASE RATE (%)	ELECTRICITY CONSUMPTION (GWh)	INCREASE RATE (%)
1998	17799	5,2	114023	8,1
1999	18938	6,4	118485	3,9
2000	19390	2,4	128276	8,3
2001	19612	1,1	126871	-1,1
2002	21006	7,1	132553	4,5
2003	21729	3,4	141151	6,5
2004	23485	8,1	150018	6,3
2005	25174	7,2	160794	7,2
2006	27594	9,6	174637	8,6
2007	29249	6,0	190000	8,8

Figure 1 : Peak Load and Electricity Consumption of Turkish Electricity System Between 1998–2017



II.2. Analysis of Daily Electricity Consumption for the Year 2007

Daily load curves of the maximum and minimum electricity consumption days in 2007, are on Figure 2 and Figure 3, daily load curves for third Wednesday of each month are on Figure 4. The peak load is 28667 MW on the maximum consumption day in 2007.

Figure 2 : Loading order of power plants regarding type of primary energy resources on the maximum consumption day of the year 2007 (July 26, 2007)

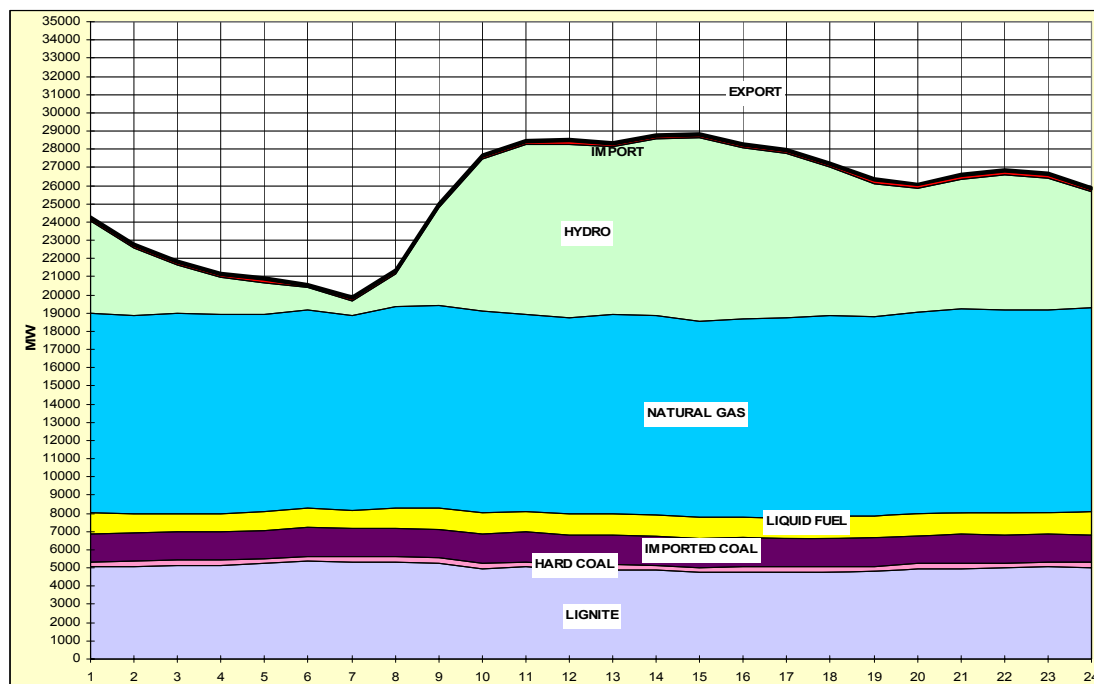


Figure 3 : Loading order of power plants regarding type of primary energy resources on the minimum consumption day of the year 2007 (October 13, 2007)

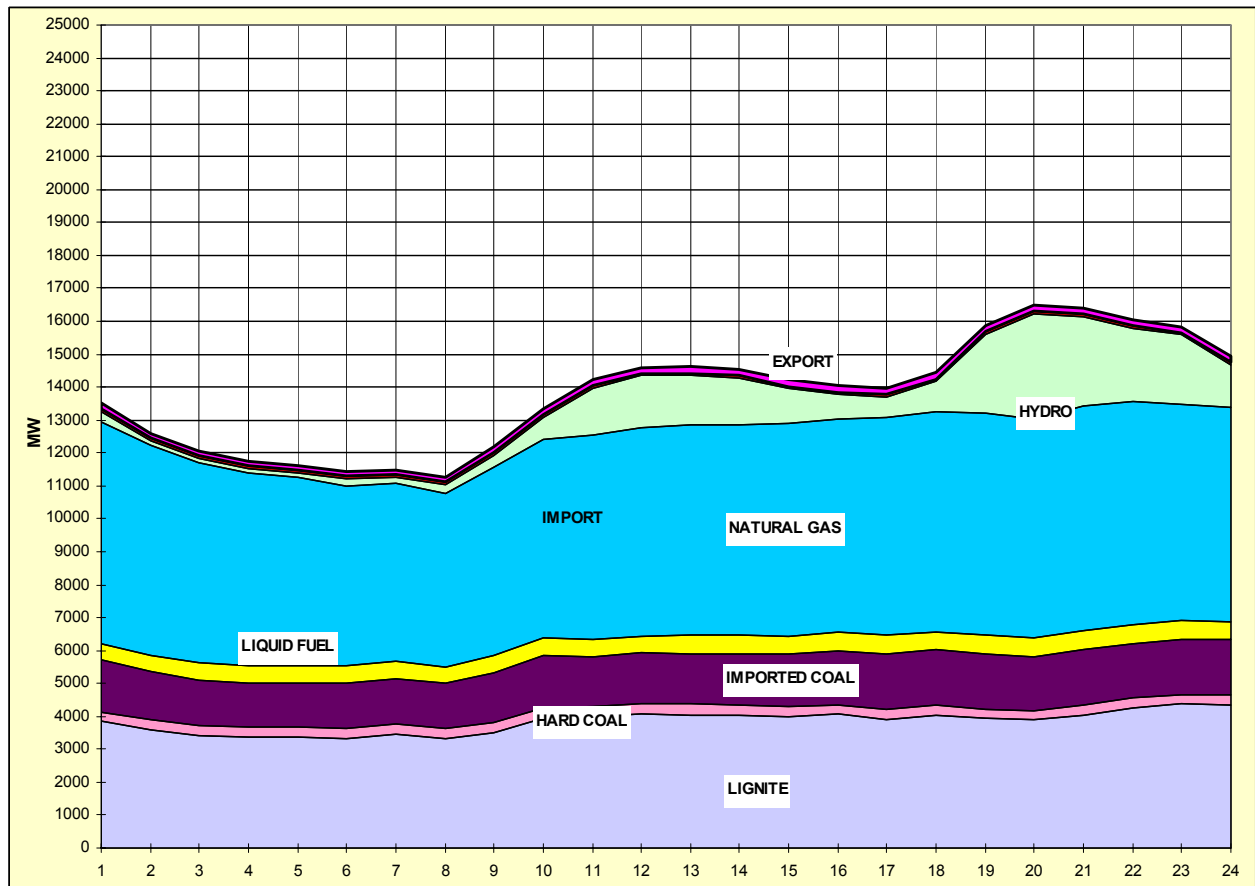
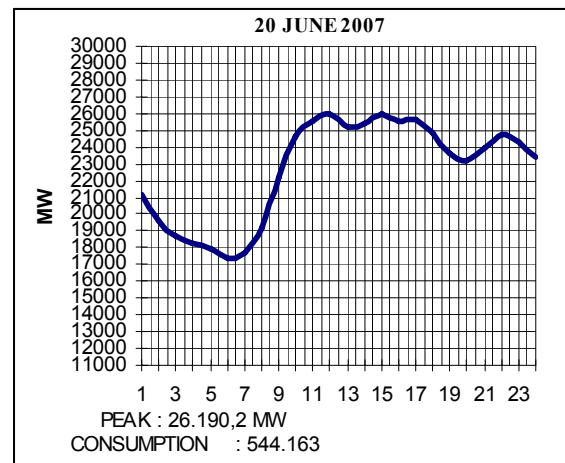
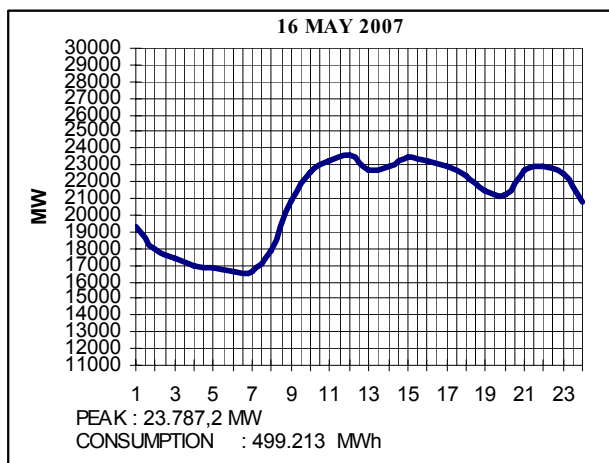
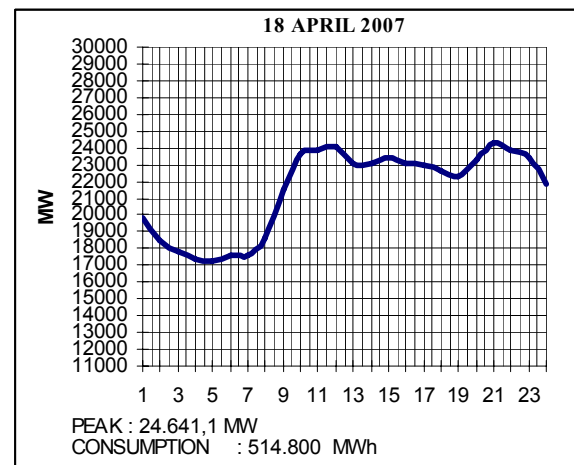
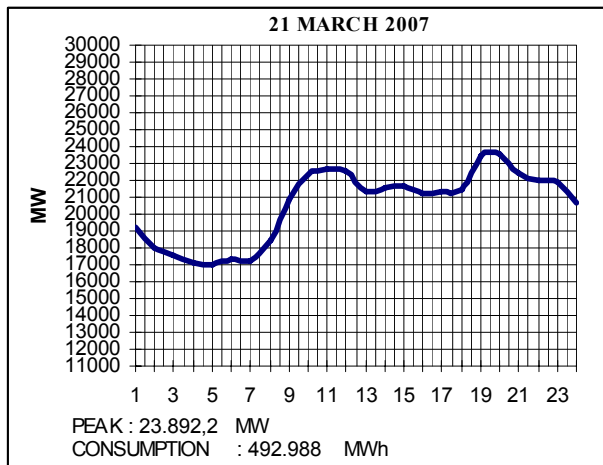
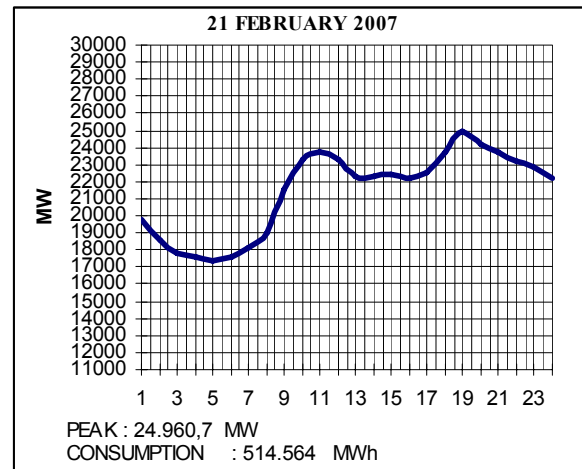
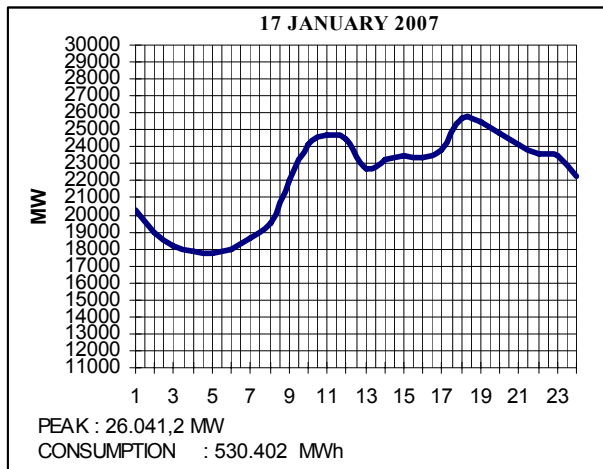
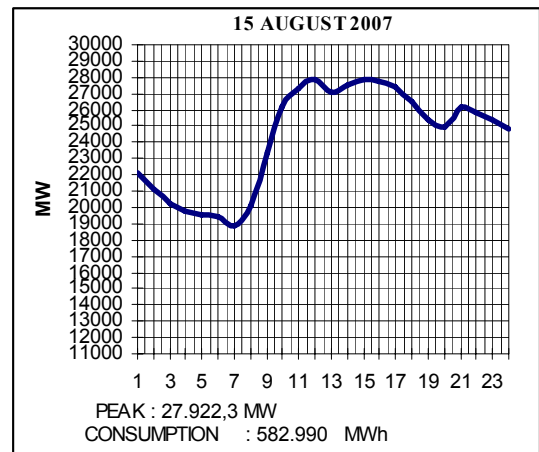
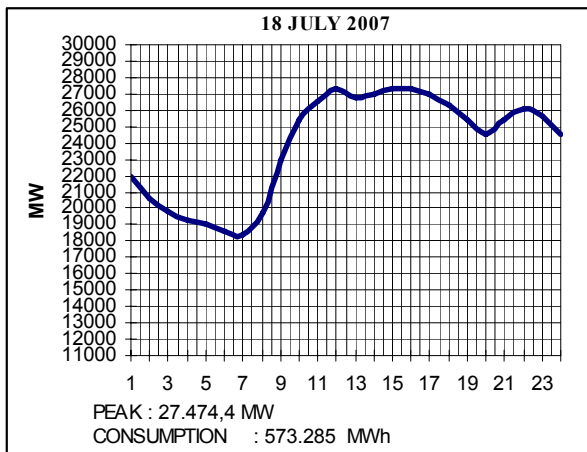


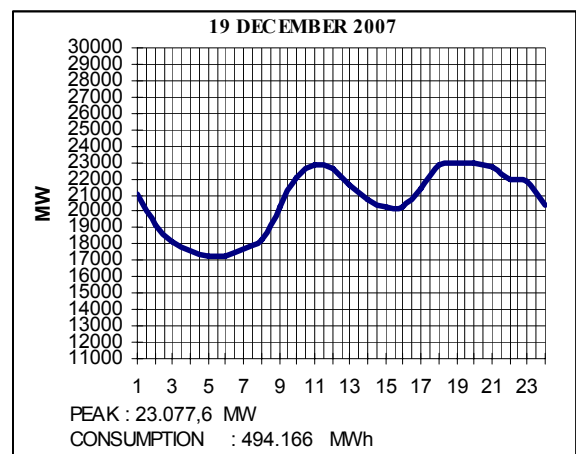
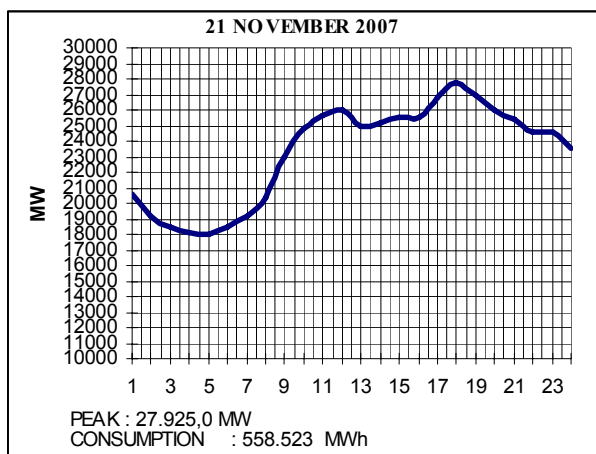
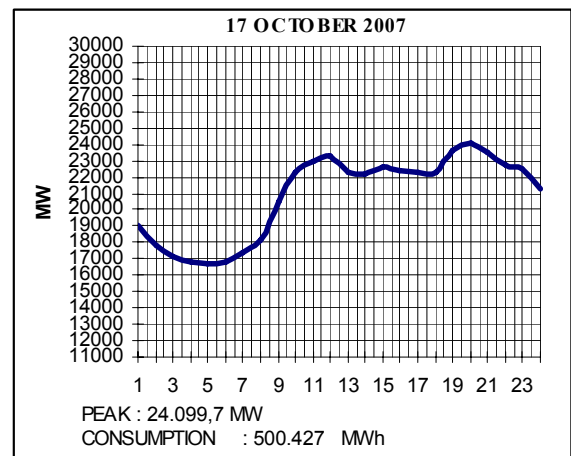
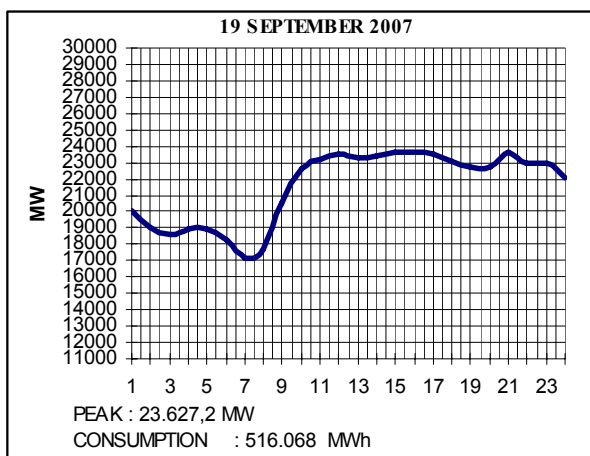
Figure 4 : Daily Load Curves of Third Wednesday of Each Month in 2007





20-33 January and 12-14 October were

Religious days in 2007.



II.3. Load Duration Curves for Years 2006 and 2007

Figure 5 : Load Duration Curve for the year 2006

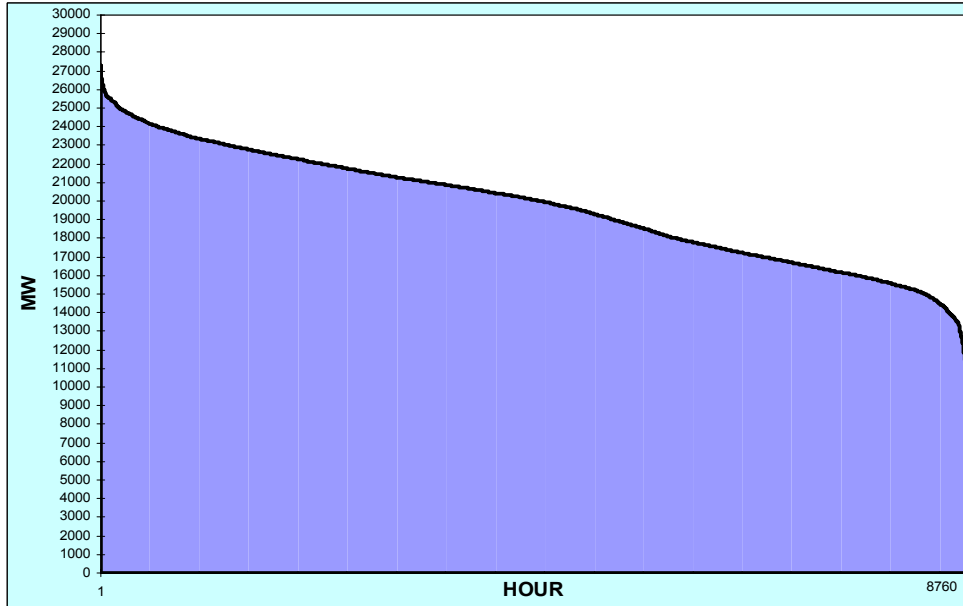
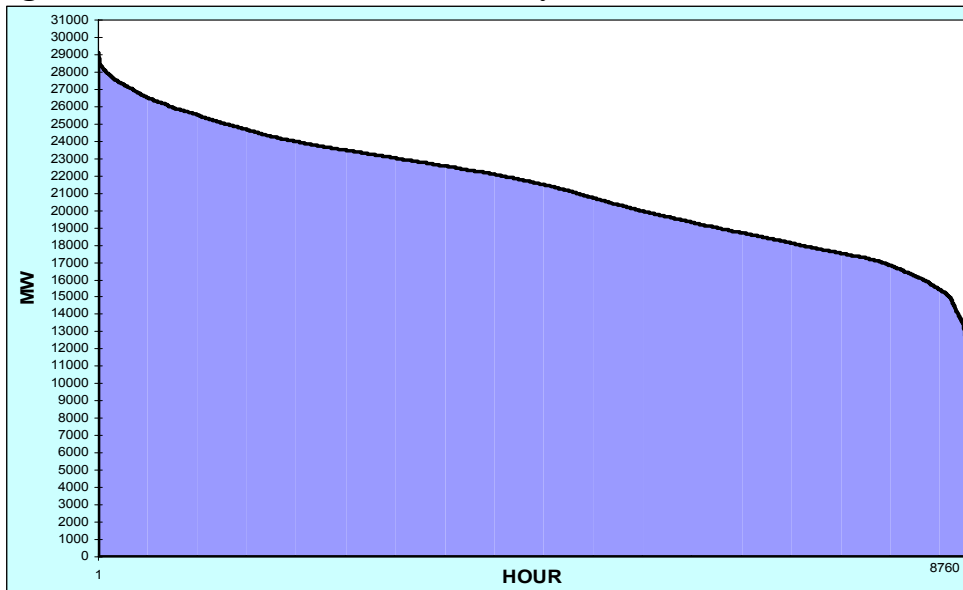


Figure 6 : Load Duration Curve for the year 2007



II.4. Demand Forecasts

In the Generation Capacity Projection study covering between years 2008 and 2017, Base Demand and Low Demand series calculated according to the results of demand forecast study carried out by ETKB as two alternative demand series on May 2008 are being used.

Comparison of former demand forecasts carried out by ETKB with realized values is submitted on Table 2 and Table 3¹.

¹ The Study Report on Long-Term Electricity Demand of Turkey, ETKB-APKK, 2004

Table 2 : Comparison of Former Demand Forecasts with Realized Values

	Electricity Consumption	PROJECTIONS												
		Policies 1985	1987	1988/1	1988/2	5 th Energy Congress 1990	1990/2	1993	6 th Energy Congress 1994	1996	2000	2002/1	2002/2	2004
1980	24.6													
1981	26.3													
1982	28.3													
1983	29.6													
1984	33.3													
1985	36.4	35.9												
1986	40.5	40.5												
1987	44.9	45.2												
1988	48.4	50.5	51.6											
1989	52.6	56.4	57.9	57.9	55.5	52.6	52.6							
1990	56.8	62.0	65.0	64.9	61.8	56.5	56.8							
1991	60.5	68.0	71.7	71.9	68.2	68.2	68.2							
1992	67.2	74.6	79.0	79.2	75.3	75.3	75.3							
1993	73.4	81.8	87.2	87.3	83.1	83.1	83.1	71.7						
1994	77.8	89.6	96.1	96.1	91.8	91.8	91.8	80.4	81.0					
1995	85.5	98.3	105.9	105.9	101.2	101.2	93.0	88.4	87.2					
1996	94.8	106.9	115.6	115.6	110.6	110.6	100.8	96.8	94.6					
1997	105.5	116.3	126.8	126.8	120.6	120.6	109.3	106.0	102.5	105.3				
1998	114.0	126.5	138.9	138.9	131.6	131.6	118.5	116.1	111.1	113.8				
1999	118.5	137.5	152.3	152.3	143.5	143.5	128.4	127.2	120.3	123.7	118.5			
2000	128.3	149.6	166.8	166.8	156.5	156.5	139.3	139.3	130.4	134.3	126.8	128.3	128.3	
2001	126.9		177.0	177.0	165.3	168.0	150.8	150.7	140.9	146.2	138.8	127.3	126.9	
2002	132.6		189.3	189.3	178.1	180.2	163.2	163.2	151.7	158.0	151.4	133.4	132.3	
2003	141.2		202.5	202.5	191.9	193.4	176.7	176.7	163.4	170.8	165.2	151.5	142.5	
2004	150.0		216.5	216.5	206.7	207.5	191.3	191.3	176.0	184.6	180.2	172.1	158.2	
2005	160.8		231.5	231.5	222.7	222.7	207.1	207.1	189.6	199.6	196.6	195.5	175.7	160.5
2006	174.6		247.6	247.6	239.9	239.9	224.2	224.2	203.7	215.2	213.2	211.0	190.7	176.4
2007	190.0		264.8	264.8	258.5	258.5	242.7	242.7	218.8	231.8	231.1	227.8	207.1	190.7

Table 3 : Deviation Ratio of Demand Forecasts from Realization (%)

	PROJECTIONS												
	Policies 1985	1987	1988/1	1988/2	5 th Energy Congress 1990	1990/2	1993	6 th Energy Congress 1994	1996	2000	2002/1	2002/2	2004
1980													
1981													
1982													
1983													
1984													
1985	-1.4												
1986	0.0												
1987	0.7												
1988	4.3	6.6											
1989	7.2	10.1	10.1	5.5	0.0	0.0							
1990	9.2	14.4	14.3	8.8	-0.5	0.0							
1991	12.4	18.5	18.8	12.7	12.7	12.7							
1992	11.0	17.6	17.9	12.1	12.1	12.1							
1993	11.4	18.8	18.9	13.2	13.2	13.2	-2.3						
1994	15.2	23.5	23.5	18.0	18.0	18.0	3.3	4.1					
1995	15.0	23.9	23.9	18.4	18.4	8.8	3.4	2.0					
1996	12.8	21.9	21.9	16.7	16.7	6.3	2.1	-0.2					
1997	10.2	20.2	20.2	14.3	14.3	3.6	0.5	-2.8	-0.2				
1998	11.0	21.8	21.8	15.4	15.4	3.9	1.8	-2.5	-0.2				
1999	16.0	28.5	28.5	21.1	21.1	8.4	7.3	1.5	4.4	0.0			
2000	16.6	30.0	30.0	22.0	22.0	8.6	8.6	1.6	4.7	-1.2	0.0	0.0	
2001		39.5	39.5	30.3	32.4	18.8	18.8	11.0	15.2	9.4	0.3	0.0	
2002		42.8	42.8	34.4	35.9	23.1	23.1	14.4	19.2	14.2	0.6	-0.2	
2003		43.5	43.5	36.0	37.0	25.2	25.2	15.8	21.0	17.0	7.3	1.0	
2004		44.3	44.3	37.8	38.3	27.5	27.5	17.3	23.1	20.1	14.7	5.5	
2005		44.0	44.0	38.5	38.5	28.8	28.8	17.9	24.1	22.3	21.6	9.3	-0.2
2006		41.8	41.8	37.4	37.4	28.4	28.4	16.7	23.3	22.1	20.8	9.2	1.0
2007		39.4	39.4	36.1	36.1	27.7	24.7	15.2	22.0	21.6	19.9	9.0	0.4

The realization ratio of forecasts are closely correlated to realization ratio of development growth rate. When the GDP growth rates used for the demand forecast studies are compared to realized values, except extraordinary crisis years, the deviation between them is calculated around 10% and -5%

When input values are closer to real values, realization of forecasts will be closer to forecasts for the short-term and mid-term, but deviations will be larger for the longer term parallel to used data.

Demand forecasts have been prepared as Base and Low Demands by ETKB on May 2008. Two of these projections are: Base Demand which is calculated by State Planning Organization (DPT) and based on the contribution to GDP by agriculture, mining, manufacturing, energy, construction, transportation and other service sectors up to 2030 and thus by means of using of GDP amount composed of these sector's total with the price of the year 1998, and Low Demand which is calculated with the assumption of GDP's %4.5 yearly increase starting from the year 2009

What follows are the development rate, Gross Domestic Product growth rate in five year period used in Base Demand and GDP's %4.5 yearly growth rate used in Low Demand, determined by DPT (State Planning Organization) in 2008:

Period	Base Demand Development Rate (%)	Low Demand Development Rate (%)
2000-2005	4.6	4.6
2005-2010	5.8	5.3
2010-2015	5.5	4.5
2015-2030	5.5	4.5

Reference : The Study Report on Long-term Electricity Demand of Turkey, ETKB

According to these development rates, the development structure of GDP by sectors is summarized below (Table 4).

Table 4 : Sectoral Structure of GDP (% share)

	2000	2005	2010	2015	2020	2025	2030
Agriculture	12.2	10.6	8.5	7.5	6.5	5.7	5.0
Construction	5.7	5.8	5.7	5.5	5.5	5.5	5.5
Mining	0.9	0.7	0.6	0.5	0.5	0.5	0.5
Manufacturing	23.5	23.5	23.5	24.0	24.1	24.2	24.3
Energy	1.9	1.9	2.3	2.8	3.3	3.7	4.1
Services	55.7	57.5	58.9	59.6	60.1	60.4	60.6
TOTAL	100.0	100.0	100.0	100.00	100.0	100.0	100.0

Reference : ETKB – EIGM

According to the table above, while the contribution of agriculture and mining sectors to GDP is expected to decrease in time, the contribution of manufacturing sector is expected to increase and the contribution of construction sector is expected to decrease a bit. In the long term, the shares of energy and manufacturing sectors will increase, but the greatest increase is expected in service sector.

The growth rate of GDP and also total GDP have been envisaged to decrease in Low Demand in spite of the share of sectors being same .

Demand projection series (Base Demand and Low Demand) together with annual increase rates are given in Table 5, Figure 7 and Table 6, Figure 8 respectively.

It is assumed that the ratio of minimum load to peak load will be around 40% as for past years, in other words it is expected that the characteristics of the load curve will remain similar. Increase in this ratio will contribute to the security of supply in the short term.

Demand series are for total Turkish Electricity System and they are gross values. Transmission and Distribution losses and internal consumptions of plants are included in this gross demand. Further, embedded generation (connected to the distribution system) and the generation of plants which are not subject to Load Dispatching instructions are included too.

Table 5 : Demand Forecast (Base Demand)

Year	PEAK LOAD		ELECTRICITY DEMAND	
	MW	Rate (%)	GWh	Rate (%)
2008	32478		204000	
2009	35053	7,9	219013	7,4
2010	37832	7,9	236182	7,8
2011	40716	7,6	253837	7,5
2012	43819	7,6	272812	7,5
2013	47159	7,6	293205	7,5
2014	50753	7,6	315123	7,5
2015	54622	7,6	338679	7,5
2016	58560	7,2	363695	7,4
2017	62782	7,2	390559	7,4

Figure 7 : Demand Forecast (Base Demand)

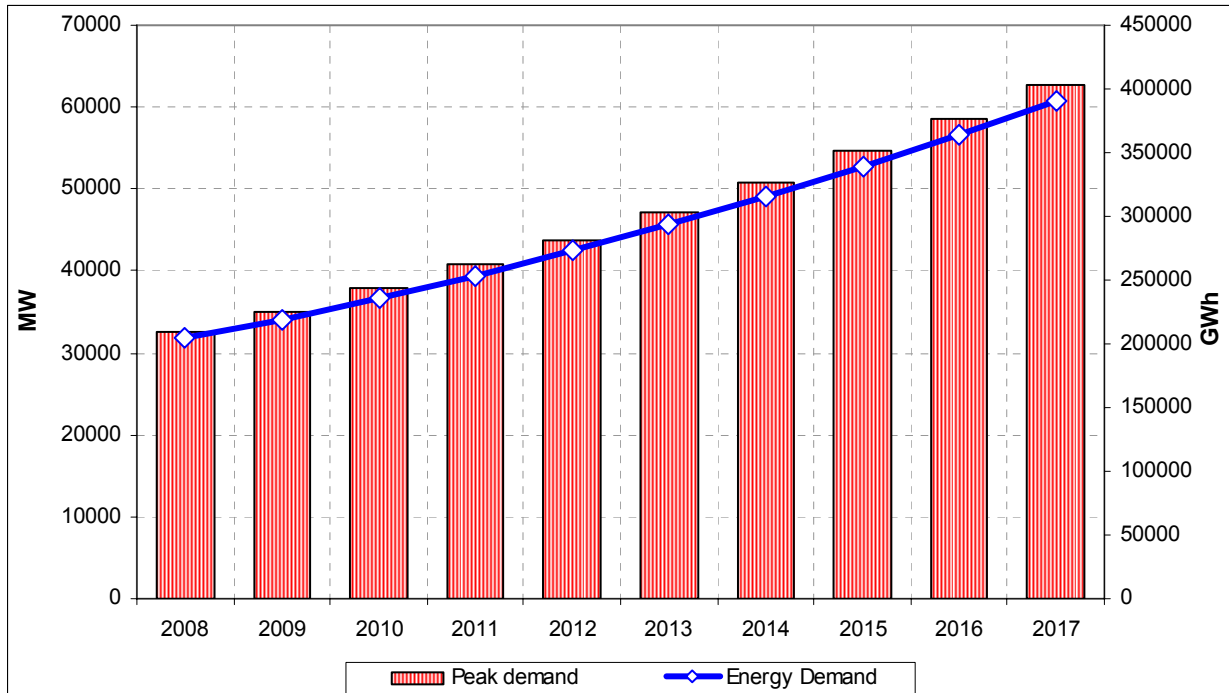
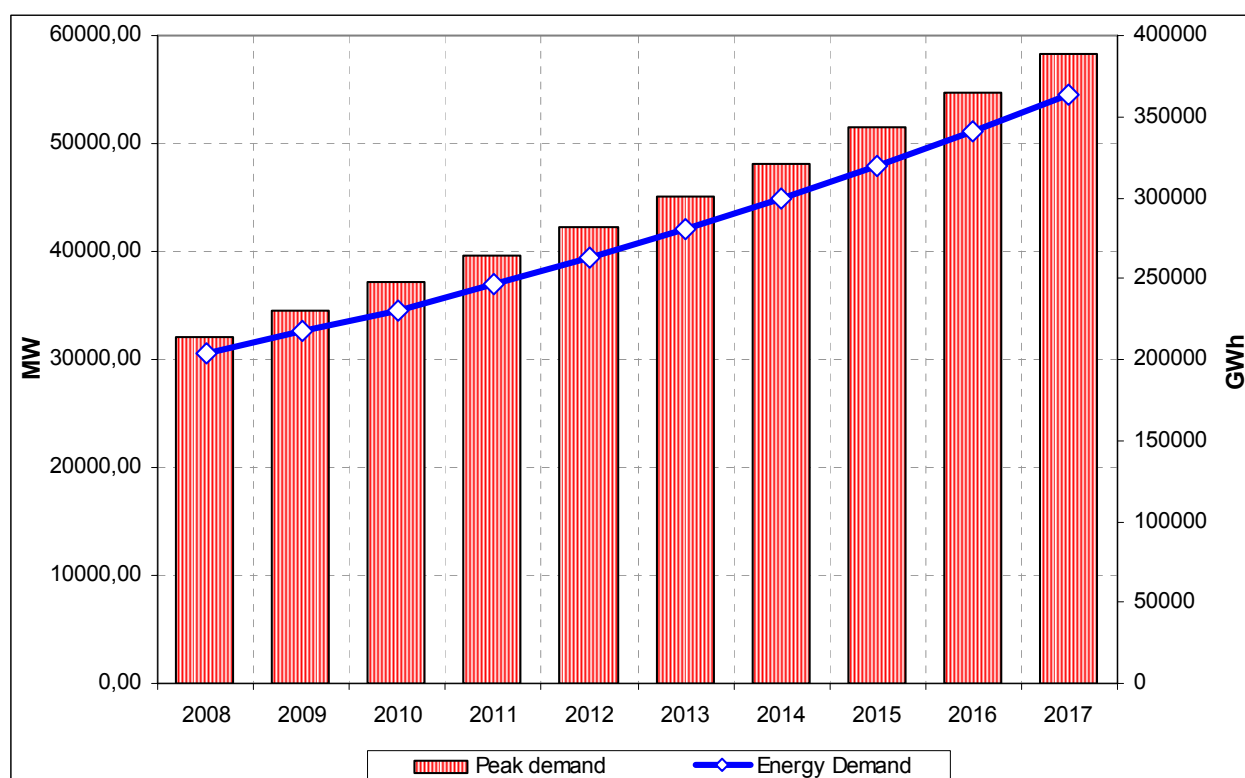


Table 6 : Demand Forecast (Low Demand)

Year	PEAK LOAD		ELECTRICITY DEMAND	
	MW	Rate(%)	GWh	Rate (%)
2008	32143		204000	
2009	34571	7,6	216992	6,4
2010	37182	7,6	230705	6,3
2011	39673	6,7	246181	6,7
2012	42331	6,7	262696	6,7
2013	45167	6,7	280319	6,7
2014	48193	6,7	299124	6,7
2015	51421	6,7	319190	6,7
2016	54788	6,5	340379	6,6
2017	58376	6,5	362975	6,6

Figure 8 : Demand Forecast (Low Demand)



III. ANNUAL GENERATION PROGRAMS AND REALIZATION FOR YEARS 2006-2007

III.1. Year 2006

Total electricity generation of Turkey has been estimated to be around 173.1 TWh in the year 2006 and so the consumption has been estimated around 171.4 TWh. The realization of the consumption is 174.6 TWh by the increase of 8.6% according to the previous year. (Table 7). By the end of the year 2006 total installed capacity is 40564.8 MW. The breakdown of total installed capacity by utilities is on Table 8.

Table 7 : Annual Generation Program and Realization for 2006 (GWh)

UTILITIES	2006 Annual Program	2006 Revised Annual Program	2006 Realization
EÜAŞ	65949	67452	71082
AFFILIATED PARTNERSHIP OF EÜAŞ	13090	12630	13634
MOBILE PLANTS	370	438	418
POWER PLANTS UNDER TRANSFER OF OPERATIONAL RIGHT CONTRACT	4196	4143	4061
POWER PLANTS UNDER BUILT- OPERATE-TRANSFER CONTRACT	14650	14834	14767
POWER PLANTS UNDER BUILT- OPERATE CONTRACT	41155	43859	42738
GENERATION COMPANIES	14533	13096	15163
AUTOPRODUCERS	19144	16531	14437
NON-EÜAŞ GENERATION	107138	105531	105218
TOTAL GENERATION OF TURKEY	173087	172983	176300
IMPORT	660	664	573
TURKEY'S GENERATION + IMPORT	173747	173647	176873
EXPORT	2370	2184	2236
TOTAL CONSUMPTION OF TURKEY	171377	171463	174637

Table 8 : Breakdown of Installed Capacity (2006)

UTILITIES		INSTALLED CAPACITY MW	TOTAL INSTALLED CAPACITY MW
EÜAŞ	THERMAL	8.705,9	19.881,9
	HYDRO	11.176,0	
AFFILIATED PARTNERSHIP OF EÜAŞ	THERMAL	3.834,0	3.834,0
POWER PLANTS UNDER TRANSFER OF OPERATIONAL RIGHT CONTRACT	THERMAL	620,0	650,1
	HYDRO	30,1	
MOBILE PLANTS	THERMAL	724,9	724,9
POWER PLANTS UNDER BUILT-OPERATE CONTRACT	THERMAL	6.101,8	6.101,8
POWER PLANTS UNDER BUILT-OPERATE- TRANSFER CONTRACT	THERMAL	1.449,6	2.449,0
	WIND	17,4	
	HYDRO	982,0	
GENERATION COMPANIES	THERMAL	2839,0	3.206,2
	WIND	40,4	
	HYDRO	326,8	
AUTOPRODUCERS	THERMAL	3.152,9	3.716,9
	WIND	1,2	
	HYDRO	562,8	
TOTAL INSTALLED CAPACITY	THERMAL	27.443,1	40.564,8
	WIND	59,0	
	HYDRO	13.062,7	

III.2. Year 2007

In the year 2007, while the forecasted total electricity generation amount was 187.7 TWh, the realization was 191.5 TWh by the increase of 8.6% from the previous year and the consumption was 190.0 TWh by the increase of 8.8% while it was forecasted as 185.2 TWh. (Table 9). By end of the year 2007, the total installed capacity is 40835.7 MW and the breakdown of this total installed capacity to the utilities is on Table 10.

The power plants connected to the system and the decommissioning power plants in 2007 are listed in Annex-2.

Table 9 : Annual Generation Program and Realization for 2007 (GWh)

UTILITIES	2007 Annual Program	2007 Revised Annual Program	2007 Yılı Realization (Temporary)
EÜAŞ	70766	75700	73839
ADUAŞ			216
AFFILIATED PARTNERSHIP OF EÜAŞ	15485	19098	18488
MOBILE PLANTS	101	138	797
POWER PLANTS UNDER TRANSFER OF OPERATIONAL RIGHT CONTRACT	4141	4480	4268
POWER PLANTS UNDER BUILT- OPERATE-TRANSFER CONTRACT	14674	14455	14256
POWER PLANTS UNDER BUILT-OPERATE CONTRACT	46013	44946	44970
GENERATION COMPANIES	16124	17927	19399
AUTOPRODUCERS	20430	16324	15325
NON-EÜAŞ GENERATION	116968	117368	117719
TOTAL TURKEY'S GENERATION	187733	193068	191558
IMPORT	540	743	864
TURKEY'S GENERATION + IMPORT	188273	193811	192422
EXPORT	3093	2873	2422
TOTAL TURKEY'S CONSUMPTION	185180	190938	190000

Table 10 : Breakdown of Installed Capacity (2007)

UTILITIES		INSTALLED CAPACITY (MW)	TOTAL INSTALLED CAPACITY
EÜAŞ	THERMAL	8.690,9	20.041,2
	HYDRO	11.350,3	
AFFILIATED PARTNERSHIP OF EÜAŞ	THERMAL	3.834,0	3.834,0
ADUAŞ	THERMAL	30,0	141,3
	HYDRO	111,3	
POWER PLANTS UNDER TRANSFER OF OPERATIONAL RIGHT CONTRACT	THERMAL	620,0	650,1
	HYDRO	30,1	
MOBILE PLANTS	THERMAL	262,7	262,7
POWER PLANTS UNDER BUILT-OPERATE CONTRACT	THERMAL	6.101,8	6.101,8
POWER PLANTS UNDER BUILT-OPERATE-TRANSFER CONTRACT	THERMAL	1.449,6	2.449,0
	WIND	17,4	
	HYDRO	982,0	
GENERATION COMPANIES	THERMAL	3.130,3	3.621,0
	WIND	127,7	
	HYDRO	363,0	
AUTOPRODUCERS	THERMAL	3.175,2	3.734,6
	WIND	1,2	
	HYDRO	558,2	
TOTAL INSTALLED CAPACITY	THERMAL	27.294,5	40.835,7
	WIND	146,3	
	HYDRO	13.394,9	

IV. ANALYSIS OF GENERATION-CONSUMPTION OF TURKISH EXISTING POWER SYSTEM

IV.1. Development of Electricity Generation Plants by Utilities

Private companies have taken place to produce electricity in Turkey beside governmental utilities. Although the concept of privatization came into agenda in the year 1984 by the Law No: 3096, privileged companies ÇEAŞ and KEPEZ had action in Turkish Electric System. Development of installed capacity and electricity generation from by means of State and private utilities from 1984 to 2007 are indicated in Table 11 and Table 12.

Table 11: Development of Total Installed Capacity by means of State and Private Utilities

	INSTALLED CAPACITY (MW)										
	STATE OWNED POWER PLANTS				PRIVATE COMPANY POWER PLANTS				TOTAL		
	THERMAL	HYDRO	TOTAL	SHARE (%)	THERMAL	HYDRO	TOTAL	SHARE (%)	THERMAL	HYDRO	TOTAL
1984	3545,4	3644,2	7189,6	85,0%	1041,4	230,6	1272,0	15,0%	4586,8	3874,8	8461,6
1985	4150,4	3644,2	7794,6	85,5%	1096,4	230,6	1327,0	14,5%	5246,8	3874,8	9121,6
1986	5144,3	3644,2	8788,5	86,9%	1093,4	233,3	1326,7	13,1%	6237,7	3877,5	10115,2
1987	6293,4	4720,1	11013,5	88,1%	1198,4	283,2	1481,6	11,9%	7491,8	5003,3	12495,1
1988	7048,9	5935,1	12984,0	89,4%	1253,4	283,2	1536,6	10,6%	8302,3	6218,3	14520,6
1989	7941,5	6298,1	14239,6	90,1%	1269,4	299,2	1568,6	9,9%	9210,9	6597,3	15808,2
1990	8264,2	6465,1	14729,3	90,3%	1289,1	299,2	1588,3	9,7%	9553,3	6764,3	16317,6
1991	8795,6	6521,5	15317,1	89,0%	1299,7	592,3	1892,0	11,0%	10095,3	7113,8	17209,1
1992	9020,6	7779,2	16799,8	89,8%	1316,8	599,5	1916,3	10,2%	10337,4	8378,7	18716,1
1993	9230,6	9049,0	18279,6	89,9%	1425,3	632,7	2058,0	10,1%	10655,9	9681,7	20337,6
1994	9440,6	9208,3	18648,9	89,4%	1554,6	656,3	2210,9	10,6%	10995,2	9864,6	20859,8
1995	9650,6	9207,6	18858,2	90,0%	1440,9	655,2	2096,1	10,0%	11091,5	9862,8	20954,3
1996	9665,6	9239,5	18905,1	89,0%	1649,0	695,3	2344,3	11,0%	11314,6	9934,8	21249,4
1997	9665,6	9403,9	19069,5	87,1%	2123,7	698,7	2822,4	12,9%	11789,3	10102,6	21891,9
1998	10064,6	9497,9	19562,5	83,8%	2974,2	817,3	3791,5	16,2%	13038,8	10315,2	23354,0
1999	11417,6	9701,7	21119,3	80,9%	4155,8	844,2	5000,0	19,1%	15573,4	10545,9	26119,3
2000	11274,6	9977,3	21251,9	77,9%	4795,4	1216,8	6012,2	22,1%	16070,0	11194,1	27264,1
2001	10954,6	10108,7	21063,3	74,3%	5686,0	1583,1	7269,1	25,7%	16640,6	11691,8	28332,4
2002	10949,6	10108,7	21058,3	66,1%	8636,4	2151,1	10787,5	33,9%	19586,0	12259,8	31845,8
2003	10803,1	10990,2	21793,3	61,2%	12186,3	1607,4	13793,7	38,8%	22989,4	12597,6	35587,0
2004	10794,9	10994,7	21789,6	59,2%	13364,8	1669,6	15034,4	40,8%	24159,7	12664,3	36824,0
2005	11474,9	11109,7	22584,6	58,1%	14442,4	1816,5	16258,9	41,9%	25917,3	12926,2	38843,5
2006	12539,9	11176,0	23715,9	58,6%	14825,2	1960,7	16785,9	41,4%	27380,1	13121,7	40564,8
2007	12554,9	11461,6	24016,5	58,6%	14888,2	2079,6	16812,2	41,4%	27294,5	13541,2	40835,7

Table 12: Development of Total Generation by means of State and Private Utilities

	GENERATION (GWh)										
	STATE OWNED POWER PLANTS				PRIVATE COMPANY POWER PLANTS				TOTAL		
	THERMAL	HYDRO	TOTAL	SHARE (%)	THERMAL	HYDRO	TOTAL	SHARE (%)	THERMAL	HYDRO	TOTAL
1984	14426	12260	26685,7	87,2%	2761,1	1166,7	3927,8	12,8%	17187,2	13426,3	30613,5
1985	19257	10992	30248,9	88,4%	2917,3	1052,7	3970,0	11,6%	22174,0	12044,9	34218,9
1986	24511	10959	35470,1	89,4%	3310,8	913,9	4224,7	10,6%	27822,2	11872,6	39694,8
1987	22122	17557	39679,3	89,5%	3612,9	1060,7	4673,6	10,5%	25735,1	18617,8	44352,9
1988	15563	27450	43013,6	89,5%	3535,8	1499,4	5035,2	10,5%	19099,2	28949,6	48048,8
1989	30408	17046	47454,1	91,2%	3695,7	893,4	4589,1	8,8%	34103,6	17939,6	52043,2
1990	30698	22156	52854,2	91,9%	3697,3	991,5	4688,8	8,1%	34395,4	23147,6	57543,0
1991	34068	21393	55460,7	92,1%	3495,2	1290,4	4785,6	7,9%	37563,0	22683,3	60246,3
1992	36936	24597	61533,3	91,4%	3837,9	1971,0	5808,9	8,6%	40774,2	26568,0	67342,2
1993	35372	31728	67099,8	90,9%	4484,9	2222,8	6707,7	9,1%	39856,6	33950,9	73807,5
1994	42998	28945	71942,5	91,9%	4737,8	1641,4	6379,2	8,1%	47735,8	30585,9	78321,7
1995	45090	33105	78194,9	90,7%	5616,9	2435,6	8052,5	9,3%	50706,5	35540,9	86247,4
1996	47975	37440	85414,7	90,0%	6411,9	3035,1	9447,0	10,0%	54386,5	40475,2	94861,7
1997	53578	37342	90919,1	88,0%	9902,2	2474,5	12376,7	12,0%	63479,7	39816,1	103295,8
1998	56473	39601	96074,8	86,5%	12314,5	2633,1	14947,6	13,5%	68787,9	42234,5	111022,4
1999	60575	31737	92312,5	79,3%	21166,7	2960,7	24127,4	20,7%	81741,9	34698,0	116439,9
2000	65462	27772	93234,0	74,6%	28547,4	3140,2	31687,6	25,4%	94009,7	30911,9	124921,6
2001	65954	20409	86362,4	70,4%	32698,8	3663,5	36362,3	29,6%	98652,4	24072,3	122724,7
2002	51028	26304	77332,1	59,8%	44639,5	7427,9	52067,4	40,2%	95667,7	33731,8	129399,5
2003	33070	30027	63096,9	44,9%	72119,8	5363,8	77483,6	55,1%	105189,6	35390,9	140580,5
2004	27349	40669	68017,2	45,1%	77208,2	5472,9	82681,1	54,9%	104556,9	46141,4	150698,3
2005	38416	35046	73461,9	45,4%	83920,6	4573,7	88494,3	54,6%	122336,7	39619,5	161956,2
2006	46037	38679	84716,1	48,1%	85892,4	5691,4	91583,8	51,9%	131929,1	44370,8	176299,8
2007	61347	30980	92327,0	48,2%	94005,0	5226,0	99230,7	51,8%	155352,0	36206,0	191558,0

The share of state owned power plants in total installed capacity has decreased from 85% to 58,6% from 1984 to 2007, and the share of state owned generation from 87,2% to 48,3% similarly in the same period. In parallel to this decrease, the shares of private companies in both installed capacity and total generation have increased. While the share of state in the sector was decreasing continuously, private sector share has increased. Figure 9 and Figure 10 show the development of state owned and private shares in total installed capacity and in total generation respectively.

Figure 9: Development of State owned and Private Shares in Total Installed Capacity

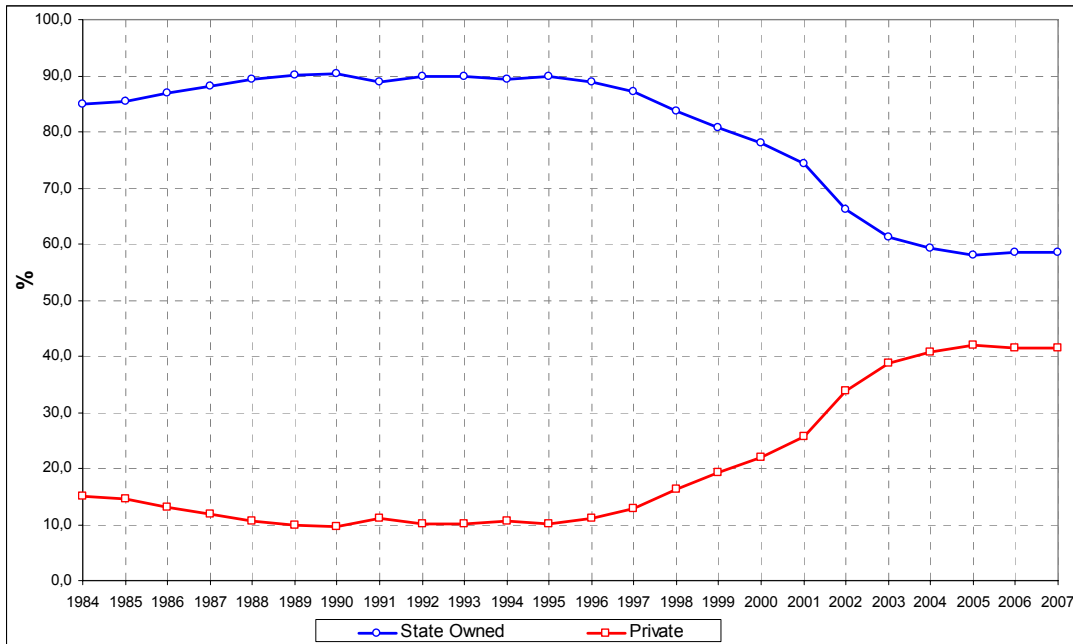


Figure 10: Development of State owned and Private Shares in Total Generation

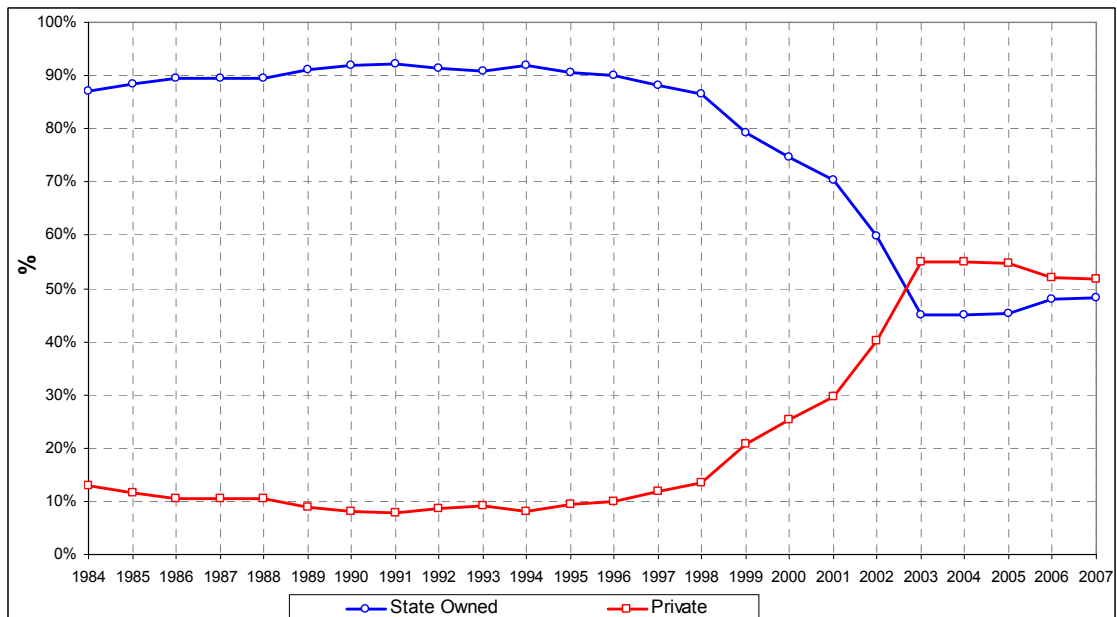


Figure 9 and Figure 10 show that the share of private sector in total electricity generation increases more than the share in total installed capacity and reaches to higher level in the year 2007, in particular, it has increased quite rapidly from 1998 to 2007. It should be noted that power plants under BOT, BOO and TOR financial models have been came in operation within this time period. Private sector share in total electricity generation has increased rapidly, because all BOO plant generations and most of BOT and TOR plant generations come from thermal capacities and also all these plants have take-or-pay type contracts with purchasing guarantee. Due to no new BOO, BOT and TOR application, there is almost no change in the share of private sector in total electricity generation.

Annual growth rates of state owned and private sector shares in total installed capacity and in total electricity generation from 1984 to 2007 are on Figure 11 and Figure 12.

Figure 11: Growth of State Owned Shares in Installed Capacity and in Generation as Referenced to the year 1984

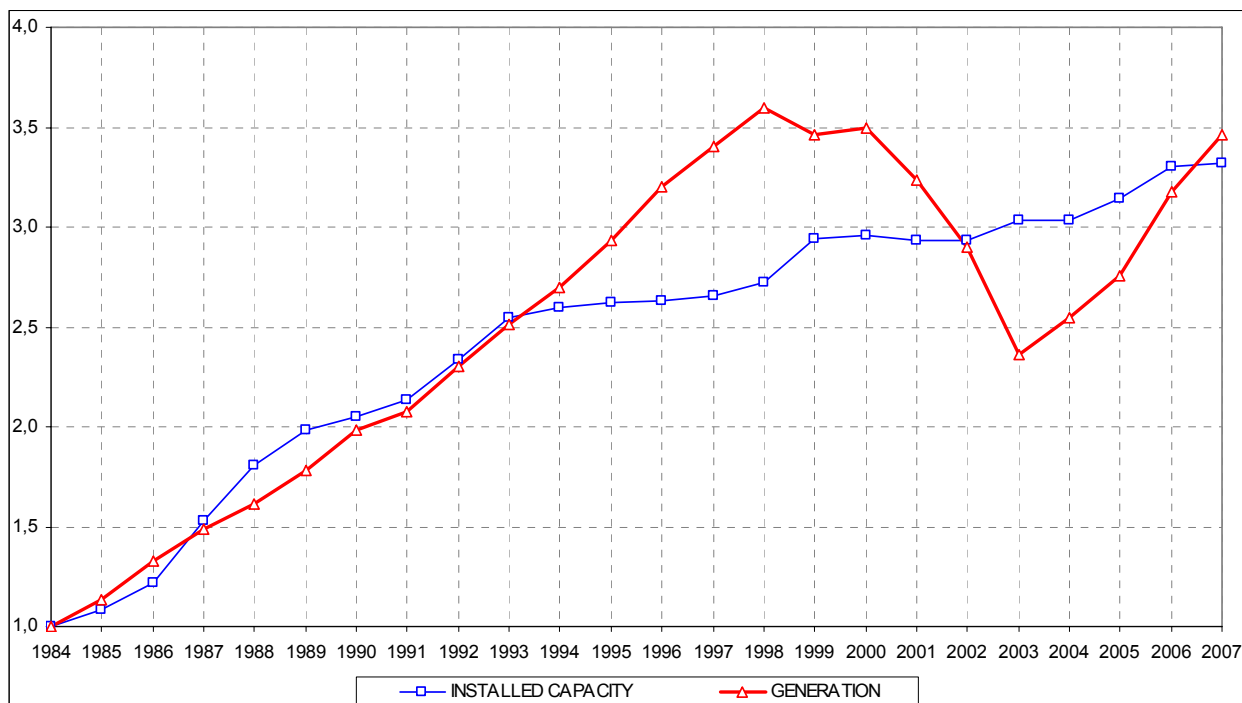
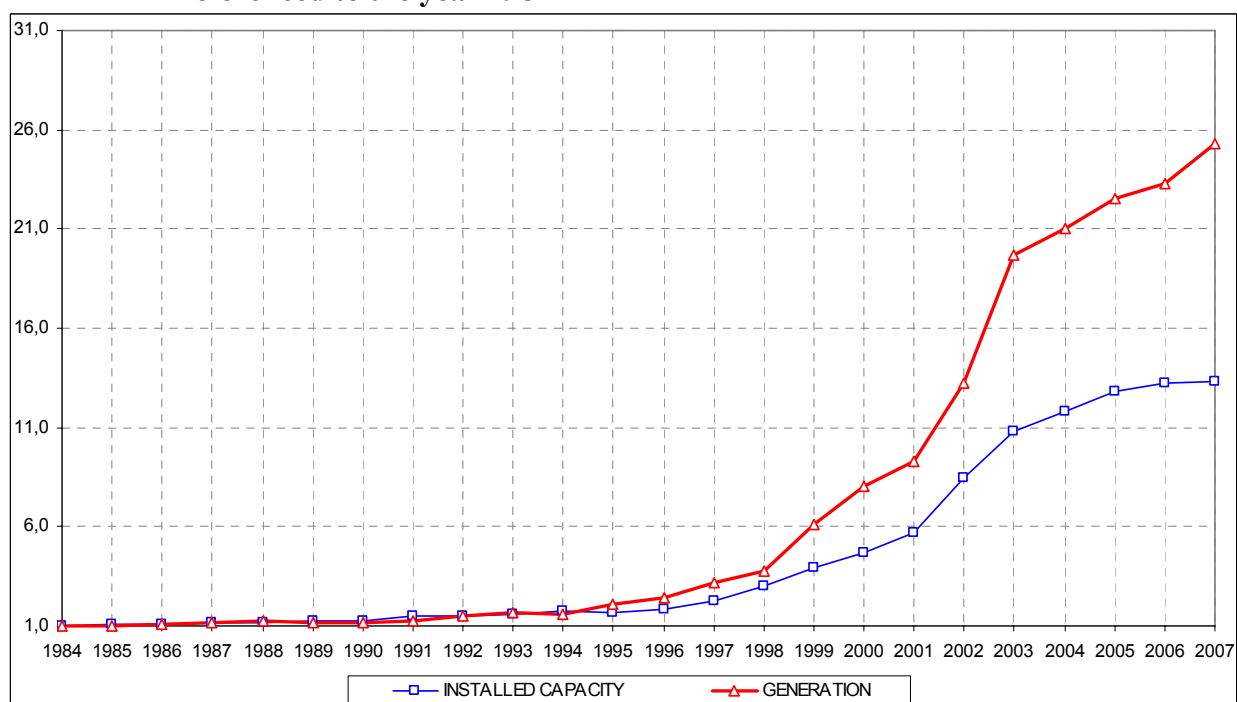


Figure 12: Growth of Private Shares in Installed Capacity and in Generation as Referenced to the year 1984



State owned installed capacity and generation amounts have grown approximately 3,5 times from the year 1984 to 2007. On the other hand, the increase of private sector installed capacity is 13 times and the generation amount is 25 times in the same period. As mentioned above, the main reason for this fast increase is purchasing the big amount of electricity from BOT, BOO and TOR financial models and giving purchasing guarantee to this Take-or-Pay type contracts.

As it is known, electricity should be produced when it is being consumed. So the main determiner for the electricity generation is demand. Due to the amount of obtainable energy from installed capacity will be as demand the remaining capacity will stay as reserve capacity. Capacity in the power system is being operated to cover the demand according to their availabilities and electricity is being produced. Availabilities of hydro power plants vary by hydro conditions, and thermal power plant availabilities are being determined according to their operating conditions. Major factors affecting availability of thermal power plants are failure probabilities, maintenance need, fuel amount and fuel quality. By considering all factors affecting thermal power plant operations, availability is being determined. Even existence of a certain amount of capacity, some amount of capacity will not be operated due to not needing according to demand.

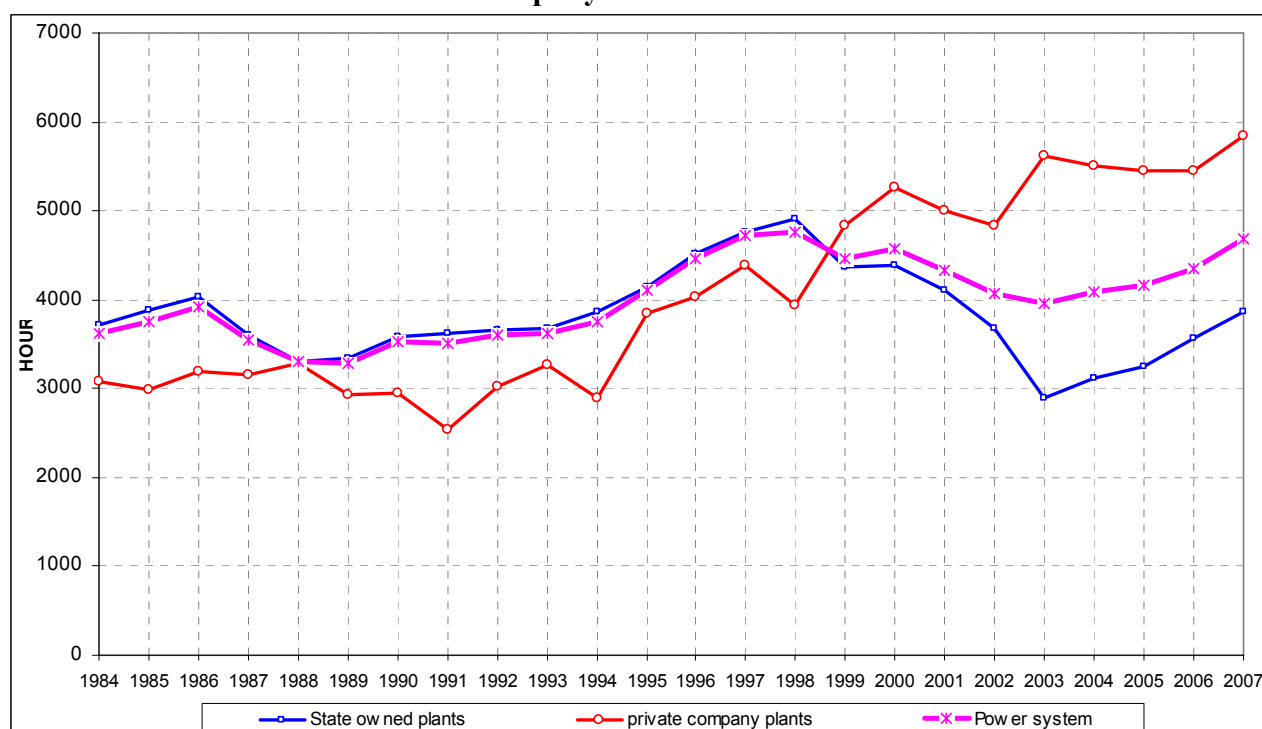
The relation between annual electricity generation amount and the total installed capacity gives an idea about use of capacity. There are different criteria to evaluate the use of capacity rate. These criteria, at the same time, are indicators of efficiency on use of installed capacity. Two of the most important criteria are *Equivalent Duration of Full Capacity Operation* and *Capacity Factor*.

Equivalent Duration of Full Capacity Operation : is the value obtained by dividing annual total electricity generation of a power plant by its installed capacity. In other words, it is the total number of hours to produce its total annual electricity by operating at its full capacity. The efficiency on the use of installed capacity is directly proportional to the number of these hours.

Capacity Factor : is the ratio calculated by dividing the total annual electricity generation of a power plant by the multiplication of its installed capacity by the number of hours in the year. The efficiency on the use of installed capacity is directly proportional to the number of these hours.

When evaluating *Equivalent Duration of Full Capacity Operation* and *Capacity Factor*, it should be kept in mind that actually generated electricity is based on the demand amount so some amount of installed capacity will not be used in order not to exceed the demand level.

Figure 13: Equivalent Duration of Full Capacity Operation of Total Power System, State owned and Private Company Power Plants

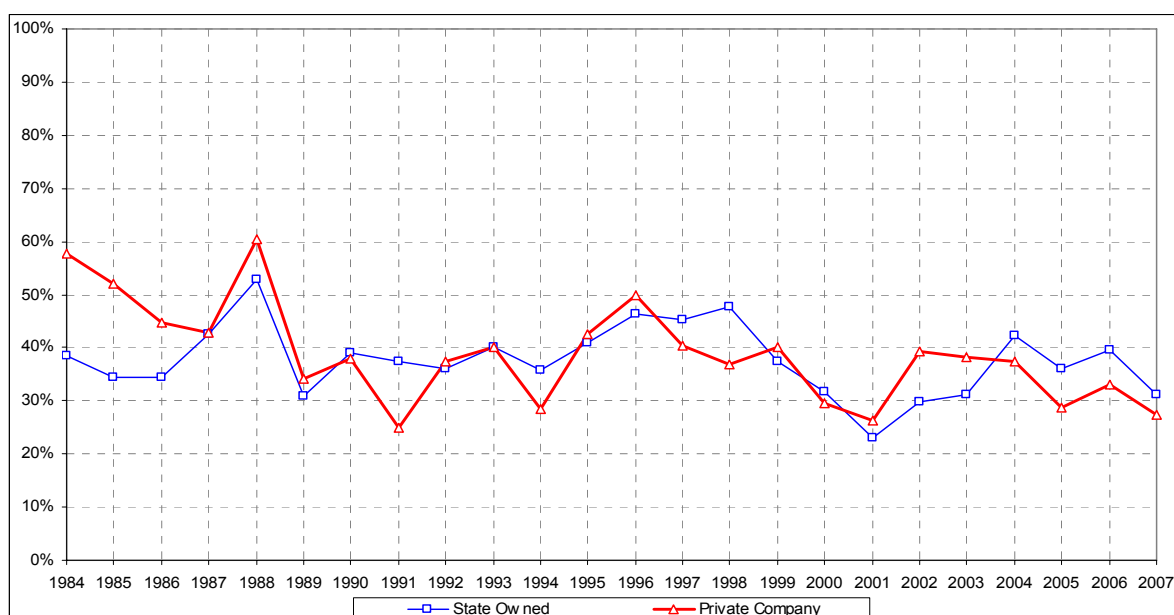


The big amount of total installed capacity was belonging to state company before the year 1999 and almost all of private company capacity was hydro. So Equivalent Duration of Full Capacity Operation of state owned power plants is nearly same as the country's power system total installed capacity. The share of private companies in total installed capacity significantly increased after the year 1999 and most of these increasing capacity is based on thermal resources. As mentioned above, since giving purchasing guarantee has been given to whole generation of BOT and to 85% of BOO power plants, these power plants have operated almost at full capacity. Therefore, Equivalent Duration of Full Capacity Operation is higher. New commissioned total installed capacity is lower than the demand increase rate after 2002, while the operating duration of private company plants was increasing state owned plants also operated more.

Another criterium of efficient use of installed capacity is *Capacity Factor*. Even a plant is available to generate, it may not be operated according to demand need.

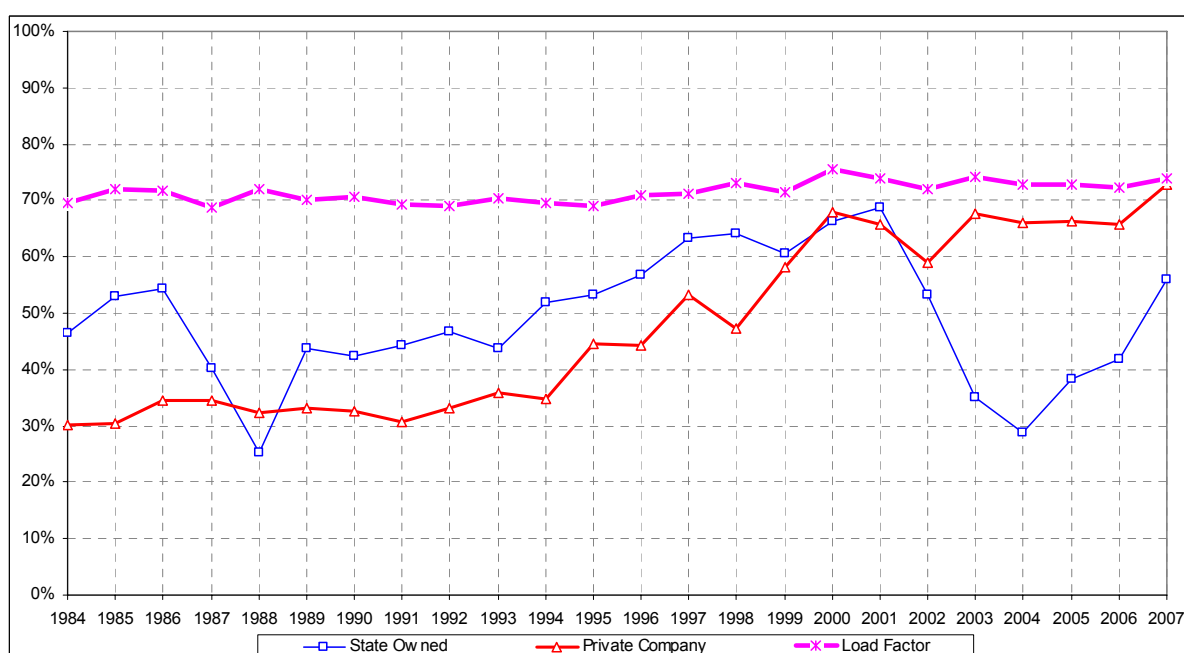
In order to cover demand reliably, power plants in the power system are being operated by ordering within the frame of certain principles based on determined policies. These principles may be economic order to operate by giving priority from the cheapest to the most costly. Or priority may be given to some special conditions. For example, power plants which have take-or-pay type contract with purchasing guarantee are being loaded primarily by not considering either economic order or generation cost. When the Capacity Factor of both state owned and private company power plants are being examined from 1984 to 2007, hydro power plants of both owners have almost the same Capacity Factor level. Because all hydro plants have similar hydro conditions. Graph 14 shows clearly that Capacity Factors of hydro plants belonging to both state and private company are significantly closer.

Figure 14: Annual Capacity Factors of State Owned and Private Hydro Power Plants



When Capacity Factors of both state owned and private company thermal power plants are examined on Figure 15, it is observed that state owned thermal power plants have higher Capacity Factor before 1999, but After this year, the Capacity factor of private company thermal plants are higher and continue to increase. A sharp decrease of state owned thermal power plants capacity factor is observed on the Figure. This is because, in this period a big amount of thermal BOO power plants have commissioned. After 2004, due to lower new capacity addition than the capacity need increase, operating hours of state owned power plants therefore their capacity factors have increased. Capacity factors of state owned and private power plants together with total power system load factor are plotted on the Figure. Power system total load factor is around 70% for all years.

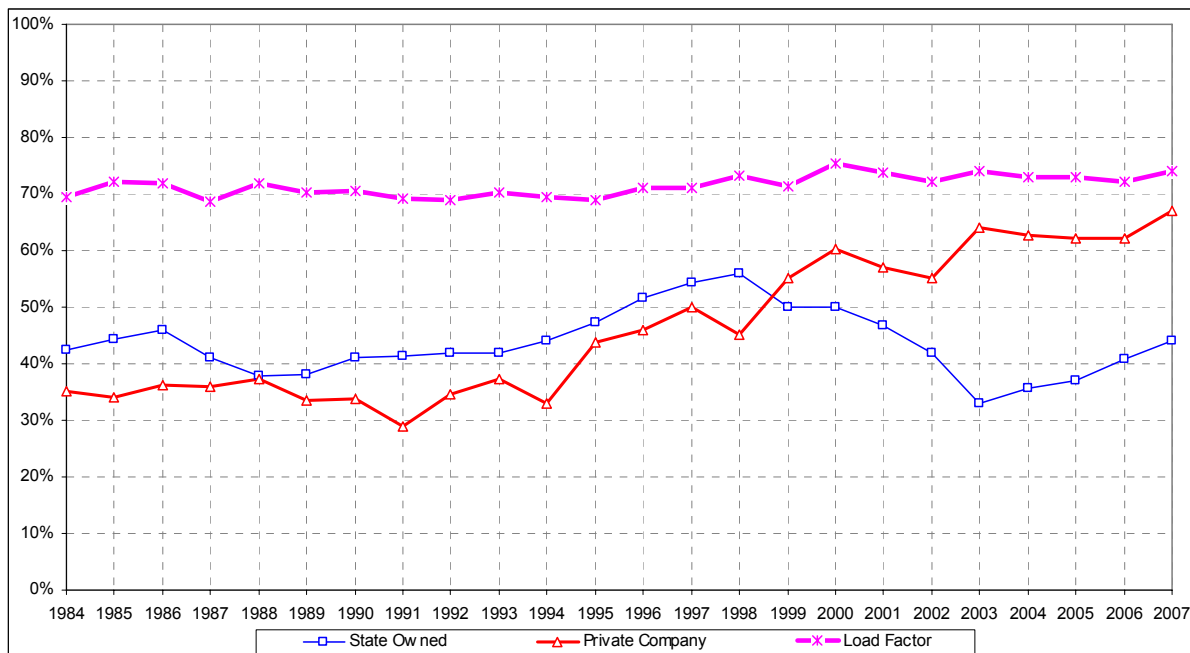
Figure 15: Annual Capacity Factors of State Owned and Private Thermal Power Plants Together with Total System Load Factor



Electricity generation of hydro power plants is more than average in the year 1988 because of excess precipitation. In this year, capacity factors of both state owned and private hydro power plants are explicitly higher than other years (Figure 14). In the same year capacity factors of state owned thermal power plants are quite low. Electricity is being produced instantaneously to cover the demand so only the needed part of total installed capacity will be used. In order to cover demand, while some amount of installed capacity is being used the remaining part will not be used. Because of excess precipitation in the year 1988, while the electricity generation from hydro power plants is more than average some certain amount of thermal capacity has not been used. Capacity belonging to private companies are concessionary, so it could not be reduced in that year and some amount of state owned thermal capacity could not be used.

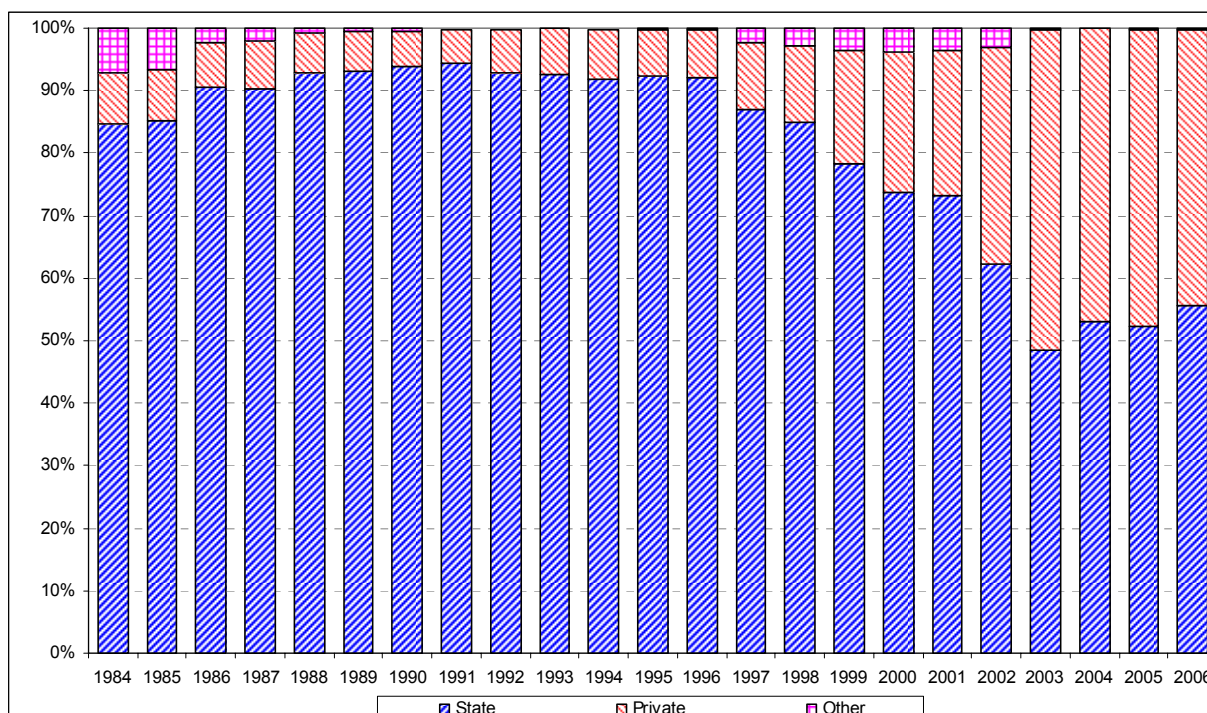
Total annual capacity factors of state owned and private power plants and total power system load factor is indicated on Figure 16. It is obvious on the Figure that the capacity factor of total private power plants start to increase in 1999 and later continue at high level. As it has been emphasized before, the main reason for this increase is new additional capacity is based on thermal resources.

Figure 16: Annual Capacity Factors of State Owned and Private Power Plants



Another indicator to determine the increase of private capacity share in total power system after 1999 is the distinctive increase of private share and a parallel decrease of state owned share in covering the peak demand. State share in covering the peak demand decreases from 80% to 50% level from the year 1999 to 2006. In the same period, private share increases from 20% to 45%. These development is on Figure 17. the share named as other on the Figure comes from Import-export Balance and from isolated capacities.

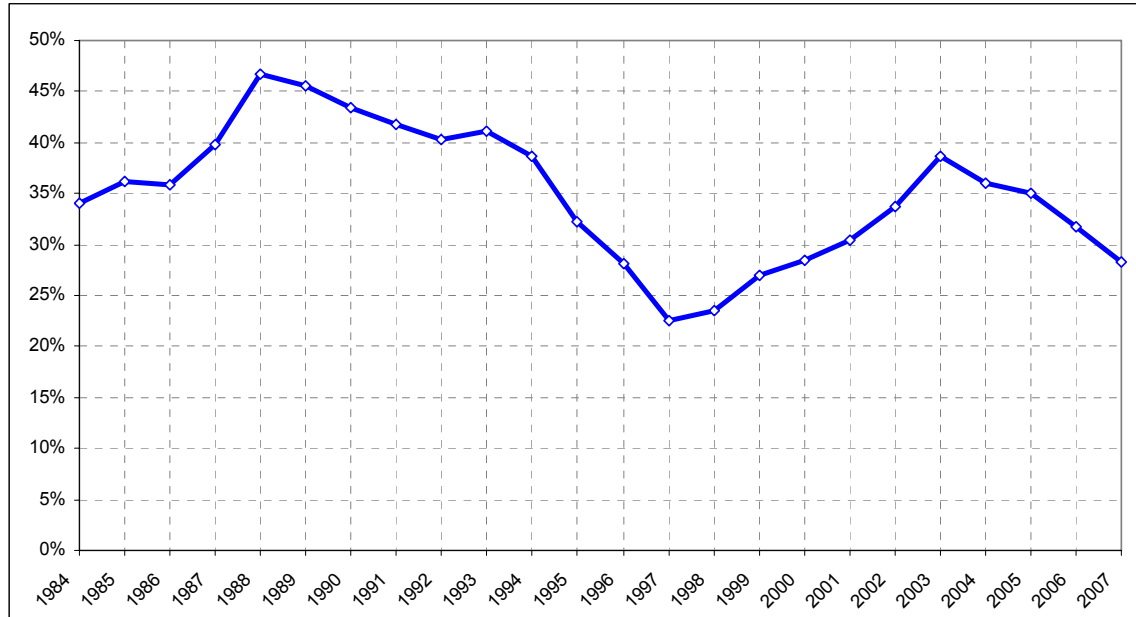
Figure 17: Annual Development of State and Private Shares in Covering the Peak Demand



A considerable amount of private thermal capacity has added to the power system and the big amount of this private thermal capacity has been used to generate electricity due to having purchasing guarantee. While the use rate of private thermal capacity was increasing the use of state owned thermal capacity has decreased. As it can be seen on Figure 17, around 35% system capacity reserve between years 2002 and 2005 causes lower use of state owned thermal capacity. Since less capacity addition than demand need in later years, the total reserve capacity rate decreases and the use of state owned thermal capacity starts to increase again.

When calculating the capacity reserve rate, shown on Figure 18, annual total installed capacity and the peak load of the same year have been used. Since 1984 the peak load increases for all years but the new capacity addition amount is not at the same ratio of that increase. so the reserve capacity rate vary from year to year. Figure explains that the more new capacity addition the higher capacity reserve rate. In the period from 1999 to 2003, a big amount of new capacity has been added to power system and whose big part belongs to private companies, and therefore the capacity reserve rate has been increased. As emphasized above, since 1999 while almost all of private company installed capacity is being used considerable amount of state owned installed capacity has been standed as reserve.

Figure 18: The Development of Annual Capacity Reserve Rates in Turkish Power System



IV.1.1. Conclusion

Because of the increase of private company installed capacities, being these private capacities based on thermal resources and having take-or-pay type contract with purchasing guarantee caused to operate state owned capacities less than their full capacity only to cover the needed demand. Electricity is produced just at the time of need. Naturally, if the generating capacity is higher than the demand the excess capacity will not be used. When all power plants are under same legal conditions, to load them starting from the cheapest and continuing in economic order is the natural method. But if some capacities have privileged rights and generation priority they are operated primarily without considering generating cost. Load profile showing total energy demand amount and consumption levels should be taken into account while generating priority and privileged rights are being determined for some capacities. Expected annual peak demand and annual minimum load level should be considered for the future and the place of privileged capacity in the annual load profile should be determined carefully. At least, total privileged capacity should not exceed the annual minimum load level.

It can be inferred from this report that, almost all of capacities having take-or-pay type contract with purchasing guarantee under BOT, BOO and TOR financing models are used but some amount of state owned capacities can not be operated according to demand amount and consumption characteristics.

IV.2. Analysis of Electricity Consumption of Turkey

IV.2.1. Introduction

Order of load dispatch based on peak and electricity demand is realized by the National Load Dispatch Centre (MYTM) in real time in order to be operated Turkish Power System reliably. The Regional Load Distribution Centres accompany to the National Load Dispatch Centre for management of power and electricity generation in real time to cover demand reliably. The management of the whole power system is realized from only one centre therefore not only operation of the system is reliable and secure but also generation and consumption values are obtained easily. The consumption values used for this Raport are taken from the publication of the MYTM and represent whole country consumption.

In this study;

- ♦ characteristic of total electricity consumption,
- ♦ Load Duration Curve and
- ♦ Characteristic of monthly electricity consumption are analysed by using historical data of MYTM

are used.

IV.2.2. Characteristic of Electrical Energy Consumption

By plotting hourly load values on a graph in the measuring order for a certain time interval represent the electricity consumption characteristic. The graph of hourly load values for a day, a month or a year show the consumption characteristic of the related time period.

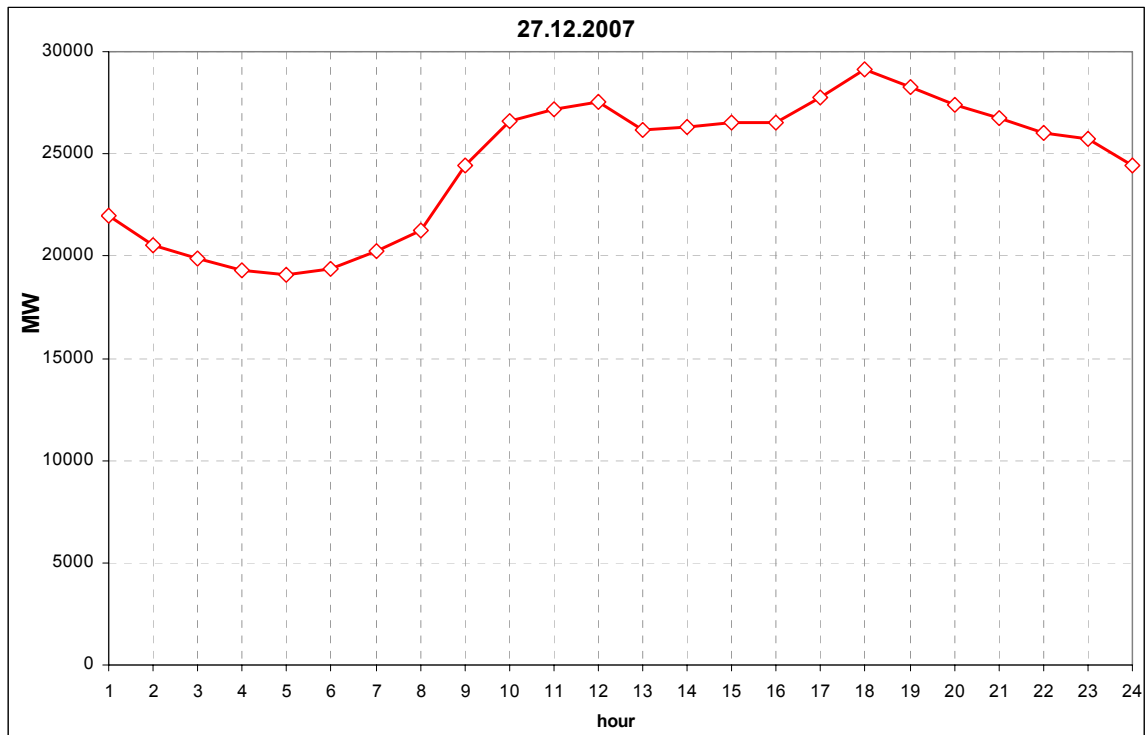
In this section how much difference electricity consumption shows between years, months and days is analysed. In addition the level of change for 24-hours per a day, 7-days per a week, 12-months per a year is analysed separately and detailed. In Turkey electricity consumption changes according to not only days, months and years but also hours of a day, days of a week and months of a year. The highest hourly load in a year is called as Maximum Hourly Load and the lowest one as Minimum Hourly Load. The highest instantaneous load in a year is called as Peak Load.

In 2007 the hourly maximum load had realized as 29150 MW at 6 pm on 27 December. In the same day the lowest instantaneous load was 19114 MW. The hourly consumption values in the time of the maximum load happened are given on Figure 19. In the last years the electricity consumption has been increasing rapidly in summer and the instantantenous maximum load in summer is getting close to the annual peak load which has observed in winter. In 2007 the summer peak happened as 28708 MW at 12:00 on 25 July. In the Turkish electricity system, the most intensive time of electricity consumption is evening period. The difference between the maximum and minimum consumptions is rather high.

The components effecting the characteristic of consumption;

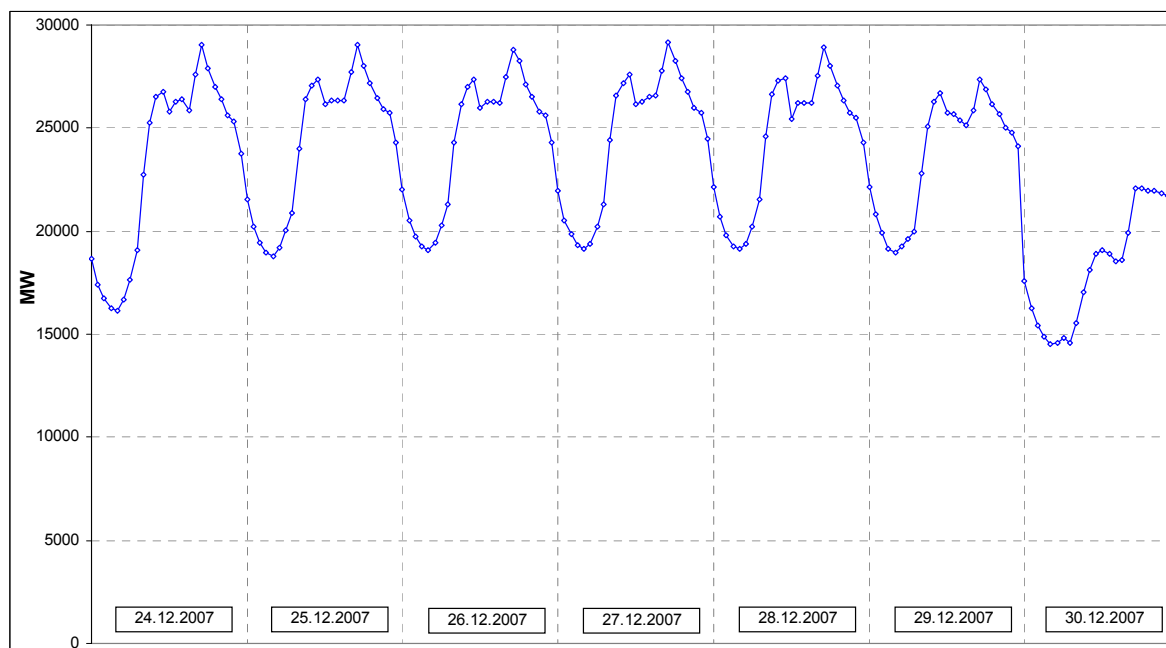
- seasonal conditions,
- intensity and type of industry
- habit of electricity usage
- equipment variety and quality used in households and
- extra-ordinary daily events.

Figure 19: Hourly Consumption Curve in the Day of the Maximum Hourly Load



The levels of hourly electricity consumption change in accordance with not only a day but also a week, a month, a season and a year. The hourly consumption data in the last week of 2007 (24.12.2007-30.12.2007) is shown on Figure 20. In this week the highest instantaneous consumption value was also the maximum hourly consumption value which was 29150 MW. In addition in the same week the minimum hourly consumption value was 16139 MW. Whenever time period spreads, difference between maximum and minimum loads also increases in this period. The difference between the hourly consumption values in the days in the weekend and during the week is shown on Figure 20.

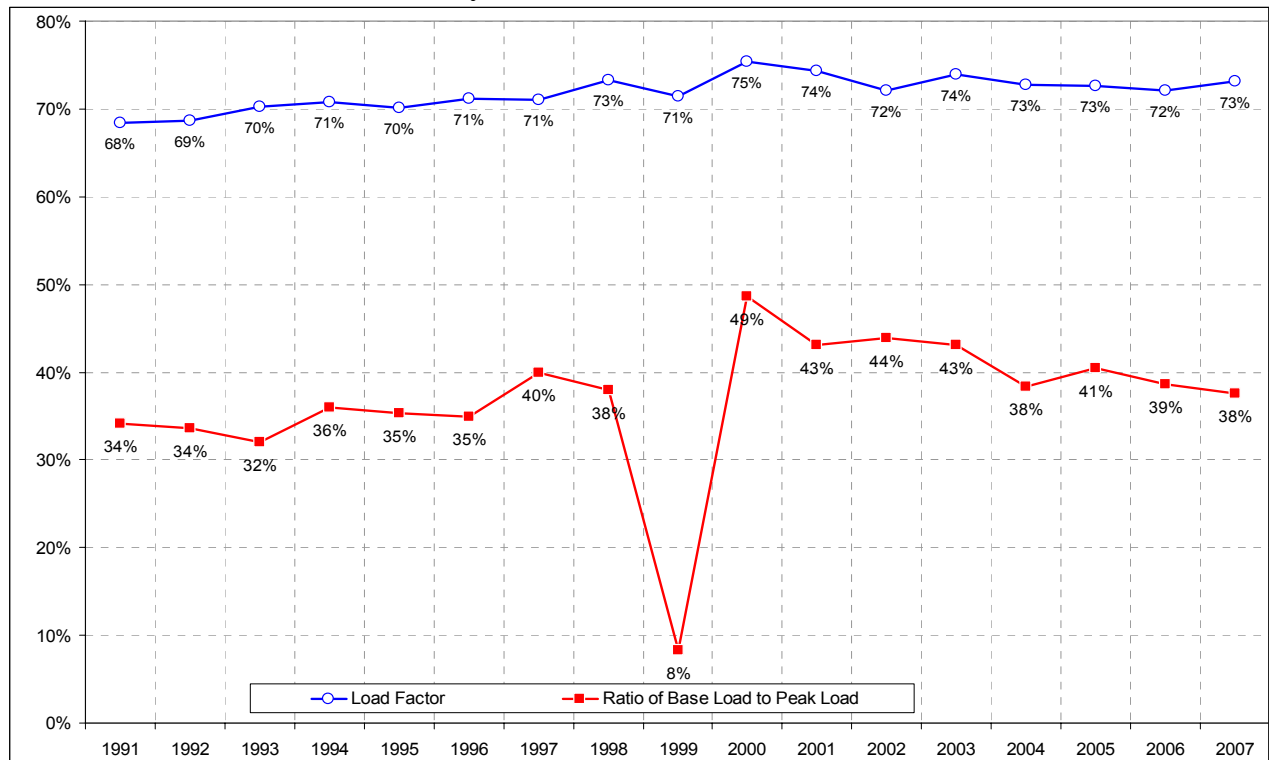
Figure 20: Hourly Consumption Curve of the Last Week of 2007



IV.2.3. Load Duration Curve

Load Duration Curve is a good indicator which represents all of hourly electricity consumptions in a year and analyzes both characteristic of annual electricity consumption and variation of this characteristic by years. By analyzing Load Duration Curve and Capacity Factor of the System, which is the ratio of total annual electricity consumption to the multiplication of Base Load by the number of hours in a year (8760 hours), an important information can be obtained about efficiency of consumed electricity. The Capacity Factor of the System being as high as possible means the electricity being used so efficiently. In other words, the Capacity Factor will increase together with the increasing of the efficiency in the electricity usage. Not only the Capacity Factor being high but also the ratio of the Base Load to the Peak Load being high are important indicators for efficient usage of electricity. While being decreased the Peak Load, being increased the Base Load and being moved the consumption from the period of the Peak Load to the period of the minimum consumption will provide to be increased both the System Load Factor and the efficiency of the electricity consumption. Developments of the System Load Factor and the ratio of the Base Load to the Peak Load by years are shown on Figure 21.

Figure 21: Variations of Load Factor and the Ratio of Base Load to Peak Load by Years in Turkish Power System



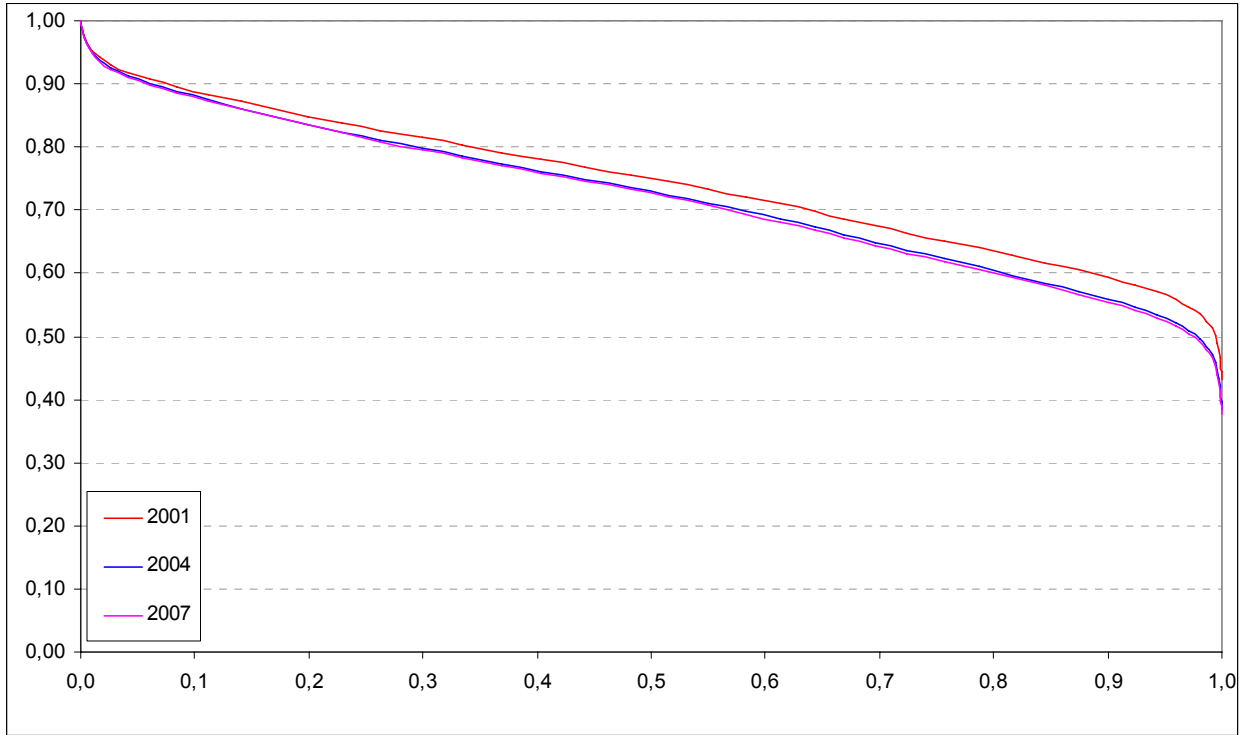
It is seen from the Figure 21 clearly that in Turkish Power System, the Load Factor increased between years 1991 and 2000 and reached to the level of 75% and decreased after the year of 2001 and became 73%. Because of the earthquake in 1999, an unusual decrease in the electricity usage caused to decrease both the System Load Factor and the ratio of the Base Load to the Peak Load exceptionally in comparison with the year before. It is a good indicator for electricity usage to be efficient that the Load Factor is getting higher than the year before or at least is the same as the level of the year.

The ratio of the Base Load to the Peak Load increased from 34% in 1991 to 49% in 2000 and then decreased to 38% in 2007.

The decreasing of the Load Factor and the ratio gives an information about the decrease in the efficient usage of electricity.

Load Duration Curves of the years of 2001, 2004 and 2007 is plotted on Figure 22 in order to be compared more clearly. It is seen that there is a decrease in both the Load Factor and the ratio of the Base Load to the Peak Load on Figure 22.

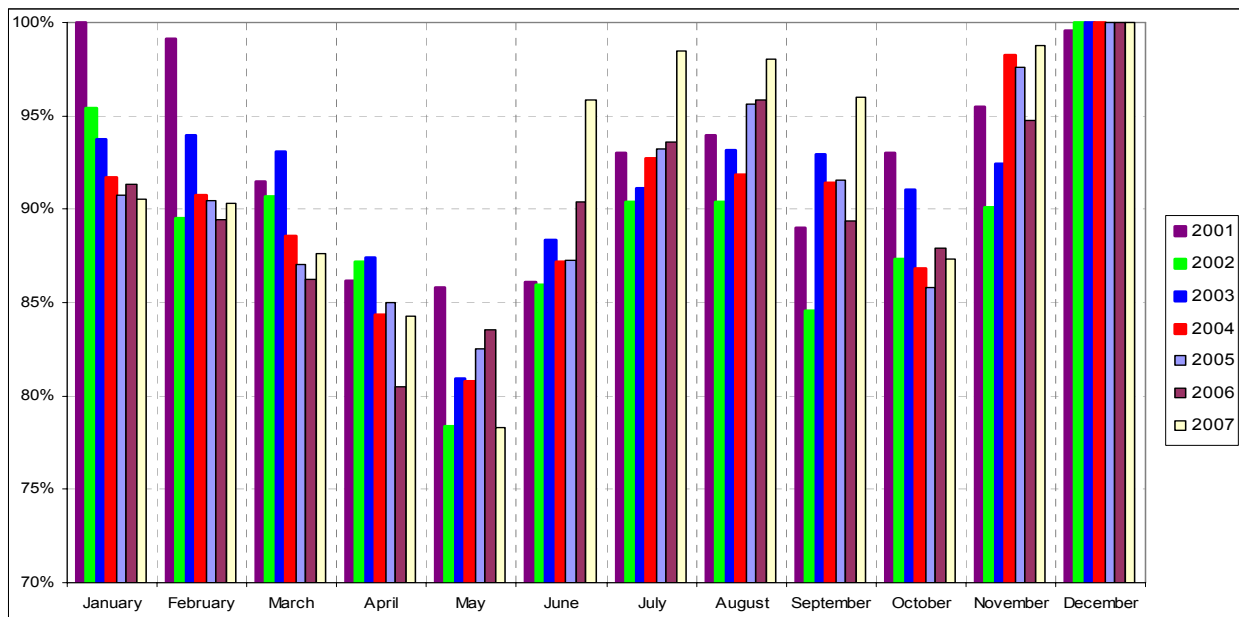
Figure 22: Variation of Load Duration Curve by Years



IV.2.4. Analysis of Electricity Consumption by Months

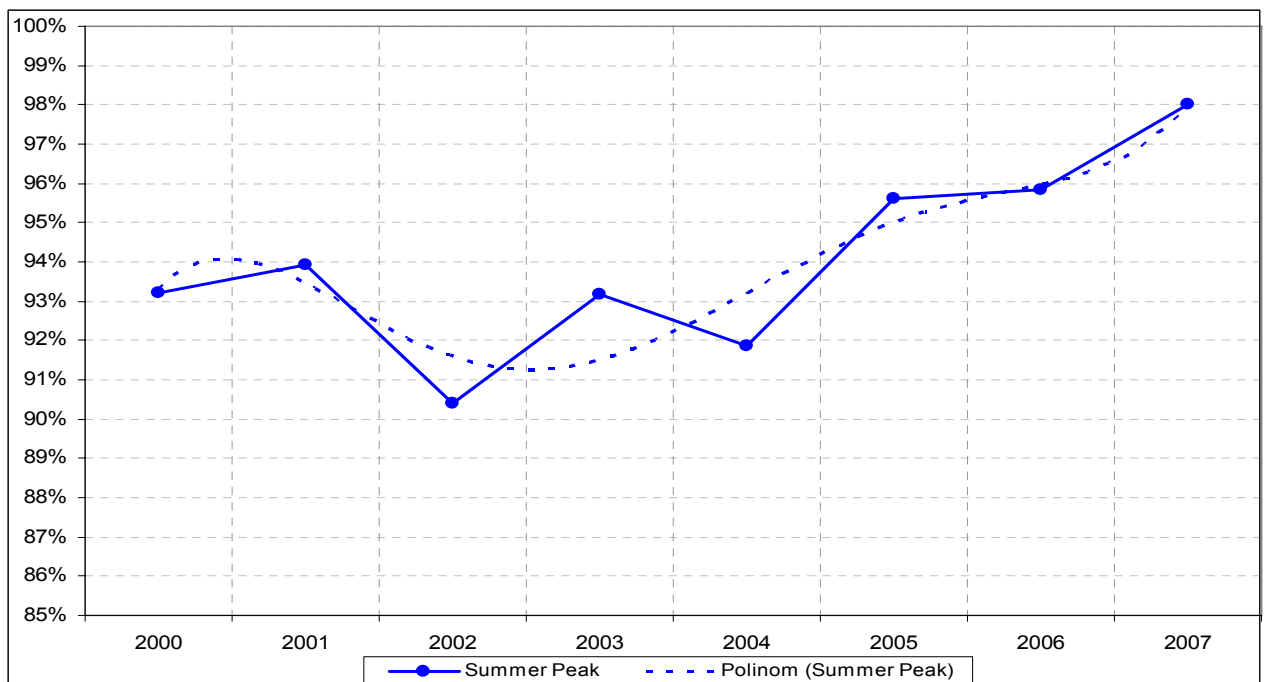
In Turkish Power System yearly instantaneous maximum load (peak) happens in winter. In the preceding years the peak load occurred in November, December or January but in the last four years the peak load occurred in December. The electricity consumption and instantaneous load started to rise in July and August in the last decade. Additionally the summer peak load has been approached to the annual (winter) peak load from time to time. The ratios of the peaks of every months to the annual peak are given on Figure 23. In April and May that the electricity usage is low, the ratio of the monthly peaks to the yearly peak is low and even is getting lower in recent years.

Figure 23: Development of the Ratios of Monthly Peak to Annual Peak Load



Habit of the electricity usage changes in time and then shape of the annual consumption curve and also ratios of the monthly peak to the annual peak change in the whole system. If the annual peak load is indexed to 100%, it is seen on Figure 24 that the hourly summer peak is getting closer to the annual peak load in recent years because of tourism and air condition. Especially in recent years the summer peak load has been increasing more rapidly than the annual peak and the difference between them has been started to close. It should not be neglected that this situation will be able to be a main component of studies of “Demand Side Management”.

Figure 24: Development of the Ratio of Hourly Summer Peak Load to Yearly Peak Load by Years



IV.2.5. Results and Recommendations

It is suggested that Demand Side Management is a method which is the easiest way and quite small investment requiring in order to meet the increasing electricity demand in the world and also in Turkey. The true policies for electricity usage should be made and put into practice as soon as possible for Demand Side Management. The Electricity Consumption Curve and the Load Duration Curve of Turkey should be analyzed in detail for this reason. In the Turkish Power System the System Load Factor and the ratio of the Base Load to the Annual Peak Load have realized as about 73% and 40% respectively. When developments of these values are analyzed by years, it is seen that the Load Curve of Turkey has a good development. Although new investments will be made to meet the demand securely, because of the construction period of power plants, in the case of increasing of the electricity demand as considered, there will be some difficulties to meet the electricity demand in the next years. So, by means of Demand Side Management, movement of electricity consumption period from peak time to time periods of mid level of load curve and level of base load and making people conscious of electricity saving is the cheapest and the most suitable solution to meet demand securely for the short time.

If the existing saving potential in electricity usage is realized, the positive effects will appear in electricity consumption. In order to see the contribution of this potential a sample study which researchs the contribution of using energy saver lamps (CFL- Compact Fluorescent Lightbulb) instead of transparent standard lamps for lightening in households to the country has been made and the results has been summarized in the following.

There are 24.055.682 household customers in Turkey according to TEDAŞ statistics at the end of year 2006, and this number has been considered in this study. Since it has been considered that energy saver lamps have been used for lightening in some of the households in spite of not much widespread, this study has been made for the different alternative numbers of household customers. For 15 million, 12 million, 9 million, 6 million and 3 million numbers of household customers, this energy and capacity conservation and their shares in the total consumption are calculated and given on Table 13.

Table 13: Energy saving Possibility being able to be Provided from Lightening related to Different Number of Households

HOUSEHOLD (NUMBER)	CONSUMPTION FROM LIGHTENING (GWh)	SAVING FROM LIGHTENING (GWh)	CAPACITY SAVING (MW)	LIHGTENING CONSUMPTION AFTER SAVING (GWh)	NET CONSUMPTION OF TURKEY (GWh)	SHARE OF SAVING IN TOTAL NET CONSUMPTION (%)
24 055 682	6893,2	5514,6	1002,6	1378,6	137555,9	3,85%
15 000 000	4298,3	3438,6	625,2	859,7	139631,9	2,40%
12 000 000	3438,6	2750,9	500,2	687,7	140319,6	1,92%
9 000 000	2579,0	2063,2	375,1	515,8	141007,3	1,44%
6 000 000	1719,3	1375,5	250,1	343,9	141695,0	0,96%
3 000 000	859,7	687,7	125,0	171,9	142382,8	0,48%

An important benefit of capacity and energy is seen to be able to be provided from the lightening saving from Table 13. If saver lamps are replaced with transparent lamps and then used about 45 hours for lightening in a week, 687.7 millions kWh of electrical energy and 125 MW of capacity will be able to be saved in a year. If the electrical energy demand increases rapidly as considered in the future, 125 MW of capacity conservation will be very important. By means of this saving, existing capacity will be able to be used more efficiently and investment of 125 MW capacity will be able to be postponed. For 6 million households and 9 million households this conservation will be 250 MW and 375 MW respectively.

V. TRANSMISSION AND DISTRIBUTION SYSTEM

V.1. Transmission System

Transmission system is the group of facilities starting from generation units to distribution network and transmitting energy at the level of High Voltage (HV) and Extra High Voltage (EHV). Components of transmission system are:

- Transmission lines and cables
- Transmission Substations and Switching Centers (switchyards not containing step down substations and transformers)

Turkish electricity transmission system, which is composed of 380 kV EHV lines and 154 kV HV lines, 380/154 kV Autotransformers and 154/MV step down substations, has been equipped with the sufficient amount of serial and shunt capacitors due to their technical and economic advantages. The transmission system has standard voltage level of 380 kV and 154 kV. Interconnection lines connecting Turkish system to Georgia and to Armenia are at the level of 220 kV appropriate to other countries' system.

Turkish generation and transmission system is being managed via 8 regional dispatching centers (Adapazarı, Çarşamba, Keban, İzmir, Gölbaşı, İkitelli, Erzurum and Çukurova) coordinated by the National Dispatching Center in Ankara. Operating of the power system is being carried out by SCADA² and Energy Management System EMS³ software. SCADA system includes 380 kV lines and power plants greater than 50 MW. System operator can manage every kind of system studies necessary for more quality, daily operating programs and system frequency control.

The existing situation of the transmission system is summarized on Table 14 and Table 15.

Table 14 : Number of Transmission Substations and Capacities by primary voltage level
(Values for 2007)

380 kV		154 kV		66 kV and lower		TOTAL	
AMOUNT	CAPACITY (MVA)	AMOUNT	CAPACITY (MVA)	AMOUNT	CAPACITY (MVA)	AMOUNT	CAPACITY (MVA)
153	28715	963	52669	57	672	1173	82056

² Supervisory Control And Data Acquisition

³ Energy Management System

Table 15 : Length of Transmission Lines (km) (Values for 2007)

380 kV	220 kV	154 kV	66 kV	TOTAL
14338.4	84.5	31.383	477.4	46283.3

154 kV underground capacity cable length is 142.2 km

380 kV underground capacity cable length is 12.8 km

Transmission system is the main backbone of the electric system. These are expensive and have long investment period. Due to their operation play a major role on country's economy regional development targets, load forecasts and supply resources should be determined in advance.

V.2. Distribution System

The total length of Turkis electricity distribution system is 922724.2 km as end of the year 2007. The breakdown of distribution line lengths by voltage level is summarized on Table 16.

Table 12 : Length of Distribution Lines (km)

33 kV	15,8 kV	10,5 kV	6,3 kV	Other	0,4 kV	TOTAL
333258.9	30290.5	5474.4	7656.8	98.8	545944.8	922724.2

Resource : TEDAŞ

The current situation of Turkish Electricity Distribution System is as end of the year 2007 outlined on Table 17.

Table 17 : Number of Distribution Substations and Capacities by primary voltage level

Secondary Voltage Level	Secondary Voltage Level	15,8 kV	10,5 kV	6,3 kV	OTHER	0,4 kV	TOTAL
33 kV	AMOUNT	479	215	438	55	261122	262309
	CAPACITY (MVA)	3978.5	3448.4	3291.5	260.5	69582.9	80561.8
15,8 kV	AMOUNT			5	3	30513	30521
	CAPACITY (MVA)			14.6	3.3	8959.9	8977.8
10,5 kV	AMOUNT			1		8034	8035
	CAPACITY (MVA)			4.0		6840.7	6844.7
6,3 kV	AMOUNT				5	7918	7923
	CAPACITY (MVA)				136.7	3522.9	3659.6
OTHER	AMOUNT				9	1868	1877
	CAPACITY (MVA)				57,6	354.0	411.6
TOTAL	AMOUNT	479	215	444	72	309455	310665
	CAPACITY (MVA)	3978.5	3448.4	3310.1	458.1	89260.4	100455.5

Resource : TEDAŞ

V.3. System Losses

Transmission system has been designed appropriate to European standards by considering population density, location of supply resources and geographical conditions and the line losses around 3% which is at the level of international performances. (Table 18)

Table 18 : Transmission Losses

YEAR	%	GWh
2001	2.8	3374.4
2002	2.7	3440.7
2003	2.4	3330.7
2004	2.4	3422.8
2005	2.4	3695.3
2006	2.7	4543.8
2007	2.5	4523.0

Resource : Turkish Electricity Generation-Transmission Statistics, TEİAŞ-APK

VI. ASSUMPTIONS USED FOR THE GENERATION CAPACITY PROJECTION

VI.1. Demand

Base Demand and Low Demand series which are occurred from the study results on May 2008 of MAED Model used by Ministry of Energy and Natural Resources (ETKB) are used in this study for the period of 2008-2017.

VI.2. Existing Generating System

- Power plants connected to Turkish Power System and in operation as the end of the year 2007 are considered as existing system.
- Maximum generating capacity called as *Project Generation* and minimum generating capacity called as *Firm Generation* for EÜAŞ thermal power plants are obtained from EÜAŞ.
- Nominal generating capacity called as *Project Generation* and minimum generating capacity called as *Firm Generation* for EÜAŞ hydro power plants are obtained from EÜAŞ.
- *Project Generation* and *Firm Generation* amounts of thermal power plants owned by affiliated partnerships are obtained from EÜAŞ between years 2008 and 2017.
- *Project Generation* and *Firm Generation* amounts of Autoproducer and Generation Company power plants are obtained from their licences and these generation amounts are accepted as to remain at the same level for the next 10-year period. Generating capacity amounts indicated on licences are obtained from EPDK.
- Generating capacity amounts of power plants under BO contract for the future ten-year period are the energy sale amounts indicated on their contracts and obtained from TETAŞ.
- Generating capacity amounts of power plants under BOT and TOR contract for the future 10-year period are the energy sale amounts indicated on their contracts and obtained from TETAŞ.
- The installed capacities of Autoproducer and Generation Company power plants (except for decommissioning) whose licences have been cancelled are kept in installed capacity total and their generation capacities are taken as zero.
- The contracted generation amounts of Mobile Plants are used as *Generating Capacity Amount* for mobile plants and these amounts are used till the end of their contracts with EÜAŞ. Due to expiration of mobile power plant contracts with EÜAŞ, the corresponding generation amounts by year will be decreased from the total generation capacity and only the mobile power plants going on their contracts are put in the lists. After finishing their contracts, the power plants will be able to produce by taking Generation Company licence. The power plants with the licence of Generation Company till the end of 2007 are taken into consideration in the study. But the plants not only expiring their contracts and but also not taking the new generation licence are not taken into consideration.
- Firm and Project generation capacity amounts of natural gas fired power plants owned by EÜAŞ and its affiliated partnerships are given by EÜAŞ by assuming there will be no constraint on natural gas supply during the study period 2008-2017.
- By taking into consideration of rehabilitation investments and maintenance-repair program for state owned power plants, the generation amounts of the plants are given by EÜAŞ.
- 2 x 150 MW units of Ambarlı fuel oil fired power plant which is currently being extended to be decommissioned in 2009 and new one to be commissioned as a natural gas fired power plants with 840 MW (540 MW + 300 MW) total installed capacity in 2012 are taken into consideration.

VI.3. Capacities Under Construction, Capacities Granted by Licence by the end of 2007 and expected to be in service on planned dates and New Additional Capacities

- On line dates and *Project* (in average hydro conditions) and *Firm* (in dry hydro conditions) generation amounts of hydro power plants having total installed capacity of 3479 MW which are constructed by DSI and expected to be in service between the years of 2008 and 2015 are obtained from DSI. Yearly generation amounts of the projects whose commissioning dates are given project by project in detail of monthly/yearly are taken into consideration in the balance tables by calculating as of their commissioning dates.
- Installed capacity, project generation and firm generation data for power plants granted by licence as the end of December 2007 and expected to be in service on proposed time are obtained according to two separate scenarios (Scenario 1 and Scenario 2) from January-2008 Progress Report by EPDK. Since EPDK hasn't given the commissioning date of private sector projects granted by licence in detail of monthly/yearly project by project, these projects are assumed to start the operation from the beginning of the second part of commissioning year and then the generations are taken into consideration in the balance tables according to this situation.
- It is assumed that power plants under construction (3479 MW) by DSI, Ambarlı thermal power plant being rehabilitated (840 MW) by EÜAŞ and power plants granted by licence as end of December 2007 and expected to be in service on proposed time (total installed capacity, 12818 MW for Scenario 1 and 8599 MW Scenario 2) by EPDK will be in service on proposed date within the period 2008-2013. The breakdown of installed capacity, project generation and firm generation of this additional capacities by primary resources are shown as two scenarios for Scenario 1 on Table 25, 26 and 27 and for Scenario 2 on Table 28, 29 and 30 respectively.
- Private sector owned wind capacities granted by licence and expected to be in service on the proposed date are taken into consideration to be 843.9 MW for scenario 1 and 434.2 MW for Scenario 2. In addition it is assumed that approximately 125 MW new wind capacity will be able to be connected to the grid per year between the years of 2008 and 2017 in accordance with the most recent "Generation Expansion Planning Study" prepared in 2004.
- No import and export are being considered.
- Capacity amount coming from the most recent Generation Expansion Planning Study prepared in 2004 is taken into account as new additional capacity in order to meet both demand projection series carried out by ETKB safely. ETKB policies on evaluation of domestic resources and diversification of primary resources are reflected to Generation Expansion Planning study.
- For the new additional thermal capacity, it is assumed that coal fired power plants can operate 6500 hours, natural gas fired power plants and nuclear power plants can operate 7000 hours per year at full capacity equivalent
- Project and firm generation capacity amounts of new additional hydro power plants are determined by DSI,
- The project generation amount of new additional wind power plants is assumed to be 3000-hour full capacity equivalent generation and the firm generation amount to be 1500-hour full capacity equivalent generation per year.
- Power plants in operation as of the end of the year 2007 are listed on ANNEX-1, power plants which have been commissioned and decommissioned in 2007 are on ANNEX-2 and power plants under construction and granted by licence and expected to be in service on proposed time by EPDK are listed for breakdown of the installed capacities by primary resources for Scenario 1 and Scenario 2 on Table 19 and on Table 22 respectively and also for breakdown of the project and firm energy by primary resources for Scenario 1 and Scenario 2 on Table 20 and 21 respectively and on Table 23 and 24 respectively.

Table 19 : Breakdown of Installed Capacity of Private Sector Power Plants Granted by Licence and Expected to be in Service on Proposed Date and State-owned Power Plants under construction by Primary Resources.

Private Sector Power Plants Granted by Licence (Scenario 1)

RESOURCES	Installed Capacity (MW)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Asphaltit		137,8							137,8
Natural Gas	176,4	103,4	881,3						1161,1
Fuel Oil	110,6								110,6
Lignite	1,7			474,7					476,4
Import Coal				887,6	744,7				1632,3
Hard Coal		165,0							165,0
Hydro	121,4	576,7	2385,3	2632,8	1353,7	1133,8			8203,7
Plantful Oil		1,5							1,5
Biogas	1,1								1,1
Waste Gas (LFG)		7,8	14,3						22,1
Geothermal	45,0	7,5		9,5					62,0
Wind	483,2	360,7							843,9
TOTAL	939,4	1360,4	3280,9	4004,6	2098,4	1133,8	0	0	12817,5

State-owned Power Plants Under Construction

RESOURCES	Installed Capacity (MW)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal					840,0				840,0
Hydro	527,0	1107,4	104,3				1200,0	540,0	3478,7
TOTAL	527,0	1107,4	104,3	0	840,0	0	1200,0	540,0	4318,7

GRAND TOTAL

LICENCED +UNDER CONSTRUCTION	Installed Capacity (MW)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal	288,7	406,2	881,3	1362,3	1584,7	0,0	0,0	0,0	4523,2
Hydro	648,4	1684,1	2489,6	2632,8	1353,7	1133,8	1200,0	540,0	11682,4
Wind+Renewable	529,3	377,5	14,3	9,5	0,0	0,0	0,0	0,0	930,6
TOTAL	1466,4	2467,8	3385,2	4004,6	2938,4	1133,8	1200,0	540,0	17136,2

Table 20 : Breakdown of Project Generation of Private Sector Power Plants Granted by Licence and Expected to be in Service on Proposed Date and State-owned Power Plants under construction by Primary Resources.

Private Sector Power Plants Granted by Licence (*Scenario 1*)

RESOURCES	Project Generation (GWh)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Asphaltit		486,0	486,0						972,0
Natural Gas	512,9	897,5	3726,9	3342,3					8479,5
Fuel Oil	356,5	356,5							712,9
Lignite	4,2	4,2		1541,3	1541,3				3090,9
Import Coal				3547,4	6193,4	2646,0			12386,8
Hard Coal		532,2	532,2						1064,3
Hydro	239,0	1358,3	5640,5	9251,9	7109,8	4710,6	2331,6		30641,5
Plantful Oil		5,8	5,8						11,6
Biogas	3,5	3,5							6,9
Waste Gas (LFG)		30,0	85,0	55,0					170,0
Geothermal	153,3	184,8	31,5	35,0	35,0				439,6
Wind	898,6	1542,9	644,4						3085,8
TOTAL	2167,8	5401,5	11152,1	17772,8	14879,5	7356,6	2331,6	0	61061,8

State-owned Power Plants Under Construction

RESOURCES	Project Generation (GWh)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal					5880,0				5880,0
Hydro	779,5	1605,0	2875,2	148,2			3833,0	1705,0	10945,9
TOTAL	779,5	1605,0	2875,2	148,2	5880,0	0,0	3833,0	1705,0	16825,9

GRAND TOTAL

LICENCED +UNDER CONSTRUCTION	Project Generation (GWh)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal	873,6	2276,3	4745,0	8430,9	13614,7	2646,0	0,0	0,0	32586,4
Hydro	1018,5	2963,3	8515,7	9400,1	7109,8	4710,6	6164,6	1705,0	41587,4
Wind+Renewable	1055,3	1767,0	766,7	90,0	35,0	0,0	0,0	0,0	3713,9
TOTAL	2947,3	7006,5	14027,3	17921,0	20759,5	7356,6	6164,6	1705,0	77887,7

Tablo 21: Breakdown of Firm Generation of Private Sector Power Plants Granted by Licence and Expected to be in Service on Proposed Date and State-owned Power Plants under construction by Primary Resources.

Private Sector Power Plants Granted by Licence (Scenario 1)

RESOURCES	Firm Generation (GWh)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Asphaltit		486,0	486,0						972,0
Natural Gas	512,9	897,5	3726,9	3342,3					8479,5
Fuel Oil	356,5	356,5							712,9
Lignite	4,2	4,2		1541,3	1541,3				3090,9
Import Coal				3547,4	6193,4	2646,0			12386,8
Hard Coal		532,2	532,2						1064,3
Hydro	150,4	831,6	3230,0	5234,0	4027,7	2656,4	1313,9		17443,9
Plantful Oil		5,8	5,8						11,6
Biogas	3,5	3,5							6,9
Waste Gas (LFG)		23,4	68,6	45,2					137,2
Geothermal	103,6	135,1	31,5	27,8	27,8				325,6
Wind	793,4	1354,1	560,7						2708,1
TOTAL	1924,3	4629,7	8641,6	13737,8	11790,1	5302,4	1313,9	0	47339,7

State-owned Power Plants Under Construction

RESOURCES	Firm Generation (GWh)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal					5606,4				5606,4
Hydro	495,8	997,6	1781,1	51,5			2459,0	1129,0	6914,0
TOTAL	495,8	997,6	1781,1	51,5	5606,4	0	2459,0	1129,0	12520,4

GRAND TOTAL

LICENCED +UNDER CONSTRUCTION	Firm Generation (GWh)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal	873,6	2276,3	4745,0	8430,9	13341,1	2646,0	0,0	0,0	32312,8
Hydro	646,2	1829,2	5011,1	5285,5	4027,7	2656,4	3772,9	1129,0	24357,9
Wind+Renewable	900,4	1521,8	666,6	73,0	27,8	0,0	0,0	0,0	3189,4
TOTAL	2420,1	5627,3	10422,7	13789,3	17396,5	5302,4	3772,9	1129,0	59860,1

Tablo 22: Breakdown of Installed Capacity of Private Sector Power Plants Granted by Licence and Expected to be in Service on Proposed Date and State-owned Power Plants under construction by Primary Resources.

Private Sector Power Plants Granted by Licence (Scenario 2)

RESOURCES	Installed Capacity (MW)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Asphaltit		137,8							137,8
Natural Gas	90,9	167,2							258,1
Fuel Oil	70,6								70,6
Lignite				170,0					170,0
Import Coal				887,6	607,9				1495,5
Hard Coal		165,0			654,5				819,5
Hydro	130,9	289,5	280,2	2640,8	1275,9	531,2			5148,5
Plantful Oil			1,5						1,5
Biogas	1,1								1,1
Geothermal	45,0	7,5		9,5					62,0
Wind	404,2	30,0							434,2
TOTAL	742,7	797,0	281,7	3707,9	2538,3	531,2	0,0	0,0	8598,8

State-owned Power Plants Under Construction

RESOURCES	Installed Capacity (MW)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal					840,0				840,0
Hydro	527,0	1107,4	104,3				1200,0	540,0	3478,7
TOTAL	527,0	1107,4	104,3	0	840,0	0	1200,0	540,0	4318,7

GENEL TOPLAM

LICENCED +UNDER CONSTRUCTION	Installed Capacity (MW)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal	161,5	470,0	0,0	1057,6	2102,4	0,0	0,0	0,0	3791,5
Hydro	657,9	1396,9	384,5	2640,8	1275,9	531,2	1200,0	540,0	8627,2
Wind+Renewable	450,3	37,5	1,5	9,5	0,0	0,0	0,0	0,0	498,8
TOTAL	1269,7	1904,4	386,0	3707,9	3378,3	531,2	1200,0	540,0	12917,5

Tablo 23: Breakdown of Project Generation of Private Sector Power Plants Granted by Licence and Expected to be in Service on Proposed Date and State-owned Power Plants under construction by Primary Resources.

Private Sector Power Plants Granted by Licence (Scenario 2)

RESOURCES	Project Generation (GWh)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Asphaltit		486,0	486,0						972,0
Natural Gas	233,6	812,2	578,6						1624,3
Fuel Oil	229,7	229,7							459,3
Lignite				650,0	650,0				1300,0
Import Coal				3547,4	5707,4	2160,0			11414,8
Hard Coal		532,2	532,2		2240,0	2240,0			5544,3
Hydro	343,9	869,1	968,1	4720,3	6887,5	3665,4	1055,4		18509,5
Plantful Oil			5,8	5,8					11,6
Biogas	3,5	3,5							6,9
Jeotermal	153,3	184,8	31,5	35,0	35,0				439,6
Rüzgar	731,5	783,3	51,8						1566,6
TOPLAM	1695,3	3900,6	2654,0	8958,5	15519,9	8065,4	1055,4	0	41848,9

State-owned Power Plants Under Construction

RESOURCES	Project Generation (GWh)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal					5880,0				5880,0
Hydro	779,5	1605,0	2875,2	148,2			3833,0	1705,0	10945,9
TOTAL	779,5	1605,0	2875,2	148,2	5880,0	0,0	3833,0	1705,0	16825,9

GRAND TOTAL

LICENCED +UNDER CONSTRUCTION	Project Generation (GWh)								TOPLAM
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal	463,2	2060,0	1596,8	4197,4	14477,4	4400,0	0,0	0,0	27194,7
Hydro	1123,4	2474,1	3843,3	4868,5	6887,5	3665,4	4888,4	1705,0	29455,4
Wind+Renewable	888,3	971,6	89,1	40,8	35,0	0,0	0,0	0,0	2024,7
TOTAL	2474,8	5505,6	5529,2	9106,7	21399,9	8065,4	4888,4	1705,0	58674,8

Tablo 24: Breakdown of Firm Generation of Private Sector Power Plants Granted by Licence and Expected to be in Service on Proposed Date and State-owned Power Plants under construction by Primary Resources.

Private Sector Power Plants Granted by Licence (Scenario 2)

RESOURCES	Firm Generation (GWh)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Asphaltit		486,0	486,0						972,0
Natural Gas	233,6	812,2	578,6						1624,3
Fuel Oil	229,7	229,7							459,3
Lignite				650,0	650,0				1300,0
Import Coal				3547,4	5707,4	2160,0			11414,8
Hard Coal		532,2	532,2		2240,0	2240,0			5544,3
Hydro	222,6	559,3	599,3	2687,5	3896,7	2067,8	596,0		10628,9
Plantful Oil			5,8	5,8					11,6
Biogas	3,5	3,5							6,9
Geothermal	103,6	135,1	31,5	27,8	27,8				325,6
Wind	600,6	647,0	46,4						1293,9
TOTAL	1393,4	3404,7	2279,7	6918,4	12521,8	6467,8	596,0	0	33581,6

State-owned Power Plants Under Construction

RESOURCES	Firm Generation (GWh)								TOTAL
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal					5606,4				5606,4
Hydro	495,8	997,6	1781,1	51,5			2459,0	1129,0	6914,0
TOTAL	495,8	997,6	1781,1	51,5	5606,4	0	2459,0	1129,0	12520,4

GRAND TOTAL

LICENCED +UNDER CONSTRUCTION	Firm Generation (GWh)								TOPLAM
	2008	2009	2010	2011	2012	2013	2014	2015	
Thermal	463,2	2060,0	1596,8	4197,4	14203,8	4400,0	0,0	0,0	26921,1
Hydro	718,4	1556,9	2380,4	2739,0	3896,7	2067,8	3055,0	1129,0	17542,9
Wind+Renewable	707,6	785,5	83,7	33,6	27,8	0,0	0,0	0,0	1638,0
TOTAL	1889,2	4402,3	4060,8	6969,9	18128,2	6467,8	3055,0	1129,0	46102,0

The installed capacities and generation data of DSİ power plants under construction and Ambarlı natural gas fired power plant extended by EÜAŞ and power plants granted by licence as end of December 2007 but not in operation yet according to “January 2008 Progress Report” of EPDK for both scenarios EÜAŞ are indicated on ANNEX-3.

The breakdown of total installed capacity which consists existing capacity as end of the year 2007 and new additional capacities which are under construction and granted by licence and expected to be in service on proposed date according to Scenario 1 by primary resources and by utilities are listed on Table 25 and Figure 25 and also according to Scenario 2 are on Table 28 and Figure 26.

When the annual peak load values are compared to annual development of this installed capacity, without considering reserve capacity the peak load will excess the installed capacity in 2016 according to both Scenario 1 in the case of which the power plants will be in operation and Base Demand and also in 2017 according to both Scenario 1 and Low Demand. In addition the excessive of the peak load from the total installed capacity will be in 2015 according to both Scenario 2 in the case of which the power plants will be in operation and Base Demand and will be in 2016 according to Scenario 2 and Low Demand. In other words, it is calculated that if the expected peak load realizes the peak load can not be covered in 2016 for both the Scenario 1 and Base Demand, in 2017 for both the Scenario 1 and Low Demand, in 2015 for both the Scenario 2 and Base Demand and in 2016 both the Scenario 2 and Low Demand.

**Table 25 : Breakdown of Installed Capacity by Utilities and by Primary Resources
(Scenario 1)**

(Including Existing, Under Construction and Granted by Licence Power Plants)

(MW)

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EÜAŞ and AFFILIATED PARTNERSHIP POWER PLANTS	FUEL OIL	680	380	380	380	380	380	380	380	380	380
	DIESEL	181	181	181	181	181	181	181	181	181	181
	HARD COAL	300	300	300	300	300	300	300	300	300	300
	LIGNITE	7461	7461	7461	7461	7461	7461	7461	7461	7461	7461
	NATURAL GAS	3903	3903	3903	3903	4743	4743	4743	4743	4743	4743
	HYDRO	11877	12985	13089	13089	13089	13089	14289	14829	14829	14829
	TOTAL	24402	25210	25314	25314	26154	26154	27354	27894	27894	27894
POWER PLANTS UNDER TOR CONTRACT	LIGNITE	620	620	620	620	620	620	620	620	620	620
	HYDRO	30	30	30	30	30	30	30	30	30	30
	TOTAL	650	650	650	650	650	650	650	650	650	650
POWER PLANTS UNDER BO CONTRACT	NATURAL GAS	4782	4782	4782	4782	4782	4782	4782	4782	4782	4782
	IMPORTED COAL	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320
	TOTAL	6102	6102	6102	6102	6102	6102	6102	6102	6102	6102
POWER PLANTS UNDER BOT CONTRACT	NATURAL GAS	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450
	HYDRO	982	982	982	982	982	982	982	982	982	982
	WIND	17	17	17	17	17	17	17	17	17	17
	TOTAL	2449	2449	2449	2449	2449	2449	2449	2449	2449	2449
MOBILE PLANTS	FUEL OIL	263	263	263	263	263	263	263	263	263	263
	TOTAL	263	263	263	263	263	263	263	263	263	263
ADÜAŞ POWER PLANTS	DIESEL	15	15	15	15	15	15	15	15	15	15
	HYDRO	111	111	111	111	111	111	111	111	111	111
	GEOTHERMAL	15	15	15	15	15	15	15	15	15	15
	TOTAL	141	141	141	141	141	141	141	141	141	141
AUTOPRODUCERS	FUEL OIL	795	795	795	795	795	795	795	795	795	795
	DIESEL	18	18	18	18	18	18	18	18	18	18
	IMPORTED COAL	331	331	331	331	331	331	331	331	331	331
	HARD COAL	255	255	255	255	255	255	255	255	255	255
	LIGNITE	179	179	179	179	179	179	179	179	179	179
	LPG	52	52	52	52	52	52	52	52	52	52
	NATURAL GAS	1369	1369	1369	1369	1369	1369	1369	1369	1369	1369
	BİOGAS	13	13	13	13	13	13	13	13	13	13
	NAPHTA	141	141	141	141	141	141	141	141	141	141
	OTHER	22	22	22	22	22	22	22	22	22	22
	HYDRO	558	558	558	558	558	558	558	558	558	558
	WIND	1	1	1	1	1	1	1	1	1	1
	TOTAL	3735	3735	3735	3735	3735	3735	3735	3735	3735	3735
GENERATION COMPANIES GRANTED BY LICENCE	FUEL OIL	412	412	412	412	412	412	412	412	412	412
	LIGNITE	2	2	2	476	476	476	476	476	476	476
	H.COAL+ASPHALTIT	0	303	303	303	303	303	303	303	303	303
	IMPORT COAL	0	0	0	888	1632	1632	1632	1632	1632	1632
	NATURAL GAS	2953	3057	3938	3938	3938	3938	3938	3938	3938	3938
	NAPHTA	37	37	37	37	37	37	37	37	37	37
	GEOTHERMAL	53	61	61	70	70	70	70	70	70	70
	HYDRO	484	1061	3446	6079	7433	8567	8567	8567	8567	8567
	BİOGAS+WASTE	9	19	33	33	33	33	33	33	33	33
	WIND	611	972	972	972	972	972	972	972	972	972
	TOTAL	4560	5921	9202	13206	15305	16439	16439	16439	16439	16439
GRAND TOTAL		42302	44470	47855	51860	54798	55932	57132	57672	57672	57672

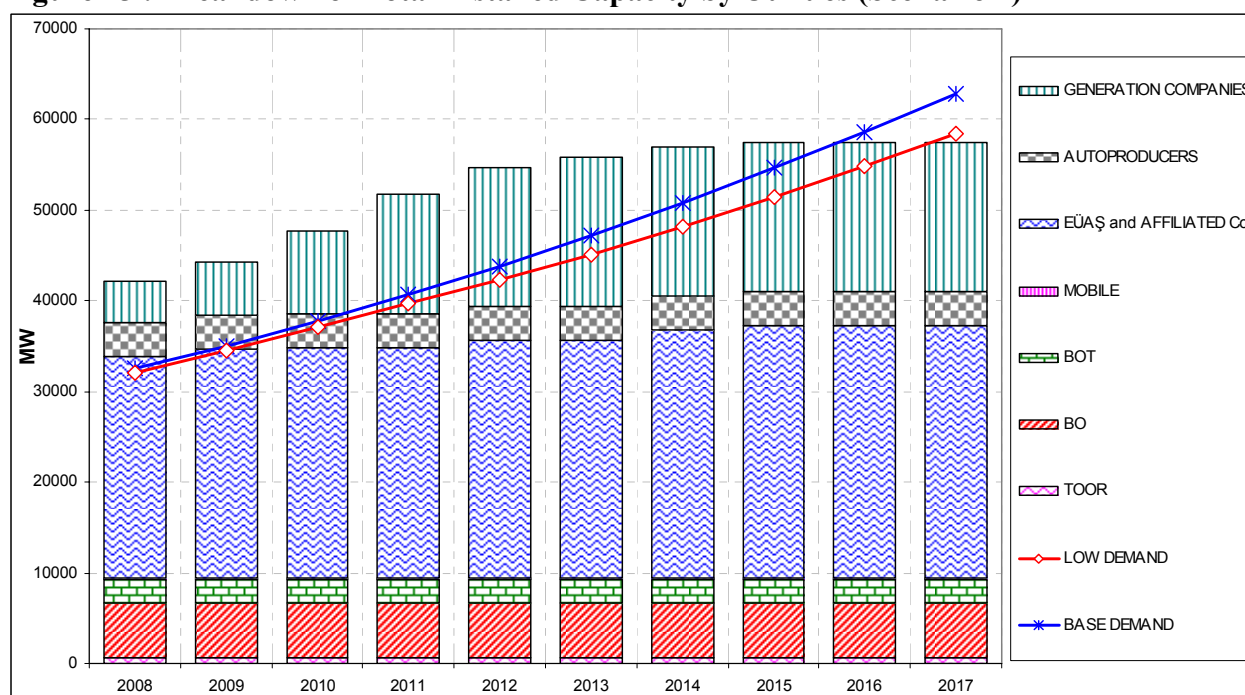
Table 25 (Cont.) : Breakdown of Total Installed Capacity by Primary Resources (Scenario 1)

(Including Existing, Under Construction and Granted by Licence Power Plants)

(MW)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
LIGNITE	8262	8262	8262	8737	8737	8737	8737	8737	8737	8737
HARD COAL+ASPHALTIT	555	858	858	858	858	858	858	858	858	858
IMPORTED COAL	1651	1651	1651	2539	3283	3283	3283	3283	3283	3283
NATURAL GAS	14456	14559	15441	15441	16281	16281	16281	16281	16281	16281
GEOTHERMAL	68	76	76	85	85	85	85	85	85	85
FUEL OIL	2149	1849	1849	1849	1849	1849	1849	1849	1849	1849
DIESEL	214	214	214	214	214	214	214	214	214	214
OTHER	251	251	251	251	251	251	251	251	251	251
THERMAL TOTAL	27607	27721	28602	29974	31559	31559	31559	31559	31559	31559
BİOGAS+WASTE	22	32	46	46	46	46	46	46	46	46
HYDRO	14043	15727	18217	20850	22203	23337	24537	25077	25077	25077
WIND	630	990	990	990	990	990	990	990	990	990
TOTAL	42302	44470	47855	51860	54798	55932	57132	57672	57672	57672

Figure 25 : Breakdown of Total Installed Capacity by Utilities (Scenario 1)



Project and firm generation capacities of existing power plants as end of the year 2007, power plants under construction and power plants granted by licence and expected to be in service on proposed date by utilities and by primary resources are indicated according to Scenario 1 on Table 26 and on Table 27 respectively and according to Scenario 2 on Table 29 and Table 30 respectively.

Table 26 : Breakdown of Project Generation Capacity by Utilities and by Primary Resources (Scenario 1)

(Including Existing, Under Construction and Granted by Licence Power Plants)

(GWh)

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EÜAŞ and AFFILIATED PARTNERSHIP POWER PLANTS	FUEL OIL	4760	2665	2665	2665	2665	2665	2665	2665	2665	2665
	DIESEL	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260
	HARD COAL	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
	LIGNITE	48497	48497	48497	48497	48497	48497	48497	48497	48497	48497
	NATURAL GAS	27320	27320	27320	27320	33200	33200	33200	33200	33200	33200
	HYDRO	40406	42010	44886	45034	45034	45034	48867	50572	50572	50572
	TOTAL	124193	123702	126578	126726	132606	132606	136439	138144	138144	138144
POWER PLANTS UNDER TOR CONTRACT	LIGNITE	3642	3642	3463	3546	3546	3642	3642	3463	3546	3546
	HYDRO	0	0	0	0	0	0	0	0	0	0
	TOTAL	3642	3642	3463	3546	3546	3642	3642	3463	3546	3546
POWER PLANTS UNDER BO CONTRACT	NATURAL GAS	38120	38327	38885	38653	38133	37947	37683	37485	38175	37973
	IMPORTED COAL	9312	9085	9092	9309	9065	9025	8526	8775	9466	9031
	TOTAL	47432	47412	47978	47962	47198	46972	46208	46260	47641	47004
POWER PLANTS UNDER BOT CONTRACT	NATURAL GAS	10657	10834	10777	9974	11012	10777	9974	10834	10777	8136
	HYDRO	3000	3592	3543	3478	3357	3308	2830	2673	1865	702
	WIND	49	49	49	49	49	49	49	49	49	49
	TOTAL	13706	14474	14368	13502	14417	14133	12853	13555	12690	8887
MOBILE PLANTS	FUEL OIL	1752	659	0	0	0	0	0	0	0	0
	TOTAL	1752	659	0	0	0	0	0	0	0	0
ADÜAŞ POWER PLANTS	DIESEL	0	0	0	0	0	0	0	0	0	0
	HYDRO	400	400	400	400	400	400	400	400	400	400
	GEO THERMAL	105	105	105	105	105	105	105	105	105	105
	TOTAL	505	505	505	505	505	505	505	505	505	505
AUTOPRODUCERS	FUEL OIL	4983	4983	4983	4983	4983	4983	4983	4983	4983	4983
	DIESEL	92	92	92	92	92	92	92	92	92	92
	IMPORTED COAL	2418	2418	2418	2418	2418	2418	2418	2418	2418	2418
	HARD COAL	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072
	LIGNITE	436	436	436	436	436	436	436	436	436	436
	LPG	401	401	401	401	401	401	401	401	401	401
	NATURAL GAS	9432	9432	9432	9432	9432	9432	9432	9432	9432	9432
	BİOGAS	72	72	72	72	72	72	72	72	72	72
	NAPHTA	944	944	944	944	944	944	944	944	944	944
	OTHER	145	145	145	145	145	145	145	145	145	145
	HYDRO	1696	1696	1696	1696	1696	1696	1696	1696	1696	1696
	WIND	2	2	2	2	2	2	2	2	2	2
	TOTAL	21693	21693	21693	21693	21693	21693	21693	21693	21693	21693
GENERATION COMPANIES GRANTED BY LICENCE	FUEL OIL	2456	2812	2812	2812	2812	2812	2812	2812	2812	2812
	LIGNITE	4	8	8	1550	3091	3091	3091	3091	3091	3091
	H.COAL+ASPHALTIT	0	1018	2036	2036	2036	2036	2036	2036	2036	2036
	IMPORT COAL	0	0	0	3547	9741	12387	12387	12387	12387	12387
	NAPHTA	173	173	173	173	173	173	173	173	173	173
	NATURAL GAS	22373	23271	26998	30340	30340	30340	30340	30340	30340	30340
	GEO THERMAL	209	394	426	461	496	496	496	496	496	496
	HYDRO	1742	3100	8741	17993	25102	29813	32145	32145	32145	32145
	BİOGAS+WASTE	66	105	196	251	251	251	251	251	251	251
	WIND	1308	2851	3495	3495	3495	3495	3495	3495	3495	3495
	TOTAL	28331	33733	44885	62658	77537	84894	87225	87225	87225	87225
GRAND TOTAL		241254	245820	259470	276591	297502	304445	308566	310845	311444	307004

Table 26 (Cont.) : Breakdown of Total Project Generation Capacity by Primary Resources (Scenario 1)

(Including Existing, Under Construction and Granted by Licence Power Plants)

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
LIGNITE	52579	52583	52404	54027	55569	55665	55665	55486	55569	55569
H.COAL+ASPHALTIT	3022	4040	5058	5058	5058	5058	5058	5058	5058	5058
IMPORTED COAL	11730	11503	11510	15275	21224	23830	23330	23580	24271	23836
NATURAL GAS	107902	109184	113412	115719	122117	121696	120629	121290	121924	119082
GEO THERMAL	314	499	531	566	601	601	601	601	601	601
FUEL OIL	13951	11119	10460	10460	10460	10460	10460	10460	10460	10460
DIESEL	1352	1352	1352	1352	1352	1352	1352	1352	1352	1352
OTHER	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663
THERMAL TOTAL	192513	191943	196390	204121	218044	220325	218759	219491	220898	217621
BIOGAS+WASTE	138	177	268	323	323	323	323	323	323	323
HYDRO	47244	50797	59265	68601	75589	80250	85937	87485	86677	85514
WIND	1359	2902	3547	3547	3547	3547	3547	3547	3547	3547
TOTAL	241254	245820	259470	276591	297502	304445	308566	310845	311444	307004

Table 27 : Breakdown of Firm Generation Capacity by Utilities and by Primary Resources (Scenario 1)

(Including Existing, Under Construction and Granted by Licence Power Plants)

(GWh)

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EÜAŞ and AFFILIATED PARTNERSHIP POWER PLANTS	FUEL OIL	3886	2638	2638	2638	2638	2638	2638	2638	2638	2638
	DIESEL	652	1051	1051	1051	1051	1051	1051	1051	1051	1051
	HARD COAL	1683	1537	1221	1537	1840	1840	1840	1840	1840	1840
	LIGNITE	34489	36435	35972	38160	44062	44062	44062	44062	44062	44574
	NATURAL GAS	24340	23967	25919	24614	31526	30223	31526	31005	31526	31005
	HYDRO	31535	32533	34314	34365	34365	34365	36824	37953	37953	37953
	TOTAL	96585	98162	101115	102365	115481	114178	117940	118548	119069	119060
POWER PLANTS UNDER TOR CONTRACT	LIGNITE	3642	3642	3463	3546	3546	3642	3642	3463	3546	3546
	HYDRO	0	0	0	0	0	0	0	0	0	0
	TOTAL	3642	3642	3463	3546	3546	3642	3642	3463	3546	3546
POWER PLANTS UNDER BO CONTRACT	NATURAL GAS	38120	38327	38885	38653	38133	37947	37683	37485	38175	37973
	IMPORTED COAL	9312	9085	9092	9309	9065	9025	8526	8775	9466	9031
	TOTAL	47432	47412	47978	47962	47198	46972	46208	46260	47641	47004
POWER PLANTS UNDER BOT CONTRACT	NATURAL GAS	10657	10834	10777	9974	11012	10777	9974	10834	10777	8136
	HYDRO	3000	3592	3543	3478	3357	3308	2830	2673	1865	702
	WIND	49	49	49	49	49	49	49	49	49	49
	TOTAL	13706	14474	14368	13502	14417	14133	12853	13555	12690	8887
MOBILE PLANTS	FUEL OIL	1752	659	0	0	0	0	0	0	0	0
	TOTAL	1752	659	0	0	0	0	0	0	0	0
ADÜAŞ POWER PLANTS	DIESEL	0	0	0	0	0	0	0	0	0	0
	HYDRO	291	291	291	291	291	291	291	291	291	291
	GEOTHERMAL	95	95	95	95	95	95	95	95	95	95
	TOTAL	386	386	386	386	386	386	386	386	386	386
AUTOPRODUCERS	FUEL OIL	4983	4983	4983	4983	4983	4983	4983	4983	4983	4983
	DIESEL	92,2	92,2	92,2	92,2	92,2	92,2	92,2	92,2	92,2	92,2
	IMPORTED COAL	2418	2418	2418	2418	2418	2418	2418	2418	2418	2418
	HARD COAL	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072
	LIGNITE	436	436	436	436	436	436	436	436	436	436
	LPG	401	401	401	401	401	401	401	401	401	401
	NATURAL GAS	9432	9432	9432	9432	9432	9432	9432	9432	9432	9432
	BIOGAS	72	72	72	72	72	72	72	72	72	72
	NAPHTA	944	944	944	944	944	944	944	944	944	944
	OTHER	145	145	145	145	145	145	145	145	145	145
	HYDRO	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231
	WIND	2	2	2	2	2	2	2	2	2	2
	TOTAL	21228	21228	21228	21228	21228	21228	21228	21228	21228	21228
GENERATION COMPANIES GRANTED BY LICENCE	FUEL OIL	2456	2812	2812	2812	2812	2812	2812	2812	2812	2812
	LIGNITE	4	8	8	1550	3091	3091	3091	3091	3091	3091
	H.COAL+ASPHALTIT	0	1018	2036	2036	2036	2036	2036	2036	2036	2036
	IMPORT COAL	0	0	0	3547	9741	12387	12387	12387	12387	12387
	NAPHTA	173	173	173	173	173	173	173	173	173	173
	NATURAL GAS	22373	23271	26998	30340	30340	30340	30340	30340	30340	30340
	GEOTHERMAL	160	295	326	354	382	382	382	382	382	382
	HYDRO	866	1697	4927	10161	14189	16846	18159	18159	18159	18159
	BIOGAS+WASTE	66	99	173	218	218	218	218	218	218	218
	WIND	1173	2527	3088	3088	3088	3088	3088	3088	3088	3088
	TOTAL	27271	31900	40542	54280	66070	71372	72686	72686	72686	72686
GRAND TOTAL		212001	217864	229080	243268	268326	271912	274943	276126	277246	272797

Table 27 (Cont.) : Breakdown of Total Firm Generation Capacity by Primary Resources (Scenario 1)

(Including Existing, Under Construction and Granted by Licence Power Plants)

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
LIGNITE	38571	40522	39879	43691	51134	51230	51230	51051	51134	51646
HARD COAL+ASPHALTIT	2755	3627	4330	4646	4948	4948	4948	4948	4948	4948
IMPORTED COAL	11730	11503	11510	15275	21224	23830	23330	23580	24271	23836
NATURAL GAS	104922	105831	112011	113013	120442	118719	118955	119095	120249	116886
GEOTHERMAL	255	390	421	449	477	477	477	477	477	477
FUEL OIL	13077	11092	10433	10433	10433	10433	10433	10433	10433	10433
DIESEL	744	1143	1143	1143	1143	1143	1143	1143	1143	1143
OTHER	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663
THERMAL TOTAL	173716	175771	181390	190312	211464	212443	212179	212390	214318	211032
BIOGAS+WASTE	138	170	245	290	290	290	290	290	290	290
HYDRO	36923	39344	44306	49527	53433	56040	59335	60307	59499	58336
WIND	1225	2579	3139	3139	3139	3139	3139	3139	3139	3139
TOTAL	212001	217864	229080	243268	268326	271912	274943	276126	277246	272797

**Table 28: Breakdown of Installed Capacity by Utilities and by Primary Resources
(Scenario 2)**

(Including Existing, Under Construction and Granted by Licence Power Plants)

(MW)

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EÜAŞ and AFFILIATED PARTNERSHIP POWER PLANTS	FUEL OIL	680	380	380	380	380	380	380	380	380	380
	DIESEL	181	181	181	181	181	181	181	181	181	181
	HARD COAL	300	300	300	300	300	300	300	300	300	300
	LIGNITE	7461	7461	7461	7461	7461	7461	7461	7461	7461	7461
	NATURAL GAS	3903	3903	3903	3903	4743	4743	4743	4743	4743	4743
	HYDRO	11877	12985	13089	13089	13089	13089	14289	14829	14829	14829
	TOTAL	24402	25210	25314	25314	26154	26154	27354	27894	27894	27894
POWER PLANTS UNDER TOR CONTRACT	LIGNITE	620	620	620	620	620	620	620	620	620	620
	HYDRO	30	30	30	30	30	30	30	30	30	30
	TOTAL	650	650	650	650	650	650	650	650	650	650
POWER PLANTS UNDER BO CONTRACT	NATURAL GAS	4782	4782	4782	4782	4782	4782	4782	4782	4782	4782
	IMPORTED COAL	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320
	TOTAL	6102	6102	6102	6102	6102	6102	6102	6102	6102	6102
POWER PLANTS UNDER BOT CONTRACT	NATURAL GAS	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450
	HYDRO	982	982	982	982	982	982	982	982	982	982
	WIND	17	17	17	17	17	17	17	17	17	17
	TOTAL	2449	2449	2449	2449	2449	2449	2449	2449	2449	2449
MOBILE PLANTS	FUEL OIL	263	263	263	263	263	263	263	263	263	263
	TOTAL	263	263	263	263	263	263	263	263	263	263
ADÜAŞ POWER PLANTS	DIESEL	15	15	15	15	15	15	15	15	15	15
	HYDRO	111	111	111	111	111	111	111	111	111	111
	GEOTHERMAL	15	15	15	15	15	15	15	15	15	15
	TOTAL	141	141	141	141	141	141	141	141	141	141
AUTOPRODUCERS	FUEL OIL	795	795	795	795	795	795	795	795	795	795
	DIESEL	18	18	18	18	18	18	18	18	18	18
	IMPORTED COAL	331	331	331	331	331	331	331	331	331	331
	HARD COAL	255	255	255	255	255	255	255	255	255	255
	LIGNITE	179	179	179	179	179	179	179	179	179	179
	LPG	52	52	52	52	52	52	52	52	52	52
	NATURAL GAS	1369	1369	1369	1369	1369	1369	1369	1369	1369	1369
	BİOGAS	13	13	13	13	13	13	13	13	13	13
	NAPHTA	141	141	141	141	141	141	141	141	141	141
	OTHER	22	22	22	22	22	22	22	22	22	22
	HYDRO	558	558	558	558	558	558	558	558	558	558
	WIND	1	1	1	1	1	1	1	1	1	1
	TOTAL	3735	3735	3735	3735	3735	3735	3735	3735	3735	3735
GENERATION COMPANIES GRANTED BY LICENCE	FUEL OIL	372	372	372	372	372	372	372	372	372	372
	LIGNITE				170	170	170	170	170	170	170
	H.COAL+ASPHALTIT		303	303	303	957	957	957	957	957	957
	IMPORT COAL				888	1496	1496	1496	1496	1496	1496
	NATURAL GAS	2868	3035	3035	3035	3035	3035	3035	3035	3035	3035
	NAPHTA	37	37	37	37	37	37	37	37	37	37
	GEOTHERMAL	53	61	61	70	70	70	70	70	70	70
	HYDRO	494	783	1063	3704	4980	5511	5511	5511	5511	5511
	BİOGAS+WASTE	9	9	11	11	11	11	11	11	11	11
	WIND	532	562	562	562	562	562	562	562	562	562
	TOTAL	4364	5161	5442	9150	11689	12220	12220	12220	12220	12220
GRAND TOTAL		42105	43710	44096	47804	51182	51713	52913	53453	53453	53453

**Table 28 (Cont.) : Breakdown of Total Installed Capacity by Primary Resources
(Scenario 2)**

(Including Existing, Under Construction and Granted by Licence Power Plants)

	(MW)									
YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
LIGNITE	8260	8260	8260	8430	8430	8430	8430	8430	8430	8430
HARD COAL+ASPHALTIT	555	858	858	858	1513	1513	1513	1513	1513	1513
IMPORTED COAL	1651	1651	1651	2539	3147	3147	3147	3147	3147	3147
NATURAL GAS	14371	14538	14538	14538	15378	15378	15378	15378	15378	15378
GEOTHERMAL	68	76	76	85	85	85	85	85	85	85
FUEL OIL	2109	1809	1809	1809	1809	1809	1809	1809	1809	1809
DIESEL	214	214	214	214	214	214	214	214	214	214
OTHER	251	251	251	251	251	251	251	251	251	251
THERMAL TOTAL	27480	27657	27657	28724	30827	30827	30827	30827	30827	30827
BİOGAS+WASTE	22	22	24	24	24	24	24	24	24	24
HYDRO	14053	15450	15834	18475	19751	20282	21482	22022	22022	22022
WIND	551	581	581	581	581	581	581	581	581	581
TOTAL	42105	43710	44096	47804	51182	51713	52913	53453	53453	53453

Figure 26: Breakdown of Total Installed Capacity by Utilities (Scenario 2)

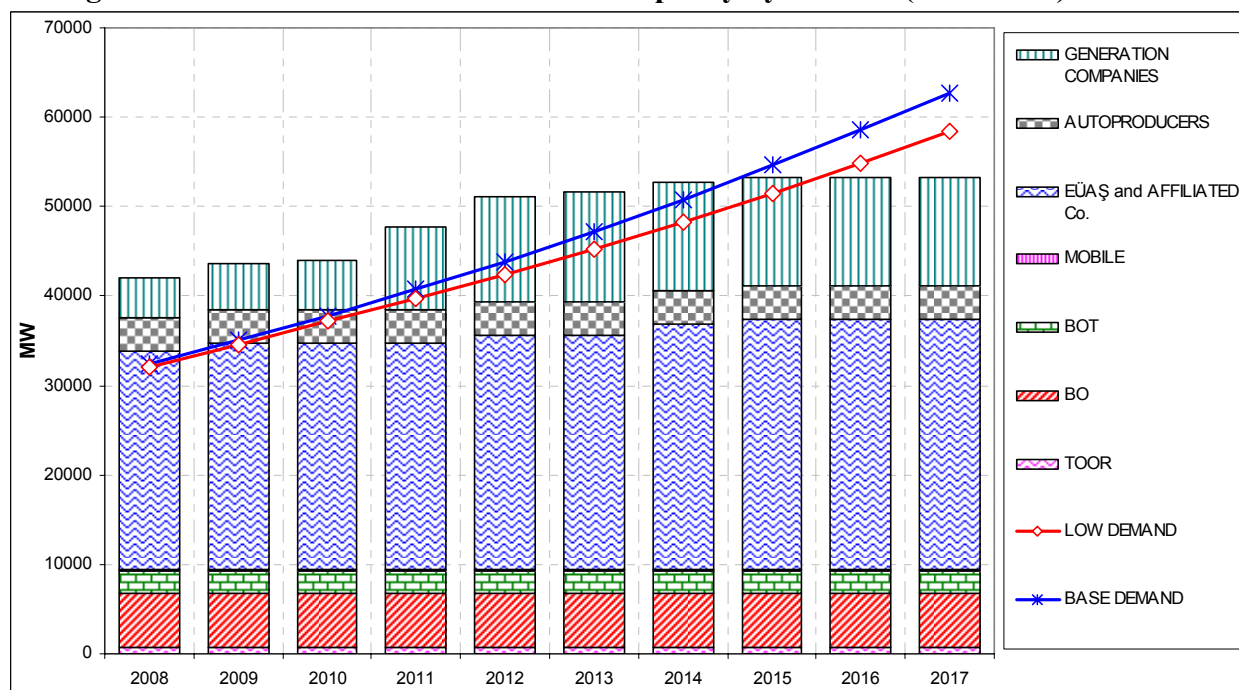


Table 29: Breakdown of Project Generation Capacity by Utilities and by Primary Resources (Scenario 2)

(Including Existing, Under Construction and Granted by Licence Power Plants)

(GWh)

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EÜAŞ and AFFILIATED PARTNERSHIP POWER PLANTS	FUEL OIL	4760	2665	2665	2665	2665	2665	2665	2665	2665	2665
	DIESEL	1260	1260	1260	1260	1260	1260	1260	1260	1260	1260
	HARD COAL	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
	LIGNITE	48497	48497	48497	48497	48497	48497	48497	48497	48497	48497
	NATURAL GAS	27320	27320	27320	27320	33200	33200	33200	33200	33200	33200
	HYDRO	40406	42010	44886	45034	45034	45034	48867	50572	50572	50572
	TOTAL	124193	123702	126578	126726	132606	132606	136439	138144	138144	138144
POWER PLANTS UNDER TOR CONTRACT	LIGNITE	3642	3642	3463	3546	3546	3642	3642	3463	3546	3546
	HYDRO	0	0	0	0	0	0	0	0	0	0
	TOTAL	3642	3642	3463	3546	3546	3642	3642	3463	3546	3546
POWER PLANTS UNDER BO CONTRACT	NATURAL GAS	38120	38327	38885	38653	38133	37947	37683	37485	38175	37973
	IMPORTED COAL	9312	9085	9092	9309	9065	9025	8526	8775	9466	9031
	TOTAL	47432	47412	47978	47962	47198	46972	46208	46260	47641	47004
POWER PLANTS UNDER BOT CONTRACT	NATURAL GAS	10657	10834	10777	9974	11012	10777	9974	10834	10777	8136
	HYDRO	3000	3592	3543	3478	3357	3308	2830	2673	1865	702
	WIND	49	49	49	49	49	49	49	49	49	49
	TOTAL	13706	14474	14368	13502	14417	14133	12853	13555	12690	8887
MOBILE PLANTS	FUEL OIL	1752	659	0	0	0	0	0	0	0	0
	TOTAL	1752	659	0	0	0	0	0	0	0	0
ADÜAŞ POWER PLANTS	DIESEL	0	0	0	0	0	0	0	0	0	0
	HYDRO	400	400	400	400	400	400	400	400	400	400
	GEOTHERMAL	105	105	105	105	105	105	105	105	105	105
	TOTAL	505	505	505	505	505	505	505	505	505	505
AUTOPRODUCERS	FUEL OIL	4983	4983	4983	4983	4983	4983	4983	4983	4983	4983
	DIESEL	92	92	92	92	92	92	92	92	92	92
	IMPORTED COAL	2418	2418	2418	2418	2418	2418	2418	2418	2418	2418
	HARD COAL	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072
	LIGNITE	436	436	436	436	436	436	436	436	436	436
	LPG	401	401	401	401	401	401	401	401	401	401
	NATURAL GAS	9432	9432	9432	9432	9432	9432	9432	9432	9432	9432
	BIOGAS	72	72	72	72	72	72	72	72	72	72
	NAPHTA	944	944	944	944	944	944	944	944	944	944
	OTHER	145	145	145	145	145	145	145	145	145	145
	HYDRO	1696	1696	1696	1696	1696	1696	1696	1696	1696	1696
	WIND	2	2	2	2	2	2	2	2	2	2
	TOTAL	21693	21693	21693	21693	21693	21693	21693	21693	21693	21693
GENERATION COMPANIES GRANTED BY LICENCE	FUEL OIL	2329	2558	2558	2558	2558	2558	2558	2558	2558	2558
	LIGNITE	0	0	0	650	1300	1300	1300	1300	1300	1300
	H.COAL+ASPHALTIT	0	1018	2036	2036	4276	6516	6516	6516	6516	6516
	IMPORT COAL	0	0	0	3547	9255	11415	11415	11415	11415	11415
	NAPHTA	173	173	173	173	173	173	173	173	173	173
	NATURAL GAS	22094	22906	23485	23485	23485	23485	23485	23485	23485	23485
	GEOTHERMAL	209	394	426	461	496	496	496	496	496	496
	HYDRO	1847	2716	3684	8404	15292	18957	20013	20013	20013	20013
	BIOGAS+WASTE	66	69	75	81	81	81	81	81	81	81
	WIND	1141	1924	1976	1976	1976	1976	1976	1976	1976	1976
	TOTAL	27859	31759	34413	43372	58892	66957	68012	68012	68012	68012
GRAND TOTAL		240781	243847	248998	257305	278856	286508	289353	291632	292231	287791

Table 29 (Cont.): Breakdown of Total Project Generation Capacity by Primary Resources (Scenario 2)

(Including Existing, Under Construction and Granted by Licence Power Plants)

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
LIGNITE	52574	52574	52395	53128	53778	53874	53874	53695	53778	53778
H.COAL+ASPHALTIT	3022	4040	5058	5058	7298	9538	9538	9538	9538	9538
IMPORTED COAL	11730	11503	11510	15275	20738	22858	22358	22608	23299	22864
NATURAL GAS	107623	108819	109899	108864	115261	114841	113774	114435	115069	112226
GEO THERMAL	314	499	531	566	601	601	601	601	601	601
FUEL OIL	13824	10866	10206	10206	10206	10206	10206	10206	10206	10206
DIESEL	1352	1352	1352	1352	1352	1352	1352	1352	1352	1352
OTHER	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663
THERMAL TOTAL	192103	191317	192615	196112	210898	214934	213368	214099	215506	212229
BIOGAS+WASTE	138	141	147	153	153	153	153	153	153	153
HYDRO	47349	50413	54208	59012	65778	69395	73805	75353	74545	73382
WIND	1192	1976	2027	2027	2027	2027	2027	2027	2027	2027
TOTAL	240781	243847	248998	257305	278856	286508	289353	291632	292231	287791

**Table 30: Breakdown of Firm Generation Capacity by Utilities and Primary Resources
(Scenario 2)**

(Including Existing, Under Construction and Granted by Licence Power Plants)

(GWh)

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EÜAŞ and AFFILIATED PARTNERSHIP POWER PLANTS	FUEL OIL	3886	2638	2638	2638	2638	2638	2638	2638	2638	2638
	DIESEL	652	1051	1051	1051	1051	1051	1051	1051	1051	1051
	HARD COAL	1683	1537	1221	1537	1840	1840	1840	1840	1840	1840
	LIGNITE	34489	36435	35972	38160	44062	44062	44062	44062	44062	44574
	NATURAL GAS	24340	23967	25919	24614	31526	30223	31526	31005	31526	31005
	HYDRO	31535	32533	34314	34365	34365	34365	36824	37953	37953	37953
	TOTAL	96585	98162	101115	102365	115481	114178	117940	118548	119069	119060
POWER PLANTS UNDER TOR CONTRACT	LIGNITE	3642	3642	3463	3546	3546	3642	3642	3463	3546	3546
	HYDRO	0	0	0	0	0	0	0	0	0	0
	TOTAL	3642	3642	3463	3546	3546	3642	3642	3463	3546	3546
POWER PLANTS UNDER BO CONTRACT	NATURAL GAS	38120	38327	38885	38653	38133	37947	37683	37485	38175	37973
	IMPORTED COAL	9312	9085	9092	9309	9065	9025	8526	8775	9466	9031
	TOTAL	47432	47412	47978	47962	47198	46972	46208	46260	47641	47004
POWER PLANTS UNDER BOT CONTRACT	NATURAL GAS	10657	10834	10777	9974	11012	10777	9974	10834	10777	8136
	HYDRO	3000	3592	3543	3478	3357	3308	2830	2673	1865	702
	WIND	49	49	49	49	49	49	49	49	49	49
	TOTAL	13706	14474	14368	13502	14417	14133	12853	13555	12690	8887
MOBILE PLANTS	FUEL OIL	1752	659	0	0	0	0	0	0	0	0
	TOTAL	1752	659	0	0	0	0	0	0	0	0
ADÜAŞ POWER PLANTS	DIESEL	0	0	0	0	0	0	0	0	0	0
	HYDRO	291	291	291	291	291	291	291	291	291	291
	GEOTHERMAL	95	95	95	95	95	95	95	95	95	95
	TOTAL	386	386	386	386	386	386	386	386	386	386
AUTOPRODUCERS	FUEL OIL	4983	4983	4983	4983	4983	4983	4983	4983	4983	4983
	DIESEL	92,2	92,2	92,2	92,2	92,2	92,2	92,2	92,2	92,2	92,2
	IMPORTED COAL	2418	2418	2418	2418	2418	2418	2418	2418	2418	2418
	HARD COAL	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072
	LIGNITE	436	436	436	436	436	436	436	436	436	436
	LPG	401	401	401	401	401	401	401	401	401	401
	NATURAL GAS	9432	9432	9432	9432	9432	9432	9432	9432	9432	9432
	BİOGAS	72	72	72	72	72	72	72	72	72	72
	NAPHTA	944	944	944	944	944	944	944	944	944	944
	OTHER	145	145	145	145	145	145	145	145	145	145
	HYDRO	1231	1231	1231	1231	1231	1231	1231	1231	1231	1231
	WIND	2	2	2	2	2	2	2	2	2	2
	TOTAL	21228	21228	21228	21228	21228	21228	21228	21228	21228	21228
GENERATION COMPANIES GRANTED BY LICENCE	FUEL OIL	2329	2558	2558	2558	2558	2558	2558	2558	2558	2558
	LIGNITE	0	0	0	650	1300	1300	1300	1300	1300	1300
	H.COAL+ASPHALTIT	0	1018	2036	2036	4276	6516	6516	6516	6516	6516
	IMPORT COAL	0	0	0	3547	9255	11415	11415	11415	11415	11415
	NAPHTA	173	173	173	173	173	173	173	173	173	173
	NATURAL GAS	22094	22906	23485	23485	23485	23485	23485	23485	23485	23485
	GEOTHERMAL	160	295	326	354	382	382	382	382	382	382
	HYDRO	938	1497	2097	4784	8681	10748	11344	11344	11344	11344
	BİOGAS+WASTE	66	69	75	81	81	81	81	81	81	81
	WIND	981	1628	1674	1674	1674	1674	1674	1674	1674	1674
	TOTAL	26740	30144	32424	39342	51864	58332	58928	58928	58928	58928
GRAND TOTAL		211470	216108	220962	228331	254120	258872	261185	262368	263488	259039

**Table 30 (Cont.) : Breakdown of Firm Generation Capacity by Utilities and Primary Resources
(Scenario 2)**

(Including Existing, Under Construction and Granted by Licence Power Plants)

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
LIGNITE	38567	40513	39870	42791	49343	49439	49439	49260	49343	49855
HARD COAL+ASPHALTIT	2755	3627	4330	4646	7188	9428	9428	9428	9428	9428
IMPORTED COAL	11730	11503	11510	15275	20738	22858	22358	22608	23299	22864
NATURAL GAS	104642	105466	108498	106158	113587	111864	112099	112239	113394	110031
GEO THERMAL	255	390	421	449	477	477	477	477	477	477
FUEL OIL	12950	10838	10179	10179	10179	10179	10179	10179	10179	10179
DIESEL	744	1143	1143	1143	1143	1143	1143	1143	1143	1143
OTHER	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663
THERMAL TOTAL	173306	175144	177615	182304	204318	207051	206788	206998	208926	205640
BIOGAS+WASTE	138	141	147	153	153	153	153	153	153	153
HYDRO	36995	39144	41475	44149	47924	49943	52520	53492	52684	51521
WIND	1032	1679	1725	1725	1725	1725	1725	1725	1725	1725
TOTAL	211470	216108	220962	228331	254120	258872	261185	262368	263488	259039

VII. RESULTS

VII.I. Case I – A (Base Demand – Scenario 1)

In this section the power plants which are

- Existing as end of the year 2007,
- Under construction and
- Granted by licence and expected to be in service on proposed date based on “January 2008 Progress Raport” of EPDK and prepared according to Scenario 1 by EPDK, and besides, Base Demand prepared in accordance with the MAED results revized on May 2008 are taken into consideration and therefore, the generation demand to reach 236.2 TWh in 2010 and 390.5 TWh in 2017 and so the results about supply and demand situation and how to cover demand are given.

According to above situation, peak demand can not be covered starting from the year 2016. When the generation capacity is considered, the energy demand can not be covered in 2009 according to firm generation capacity and in 2014 according to project generation capacity.

Electricity generation expansion planning study determining the additional capacity requirement in order to meet demand has been carried out on November 2004 by considering long term natural gas supply contracts within the ETKB policies regarding evaluation of domestic and renewable resources together with resource diversification. This planning study is carried out by TEİAŞ on behalf of ETKB. According to this planning study results, in order to meet the expected demand, it will be necessary to add 34155 MW new capacity in total. 11645 MW of this total capacity comes from wind and hydro resources and the remaining 22510 MW from thermal resources up to the year of 2017.

Existing capacity, capacity under construction, capacity granted by licence and expected to be in service on the proposed time and the development of new additional capacity requirement to meet the increasing demand by years are indicated on Table 31.

Beside this, the development of total installed capacity with existing, under construction, granted by licence and expected to be in service on proposed date and new additional capacities together with capacity reserve after covering the peak load with power plants;

- only existing capacity,
- existing capacity + capacity under construction,
- existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date,
- existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date + new additional capacity requirement

are submitted on Table 31.

When the existing power plants are considered solely, capacity reserve starts from 25.7% in 2008 and continuously decreases and the peak demand exceeds the total installed capacity in 2011 by reaching to -0.4%. According to the increase of peak demand the capacity reserve reaches to -35.4% in year 2017 with the existing capacity as end of the year 2007.

When the sum of existing capacity and capacity under construction are considered, the capacity reserve is 27.4% in 2008, drops to 3.8% in 2011, to -1.6% in 2012 and reaches to -28.6% in 2017.

When the sum of existing capacity, capacity under construction and capacity granted by licence and expected to be in service on proposed date are examined together, capacity reserve is 30.2% in 2008, decreases to -1.5% in 2016 and drops to -8.1% in 2017. If the new additional

capacity to be commissioned starting from 2008 calculated by the planning study is considered together with existing capacity, capacity under construction and capacity granted by licence and expected to be in service on proposed date according to Scenario 1, capacity reserve is calculated to be between 36% and 54% after the year 2010.

Table 31 :Installed Capacity and Peak Demand Balance (Case I – A) Base Demand–Scenario1
(MW)

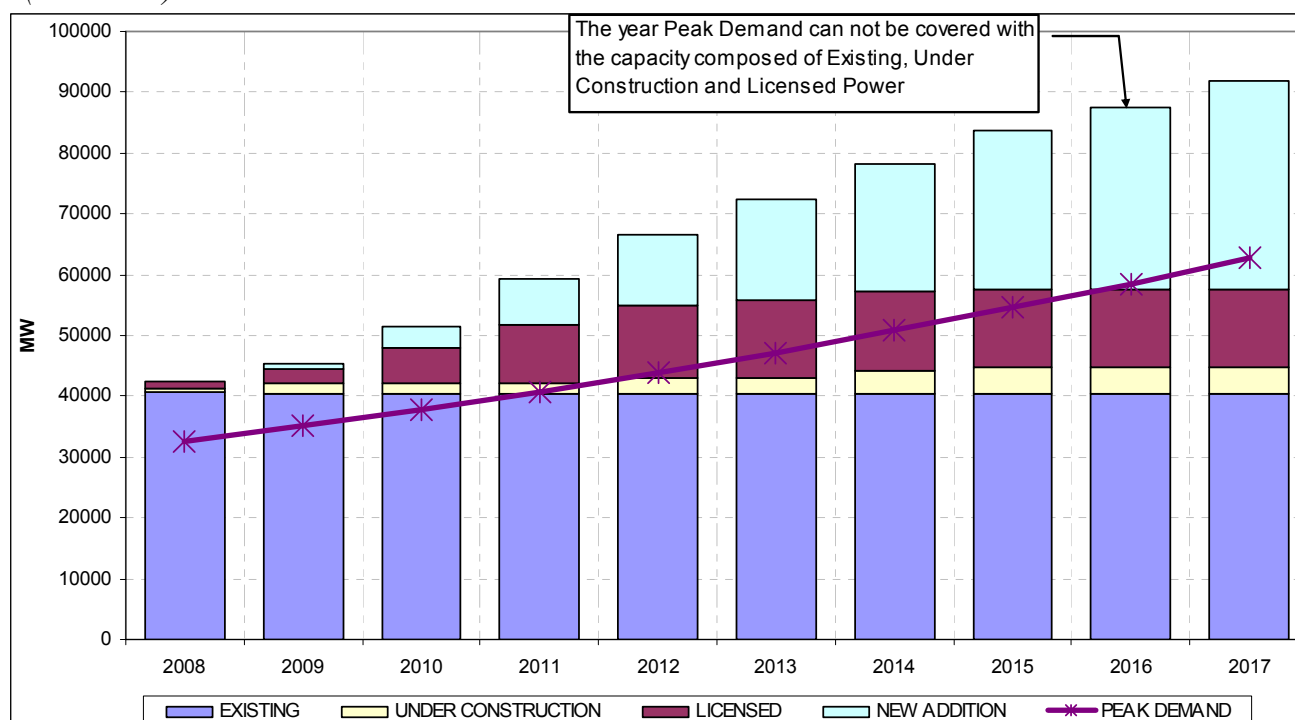
YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EXISTING POWER PLANTS										
THERMAL TOTAL	27250	26950	26950	26950	26950	26950	26950	26950	26950	26950
HYDRO TOTAL	13395	13395	13395	13395	13395	13395	13395	13395	13395	13395
WIND + RENEWABLE TOTAL	191	191	191	191	191	191	191	191	191	191
GRAND TOTAL	40836	40536	40536	40536	40536	40536	40536	40536	40536	40536
COVERING OF PEAK DEMAND WITH EXISTING POWER PLANTS										
PEAK LOAD DEMAND	32478	35053	37832	40716	43819	47159	50753	54622	58560	62782
RESERVE %	25,7	15,6	7,1	-0,4	-7,5	-14,0	-20,1	-25,8	-30,8	-35,4
POWER PLANTS UNDER CONSTRUCTION										
THERMAL TOTAL	0	0	0	0	840	840	840	840	840	840
HYDRO TOTAL	527	1634	1739	1739	1739	1739	2939	3479	3479	3479
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	527	1634	1739	1739	2579	2579	3779	4319	4319	4319
EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
THERMAL TOTAL	27250	26950	26950	26950	27790	27790	27790	27790	27790	27790
HYDRO TOTAL	13922	15029	15133	15133	15133	15133	16333	16873	16873	16873
WIND + RENEWABLE TOTAL	191	191	191	191	191	191	191	191	191	191
GRAND TOTAL	41363	42170	42274	42274	43114	43114	44314	44854	44854	44854
COVERING OF PEAK DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
PEAK LOAD DEMAND	32478	35053	37832	40716	43819	47159	50753	54622	58560	62782
RESERVE %	27,4	20,3	11,7	3,8	-1,6	-8,6	-12,7	-17,9	-23,4	-28,6
LICENCED POWER PLANTS										
THERMAL TOTAL	289	695	1576	2939	3683	3683	3683	3683	3683	3683
HYDRO TOTAL	121	698	3083	5716	7070	8204	8204	8204	8204	8204
WIND + RENEWABLE TOTAL	529	907	921	931	931	931	931	931	931	931
GRAND TOTAL	939	2300	5581	9585	11684	12818	12818	12818	12818	12818
UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	289	695	1576	2939	4523	4523	4523	4523	4523	4523
HYDRO TOTAL	648	2332	4822	7455	8809	9942	11142	11682	11682	11682
WIND + RENEWABLE TOTAL	529	907	921	931	931	931	931	931	931	931
GRAND TOTAL	1466	3934	7319	11324	14262	15396	16596	17136	17136	17136
EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	27539	27645	28527	29889	31474	31474	31474	31474	31474	31474
HYDRO TOTAL	14043	15727	18217	20850	22203	23337	24537	25077	25077	25077
WIND + RENEWABLE TOTAL	720	1097	1112	1121	1121	1121	1121	1121	1121	1121
GRAND TOTAL	42302	44470	47855	51860	54798	55932	57132	57672	57672	57672
COVERING OF PEAK DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
PEAK LOAD DEMAND	32478	35053	37832	40716	43819	47159	50753	54622	58560	62782
RESERVE %	30,2	26,9	26,5	27,4	25,1	18,6	12,6	5,6	-1,5	-8,1

Table 31 (Cont.) : Installed Capacity and Peak Demand Balance (Case I – A)
Base Demand–Scenario I

(MW)										
YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	0	700	2800	5790	8510	11225	14305	17820	19835	22510
HYDRO TOTAL	0	0	543	1274	2752	4350	5908	7353	8836	10395
WIND + RENEWABLE TOTAL	125	250	375	500	625	750	875	1000	1125	1250
GRAND TOTAL	125	950	3718	7564	11887	16325	21088	26173	29796	34155
EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	27539	28345	31327	35679	39984	42699	45779	49294	51309	53984
HYDRO TOTAL	14043	15727	18760	22124	24955	27687	30445	32430	33913	35472
WIND + RENEWABLE TOTAL	845	1347	1487	1621	1746	1871	1996	2121	2246	2371
GRAND TOTAL	42427	45420	51573	59424	66685	72257	78220	83845	87468	91827
COVERING OF PEAK DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
PEAK LOAD DEMAND	32478	35053	37832	40716	43819	47159	50753	54622	58560	62782
RESERVE %	30,6	29,6	36,3	45,9	52,2	53,2	54,1	53,5	49,4	46,3

The annual development of total installed capacity composed of existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed time + new additional capacity is on Figure 27. On the figure, when the installed capacity development is compared with peak demand, the peak demand can not be covered with the total installed capacity which are composed of the existing, under construction and granted by licence and expected to be in service on proposed time starting from the year 2016.

Figure 27 : Development of Installed Capacity Composed of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Time + New Additional Capacity and Peak Demand
(Case I - A) Base Demand-Scenario I



The development of total project generation composed of existing, under construction, granted by licence and expected to be in service on proposed time and new additional capacities together with energy reserve after covering the demand with power plants are submitted on Table 32 for each composition.

When the existing power plants are considered solely, energy reserve starts from 16.8% in 2008 and decreases continuously by year, the energy demand exceeds the project generation capacity in 2010 and the energy reserve drops to -41.3% in 2017.

When the total project generation of existing power plants and power plants under construction are considered, the energy reserve is 17.2% in 2008, vanishes in 2010 and drops to negative value of -5.4% in 2011 and reaches to -37% in 2017.

If the total project generation of existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date are examined together, 18.3% of energy reserve is calculated in 2008, by decreasing the reserve becomes negative value of -2.1% in 2014 and drops to -21.4% in 2017. And if project generation capacity of the new additional capacity calculated by the planning study is considered together with existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date, energy reserve is 18.4% in 2008 and is calculated to be between 27% and 37% after the year 2011.

Table 32 : Project Generation Capacity and Energy Demand Balance 2008-2017 (Case I-A)
Base Demand – Scenario I

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EXISTING POWER PLANTS										
THERMAL TOTAL	191325	188294	187965	187230	187503	187138	185572	186304	187711	184434
HYDRO TOTAL	46225	46816	46767	46703	46581	46532	46054	45898	45089	43926
WIND + RENEWABLE TOTAL	756	756	756	756	756	756	756	756	756	756
GRAND TOTAL	238306	235867	235488	234689	234840	234427	232383	232957	233556	229116
COVERING OF ENERGY DEMAND WITH EXISTING POWER PLANTS										
ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	16,8	7,7	-0,3	-7,5	-13,9	-20,0	-26,3	-31,2	-35,8	-41,3
POWER PLANTS UNDER CONSTRUCTION										
THERMAL TOTAL	0	0	0	0	5880	5880	5880	5880	5880	5880
HYDRO TOTAL	780	2384	5260	5408	5408	5408	9241	10946	10946	10946
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	780	2384	5260	5408	11288	11288	15121	16826	16826	16826
EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
THERMAL TOTAL	191325	188294	187965	187230	193383	193018	191452	192184	193591	190314
HYDRO TOTAL	47005	49200	52027	52111	51989	51940	55295	56844	56035	54872
WIND + RENEWABLE TOTAL	756	756	756	756	756	756	756	756	756	756
GRAND TOTAL	239086	238251	240748	240097	246128	245715	247504	249783	250382	245942
COVERING OF ENERGY DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	17,2	8,8	1,9	-5,4	-9,8	-16,2	-21,5	-26,2	-31,2	-37,0
LICENCED POWER PLANTS										
THERMAL TOTAL	874	3150	7895	16326	24060	26706	26706	26706	26706	26706
HYDRO TOTAL	239	1597	7238	16490	23599	28310	30642	30642	30642	30642
WIND + RENEWABLE TOTAL	1055	2822	3589	3679	3714	3714	3714	3714	3714	3714
GRAND TOTAL	2168	7569	18722	36494	51374	58730	61062	61062	61062	61062
UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	874	3150	7895	16326	29940	32586	32586	32586	32586	32586
HYDRO TOTAL	1019	3981	12498	21898	29007	33718	39883	41588	41588	41588
WIND + RENEWABLE TOTAL	1055	2822	3589	3679	3714	3714	3714	3714	3714	3714
GRAND TOTAL	2948	9953	23982	41902	62662	70018	76183	77888	77888	77888
EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	192199	191444	195860	203555	217443	219725	218159	218890	220297	217020
HYDRO TOTAL	47244	50797	59265	68601	75589	80250	85937	87485	86677	85514
WIND + RENEWABLE TOTAL	1811	3578	4345	4435	4470	4470	4470	4470	4470	4470
GRAND TOTAL	241254	245820	259470	276591	297502	304445	308566	310845	311444	307004
COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	18,3	12,2	9,9	9,0	9,1	3,8	-2,1	-8,2	-14,4	-21,4

Table 32 (Cont.) : Project Generation Capacity and Energy Demand Balance 2008-2017
(Case I - A) Base Demand – Scenario I

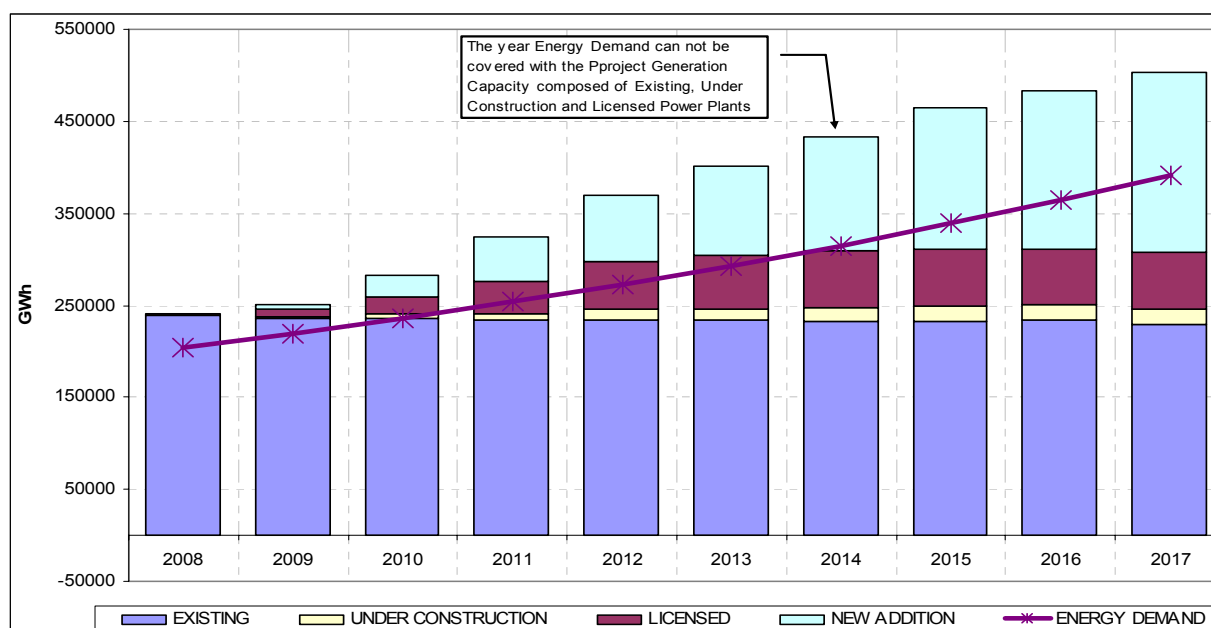
(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	0	4914	19656	40197	59037	77647	98858	123054	136750	154794
HYDRO TOTAL	0	0	2401	5586	11040	17160	22979	27483	32489	37801
WIND + RENEWABLE TOTAL	350	700	1050	1400	1750	2100	2450	2800	3150	3500
GRAND TOTAL	350	5614	23107	47183	71827	96907	124287	153337	172389	196095
EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	192199	196358	215516	243752	276480	297372	317017	341944	357047	371814
HYDRO TOTAL	47244	50797	61666	74187	86629	97410	108916	114968	119166	123315
WIND + RENEWABLE TOTAL	2161	4278	5395	5835	6220	6570	6920	7270	7620	7970
GRAND TOTAL	241604	251434	282577	323774	369329	401352	432853	464182	483833	503099
COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	18,4	14,8	19,6	27,6	35,4	36,9	37,4	37,1	33,0	28,8

Note : Balance tables are calculated by assuming that autoproducers and generation companies will be able to have additional 10 billion kWh generation to their 2007 actual generations in the case of the system requirement.

The annual development of total project generation of existing power plants + power plants under construction + power plants granted by licence and expected to be in service on proposed date + new additional capacity is on Figure 28 and the firm generation of the same capacity composition is on Figure 29. The demand can not be covered with the total project generation in 2014 and with the total firm generation in 2009 with the capacities existing power plants + power plants under construction + power plants granted by licence and expected to be in service on proposed date .

Figure 28 : Development of Project Generation Capacity of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Time + New Additional Capacity and Energy Demand (Case I - A)
Base Demand – Scenario I



The development of total firm generation composed of existing, under construction, granted by licence and expected to be in service on proposed time and new additional capacities together with energy reserve after covering the demand with power plants;

- only existing capacity,
 - existing capacity + capacity under construction,
 - existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date,
 - existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date + new additional capacity requirement
- are submitted on Table 33 for each composition.

When the existing power plants are considered solely, firm energy reserve starts from 2.7% in 2008 and decreases by year, the energy demand exceeds the firm generation capacity and the energy reserve drops to negative value of -4.2% in 2009. The energy reserve drops persistently to the level of -45.5% in 2017.

When the total firm generation of existing power plants and power plants under construction are considered, energy reserve is 3% in 2008, drops to negative value of -3.5% in 2009 and reaches to -42.3% in 2017.

If the total firm generation of existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date are examined together 3.9% of energy reserve is calculated in 2008, by decreasing the energy reserve becomes negative value of -0.5% in 2009 and drops to -30.2% in 2017. And if firm generation capacity of the new additional capacity calculated by the planning study is considered together with existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date, firm energy reserve is 4% in 2008 and is calculated to be between 13%-23% after the year 2011.

Table 33 : Firm Generation Capacity and Energy Demand Balance 2006-2015 (Case I - A)
Base Demand – Scenario 1

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
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EXISTING POWER PLANTS

THERMAL TOTAL	172588	172231	173074	173537	181320	179654	179390	179600	181528	178243
HYDRO TOTAL	36277	36868	36819	36755	36633	36584	36106	35950	35141	33978
WIND + RENEWABLE TOTAL	717	717	717	717	717	717	717	717	717	717
GRAND TOTAL	209581	209816	210610	211009	218670	216954	216213	216267	217386	212938

COVERING OF ENERGY DEMAND WITH EXISTING POWER PLANTS

ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	2,7	-4,2	-10,8	-16,9	-19,8	-26,0	-31,4	-36,1	-40,2	-45,5

POWER PLANTS UNDER CONSTRUCTION

THERMAL TOTAL	0	0	0	0	5606	5606	5606	5606	5606	5606
HYDRO TOTAL	496	1494	3275	3326	3326	3326	5785	6914	6914	6914
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	496	1494	3275	3326	8932	8932	11391	12520	12520	12520

EXISTING AND UNDER CONSTRUCTION POWER PLANTS

THERMAL TOTAL	172588	172231	173074	173537	186927	185260	184996	185207	187135	183849
HYDRO TOTAL	36772	38362	40094	40081	39959	39910	41891	42863	42055	40892
WIND + RENEWABLE TOTAL	717	717	717	717	717	717	717	717	717	717
GRAND TOTAL	210077	211310	213885	214335	227602	225886	227604	228787	229906	225458

COVERING OF ENERGY DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS

ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	3,0	-3,5	-9,4	-15,6	-16,6	-23,0	-27,8	-32,4	-36,8	-42,3

LICENCED POWER PLANTS

THERMAL TOTAL	874	3150	7895	16326	24060	26706	26706	26706	26706	26706
HYDRO TOTAL	150	982	4212	9446	13474	16130	17444	17444	17444	17444
WIND + RENEWABLE TOTAL	901	2422	3089	3162	3189	3189	3189	3189	3189	3189
GRAND TOTAL	1925	6554	15196	28934	40724	46026	47340	47340	47340	47340

UNDER CONSTRUCTION AND LICENCED POWER PLANTS

THERMAL TOTAL	874	3150	7895	16326	29667	32313	32313	32313	32313	32313
HYDRO TOTAL	646	2476	7487	12772	16799	19456	23229	24358	24358	24358
WIND + RENEWABLE TOTAL	901	2422	3089	3162	3189	3189	3189	3189	3189	3189
GRAND TOTAL	2420	8048	18470	32259	49656	54958	58731	59860	59860	59860

EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS

THERMAL TOTAL	173461	175381	180969	189863	210987	211966	211703	211913	213841	210555
HYDRO TOTAL	36923	39344	44306	49527	53433	56040	59335	60307	59499	58336
WIND + RENEWABLE TOTAL	1617	3139	3805	3878	3906	3906	3906	3906	3906	3906
GRAND TOTAL	212001	217864	229080	243268	268326	271912	274943	276126	277246	272797

COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS

ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	3,9	-0,5	-3,0	-4,2	-1,6	-7,3	-12,8	-18,5	-23,8	-30,2

Table 33 (Cont.) : Firm Generation Capacity and Energy Demand 2006-2015 (Case I - A)
Base Demand – Scenario I

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
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NEW ADDITIONAL CAPACITY

THERMAL TOTAL	0	4914	19656	40197	59037	77647	98858	123054	136750	154794
HYDRO TOTAL	0	0	1104	2370	5636	9327	12585	14789	17640	20811
WIND + RENEWABLE TOTAL	175	350	525	700	875	1050	1225	1400	1575	1750
GRAND TOTAL	175	5264	21285	43267	65548	88024	112668	139243	155965	177355

EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY

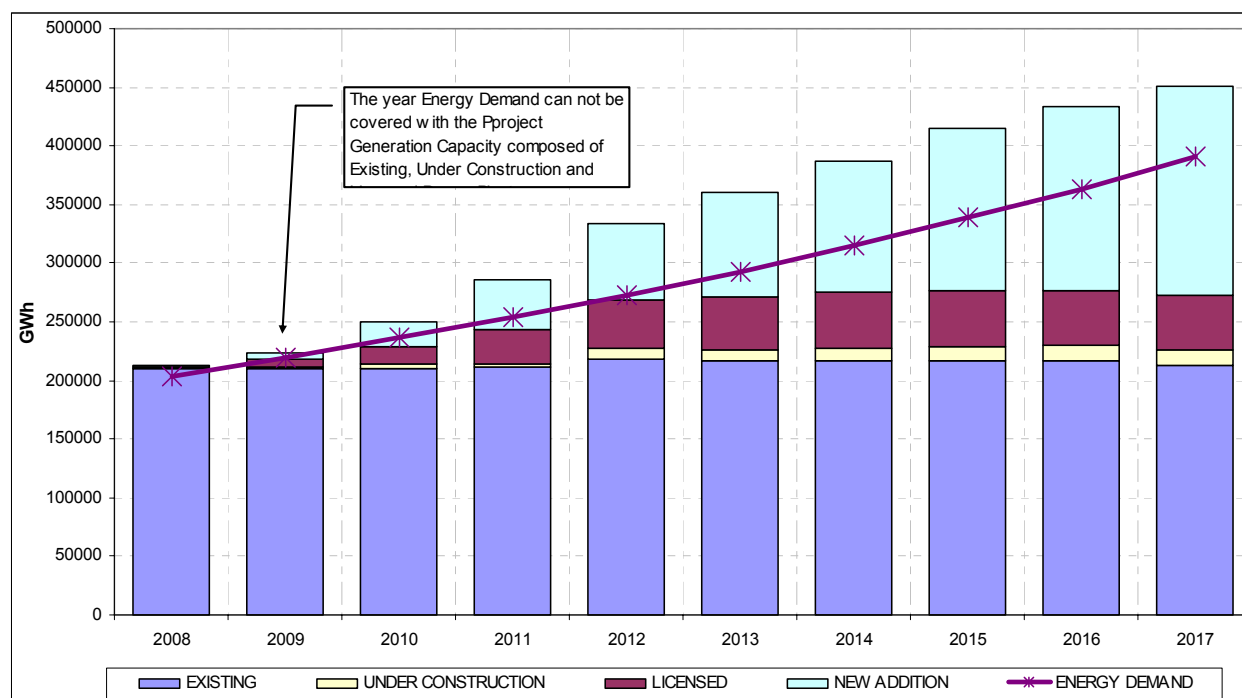
THERMAL TOTAL	173461	180295	200625	230060	270024	289613	310561	334967	350591	365349
HYDRO TOTAL	36923	39344	45410	51897	59069	65367	71920	75096	77139	79147
WIND + RENEWABLE TOTAL	1792	3489	4330	4578	4781	4956	5131	5306	5481	5656
GRAND TOTAL	212176	223128	250365	286535	333874	359936	387611	415369	433211	450152

COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY

ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	4,0	1,9	6,0	12,9	22,4	22,8	23,0	22,6	19,1	15,3

Note : Balance tables are calculated by assuming that autoproducers and generation companies will be able to have additional 10 billion kWh generation to their 2007 actual generations in the case of the system requirement.

Figure 29 : Development of Firm Generation Capacity of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Date + New Additional Capacity and Energy Demand (Case I - A)
Base Demand – Scenario I



In order to cover the energy demand between the years of 2008 and 2017 with the addition of 4319 MW capacity under construction, 12818 MW capacity granted by licence and expected to be in service on proposed date and 34155 MW capacity calculated by the long term generation expansion planning study to the existing system, the total installed capacity will reach to 91827 MW in the year 2017.

According to the Base Demand results of “2004 Turkish Electrical Energy Generation Planning Study”, the breakdown of this total installed capacity by hydro, thermal and wind resources by year is shown on Table 34, Table 35 and Table 36. In accordance with “Case 1 – A” the breakdown of installed capacity by thermal, hydro and wind resources by year is shown also on Table 37 and Figure 30.

In conclusion, the power plants of existing system, 4319 MW under construction, 12818 MW granted by licence and expected to be in service on proposed date according to Scenario 1 will not cover the Base Energy Demand according to Project Generation and Firm Generation starting from the years 2014 and 2009 respectively.

Table 34 : Breakdown of Installed Capacity of Power Plants to be New Added to the System by Thermal, Hydro and Wind Resources by Year (Case I - A) Base Demand – Scenario 1

Fuel Type	MW										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2008-2017
THERMAL	0,0	700,0	2100,0	2990,0	2720,0	2715,0	3080,0	3515,0	2015,0	2675	22510,0
HYDRO	0,0	0,0	543,0	731,0	1478,0	1598,0	1558,0	1445,0	1483,0	1559	10395,0
WIND+RENEWABLE	125,0	125,0	125,0	125,0	125,0	125,0	125,0	125,0	125,0	125,0	1250,0
TOTAL	125,0	825,0	2768,0	3846,0	4323,0	4438,0	4763,0	5085,0	3623,0	4359,0	34155,0

Table 35 : Breakdown of Project Generation of Power Plants to be New Added to the System by Thermal, Hydro and Wind Resources by Year (Case I - A) Base Demand – Scenario 1

Fuel Type	GWh										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2008-2017
THERMAL	0,0	4914,0	14742,0	20541,0	18840,0	18610,0	21211,0	24196,0	13696,0	18044,0	154794,0
HYDRO	0,0	0,0	2401,0	3185,0	5454,0	6120,0	5819,0	4504,0	5006,0	5312,0	37801,0
WIND+RENEWABLE	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	3500,0
TOTAL	350,0	5264,0	17493,0	24076,0	24644,0	25080,0	27380,0	29050,0	19052,0	23706,0	196095,0

Table 36 : Breakdown of Firm Generation of Power Plants to be New Added to the System by Thermal, Hydro and Wind Resources by Year (Case I - A) Base Demand – Scenario 1

Fuel Type	GWh										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2008-2017
THERMAL	0,0	4914,0	14742,0	20541,0	18840,0	18610,0	21211,0	24196,0	13696,0	18044,0	154794,0
HYDRO	0,0	0,0	1104,0	1266,0	3266,0	3691,0	3258,0	2204,0	2851,0	3171,0	20811,0
WIND+RENEWABLE	175,0	175,0	175,0	175,0	175,0	175,0	175,0	175,0	175,0	175,0	1750,0
TOTAL	175,0	5089,0	16021,0	21982,0	22281,0	22476,0	24644,0	26575,0	16722,0	21390,0	177355,0

Figure 30 : Development of Total Installed Capacity and Peak Demand (Case I - A)
Base Demand – Scenario 1

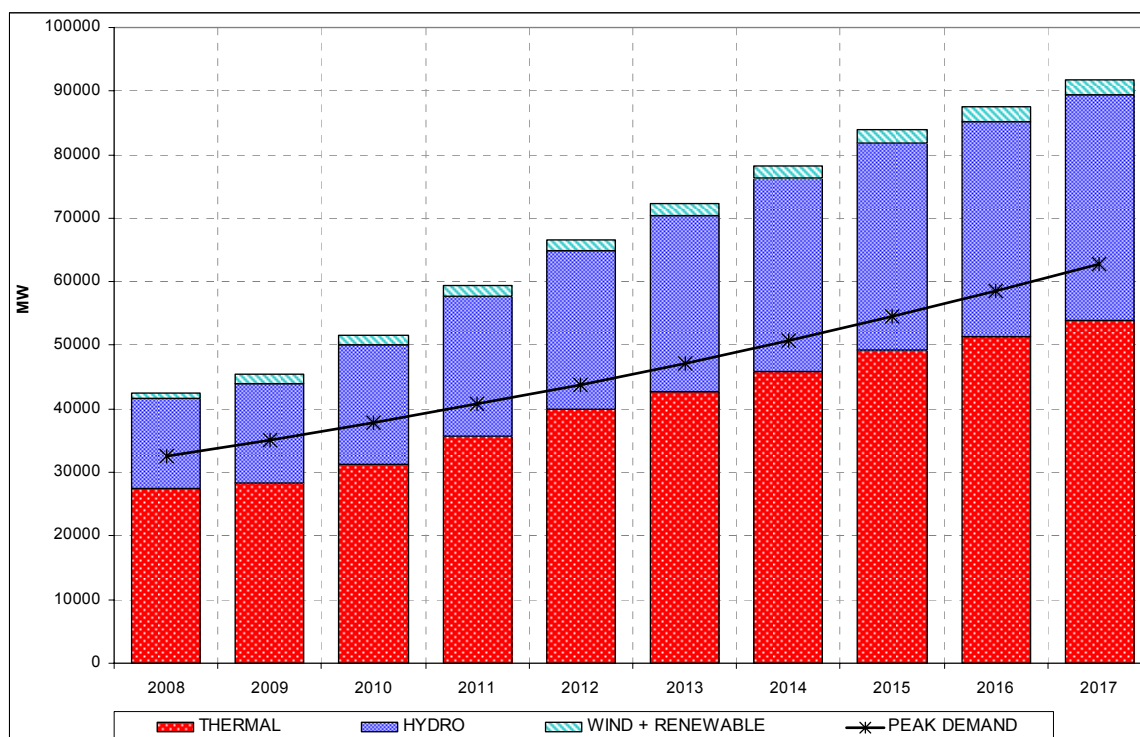
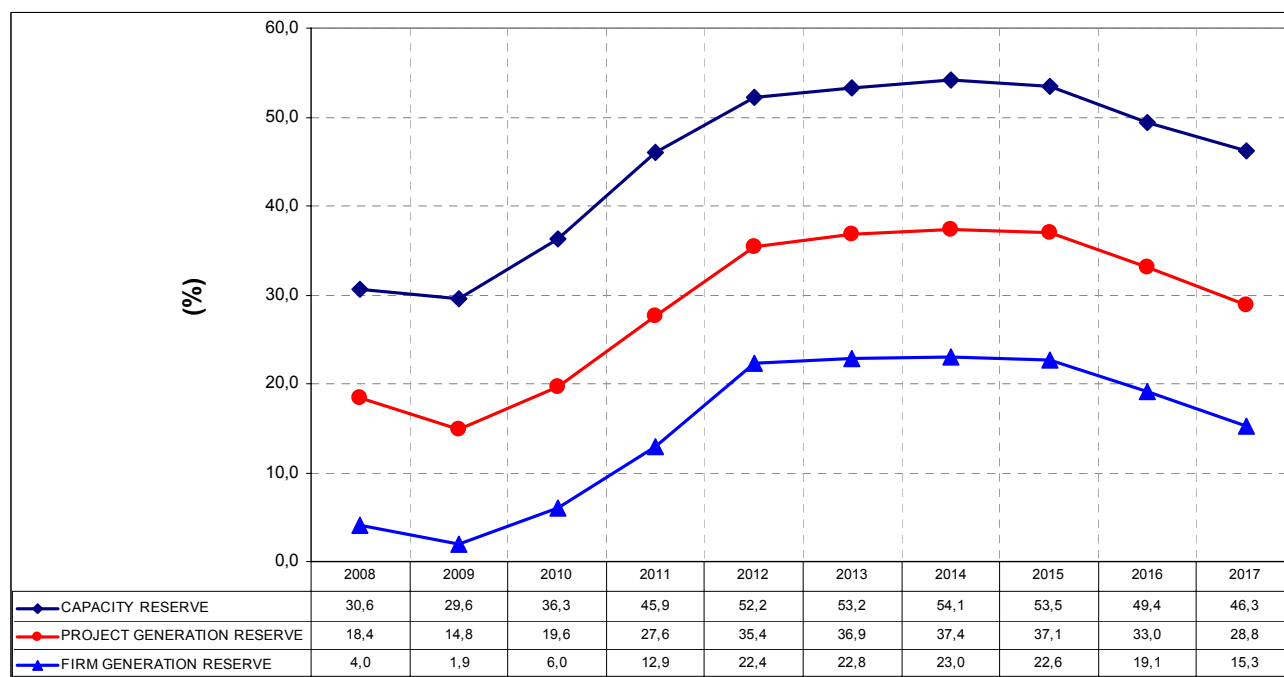


Table 37 : Development of Total Installed Capacity (Case I - A) Base Demand – Scenario 1

	THERMAL		HYDRO		WIND+RENEWABLE		TOTAL
	MW	%	MW	%	MW	%	MW
2008	27539	65	14043	33	845	2	42427
2009	28345	62	15727	35	1347	3	45419
2010	31327	61	18760	36	1487	3	51574
2011	35679	60	22124	37	1621	3	59424
2012	39984	60	24955	37	1746	3	66685
2013	42699	59	27687	38	1871	3	72257
2014	45779	59	30445	39	1996	3	78220
2015	49294	59	32430	39	2121	3	83845
2016	51309	59	33913	39	2246	3	87468
2017	53984	59	35472	39	2371	3	91827

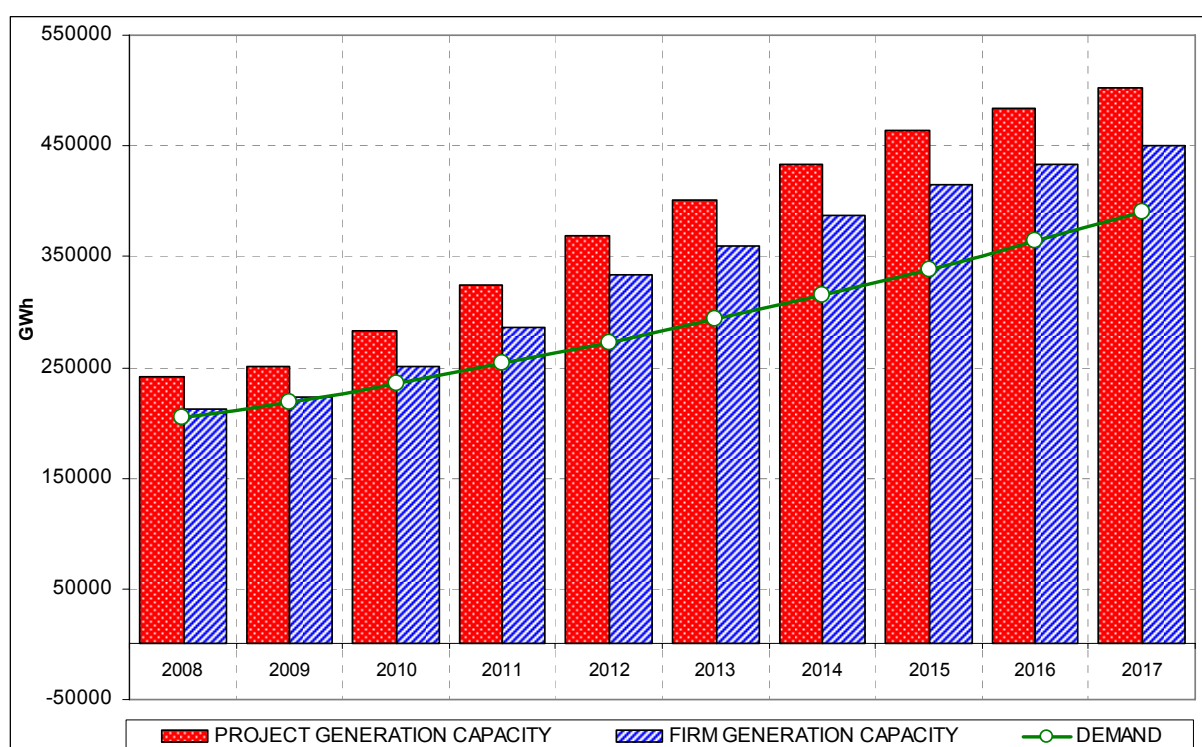
When the development of installed capacity and peak demand is considered for the 10-year study period, the capacity reserve is calculated as to be between 36% and 54%, energy reserves according to project generation and firm generation are calculated as to be between 20% and 37% and between 6% and 23% respectively in accordance with Base Demand after the year 2010 with addition of power plants under construction, power plants granted by licence as the end of December 2007 and expected to be in service on proposed date to the existing system revised according to Scenario 1 and January 2008 Progress Report of EPDK and power plants determined by 2004 long term generation expansion planning study.

Figure 31 : Capacity Reserve, Project Generation Reserve and Firm Generation Reserve
(Case I - A) Base demand – Scenario 1



Note: New additional capacities are taken from “Long Term Generation Expansion Planning Study” prepared by APK, TEİAŞ in November 2004. Since this study has not been revised yet, firm energy reserves for new added capacities become low. After revising the planning study these values are subject to change.

Figure 32 : Development of Project Generation, Firm Generation and Energy Demand
(Case I - A) Base Demand – Scenario 1



VII.2. Case I – B (Base Demand – Scenario 2)

In this section the power plants which are

- Existing as end of the year 2007,
- Under construction and
- Granted by licence and expected to be in service on proposed date based on “January 2008 Progress Raport” of EPDK and prepared according to Scenario 2 by EPDK, and besides, Base Demand prepared in accordance with the MAED results revized on May 2008 are taken into consideration and therefore, the generation demands to reach 236.2 TWh in 2010 and 390.5 TWh in 2017 and so the results about supply and demand situation and how to cover demand are given.

According to above situation, peak demand can not be covered starting from the year 2015. When the generation capacity is considered, the energy demand can not be covered in 2009 according to firm generation capacity and in 2013 according to project generation capacity.

Electricity generation expansion planning study determining the additional capacity requirement in order to meet demand has been carried out on November 2004 by considering long term natural gas supply contracts within the ETKB policies regarding evaluation of domestic and renewable resources together with resource diversification. This planning study is carried out by TEİAŞ on behalf of ETKB. According to this planning study results, in order to meet the expected demand, it will be necessary to add 34155 MW new capacity in total. 11645 MW of this total capacity comes from wind and hydro resources and the remaining 22510 MW from thermal resources up to the year of 2017.

Existing capacity, capacity under construction, capacity granted by licence and expected to be in service on the proposed time and the development of new additional capacity requirement to meet the increasing demand by years are indicated on Table 38.

Beside this, the development of total installed capacity with existing, under construction, granted by licence and expected to be in service on proposed date and new additional capacities together with capacity reserve after covering the peak load with power plants;

- only existing capacity,
 - existing capacity + capacity under construction,
 - existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date,
 - existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date + new additional capacity requirement
- are submitted on Table 38.

When the existing power plants are considered solely, capacity reserve starts from 25.7% in 2008 and continuously decreases and the peak demand exceeds the total installed capacity in 2011 by reaching to -0.4%. According to the increase of peak demand the capacity reserve reaches to -35.4% in year 2017 with the existing capacity as end of the year 2007.

When the sum of existing capacity and capacity under construction are considered, the capacity reserve is 27.4% in 2008, drops to 3.8% in 2011, to -1.6% in 2012 and reaches to -28.6% in 2017.

When the sum of existing capacity, capacity under construction and capacity granted by licence and expected to be in service on proposed date are examined together, capacity reserve is 29.6% in 2008, decreases to -2.1% in 2015 and drops to -14.9% in 2017. If the new additional capacity to be commissioned starting from 2008 calculated by the planning study is considered together with existing capacity, capacity under construction and capacity granted by licence and

expected to be in service on proposed date according to Scenario 2, capacity reserve which is 30% in 2008 is calculated to be between 36% and 46% after the year 2011.

Table 38 :Installed Capacity and Peak Demand Balance (Case I – B) Base Demand–Scenario2 (MW)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EXISTING POWER PLANTS										
THERMAL TOTAL	27250	26950	26950	26950	26950	26950	26950	26950	26950	26950
HYDRO TOTAL	13395	13395	13395	13395	13395	13395	13395	13395	13395	13395
WIND + RENEWABLE TOTAL	191	191	191	191	191	191	191	191	191	191
GRAND TOTAL	40836	40536	40536	40536	40536	40536	40536	40536	40536	40536
COVERING OF PEAK DEMAND WITH EXISTING POWER PLANTS										
PEAK LOAD DEMAND	32478	35053	37832	40716	43819	47159	50753	54622	58560	62782
RESERVE %	25,7	15,6	7,1	-0,4	-7,5	-14,0	-20,1	-25,8	-30,8	-35,4
POWER PLANTS UNDER CONSTRUCTION										
THERMAL TOTAL	0	0	0	0	840	840	840	840	840	840
HYDRO TOTAL	527	1634	1739	1739	1739	1739	2939	3479	3479	3479
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	527	1634	1739	1739	2579	2579	3779	4319	4319	4319
EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
THERMAL TOTAL	27250	26950	26950	26950	27790	27790	27790	27790	27790	27790
HYDRO TOTAL	13922	15029	15133	15133	15133	15133	16333	16873	16873	16873
WIND + RENEWABLE TOTAL	191	191	191	191	191	191	191	191	191	191
GRAND TOTAL	41363	42170	42274	42274	43114	43114	44314	44854	44854	44854
COVERING OF PEAK DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
PEAK LOAD DEMAND	32478	35053	37832	40716	43819	47159	50753	54622	58560	62782
RESERVE %	27,4	20,3	11,7	3,8	-1,6	-8,6	-12,7	-17,9	-23,4	-28,6
LICENCED POWER PLANTS										
THERMAL TOTAL	162	632	632	1689	2952	2952	2952	2952	2952	2952
HYDRO TOTAL	131	420	701	3341	4617	5149	5149	5149	5149	5149
WIND + RENEWABLE TOTAL	450	488	489	499	499	499	499	499	499	499
GRAND TOTAL	743	1540	1821	5529	8068	8599	8599	8599	8599	8599
UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	162	632	632	1689	3792	3792	3792	3792	3792	3792
HYDRO TOTAL	658	2055	2439	5080	6356	6887	8087	8627	8627	8627
WIND + RENEWABLE TOTAL	450	488	489	499	499	499	499	499	499	499
GRAND TOTAL	1270	3174	3560	7268	10646	11177	12377	12917	12917	12917
EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	27412	27582	27582	28639	30742	30742	30742	30742	30742	30742
HYDRO TOTAL	14053	15450	15834	18475	19751	20282	21482	22022	22022	22022
WIND + RENEWABLE TOTAL	641	678	680	689	689	689	689	689	689	689
GRAND TOTAL	42105	43710	44096	47804	51182	51713	52913	53453	53453	53453
COVERING OF PEAK DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
PEAK LOAD DEMAND	32478	35053	37832	40716	43819	47159	50753	54622	58560	62782
RESERVE %	29,6	24,7	16,6	17,4	16,8	9,7	4,3	-2,1	-8,7	-14,9

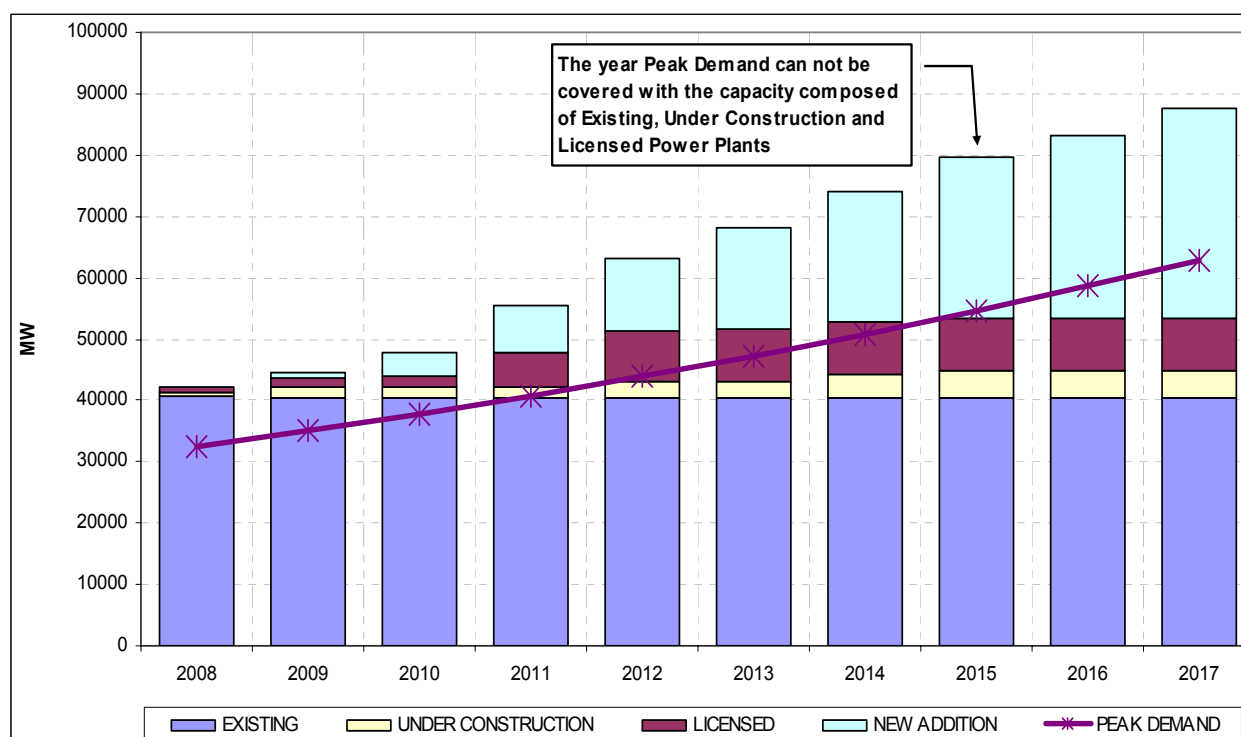
Table 38 (Cont.) : Installed Capacity and Peak Demand Balance
(Case I – BA) Base Demand–Scenario 2

(MW)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	0	700	2800	5790	8510	11225	14305	17820	19835	22510
HYDRO TOTAL	0	0	543	1274	2752	4350	5908	7353	8836	10395
WIND + RENEWABLE TOTAL	125	250	375	500	625	750	875	1000	1125	1250
GRAND TOTAL	125	950	3718	7564	11887	16325	21088	26173	29796	34155
EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	27412	28282	30382	34429	39252	41967	45047	48562	50577	53252
HYDRO TOTAL	14053	15450	16377	19749	22503	24632	27390	29375	30858	32417
WIND + RENEWABLE TOTAL	766	928	1055	1189	1314	1439	1564	1689	1814	1939
GRAND TOTAL	42230	44660	47814	55368	63069	68038	74001	79626	83249	87608
COVERING OF PEAK DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
PEAK LOAD DEMAND	32478	35053	37832	40716	43819	47159	50753	54622	58560	62782
RESERVE %	30,0	27,4	26,4	36,0	43,9	44,3	45,8	45,8	42,2	39,5

The annual development of total installed capacity composed of existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed time + new additional capacity is on Figure 33. On the figure, when the installed capacity development is compared with peak demand, the peak demand can not be covered with the total installed capacity which are composed of the existing, under construction and granted by licence and expected to be in service on proposed time starting from the year 2015.

Figure 33 : Development of Installed Capacity Composed of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Time + New Additional Capacity and Peak Demand
(Case I - B) Base Demand-Scenario 2



- The development of total project generation composed of existing, under construction, granted by licence and expected to be in service on proposed time and new additional capacities together with energy reserve after covering the demand with power plants are submitted on Table 39 for each composition.

When the existing power plants are considered solely, energy reserve starts from 16.8% in 2008 and decreases continuously by year, the energy demand exceeds the project generation capacity in 2010 and the energy reserve drops to –41.3% in 2017.

When the total project generation of existing power plants and power plants under construction are considered, the energy reserve is 17.2% in 2008, vanishes in 2010 and drops to negative value of -5.4% in 2011 and reaches to –37% in 2017.

If the total project generation of existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date are examined together, 18% of energy reserve is calculated in 2008, by decreasing the reserve becomes negative value of –2.3% in 2013 and drops to –26.3% in 2017. And if project generation capacity of the new additional capacity calculated by the planning study is considered together with existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date, energy reserve is 18.2% in 2008 and is calculated to be between 20% and 31% after the year 2011.

Table 39 : Project Generation Capacity and Energy Demand Balance 2008-2017 (Case I-B)
Base Demand – Scenario 2

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EXISTING POWER PLANTS										
THERMAL TOTAL	191325	188294	187965	187230	187503	187138	185572	186304	187711	184434
HYDRO TOTAL	46225	46816	46767	46703	46581	46532	46054	45898	45089	43926
WIND + RENEWABLE TOTAL	756	756	756	756	756	756	756	756	756	756
GRAND TOTAL	238306	235867	235488	234689	234840	234427	232383	232957	233556	229116
COVERING OF ENERGY DEMAND WITH EXISTING POWER PLANTS										
ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	16,8	7,7	-0,3	-7,5	-13,9	-20,0	-26,3	-31,2	-35,8	-41,3
POWER PLANTS UNDER CONSTRUCTION										
THERMAL TOTAL	0	0	0	0	5880	5880	5880	5880	5880	5880
HYDRO TOTAL	780	2384	5260	5408	5408	5408	9241	10946	10946	10946
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	780	2384	5260	5408	11288	11288	15121	16826	16826	16826
EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
THERMAL TOTAL	191325	188294	187965	187230	193383	193018	191452	192184	193591	190314
HYDRO TOTAL	47005	49200	52027	52111	51989	51940	55295	56844	56035	54872
WIND + RENEWABLE TOTAL	756	756	756	756	756	756	756	756	756	756
GRAND TOTAL	239086	238251	240748	240097	246128	245715	247504	249783	250382	245942
COVERING OF ENERGY DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	17,2	8,8	1,9	-5,4	-9,8	-16,2	-21,5	-26,2	-31,2	-37,0
LICENCED POWER PLANTS										
THERMAL TOTAL	463	2523	4120	8317	16915	21315	21315	21315	21315	21315
HYDRO TOTAL	344	1213	2181	6901	13789	17454	18510	18510	18510	18510
WIND + RENEWABLE TOTAL	888	1860	1949	1990	2025	2025	2025	2025	2025	2025
GRAND TOTAL	1696	5596	8250	17208	32728	40794	41849	41849	41849	41849
UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	463	2523	4120	8317	22795	27195	27195	27195	27195	27195
HYDRO TOTAL	1124	3597	7441	12309	19197	22862	27751	29456	29456	29456
WIND + RENEWABLE TOTAL	888	1860	1949	1990	2025	2025	2025	2025	2025	2025
GRAND TOTAL	2476	7980	13510	22616	44016	52082	56970	58675	58675	58675
EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	191788	190818	192085	195547	210298	214333	212767	213498	214905	211628
HYDRO TOTAL	47349	50413	54208	59012	65778	69395	73805	75353	74545	73382
WIND + RENEWABLE TOTAL	1644	2616	2705	2746	2781	2781	2781	2781	2781	2781
GRAND TOTAL	240781	243847	248998	257305	278856	286508	289353	291632	292231	287791
COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	18,0	11,3	5,4	1,4	2,2	-2,3	-8,2	-13,9	-19,6	-26,3

Table 39 (Cont.) : Project Generation Capacity and Energy Demand Balance 2008-2017
(Case I - B) Base Demand – Scenario 2

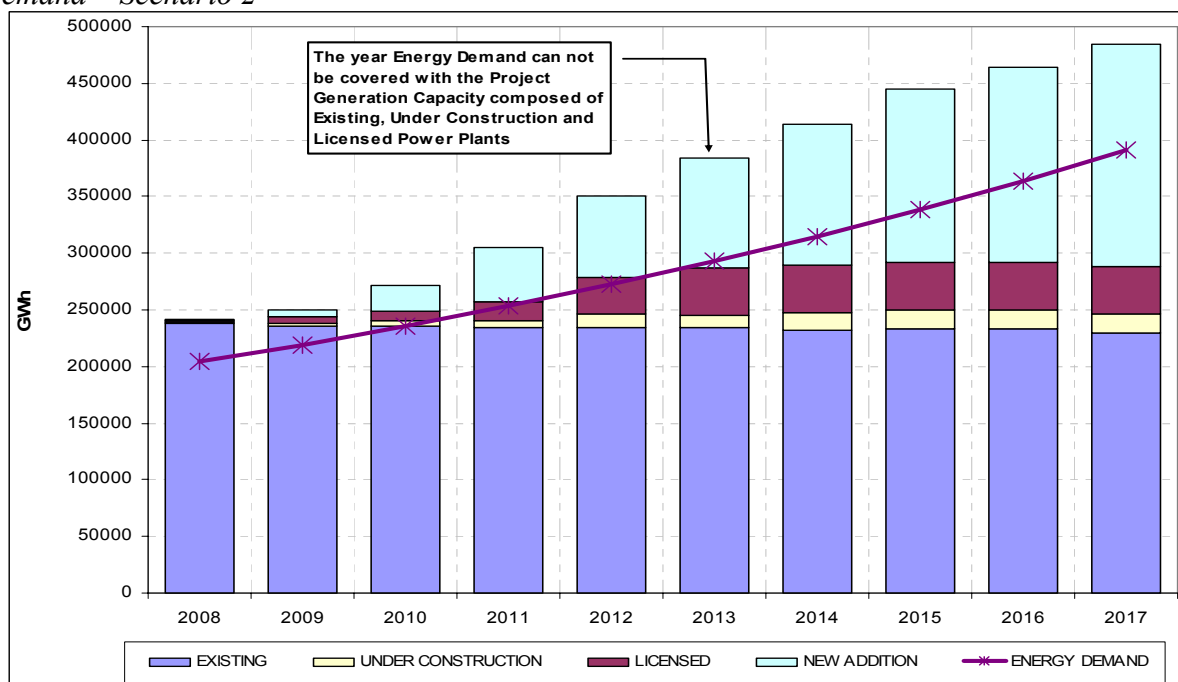
(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	0	4914	19656	40197	59037	77647	98858	123054	136750	154794
HYDRO TOTAL	0	0	2401	5586	11040	17160	22979	27483	32489	37801
WIND + RENEWABLE TOTAL	350	700	1050	1400	1750	2100	2450	2800	3150	3500
GRAND TOTAL	350	5614	23107	47183	71827	96907	124287	153337	172389	196095
EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	191788	195732	211741	235744	269335	291980	311625	336552	351655	366422
HYDRO TOTAL	47349	50413	56609	64598	76818	86555	96784	102836	107034	111183
WIND + RENEWABLE TOTAL	1994	3316	3755	4146	4531	4881	5231	5581	5931	6281
GRAND TOTAL	241131	249461	272105	304488	350683	383415	413640	444969	464620	483886
COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	18,2	13,9	15,2	20,0	28,5	30,8	31,3	31,4	27,7	23,9

Note : Balance tables are calculated by assuming that autoproducers and generation companies will be able to have additional 10 billion kWh generation to their 2007 actual generations in the case of the system requirement.

The annual development of total project generation of existing power plants + power plants under construction + power plants granted by licence and expected to be in service on proposed date + new additional capacity is on Figure 34 and the firm generation of the same capacity composition is on Figure 35. The demand can not be covered with the total project generation in 2013 and with the total firm generation in 2009 with the capacities existing power plants + power plants under construction + power plants granted by licence and expected to be in service on proposed date .

Figure 34 : Development of Project Generation Capacity of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Time + New Additional Capacity and Energy Demand (Case I - B) Base Demand – Scenario 2



The development of total firm generation composed of existing, under construction, granted by licence and expected to be in service on proposed time and new additional capacities together with energy reserve after covering the demand with power plants;

- only existing capacity,
- existing capacity + capacity under construction,
- existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date,
- existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date + new additional capacity requirement

are submitted on Table 40 for each composition.

When the existing power plants are considered solely, firm energy reserve starts from 2.7% in 2008 and decreases by year, the energy demand exceeds the firm generation capacity and the energy reserve drops to negative value of -4.2% in 2009. The energy reserve drops persistently to the level of -45.5% in 2017.

When the total firm generation of existing power plants and power plants under construction are considered, energy reserve is 3% in 2008, drops to negative value of -3.5% in 2009 and reaches to -42.3% in 2017.

If the total firm generation of existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date are examined together 3.7% of energy reserve is calculated in 2008, by decreasing the energy reserve becomes negative value of -1.3% in 2009 and drops to -33.7% in 2017. And if firm generation capacity of the new additional capacity calculated by the planning study is considered together with existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date, firm energy reserve is 3.7% in 2008 and is calculated to be between 7% and 18% after the year 2011.

In conclusion, the power plants of existing system, 4319 MW under construction, 8599 MW granted by licence and expected to be in service on proposed date according to Scenario 2 will not cover the Base Energy Demand according to Project Generation and Firm Generation starting from the years 2013 and 2009 respectively.

Table 40 : Firm Generation Capacity and Energy Demand Balance 2006-2015 (Case I - B)
Base Demand – Scenario 2

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
------	------	------	------	------	------	------	------	------	------	------

EXISTING POWER PLANTS

THERMAL TOTAL	172588	172231	173074	173537	181320	179654	179390	179600	181528	178243
HYDRO TOTAL	36277	36868	36819	36755	36633	36584	36106	35950	35141	33978
WIND + RENEWABLE TOTAL	717	717	717	717	717	717	717	717	717	717
GRAND TOTAL	209581	209816	210610	211009	218670	216954	216213	216267	217386	212938

COVERING OF ENERGY DEMAND WITH EXISTING POWER PLANTS

ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	2,7	-4,2	-10,8	-16,9	-19,8	-26,0	-31,4	-36,1	-40,2	-45,5

POWER PLANTS UNDER CONSTRUCTION

THERMAL TOTAL	0	0	0	0	5606	5606	5606	5606	5606	5606
HYDRO TOTAL	496	1494	3275	3326	3326	3326	5785	6914	6914	6914
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	496	1494	3275	3326	8932	8932	11391	12520	12520	12520

EXISTING AND UNDER CONSTRUCTION POWER PLANTS

THERMAL TOTAL	172588	172231	173074	173537	186927	185260	184996	185207	187135	183849
HYDRO TOTAL	36772	38362	40094	40081	39959	39910	41891	42863	42055	40892
WIND + RENEWABLE TOTAL	717	717	717	717	717	717	717	717	717	717
GRAND TOTAL	210077	211310	213885	214335	227602	225886	227604	228787	229906	225458

COVERING OF ENERGY DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS

ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	3,0	-3,5	-9,4	-15,6	-16,6	-23,0	-27,8	-32,4	-36,8	-42,3

LICENCED POWER PLANTS

THERMAL TOTAL	463	2523	4120	8317	16915	21315	21315	21315	21315	21315
HYDRO TOTAL	223	782	1381	4069	7965	10033	10629	10629	10629	10629
WIND + RENEWABLE TOTAL	708	1493	1577	1610	1638	1638	1638	1638	1638	1638
GRAND TOTAL	1394	4798	7078	13996	26518	32986	33582	33582	33582	33582

UNDER CONSTRUCTION AND LICENCED POWER PLANTS

THERMAL TOTAL	463	2523	4120	8317	22521	26921	26921	26921	26921	26921
HYDRO TOTAL	718	2276	4656	7394	11291	13359	16414	17543	17543	17543
WIND + RENEWABLE TOTAL	708	1493	1577	1610	1638	1638	1638	1638	1638	1638
GRAND TOTAL	1889	6292	10352	17322	35450	41918	44973	46102	46102	46102

EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS

THERMAL TOTAL	173051	174755	177194	181855	203842	206575	206311	206521	208449	205164
HYDRO TOTAL	36995	39144	41475	44149	47924	49943	52520	53492	52684	51521
WIND + RENEWABLE TOTAL	1424	2210	2293	2327	2355	2355	2355	2355	2355	2355
GRAND TOTAL	211470	216108	220962	228331	254120	258872	261185	262368	263488	259039

COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS

ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	3,7	-1,3	-6,4	-10,0	-6,9	-11,7	-17,1	-22,5	-27,6	-33,7

Table 40 (Cont.) : Firm Generation Capacity and Energy Demand 2006-2015 (Case I - B)
Base Demand – Scenario 2

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
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NEW ADDITIONAL CAPACITY

THERMAL TOTAL	0	4914	19656	40197	59037	77647	98858	123054	136750	154794
HYDRO TOTAL	0	0	1104	2370	5636	9327	12585	14789	17640	20811
WIND + RENEWABLE TOTAL	175	350	525	700	875	1050	1225	1400	1575	1750
GRAND TOTAL	175	5264	21285	43267	65548	88024	112668	139243	155965	177355

EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY

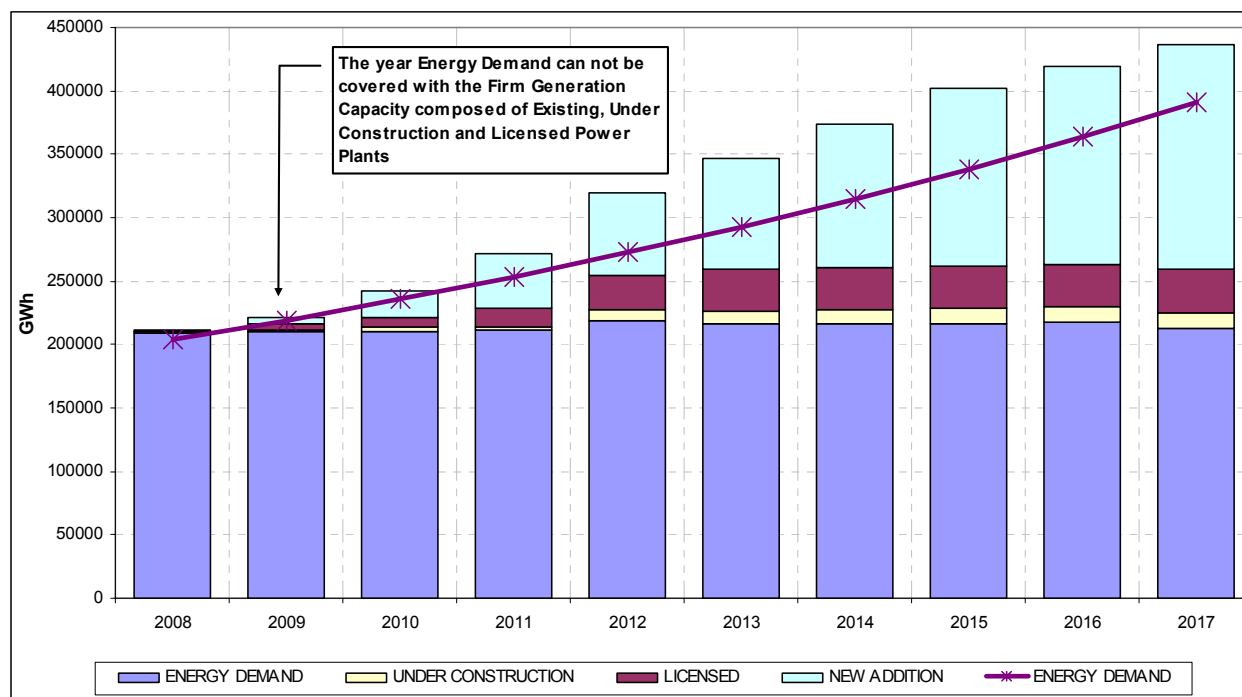
THERMAL TOTAL	173051	179669	196850	222052	262879	284222	305169	329575	345199	359958
HYDRO TOTAL	36995	39144	42579	46519	53560	59270	65105	68281	70324	72332
WIND + RENEWABLE TOTAL	1599	2560	2818	3027	3230	3405	3580	3755	3930	4105
GRAND TOTAL	211645	221372	242247	271598	319668	346896	373853	401611	419453	436394

COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY

ENERGY DEMAND	204000	219013	236182	253837	272812	293205	315123	338679	363695	390559
RESERVE %	3,7	1,1	2,6	7,0	17,2	18,3	18,6	18,6	15,3	11,7

Note : Balance tables are calculated by assuming that autoproducers and generation companies will be able to have additional 10 billion kWh generation to their 2007 actual generations in the case of the system requirement.

Figure 35 : Development of Firm Generation Capacity of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Date + New Additional Capacity and Energy Demand (Case I - B)
Base Demand – Scenario 2

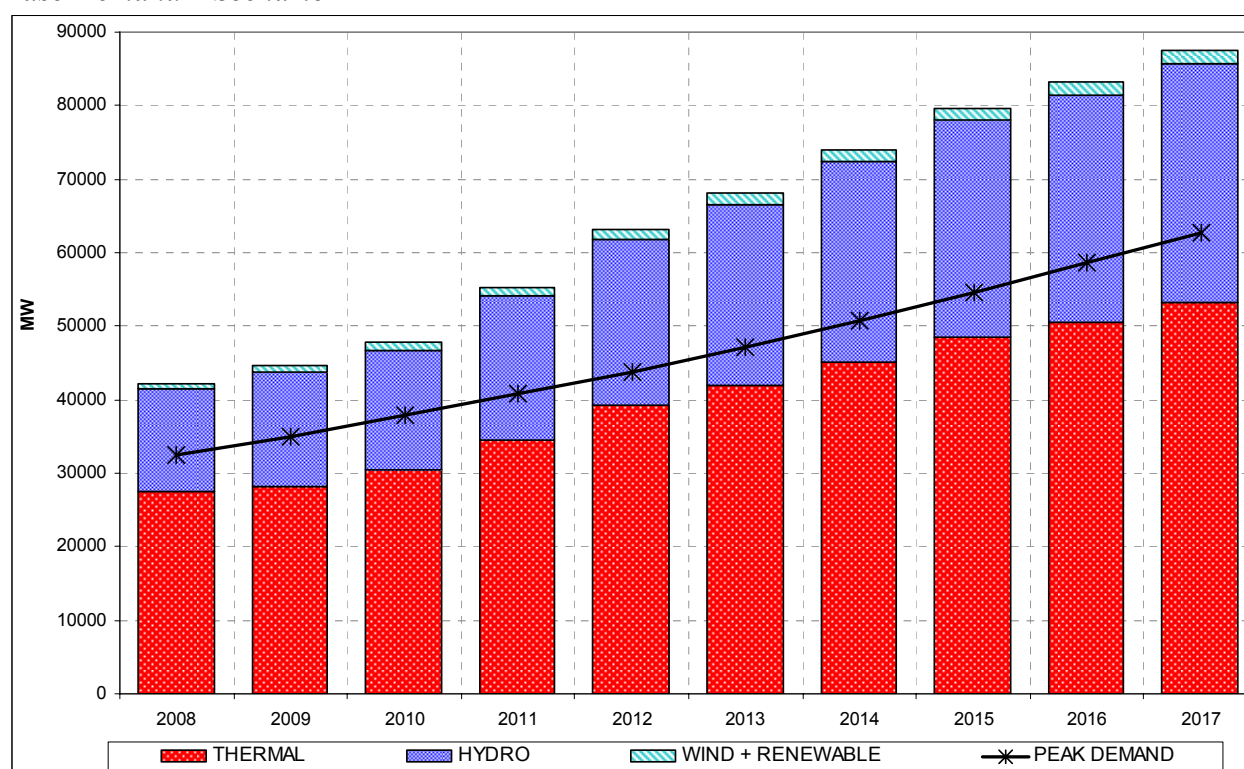


In accordance with “Case 1 – B” the breakdown of the total installed capacity to thermal, hydro and wind resources by year is shown on Table 41 and Figure 36.

Table 41 : Development of Total Installed Capacity (Case I - B) Base Demand – Scenario 2

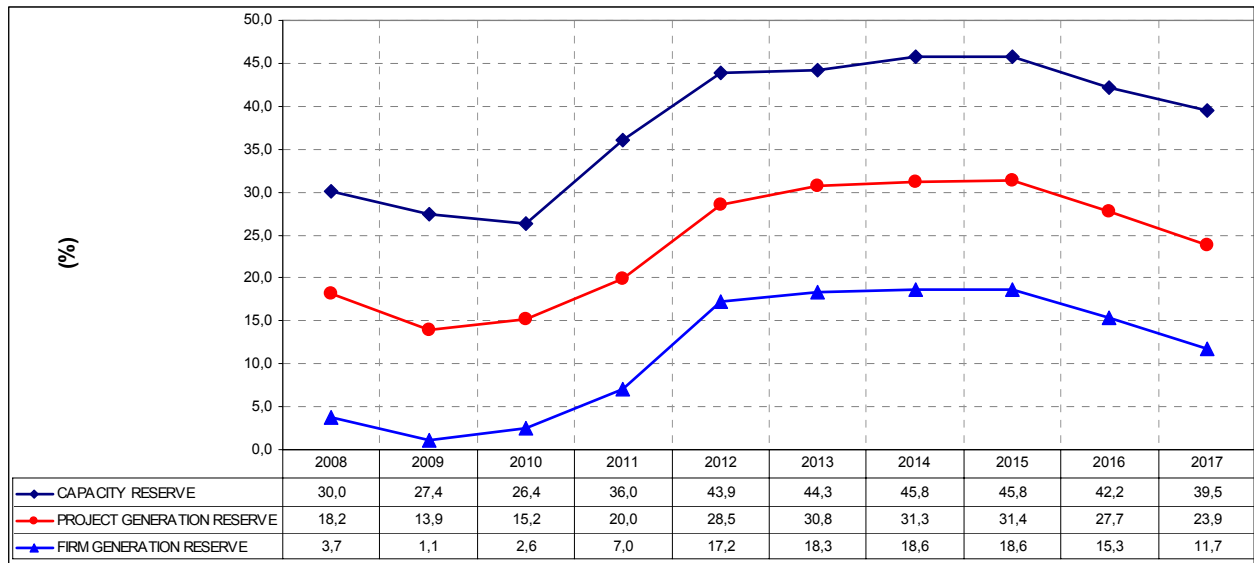
	THERMAL		HYDRO		WIND+RENEWABLE		TOTAL
	MW	%	MW	%	MW	%	MW
2008	27412	65	14053	33	765	2	42230
2009	28282	63	15450	35	928	2	44660
2010	30382	64	16377	34	1055	2	47814
2011	34429	62	19749	36	1189	2	55367
2012	39252	62	22503	36	1314	2	63069
2013	41967	62	24632	36	1439	2	68038
2014	45047	61	27390	37	1564	2	74001
2015	48562	61	29375	37	1689	2	79626
2016	50577	61	30858	37	1814	2	83249
2017	53252	61	32417	37	1939	2	87608

Figure 36 : Development of Total Installed Capacity and Peak Demand (Case I - B) Base Demand – Scenario 2



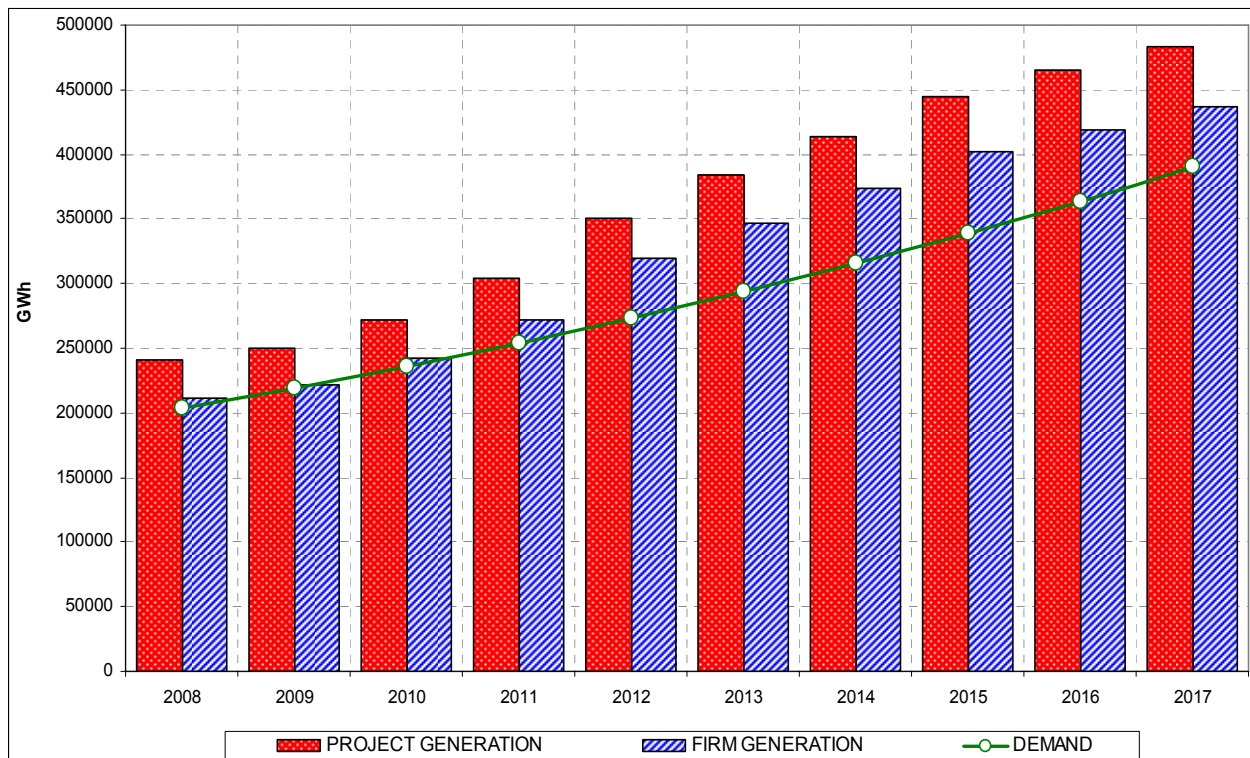
When the development of installed capacity and peak demand is considered for the 10-year study period, the capacity reserve is calculated as to be between 36% and 46%, energy reserves according to project generation and firm generation are calculated as to be between 20% and 31% and between 7% and 18% respectively in accordance with Base Demand after the year 2010 with addition of power plants under construction, power plants granted by licence as the end of December 2007 and expected to be in service on proposed date to the existing system revised according to Scenario 2 and January 2008 Progress Report of EPDK and power plants determined by 2004 long term generation expansion planning study.

Figure 37 : Capacity Reserve, Project Generation Reserve and Firm Generation Reserve
(Case I - B) Base Demand – Scenario 2



Note: New additional capacities are taken from “Long Term Generation Expansion Planning Study” prepared by APK, TEİAŞ in November 2004. Since this study has not been revised yet, firm energy reserves for new added capacities become low. After revising the planning study these values are subject to change.

Figure 38 : Development of Project Generation, Firm Generation and Energy Demand
(Case I - B) Base Demand – Scenario 2



VII.3. Case II – A (Low Demand – Scenario 1)

In this section the power plants which are

- Existing as end of the year 2007,
- Under construction and
- Granted by licence and expected to be in service on proposed date based on “January 2008 Progress Report” of EPDK and prepared according to Scenario 1 by EPDK, and besides, Low Demand prepared in accordance with the MAED results revised on May 2008 are taken into consideration and therefore, the generation demands to reach 230.7 TWh in 2010 and 363 TWh in 2017 and so the results about supply and demand situation and how to cover demand are given.

According to above situation, peak demand can not be covered starting from the year 2017. When the generation capacity is considered, the energy demand can not be covered in 2010 according to firm generation capacity and in 2015 according to project generation capacity.

Electricity generation expansion planning study determining the additional capacity requirement in order to meet demand has been carried out on November 2004 by considering long term natural gas supply contracts within the ETKB policies regarding evaluation of domestic and renewable resources together with resource diversification. This planning study is carried out by TEİAŞ on behalf of ETKB. According to this planning study results, in order to meet the expected demand, it will be necessary to add 22028 MW new capacity in total. 7158 MW of this total capacity comes from wind and hydro resources and the remaining 14870 MW from thermal resources up to the year of 2017.

Existing capacity, capacity under construction, capacity granted by licence and expected to be in service on the proposed time and the development of new additional capacity requirement to meet the increasing demand by years are indicated on Table 42.

Beside this, the development of total installed capacity with existing, under construction, granted by licence and expected to be in service on proposed date and new additional capacities together with capacity reserve after covering the peak load with power plants;

- only existing capacity,
 - existing capacity + capacity under construction,
 - existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date,
 - existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date + new additional capacity requirement
- are submitted on Table 42.

When the existing power plants are considered solely, capacity reserve starts from 27% in 2008 and continuously decreases and the peak demand exceeds the total installed capacity in 2012 by reaching to -4.2%. According to the increase of peak demand the capacity reserve reaches to -30.6% in year 2017 with the existing capacity as end of the year 2007.

When the sum of existing capacity and capacity under construction are considered, the capacity reserve is 28.7% in 2008, drops to 1.9% in 2012, to -4.5% in 2013 and reaches to -23.2% in 2017.

When the sum of existing capacity, capacity under construction and capacity granted by licence and expected to be in service on proposed date are examined together, capacity reserve is 31.6% in 2008, decreases to 5.3% in 2016 and drops to -1.2% in 2017. If the new additional capacity to be commissioned starting from 2008 calculated by the planning study is considered together with existing capacity, capacity under construction and capacity granted by licence and

expected to be in service on proposed date according to Scenario 1, capacity reserve which is 31.6% in 2008 is calculated to be between 35% and 41% after the year 2011.

Table 42 :Installed Capacity and Peak Demand Balance (Case II – A) Low Demand–Scenario I
(MW)

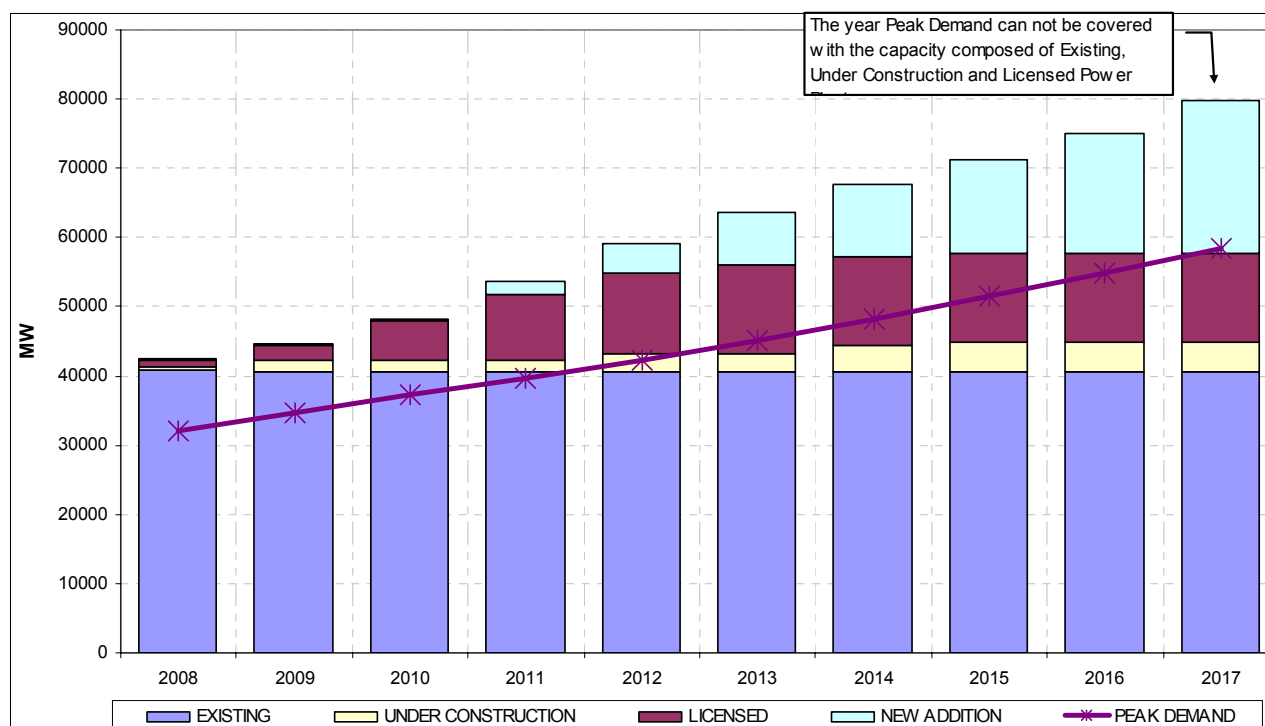
YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EXISTING POWER PLANTS										
THERMAL TOTAL	27250	26950	26950	26950	26950	26950	26950	26950	26950	26950
HYDRO TOTAL	13395	13395	13395	13395	13395	13395	13395	13395	13395	13395
WIND + RENEWABLE TOTAL	191	191	191	191	191	191	191	191	191	191
GRAND TOTAL	40836	40536	40536	40536	40536	40536	40536	40536	40536	40536
COVERING OF PEAK DEMAND WITH EXISTING POWER PLANTS										
PEAK LOAD DEMAND	32143	34571	37182	39673	42331	45167	48193	51421	54788	58376
RESERVE %	27,0	17,3	9,0	2,2	-4,2	-10,3	-15,9	-21,2	-26,0	-30,6
POWER PLANTS UNDER CONSTRUCTION										
THERMAL TOTAL	0	0	0	0	840	840	840	840	840	840
HYDRO TOTAL	527	1634	1739	1739	1739	1739	2939	3479	3479	3479
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	527	1634	1739	1739	2579	2579	3779	4319	4319	4319
EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
THERMAL TOTAL	27250	26950	26950	26950	27790	27790	27790	27790	27790	27790
HYDRO TOTAL	13922	15029	15133	15133	15133	15133	16333	16873	16873	16873
WIND + RENEWABLE TOTAL	191	191	191	191	191	191	191	191	191	191
GRAND TOTAL	41363	42170	42274	42274	43114	43114	44314	44854	44854	44854
COVERING OF PEAK DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
PEAK LOAD DEMAND	32143	34571	37182	39673	42331	45167	48193	51421	54788	58376
RESERVE %	28,7	22,0	13,7	6,6	1,9	-4,5	-8,0	-12,8	-18,1	-23,2
LICENCED POWER PLANTS										
THERMAL TOTAL	289	695	1576	2939	3683	3683	3683	3683	3683	3683
HYDRO TOTAL	121	698	3083	5716	7070	8204	8204	8204	8204	8204
WIND + RENEWABLE TOTAL	529	907	921	931	931	931	931	931	931	931
GRAND TOTAL	939	2300	5581	9585	11684	12818	12818	12818	12818	12818
UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	289	695	1576	2939	4523	4523	4523	4523	4523	4523
HYDRO TOTAL	648	2332	4822	7455	8809	9942	11142	11682	11682	11682
WIND + RENEWABLE TOTAL	529	907	921	931	931	931	931	931	931	931
GRAND TOTAL	1466	3934	7319	11324	14262	15396	16596	17136	17136	17136
EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	27539	27645	28527	29889	31474	31474	31474	31474	31474	31474
HYDRO TOTAL	14043	15727	18217	20850	22203	23337	24537	25077	25077	25077
WIND + RENEWABLE TOTAL	720	1097	1112	1121	1121	1121	1121	1121	1121	1121
GRAND TOTAL	42302	44470	47855	51860	54798	55932	57132	57672	57672	57672
COVERING OF PEAK DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
PEAK LOAD DEMAND	32143	34571	37182	39673	42331	45167	48193	51421	54788	58376
RESERVE %	31,6	28,6	28,7	30,7	29,5	23,8	18,5	12,2	5,3	-1,2

Table 42 (Cont.) : Installed Capacity and Peak Demand Balance (Case II – A)
Low Demand-Scenario I

(MW)										
YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	0	0	0	1400	3235	5355	7570	9930	11970	14870
HYDRO TOTAL	0	0	0	0	543	1660	2148	2752	4350	5908
WIND + RENEWABLE TOTAL	125	250	375	500	625	750	875	1000	1125	1250
GRAND TOTAL	125	250	375	1900	4403	7765	10593	13682	17445	22028
EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	27539	27645	28527	31289	34709	36829	39044	41404	43444	46344
HYDRO TOTAL	14043	15727	18217	20850	22746	24997	26685	27829	29427	30985
WIND + RENEWABLE TOTAL	845	1347	1487	1621	1746	1871	1996	2121	2246	2371
GRAND TOTAL	42427	44720	48230	53760	59201	63697	67725	71354	75117	79700
COVERING OF PEAK DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
PEAK LOAD DEMAND	32143	34571	37182	39673	42331	45167	48193	51421	54788	58376
RESERVE %	32,0	29,4	29,7	35,5	39,9	41,0	40,5	38,8	37,1	36,5

The annual development of total installed capacity composed of existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed time + new additional capacity is on Figure 39. On the figure, when the installed capacity development is compared with peak demand, the peak demand can not be covered with the total installed capacity which are composed of the existing, under construction and granted by licence and expected to be in service on proposed time starting from the year 2017.

Figure 39 : Development of Installed Capacity Composed of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Time + New Additional Capacity and Peak Demand
(Case II - A) Low Demand-Scenario I



- The development of total project generation composed of existing, under construction, granted by licence and expected to be in service on proposed time and new additional capacities together with energy reserve after covering the demand with power plants are submitted on Table 43 for each composition.

When the existing power plants are considered solely, energy reserve starts from 16.8% in 2008 and decreases continuously by year, the energy demand exceeds the project generation capacity in 2011 and the energy reserve drops to –36.9% in 2017.

When the total project generation of existing power plants and power plants under construction are considered, the energy reserve is 17.2% in 2008, vanishes in 2010 and drops to negative value of -2.5% in 2011 and reaches to –32.2% in 2017.

If the total project generation of existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date are examined together, 18.3% of energy reserve is calculated in 2008, by decreasing the reserve becomes negative value of –2.6% in 2015 and drops to –15.4% in 2017. And if project generation capacity of the new additional capacity calculated by the planning study is considered together with existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date, energy reserve is 18.4% in 2008 and is calculated to be between 17% and 25% after the year 2011.

Table 43 : Project Generation Capacity and Energy Demand Balance 2008-2017 (Case II-A)
Low Demand – Scenario 1

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EXISTING POWER PLANTS										
THERMAL TOTAL	191325	188294	187965	187230	187503	187138	185572	186304	187711	184434
HYDRO TOTAL	46225	46816	46767	46703	46581	46532	46054	45898	45089	43926
WIND + RENEWABLE TOTAL	756	756	756	756	756	756	756	756	756	756
GRAND TOTAL	238306	235867	235488	234689	234840	234427	232383	232957	233556	229116
COVERING OF ENERGY DEMAND WITH EXISTING POWER PLANTS										
ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	16,8	8,7	2,1	-4,7	-10,6	-16,4	-22,3	-27,0	-31,4	-36,9
POWER PLANTS UNDER CONSTRUCTION										
THERMAL TOTAL	0	0	0	0	5880	5880	5880	5880	5880	5880
HYDRO TOTAL	780	2384	5260	5408	5408	5408	9241	10946	10946	10946
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	780	2384	5260	5408	11288	11288	15121	16826	16826	16826
EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
THERMAL TOTAL	191325	188294	187965	187230	193383	193018	191452	192184	193591	190314
HYDRO TOTAL	47005	49200	52027	52111	51989	51940	55295	56844	56035	54872
WIND + RENEWABLE TOTAL	756	756	756	756	756	756	756	756	756	756
GRAND TOTAL	239086	238251	240748	240097	246128	245715	247504	249783	250382	245942
COVERING OF ENERGY DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	17,2	9,8	4,4	-2,5	-6,3	-12,3	-17,3	-21,7	-26,4	-32,2
LICENCED POWER PLANTS										
THERMAL TOTAL	874	3150	7895	16326	24060	26706	26706	26706	26706	26706
HYDRO TOTAL	239	1597	7238	16490	23599	28310	30642	30642	30642	30642
WIND + RENEWABLE TOTAL	1055	2822	3589	3679	3714	3714	3714	3714	3714	3714
GRAND TOTAL	2168	7569	18722	36494	51374	58730	61062	61062	61062	61062
UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	874	3150	7895	16326	29940	32586	32586	32586	32586	32586
HYDRO TOTAL	1019	3981	12498	21898	29007	33718	39883	41588	41588	41588
WIND + RENEWABLE TOTAL	1055	2822	3589	3679	3714	3714	3714	3714	3714	3714
GRAND TOTAL	2948	9953	23982	41902	62662	70018	76183	77888	77888	77888
EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	192199	191444	195860	203555	217443	219725	218159	218890	220297	217020
HYDRO TOTAL	47244	50797	59265	68601	75589	80250	85937	87485	86677	85514
WIND + RENEWABLE TOTAL	1811	3578	4345	4435	4470	4470	4470	4470	4470	4470
GRAND TOTAL	241254	245820	259470	276591	297502	304445	308566	310845	311444	307004
COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	18,3	13,3	12,5	12,4	13,2	8,6	3,2	-2,6	-8,5	-15,4

Table 43 (Cont.) : Project Generation Capacity and Energy Demand Balance 2008-2017
(Case II - A) Low Demand – Scenario 1

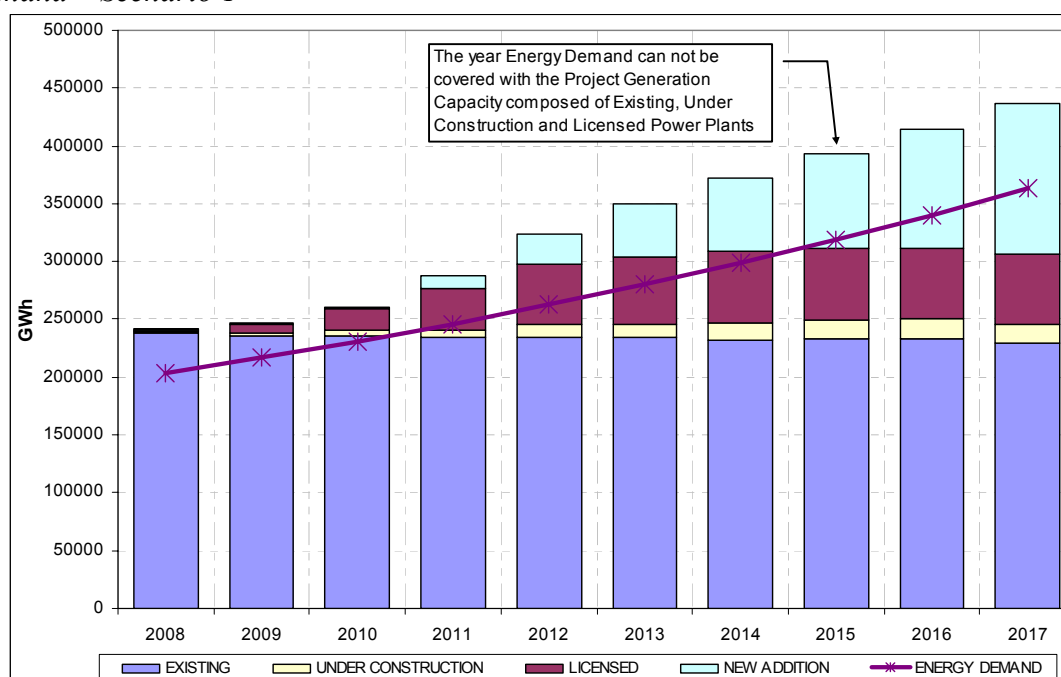
(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	0	0	0	9828	22641	37212	52226	68694	82738	103066
HYDRO TOTAL	0	0	0	0	2401	6705	8521	11041	17161	22980
WIND + RENEWABLE TOTAL	350	700	1050	1400	1750	2100	2450	2800	3150	3500
GRAND TOTAL	350	700	1050	11228	26792	46017	63197	82535	103049	129546
EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	192199	191444	195860	213383	240084	256937	270385	287584	303035	320086
HYDRO TOTAL	47244	50797	59265	68601	77990	86955	94458	98526	103838	108494
WIND + RENEWABLE TOTAL	2161	4278	5395	5835	6220	6570	6920	7270	7620	7970
GRAND TOTAL	241604	246520	260520	287819	324294	350462	371763	393380	414493	436550
COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	18,4	13,6	12,9	16,9	23,4	25,0	24,3	23,2	21,8	20,3

Note : Balance tables are calculated by assuming that autoproducers and generation companies will be able to have additional 10 billion kWh generation to their 2007 actual generations in the case of the system requirement.

The annual development of total project generation of existing power plants + power plants under construction + power plants granted by licence and expected to be in service on proposed date + new additional capacity is on Figure 40 and the firm generation of the same capacity composition is on Figure 41. The demand can not be covered with the total project generation in 2015 and with the total firm generation in 2010 with the capacities existing power plants + power plants under construction + power plants granted by licence and expected to be in service on proposed date .

Figure 40 : Development of Project Generation Capacity of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Time + New Additional Capacity and Energy Demand (Case II - A)
Low Demand – Scenario 1



- The development of total firm generation composed of existing, under construction, granted by licence and expected to be in service on proposed time and new additional capacities together with energy reserve after covering the demand with power plants are submitted on Table 44 for each composition.

When the existing power plants are considered solely, firm energy reserve starts from 2.7% in 2008 and decreases by year, the energy demand exceeds the firm generation capacity and the energy reserve drops to negative value of -3.3% in 2009. The energy reserve drops persistently to the level of -41.3% in 2017.

When the total firm generation of existing power plants and power plants under construction are considered, energy reserve is 3% in 2008, drops to negative value of -2.6% in 2009 and reaches to -37.9% in 2017.

If the total firm generation of existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date are examined together 3.9% of energy reserve is calculated in 2008, by decreasing the energy reserve becomes negative value of -0.7% in 2010 and drops to -24.8% in 2017. And if firm generation capacity of the new additional capacity calculated by the planning study is considered together with existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date, firm energy reserve is 4% in 2008 and is calculated to be between 3%-12% after the year 2011.

In conclusion, the power plants of existing system, 4319 MW under construction, 12818 MW granted by licence and expected to be in service on proposed date according to Scenario 1 will not cover the Low Energy Demand according to Project Generation and Firm Generation starting from the years 2015 and 2010 respectively.

Table 44 : Firm Generation Capacity and Energy Demand Balance 2006-2015 (Case II - A)
Low Demand – Scenario 1

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
------	------	------	------	------	------	------	------	------	------	------

EXISTING POWER PLANTS

THERMAL TOTAL	172588	172231	173074	173537	181320	179654	179390	179600	181528	178243
HYDRO TOTAL	36277	36868	36819	36755	36633	36584	36106	35950	35141	33978
WIND + RENEWABLE TOTAL	717	717	717	717	717	717	717	717	717	717
GRAND TOTAL	209581	209816	210610	211009	218670	216954	216213	216267	217386	212938

COVERING OF ENERGY DEMAND WITH EXISTING POWER PLANTS

ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	2,7	-3,3	-8,7	-14,3	-16,8	-22,6	-27,7	-32,2	-36,1	-41,3

POWER PLANTS UNDER CONSTRUCTION

THERMAL TOTAL	0	0	0	0	5606	5606	5606	5606	5606	5606
HYDRO TOTAL	496	1494	3275	3326	3326	3326	5785	6914	6914	6914
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	496	1494	3275	3326	8932	8932	11391	12520	12520	12520

EXISTING AND UNDER CONSTRUCTION POWER PLANTS

THERMAL TOTAL	172588	172231	173074	173537	186927	185260	184996	185207	187135	183849
HYDRO TOTAL	36772	38362	40094	40081	39959	39910	41891	42863	42055	40892
WIND + RENEWABLE TOTAL	717	717	717	717	717	717	717	717	717	717
GRAND TOTAL	210077	211310	213885	214335	227602	225886	227604	228787	229906	225458

COVERING OF ENERGY DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS

ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	3,0	-2,6	-7,3	-12,9	-13,4	-19,4	-23,9	-28,3	-32,5	-37,9

LICENCED POWER PLANTS

THERMAL TOTAL	874	3150	7895	16326	24060	26706	26706	26706	26706	26706
HYDRO TOTAL	150	982	4212	9446	13474	16130	17444	17444	17444	17444
WIND + RENEWABLE TOTAL	901	2422	3089	3162	3189	3189	3189	3189	3189	3189
GRAND TOTAL	1925	6554	15196	28934	40724	46026	47340	47340	47340	47340

UNDER CONSTRUCTION AND LICENCED POWER PLANTS

THERMAL TOTAL	874	3150	7895	16326	29667	32313	32313	32313	32313	32313
HYDRO TOTAL	646	2476	7487	12772	16799	19456	23229	24358	24358	24358
WIND + RENEWABLE TOTAL	901	2422	3089	3162	3189	3189	3189	3189	3189	3189
GRAND TOTAL	2420	8048	18470	32259	49656	54958	58731	59860	59860	59860

EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS

THERMAL TOTAL	173461	175381	180969	189863	210987	211966	211703	211913	213841	210555
HYDRO TOTAL	36923	39344	44306	49527	53433	56040	59335	60307	59499	58336
WIND + RENEWABLE TOTAL	1617	3139	3805	3878	3906	3906	3906	3906	3906	3906
GRAND TOTAL	212001	217864	229080	243268	268326	271912	274943	276126	277246	272797

COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS

ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	3,9	0,4	-0,7	-1,2	2,1	-3,0	-8,1	-13,5	-18,5	-24,8

Table 44 (Cont.) : Firm Generation Capacity and Energy Demand 2006-2015 (Case II - A)
Low Demand – Scenario 1

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
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NEW ADDITIONAL CAPACITY

THERMAL TOTAL	0	0	0	9828	22641	37212	52226	68694	82738	103066
HYDRO TOTAL	0	0	0	0	1104	3397	3922	5636	9327	12585
WIND + RENEWABLE TOTAL	175	350	525	700	875	1050	1225	1400	1575	1750
GRAND TOTAL	175	350	525	10528	24620	41659	57373	75730	93640	117401

EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY

THERMAL TOTAL	173461	175381	180969	199691	233628	249178	263929	280607	296579	313621
HYDRO TOTAL	36923	39344	44306	49527	54537	59437	63257	65943	68826	70921
WIND + RENEWABLE TOTAL	1792	3489	4330	4578	4781	4956	5131	5306	5481	5656
GRAND TOTAL	212176	218214	229605	253796	292946	313571	332316	351856	370886	390198

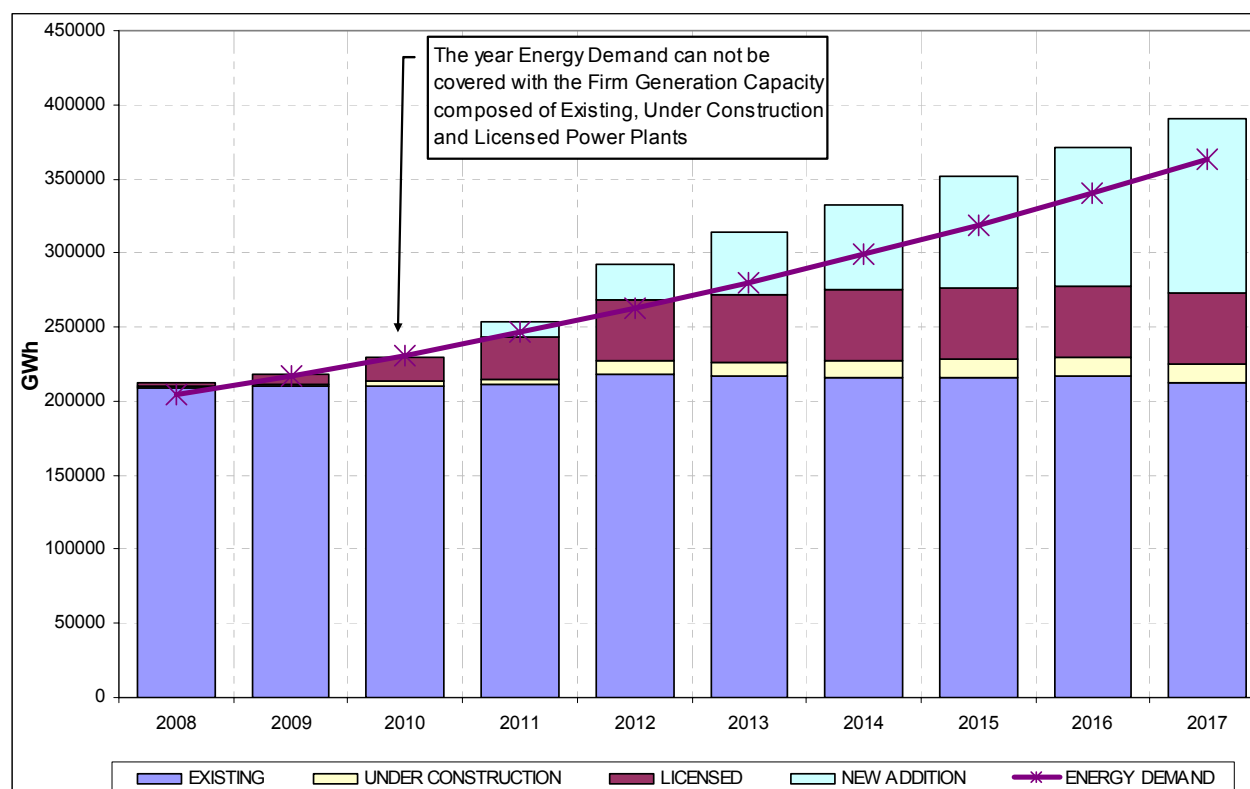
COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY

ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	4,0	0,6	-0,5	3,1	11,5	11,9	11,1	10,2	9,0	7,5

Note : - Balance tables are calculated by assuming that autoproducers and generation companies will be able to have additional 10 billion kWh generation to their 2007 actual generations in the case of the system requirement.

- New additional capacities are taken from “Long Term Generation Expansion Planning Study” prepared by APK, TEİAŞ in November 2004. Since this study has not been revised yet, firm energy reserves for new added capacities become low. After revising the planning study these values are subject to change.

Figure 41 : Development of Firm Generation Capacity of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Date + New Additional Capacity and Energy Demand (Case II - A)
Low Demand – Scenario 1



In order to cover the energy demand between the years of 2008 and 2017 with the addition of 4319 MW capacity under construction, 12818 MW capacity granted by licence and expected to be in service on proposed date and 22028 MW capacity calculated by the long term generation expansion planning study to the existing system, the total installed capacity will reach to 79700 MW in the year 2017.

According to the Low Demand results of “2004 Turkish Electrical Energy Generation Planning Study”, the breakdown of this total installed capacity by hydro, thermal and wind resources by year is shown on Table 45, Table 46 and Table 47. In accordance with “Case II – A” the breakdown of installed capacity by thermal, hydro and wind resources by year is shown also on Table 48 and Figure 42.

Table 45 : Breakdown of Installed Capacity of Power Plants to be New Added to the System by Thermal, Hydro and Wind Resources by Year (Case II - A) Low Demand – Scenario I

Fuel Type	MW										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2008-2017
THERMAL	0,0	0,0	0,0	1400,0	1835,0	2120,0	2215,0	2360,0	2040,0	2900,0	14870,0
HYDRO	0,0	0,0	0,0	0,0	543,0	1117,0	488,0	604,0	1598,0	1558,0	5908,0
WIND+RENEWABLE	125,0	125,0	125,0	125,0	125,0	125,0	125,0	125,0	125,0	125,0	1250,0
TOTAL	125,0	125,0	125,0	1525,0	2503,0	3362,0	2828,0	3089,0	3763,0	4583,0	22028,0

Table 46 : Breakdown of Project Generation of Power Plants to be New Added to the System by Thermal, Hydro and Wind Resources by Year (Case II - A) Low Demand – Scenario I

Fuel Type	GWh										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2008-2017
THERMAL	0,0	0,0	0,0	9828,0	12813,0	14571,0	15014,0	16468,0	14044,0	20328,0	103066,0
HYDRO	0,0	0,0	0,0	0,0	2401,0	4304,0	1816,0	2520,0	6120,0	5819,0	22980,0
WIND+RENEWABLE	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	350,0	3500,0
TOTAL	350,0	350,0	350,0	10178,0	15564,0	19225,0	17180,0	19338,0	20514,0	26497,0	129546,0

Table 47 : Breakdown of Firm Generation of Power Plants to be New Added to the System by Thermal, Hydro and Wind Resources by Year (Case II - A) Low Demand – Scenario I

Fuel Type	GWh										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2008-2017
THERMAL	0,0	0,0	0,0	9828,0	12813,0	14571,0	15014,0	16468,0	14044,0	20328,0	103066,0
HYDRO	0,0	0,0	0,0	0,0	1104,0	2293,0	525,0	1714,0	3691,0	3258,0	12585,0
WIND+RENEWABLE	175,0	175,0	175,0	175,0	175,0	175,0	175,0	175,0	175,0	175,0	1750,0
TOTAL	175,0	175,0	175,0	10003,0	14092,0	17039,0	15714,0	18357,0	17910,0	23761,0	117401,0

Figure 42 : Development of Total Installed Capacity and Peak Demand (Case II - A)
Low Demand – Scenario 1

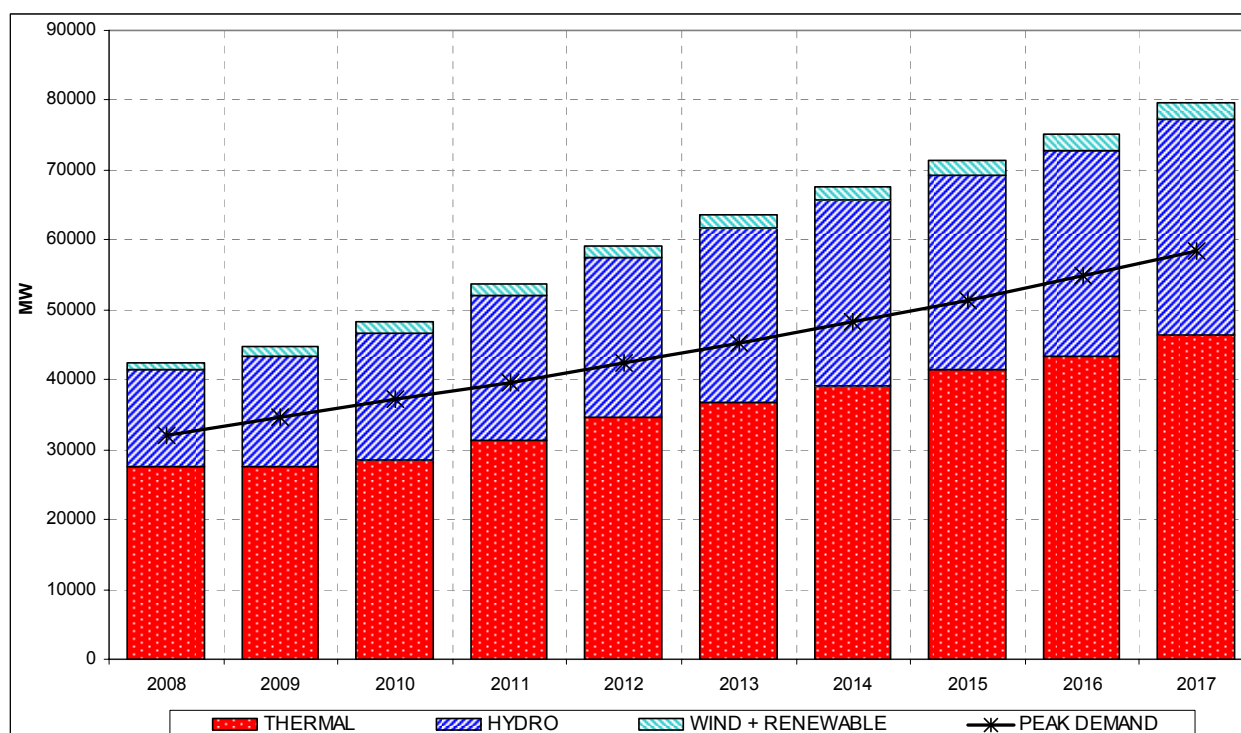
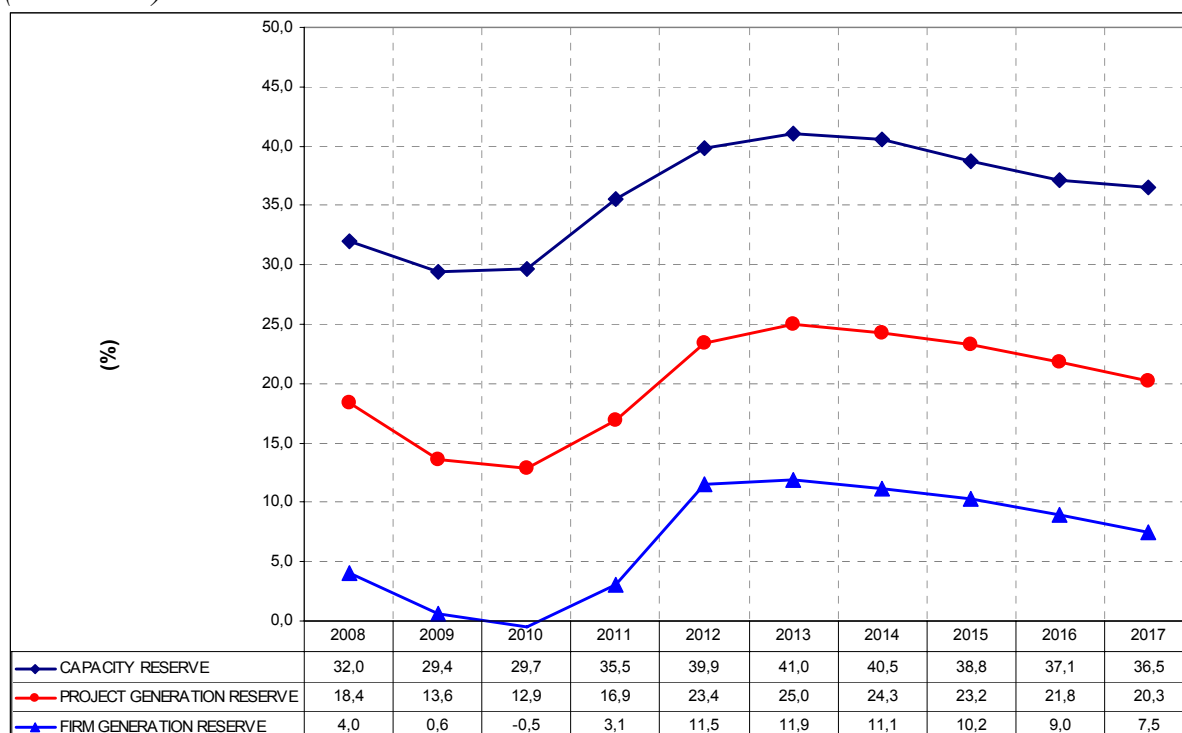


Table 48 : Development of Total Installed Capacity (Case II - A) Low Demand – Scenario 1

	THERMAL		HYDRO		WIND+RENEWABLE		TOTAL
	MW	%	MW	%	MW	%	
2008	27539	65	14043	33	845	2	42427
2009	27645	62	15727	35	1347	3	44719
2010	28527	59	18217	38	1487	3	48231
2011	31289	58	20850	39	1621	3	53760
2012	34709	59	22746	38	1746	3	59201
2013	36829	58	24997	39	1871	3	63697
2014	39044	58	26685	39	1996	3	67725
2015	41404	58	27829	39	2121	3	71354
2016	43444	58	29427	39	2246	3	75117
2017	46344	58	30985	39	2371	3	79700

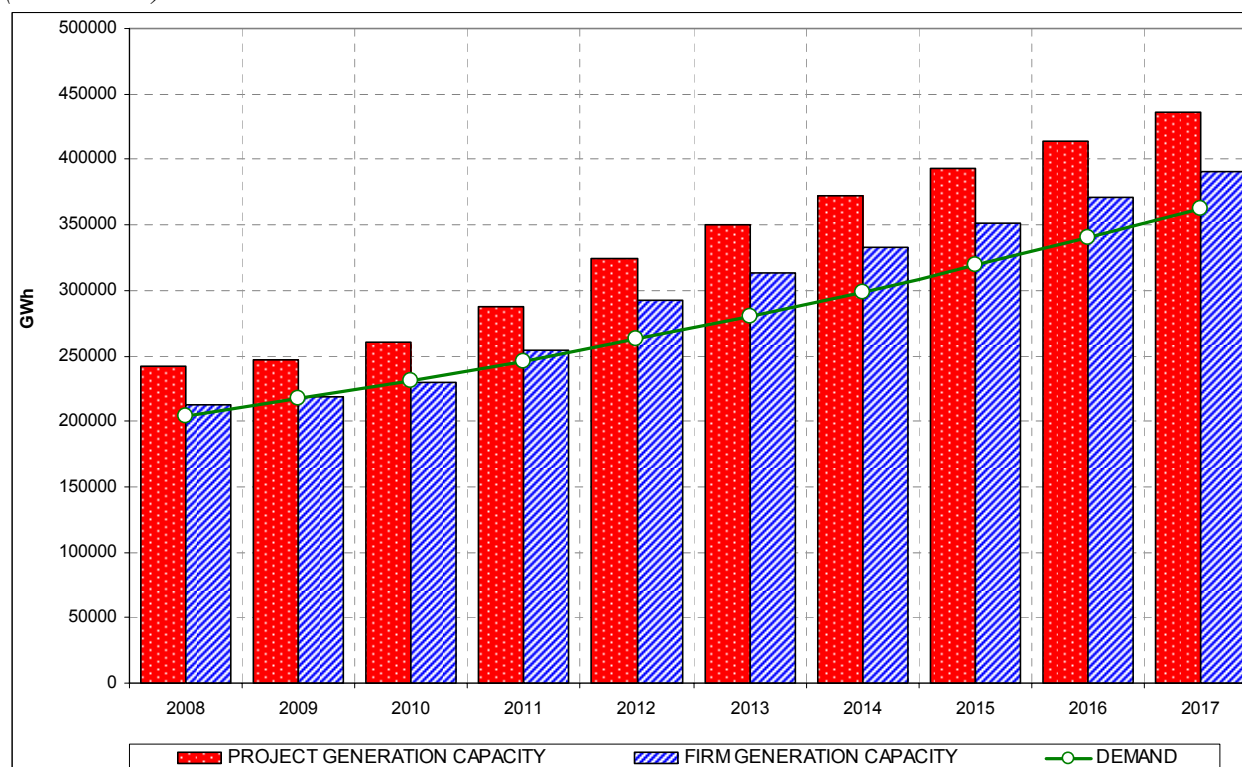
When the development of installed capacity and peak demand is considered for the 10-year study period, the capacity reserve is calculated as to be between 35% and 41%, energy reserves according to project generation and firm generation are calculated as to be between 17% and 25% and between 3% and 12% respectively in accordance with Low Demand after the year 2011 with addition of power plants under construction, power plants granted by licence as the end of December 2007 and expected to be in service on proposed date to the existing system revised according to Scenario 1 and January 2008 Progress Report of EPDK and power plants determined by 2004 long term generation expansion planning study. (Figure 43)

Figure 43 : Capacity Reserve, Project Generation Reserve and Firm Generation Reserve
(Case II - A) Low Demand – Scenario 1



Note: New additional capacities are taken from “Long Term Generation Expansion Planning Study” prepared by APK, TEİAŞ in November 2004. Since this study has not been revised yet, firm energy reserves for new added capacities become low. After revising the planning study these values are subject to change.

Figure 44: Development of Project Generation, Firm Generation and Energy Demand
(Case II - A) Low Demand – Scenario 1



VII.4. Case II – B (Low Demand – Scenario 2)

In this section the power plants which are

- Existing as end of the year 2007,
- Under construction and
- Granted by licence and expected to be in service on proposed date based on “January 2008 Progress Raport” of EPDK and prepared according to Scenario 2 by EPDK, and besides, Low Demand prepared in accordance with the MAED results revized on May 2008 are taken into consideration and therefore, the generation demands to reach 230.7 TWh in 2010 and 363 TWh in 2017 and so the results about supply and demand situation and how to cover demand are given.

According to above situation, peak demand can not be covered starting from the year 2016. When the generation capacity is considered, the energy demand can not be covered in 2009 according to firm generation capacity and in 2014 according to project generation capacity.

Electricity generation expansion planning study determining the additional capacity requirement in order to meet demand has been carried out on November 2004 by considering long term natural gas supply contracts within the ETKB policies regarding evaluation of domestic and renewable resources together with resource diversification. This planning study is carried out by TEİAŞ on behalf of ETKB. According to this planning study results, in order to meet the expected demand, it will be necessary to add 22028 MW new capacity in total. 7158 MW of this total capacity comes from wind and hydro resources and the remaining 14870 MW from thermal resources up to the year of 2017.

Existing capacity, capacity under construction, capacity granted by licence and expected to be in service on the proposed time and the development of new additional capacity requirement to meet the increasing demand by years are indicated on Table 49.

Beside this, the development of total installed capacity with existing, under construction, granted by licence and expected to be in service on proposed date and new additional capacities together with capacity reserve after covering the peak load with power plants;

- only existing capacity,
 - existing capacity + capacity under construction,
 - existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date,
 - existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed date + new additional capacity requirement
- are submitted on Table 49.

When the existing power plants are considered solely, capacity reserve starts from 27% in 2008 and continuously decreases and the peak demand exceeds the total installed capacity in 2012 by reaching to -4.2%. According to the increase of peak demand the capacity reserve reaches to -30.6% in year 2017 with the existing capacity as end of the year 2007.

When the sum of existing capacity and capacity under construction are considered, the capacity reserve is 28.7% in 2008, drops to 1.9% in 2012, to -4.5% in 2013 and reaches to -23.2% in 2017.

When the sum of existing capacity, capacity under construction and capacity granted by licence and expected to be in service on proposed date are examined together, capacity reserve is 31% in 2008, decreases to -2.4% in 2016 and drops to -8.4% in 2017. If the new additional capacity to be commissioned starting from 2008 calculated by the planning study is considered together with existing capacity, capacity under construction and capacity granted by licence and

expected to be in service on proposed date according to Scenario 2, capacity reserve which is 31.4% in 2008 is calculated to be between 25% and 32% after the year 2011.

Table 49 :Installed Capacity and Peak Demand Balance (Case II – B) Low Demand–Scenario2
(MW)

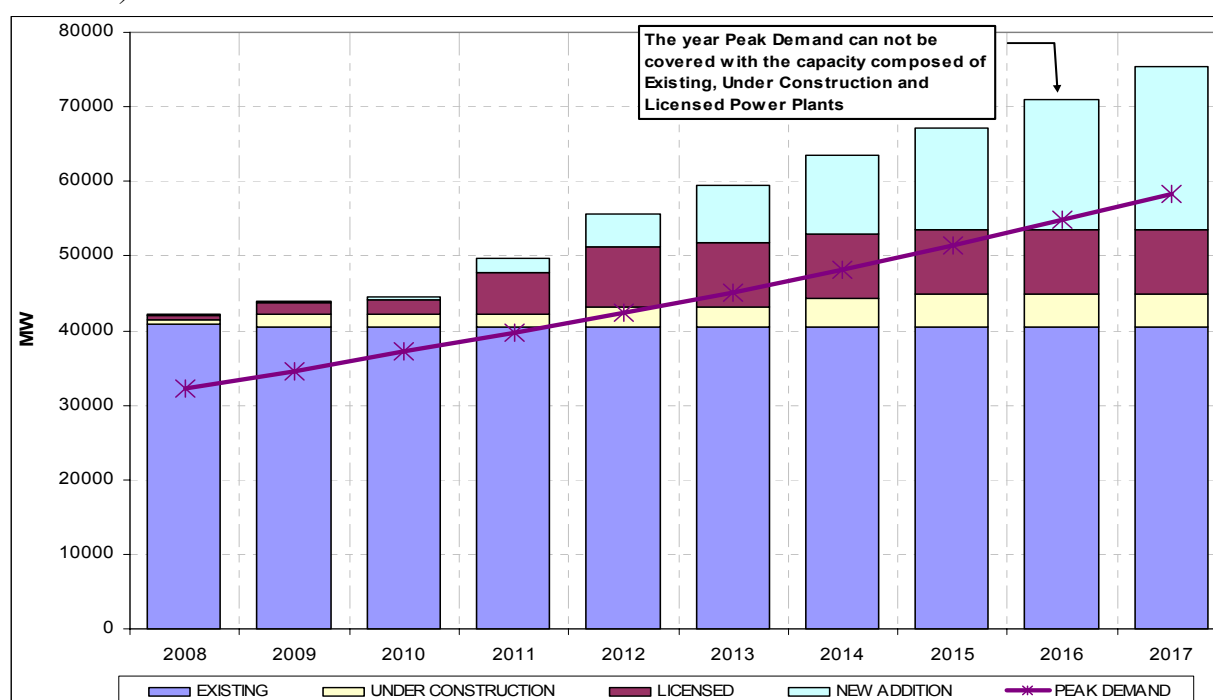
YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EXISTING POWER PLANTS										
THERMAL TOTAL	27250	26950	26950	26950	26950	26950	26950	26950	26950	26950
HYDRO TOTAL	13395	13395	13395	13395	13395	13395	13395	13395	13395	13395
WIND + RENEWABLE TOTAL	191	191	191	191	191	191	191	191	191	191
GRAND TOTAL	40836	40536	40536	40536	40536	40536	40536	40536	40536	40536
COVERING OF PEAK DEMAND WITH EXISTING POWER PLANTS										
PEAK LOAD DEMAND	32143	34571	37182	39673	42331	45167	48193	51421	54788	58376
RESERVE %	27,0	17,3	9,0	2,2	-4,2	-10,3	-15,9	-21,2	-26,0	-30,6
POWER PLANTS UNDER CONSTRUCTION										
THERMAL TOTAL	0	0	0	0	840	840	840	840	840	840
HYDRO TOTAL	527	1634	1739	1739	1739	1739	2939	3479	3479	3479
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	527	1634	1739	1739	2579	2579	3779	4319	4319	4319
EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
THERMAL TOTAL	27250	26950	26950	26950	27790	27790	27790	27790	27790	27790
HYDRO TOTAL	13922	15029	15133	15133	15133	15133	16333	16873	16873	16873
WIND + RENEWABLE TOTAL	191	191	191	191	191	191	191	191	191	191
GRAND TOTAL	41363	42170	42274	42274	43114	43114	44314	44854	44854	44854
COVERING OF PEAK DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
PEAK LOAD DEMAND	32143	34571	37182	39673	42331	45167	48193	51421	54788	58376
RESERVE %	28,7	22,0	13,7	6,6	1,9	-4,5	-8,0	-12,8	-18,1	-23,2
LICENCED POWER PLANTS										
THERMAL TOTAL	162	632	632	1689	2952	2952	2952	2952	2952	2952
HYDRO TOTAL	131	420	701	3341	4617	5149	5149	5149	5149	5149
WIND + RENEWABLE TOTAL	450	488	489	499	499	499	499	499	499	499
GRAND TOTAL	743	1540	1821	5529	8068	8599	8599	8599	8599	8599
UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	162	632	632	1689	3792	3792	3792	3792	3792	3792
HYDRO TOTAL	658	2055	2439	5080	6356	6887	8087	8627	8627	8627
WIND + RENEWABLE TOTAL	450	488	489	499	499	499	499	499	499	499
GRAND TOTAL	1270	3174	3560	7268	10646	11177	12377	12917	12917	12917
EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	27412	27582	27582	28639	30742	30742	30742	30742	30742	30742
HYDRO TOTAL	14053	15450	15834	18475	19751	20282	21482	22022	22022	22022
WIND + RENEWABLE TOTAL	641	678	680	689	689	689	689	689	689	689
GRAND TOTAL	42105	43710	44096	47804	51182	51713	52913	53453	53453	53453
COVERING OF PEAK DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
PEAK LOAD DEMAND	32143	34571	37182	39673	42331	45167	48193	51421	54788	58376
RESERVE %	31,0	26,4	18,6	20,5	20,9	14,5	9,8	4,0	-2,4	-8,4

Table 49 (Cont.) : Installed Capacity and Peak Demand Balance (Case II – B)
Low Demand-Scenario2

(MW)										
YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	0	0	0	1400	3235	5355	7570	9930	11970	14870
HYDRO TOTAL	0	0	0	0	543	1660	2148	2752	4350	5908
WIND + RENEWABLE TOTAL	125	250	375	500	625	750	875	1000	1125	1250
GRAND TOTAL	125	250	375	1900	4403	7765	10593	13682	17445	22028
EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	27412	27582	27582	30039	33977	36097	38312	40672	42712	45612
HYDRO TOTAL	14053	15450	15834	18475	20294	21942	23630	24774	26372	27930
WIND + RENEWABLE TOTAL	766	928	1055	1189	1314	1439	1564	1689	1814	1939
GRAND TOTAL	42230	43960	44471	49704	55585	59478	63506	67135	70898	75481
COVERING OF PEAK DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
PEAK LOAD DEMAND	32143	34571	37182	39673	42331	45167	48193	51421	54788	58376
RESERVE %	31,4	27,2	19,6	25,3	31,3	31,7	31,8	30,6	29,4	29,3

The annual development of total installed capacity composed of existing capacity + capacity under construction + capacity granted by licence and expected to be in service on proposed time + new additional capacity is on Figure 45. On the figure, when the installed capacity development is compared with peak demand, the peak demand can not be covered with the total installed capacity which are composed of the existing, under construction and granted by licence and expected to be in service on proposed time starting from the year 2016. Peak demand can be covered with a small reserve in 2015

Figure 45 : Development of Installed Capacity Composed of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Time + New Additional Capacity and Peak Demand
(Case II - B) Low Demand-Scenario 2



- The development of total project generation composed of existing, under construction, granted by licence and expected to be in service on proposed time and new additional capacities together with energy reserve after covering the demand with power plants are submitted on Table 50 for each composition.

When the existing power plants are considered solely, energy reserve starts from 16.8% in 2008 and decreases continuously by year, the energy demand exceeds the project generation capacity in 2011 and the energy reserve drops to –36.9% in 2017.

When the total project generation of existing power plants and power plants under construction are considered, the energy reserve is 17.2% in 2008, vanishes in 2010 and drops to negative value of -2.5% in 2011 and reaches to –32.2% in 2017.

If the total project generation of existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date are examined together, 18% of energy reserve is calculated in 2008, by decreasing the reserve becomes negative value of –3.3% in 2014 and drops to –20.7% in 2017. And if project generation capacity of the new additional capacity calculated by the planning study is considered together with existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date, energy reserve is 18.2% in 2008 and is calculated to be between 9% and 18% after the year 2011.

Table 50 : Project Generation Capacity and Energy Demand Balance 2008-2017 (Case II-B)
Low Demand – Scenario 2

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EXISTING POWER PLANTS										
THERMAL TOTAL	191325	188294	187965	187230	187503	187138	185572	186304	187711	184434
HYDRO TOTAL	46225	46816	46767	46703	46581	46532	46054	45898	45089	43926
WIND + RENEWABLE TOTAL	756	756	756	756	756	756	756	756	756	756
GRAND TOTAL	238306	235867	235488	234689	234840	234427	232383	232957	233556	229116
COVERING OF ENERGY DEMAND WITH EXISTING POWER PLANTS										
ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	16,8	8,7	2,1	-4,7	-10,6	-16,4	-22,3	-27,0	-31,4	-36,9
POWER PLANTS UNDER CONSTRUCTION										
THERMAL TOTAL	0	0	0	0	5880	5880	5880	5880	5880	5880
HYDRO TOTAL	780	2384	5260	5408	5408	5408	9241	10946	10946	10946
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	780	2384	5260	5408	11288	11288	15121	16826	16826	16826
EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
THERMAL TOTAL	191325	188294	187965	187230	193383	193018	191452	192184	193591	190314
HYDRO TOTAL	47005	49200	52027	52111	51989	51940	55295	56844	56035	54872
WIND + RENEWABLE TOTAL	756	756	756	756	756	756	756	756	756	756
GRAND TOTAL	239086	238251	240748	240097	246128	245715	247504	249783	250382	245942
COVERING OF ENERGY DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS										
ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	17,2	9,8	4,4	-2,5	-6,3	-12,3	-17,3	-21,7	-26,4	-32,2
LICENCED POWER PLANTS										
THERMAL TOTAL	463	2523	4120	8317	16915	21315	21315	21315	21315	21315
HYDRO TOTAL	344	1213	2181	6901	13789	17454	18510	18510	18510	18510
WIND + RENEWABLE TOTAL	888	1860	1949	1990	2025	2025	2025	2025	2025	2025
GRAND TOTAL	1696	5596	8250	17208	32728	40794	41849	41849	41849	41849
UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	463	2523	4120	8317	22795	27195	27195	27195	27195	27195
HYDRO TOTAL	1124	3597	7441	12309	19197	22862	27751	29456	29456	29456
WIND + RENEWABLE TOTAL	888	1860	1949	1990	2025	2025	2025	2025	2025	2025
GRAND TOTAL	2476	7980	13510	22616	44016	52082	56970	58675	58675	58675
EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
THERMAL TOTAL	191788	190818	192085	195547	210298	214333	212767	213498	214905	211628
HYDRO TOTAL	47349	50413	54208	59012	65778	69395	73805	75353	74545	73382
WIND + RENEWABLE TOTAL	1644	2616	2705	2746	2781	2781	2781	2781	2781	2781
GRAND TOTAL	240781	243847	248998	257305	278856	286508	289353	291632	292231	287791
COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS										
ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	18,0	12,4	7,9	4,5	6,2	2,2	-3,3	-8,6	-14,1	-20,7

Table 50 (Cont.) : Project Generation Capacity and Energy Demand Balance 2008-2017
(Case II - B) Low Demand – Scenario 2

(GWh)

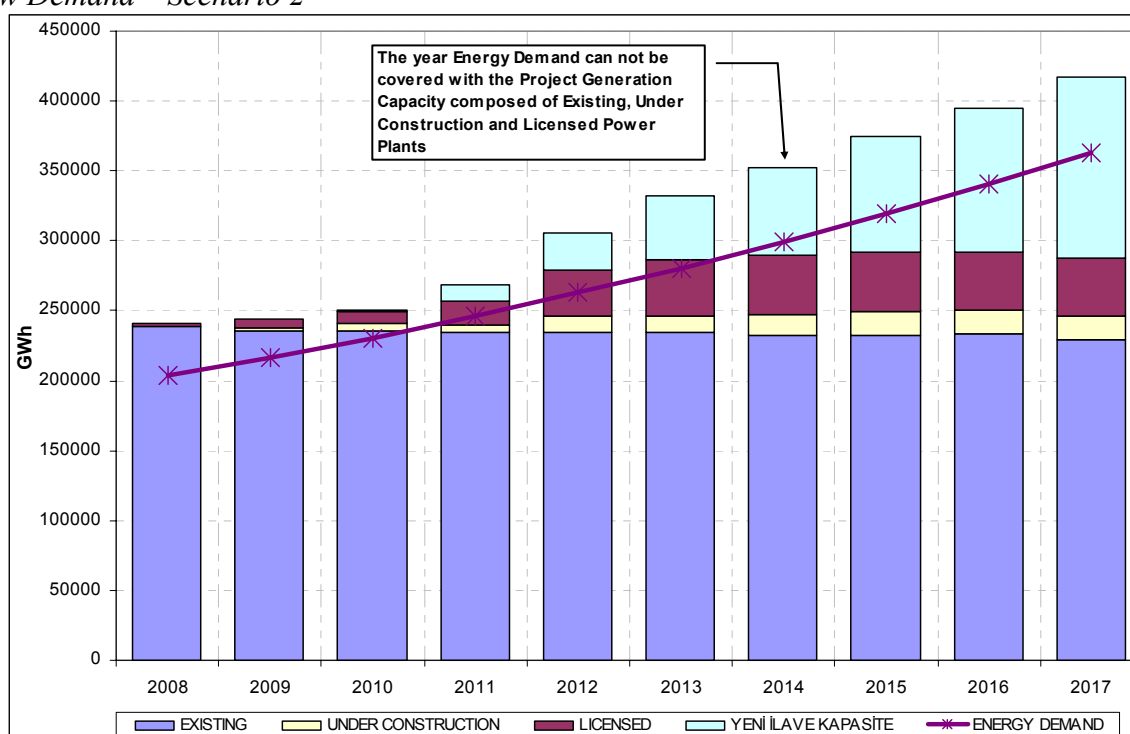
YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	0	0	0	9828	22641	37212	52226	68694	82738	103066
HYDRO TOTAL	0	0	0	0	2401	6705	8521	11041	17161	22980
WIND + RENEWABLE TOTAL	350	700	1050	1400	1750	2100	2450	2800	3150	3500
GRAND TOTAL	350	700	1050	11228	26792	46017	63197	82535	103049	129546
EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
THERMAL TOTAL	191788	190818	192085	205375	232939	251545	264993	282192	297643	314694
HYDRO TOTAL	47349	50413	54208	59012	68179	76100	82326	86394	91706	96362
WIND + RENEWABLE TOTAL	1994	3316	3755	4146	4531	4881	5231	5581	5931	6281
GRAND TOTAL	241131	244547	250048	268533	305648	332525	352550	374167	395280	417337
COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY										
ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	18,2	12,7	8,4	9,1	16,4	18,6	17,9	17,2	16,1	15,0

Note : Balance tables are calculated by assuming that autoproducers and generation companies will be able to have additional 10 billion kWh generation to their 2007 actual generations in the case of the system requirement.

The annual development of total project generation of existing power plants + power plants under construction + power plants granted by licence and expected to be in service on proposed date + new additional capacity is on Figure 46 and the firm generation of the same capacity composition is on Figure 47. The demand can not be covered with the total project generation in 2014 and with the total firm generation in 2009 with the capacities existing power plants + power plants under construction + power plants granted by licence and expected to be in service on proposed date .

Figure 46 : Development of Project Generation Capacity of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Time + New Additional Capacity and Energy Demand (Case II - B)

Low Demand – Scenario 2



- The development of total firm generation composed of existing, under construction, granted by licence and expected to be in service on proposed time and new additional capacities together with energy reserve after covering the demand with power plants are submitted on Table 51 for each composition.

When the existing power plants are considered solely, firm energy reserve starts from 2.7% in 2008 and decreases by year, the energy demand exceeds the firm generation capacity and the energy reserve drops to negative value of -3.3% in 2009. The energy reserve drops persistently to the level of -41.3% in 2017.

When the total firm generation of existing power plants and power plants under construction are considered, energy reserve is 3% in 2008, drops to negative value of -2.6% in 2009 and reaches to -37.9% in 2017.

If the total firm generation of existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date are examined together 3.7% of energy reserve is calculated in 2008, by decreasing the energy reserve becomes negative value of -0.4% in 2009 and drops to -28.6% in 2017. And if firm generation capacity of the new additional capacity calculated by the planning study is considered together with existing power plants, power plants under construction and power plants granted by licence and expected to be in service on proposed date, firm energy reserve is 3.7% in 2008 and is calculated to be between 4% and 7% after the year 2012.

In conclusion, the power plants of existing system, 4319 MW under construction, 8599 MW granted by licence and expected to be in service on proposed date according to Scenario 2 will not cover the Low Energy Demand according to Project Generation and Firm Generation starting from the years 2014 and 2009 respectively.

Table 51 : Firm Generation Capacity and Energy Demand Balance 2006-2015 (Case II - B)
Low Demand – Scenario 2

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
------	------	------	------	------	------	------	------	------	------	------

EXISTING POWER PLANTS

THERMAL TOTAL	172588	172231	173074	173537	181320	179654	179390	179600	181528	178243
HYDRO TOTAL	36277	36868	36819	36755	36633	36584	36106	35950	35141	33978
WIND + RENEWABLE TOTAL	717	717	717	717	717	717	717	717	717	717
GRAND TOTAL	209581	209816	210610	211009	218670	216954	216213	216267	217386	212938

COVERING OF ENERGY DEMAND WITH EXISTING POWER PLANTS

ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	2,7	-3,3	-8,7	-14,3	-16,8	-22,6	-27,7	-32,2	-36,1	-41,3

POWER PLANTS UNDER CONSTRUCTION

THERMAL TOTAL	0	0	0	0	5606	5606	5606	5606	5606	5606
HYDRO TOTAL	496	1494	3275	3326	3326	3326	5785	6914	6914	6914
WIND + RENEWABLE TOTAL	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	496	1494	3275	3326	8932	8932	11391	12520	12520	12520

EXISTING AND UNDER CONSTRUCTION POWER PLANTS

THERMAL TOTAL	172588	172231	173074	173537	186927	185260	184996	185207	187135	183849
HYDRO TOTAL	36772	38362	40094	40081	39959	39910	41891	42863	42055	40892
WIND + RENEWABLE TOTAL	717	717	717	717	717	717	717	717	717	717
GRAND TOTAL	210077	211310	213885	214335	227602	225886	227604	228787	229906	225458

COVERING OF ENERGY DEMAND WITH EXISTING AND UNDER CONSTRUCTION POWER PLANTS

ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	3,0	-2,6	-7,3	-12,9	-13,4	-19,4	-23,9	-28,3	-32,5	-37,9

LICENCED POWER PLANTS

THERMAL TOTAL	463	2523	4120	8317	16915	21315	21315	21315	21315	21315
HYDRO TOTAL	223	782	1381	4069	7965	10033	10629	10629	10629	10629
WIND + RENEWABLE TOTAL	708	1493	1577	1610	1638	1638	1638	1638	1638	1638
GRAND TOTAL	1394	4798	7078	13996	26518	32986	33582	33582	33582	33582

UNDER CONSTRUCTION AND LICENCED POWER PLANTS

THERMAL TOTAL	463	2523	4120	8317	22521	26921	26921	26921	26921	26921
HYDRO TOTAL	718	2276	4656	7394	11291	13359	16414	17543	17543	17543
WIND + RENEWABLE TOTAL	708	1493	1577	1610	1638	1638	1638	1638	1638	1638
GRAND TOTAL	1889	6292	10352	17322	35450	41918	44973	46102	46102	46102

EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS

THERMAL TOTAL	173051	174755	177194	181855	203842	206575	206311	206521	208449	205164
HYDRO TOTAL	36995	39144	41475	44149	47924	49943	52520	53492	52684	51521
WIND + RENEWABLE TOTAL	1424	2210	2293	2327	2355	2355	2355	2355	2355	2355
GRAND TOTAL	211470	216108	220962	228331	254120	258872	261185	262368	263488	259039

COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION AND LICENCED POWER PLANTS

ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	3,7	-0,4	-4,2	-7,3	-3,3	-7,7	-12,7	-17,8	-22,6	-28,6

Table 51 (Cont.) : Firm Generation Capacity and Energy Demand 2006-2015 (Case II - B)
Low Demand – Scenario 2

(GWh)

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
------	------	------	------	------	------	------	------	------	------	------

NEW ADDITIONAL CAPACITY

THERMAL TOTAL	0	0	0	9828	22641	37212	52226	68694	82738	103066
HYDRO TOTAL	0	0	0	0	1104	3397	3922	5636	9327	12585
WIND + RENEWABLE TOTAL	175	350	525	700	875	1050	1225	1400	1575	1750
GRAND TOTAL	175	350	525	10528	24620	41659	57373	75730	93640	117401

EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY

THERMAL TOTAL	173051	174755	177194	191683	226483	243787	258537	275215	291187	308230
HYDRO TOTAL	36995	39144	41475	44149	49028	53340	56442	59128	62011	64106
WIND + RENEWABLE TOTAL	1599	2560	2818	3027	3230	3405	3580	3755	3930	4105
GRAND TOTAL	211645	216458	221487	238859	278740	300531	318558	338098	357128	376440

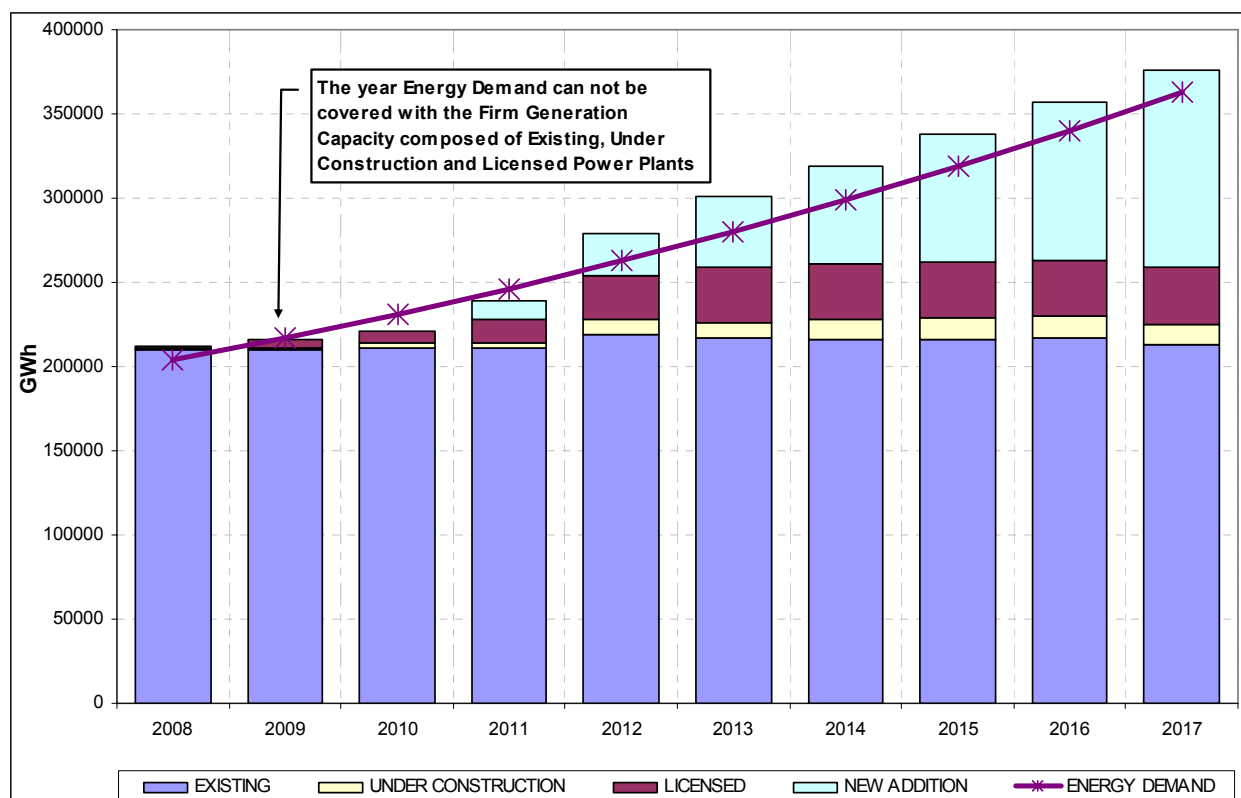
COVERING OF ENERGY DEMAND WITH EXISTING, UNDER CONSTRUCTION, LICENCED POWER PLANTS AND NEW ADDITIONAL CAPACITY

ENERGY DEMAND	204000	216992	230705	246181	262696	280319	299124	319190	340379	362975
RESERVE %	3,7	-0,2	-4,0	-3,0	6,1	7,2	6,5	5,9	4,9	3,7

Note : - Balance tables are calculated by assuming that autoproducers and generation companies will be able to have additional 10 billion kWh generation to their 2007 actual generations in the case of the system requirement.

- New additional capacities are taken from “Long Term Generation Expansion Planning Study” prepared by APK, TEİAŞ in November 2004. Since this study has not been revised yet, firm energy reserves for new added capacities become low. After revising the planning study these values are subject to change.

Figure 47 : Development of Firm Generation Capacity of Existing Power Plants + Power Plants Under Construction + Power Plants Granted by Licence and Expected to be in Service on Proposed Date + New Additional Capacity and Energy Demand (Case II - B)
Low Demand – Scenario 2

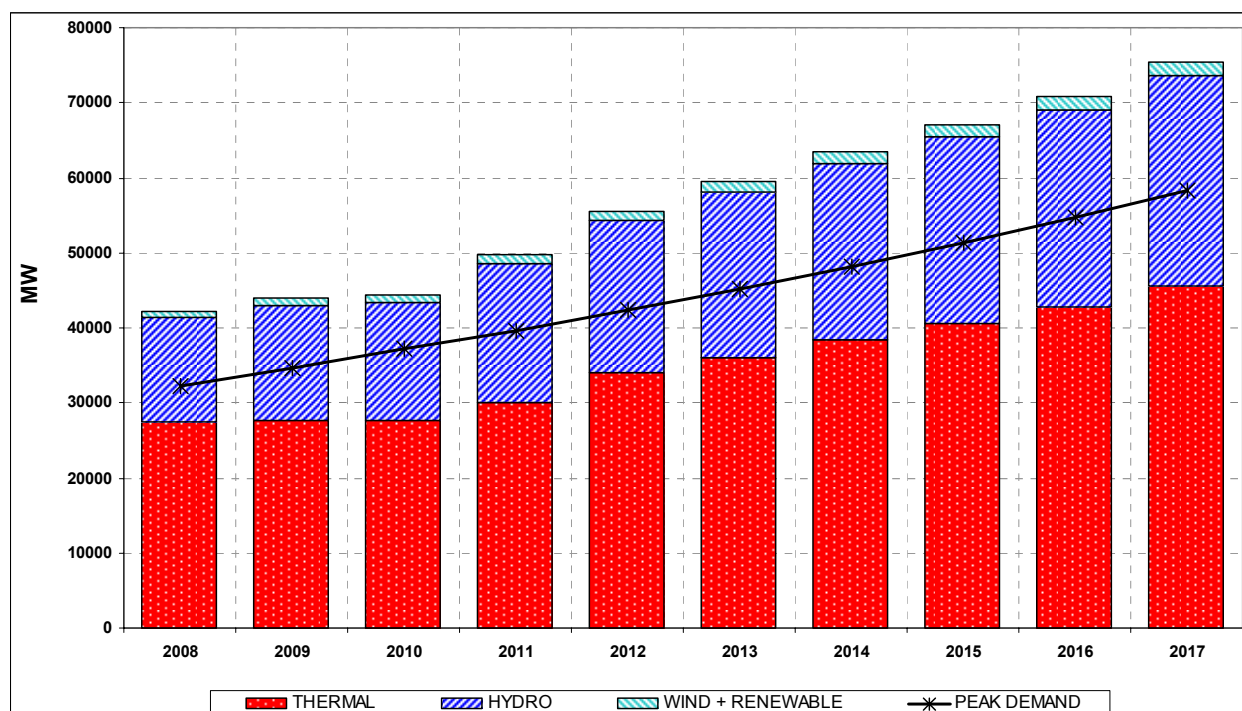


In accordance with “Case II – B”, breakdown of the total installed capacity to thermal, hydro and wind resources by year is given on Table 52 and Figure 48.

Table 52 : Development of Total Installed Capacity (Case II - B) Low Demand – Scenario 2

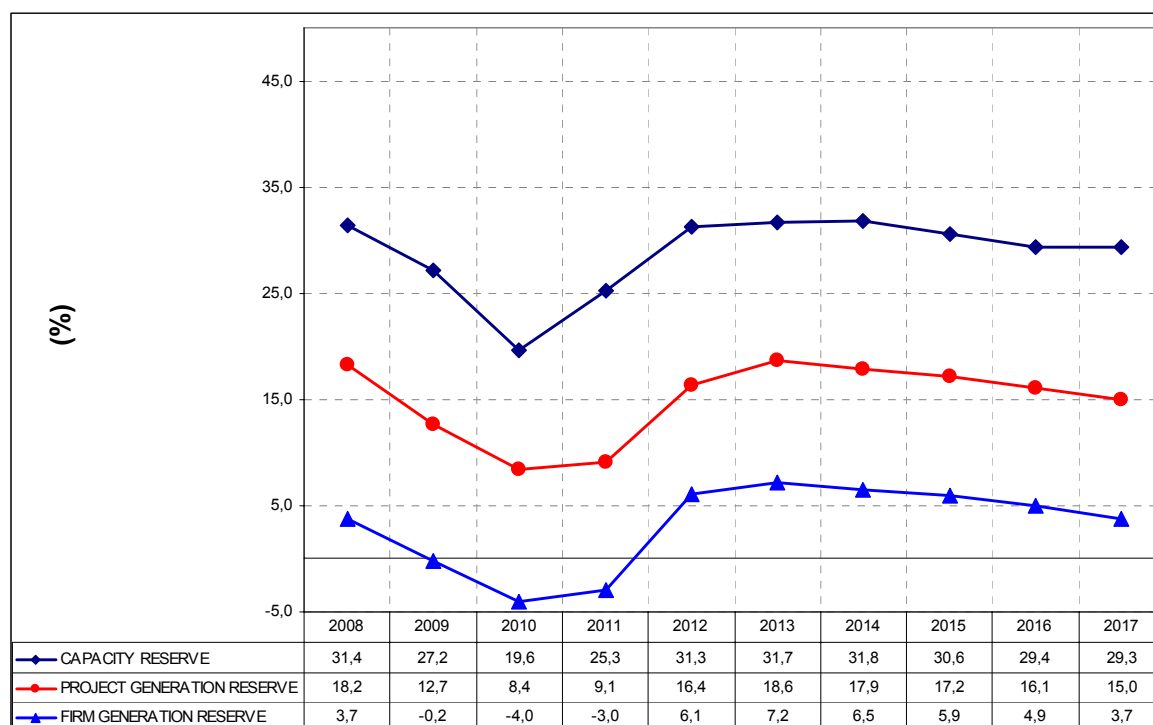
	THERMAL		HYDRO		WIND+RENEWABLE		TOTAL
	MW	%	MW	%	MW	%	MW
2008	27412	65	14053	33	765	2	42230
2009	27582	63	15450	35	928	2	43960
2010	27582	62	15834	36	1055	2	44471
2011	30039	60	18475	37	1189	2	49703
2012	33977	61	20294	37	1314	2	55585
2013	36097	61	21942	37	1439	2	59478
2014	38312	60	23630	37	1564	2	63506
2015	40672	61	24774	37	1689	3	67135
2016	42712	60	26372	37	1814	3	70898
2017	45612	60	27930	37	1939	3	75481

Figure 48 : Development of Total Installed Capacity and Peak Demand (Case II - B) Low Demand – Scenario 2



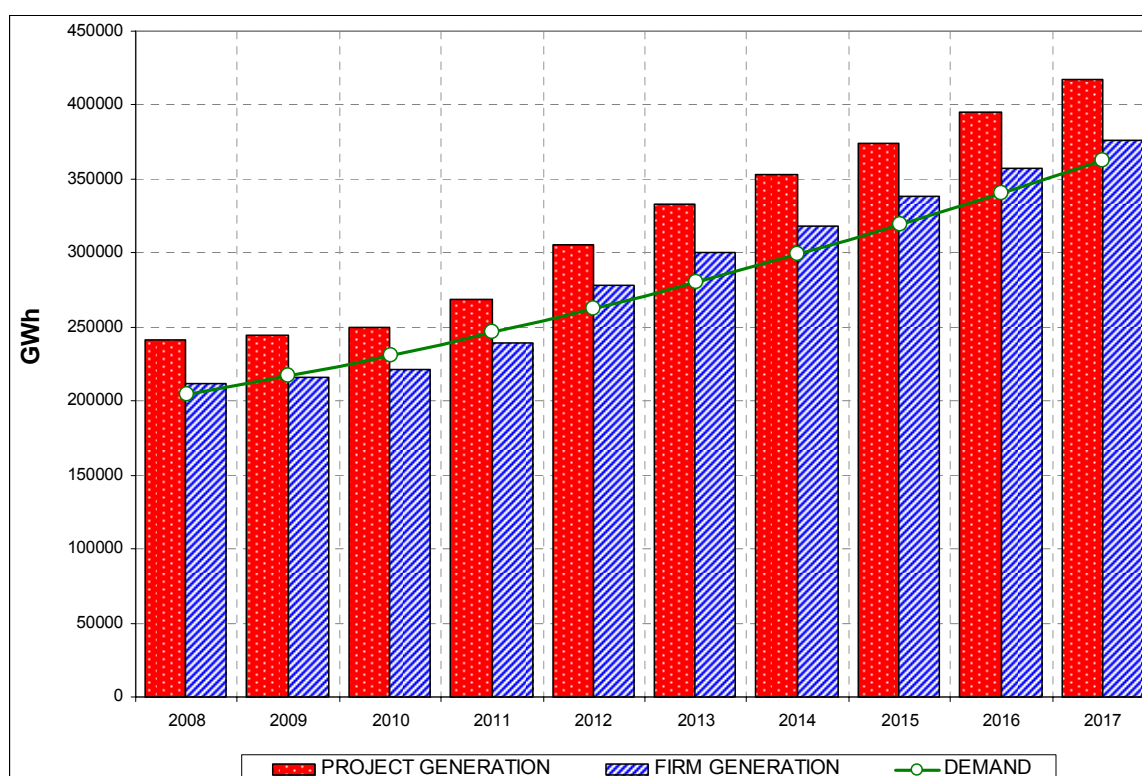
When the development of installed capacity and peak demand is considered for the 10-year study period, the capacity reserve is calculated as to be between 25% and 31%, energy reserves according to project generation and firm generation are calculated as to be between 15% and 18% and between 4% and 7% respectively in accordance with Low Demand after the year 2012 with addition of power plants under construction, power plants granted by licence as the end of December 2007 and expected to be in service on proposed date to the existing system revised according to Scenario 2 and January 2008 Progress Report of EPDK and power plants determined by 2004 long term generation expansion planning study. (Figure 49)

Figure 49 : Capacity Reserve, Project Generation Reserve and Firm Generation Reserve
(Case II - B) Low Demand – Scenario 2



Note: New additional capacities are taken from “Long Term Generation Expansion Planning Study” prepared by APK, TEİAŞ in November 2004. Since this study has not been revised yet, firm energy reserves for new added capacities become low. After revising the planning study these values are subject to change.

Figure 50: Development of Project Generation, Firm Generation and Energy Demand
(Case II - B) Low Demand – Scenario 2



VIII. CONCLUSION AND RECOMMENDATIONS

In case if Base Energy Demand prepared by ETKB is realized;

with addition of 17136 MW new installed capacity composed of 4319 MW under construction and 12817 MW granted by licence (Scenario 1) to the existing power system as end of the year 2007, it is calculated that the expected electricity demands according to project generation capacity and firm generation capacity will not be covered as from the years of 2014 and 2009 respectively.

- with addition of 12917 MW new installed capacity composed of 4319 MW under construction and 8599 MW granted by licence (Scenario 2) to the existing power system as end of the year 2007, it is calculated that the expected electricity demands according to project generation capacity and firm generation capacity will not be covered as from the years of 2013 and 2009 respectively.

As mentioned in the Assumptions Section of this report before, balance tables and years of demand not covered have been calculated in accordance with the following assumptions :

- all of the power plants which are existing connected to the system, under construction and granted by licence will generate electricity as much as the amount of their project and firm generation capacities,
- there will not any constraint with supply of fuel,
- related to hydro conditions, generations of hydro power plants will realise as expected before and
- power plants which are granted by licence and under construction will be in service on proposed date.

But different realization of any assumption from the Assumptions mentioned in The Capacity Projection Study will affect the results calculated in the report and so the years of demand not covered will change.

In case if ;

- demand does not realize as estimated
- water flow accumulated in hydro plants does not realize as estimated before,
- some constrains are faced with in the supply and quality of fuel,
- long term outages occur at power plants,
- plants which are licensed and under construction, are not become in service on foreseen dates,

it is essentially necessary that capacity and energy reserves by primary energy resources should be kept on certain amounts for reliable operation of the electricity system. Therefore, in order to operate generation system with reserves before the overlap of demand with supply, necessary measures should be adopted by taking into consideration of construction duration of investment facilities.

By intensity of primary resource allocation of new additional capacity at thermal plants, the amount of additional capacity connected to system decreases and at hydro and wind plants increases. While a decision and a policy are determined about the additional capacity connected to the system, this situation should be considered. Especially, this situation should be considered more sensitively for investments and security of supply in electricity systems in which high demand increases are expected. In the case of covering whole of required new capacity to be

constructed in order to meet peak demand, from thermal plants, the additional capacity will be about half of the same capacity that is totally covered by hydro and renewable plants.

Moreover, not only in the market structure that investment decisions from the point of view of resource types and commissioning years of power plants are given by investors and but also especially in the electricity system that electricity demand is expected to increase with a high rate of about 8%, how the necessary investments break primary resources down is extremely important. In other words, it is very important that how much suitable diversification policies of necessary generation in point of primary resources are, should be investigated in order to meet the country demand with a reliable reserve and for security of supply.

In addition in the market that demand is expected to increase high, it is extremely important that required measurements should be taken in order to have plants both granted by license and applied for license been in operation on proposed date for security of supply..

Especially since the end of 1990's increasing of the private sector's installed capacities, huge amount of these capacities being thermal and also guaranteed with "take or pay contracts" have caused the state owned power plants to be operated limited related to low demand. In actual conditions, when generation capacity is higher than demand, extra capacities aren't used. Moreover when all of the power plants are in equal conditions, operation order of the power plants starts from the plants with cheapest generation cost to the most expensive one. However since the specific capacity has privilege rights or generation priority, electricity is generated from this capacity first without taking cost into consideration. Therefore not only total electricity demand but also load profile showing levels of electricity consumption should be kept in mind while generation priority or privilege rights are given to the plants. At least, total amount of the capacity to which the priority is given should be paid attention to be less than level of the base load of the electricity system.

The capacities in the scope of the models of BOT, TOR and BO guaranteed for purchasing of their electricity have been used almost fully productive, but it is seen clearly from this study that some part of the state owned capacity couldn't have been used because of the demand quantity and the load characteristics.

Recently, habit of electricity consumption has varied with time and so shape of the yearly load curve has changed. This variation causes to change the proportion of monthly peak values to yearly peak. Since that tourism and air conditions, hourly summer peak has closed to winter peak (annual peak) recently. Especially, recently the summer peak has increased more rapidly than the yearly peak and the summer peak has been getting closer to the winter peak (annual peak). It should not be forgotten that the reasons and effects of this situation will be able to be one of the non-negligible fundamental components for studies of "Demand Side Management".

Electricity using sectors are grouped mainly as household, industry, transportation, agriculture and street lightening. Efficiency and conservation in usage of electricity are getting have more importance by time. Every sector has possibility of efficient and conservative usage of electricity according to their special feature. An increase in the efficiency and the conservation of electricity usage can be achieved for some sectors without any investment or with very little expenditure, in spite of necessity of additional investment and expenditures for some sectors.

Electricity used for lightening in household and offices can be conserved so easily and without any investment. 80% of total lightening in households being 6893.2 million kWh in the year of 2006 could have been conserved by using energy saver lamps instead of transparent

standard lamps for lightening in households. This quantity is equal to an investment conservation with 1000 MW capacity. When it is considered that this conserved quantity is about 4% of the total electricity consumption of Turkey, it can be understood the importance of this application clearly.

Especially, usage of electricity for refrigerators and lightening in households spreads for a whole day. Lightening time being the most overlaps with day-peak time that the consumption is the most in Turkey. The decreasing of the electricity amount used for lightening in households by means of the easiest and the cheapest way, will also cause a positive effect for the electricity consumption of Turkey to decrease directly. In conclusion, in the time period known as the peak time which the total consumption is the most, the required capacity will decrease and the portion of the efficient electricity usage to the total consumption will increase.

IX. ANNEXES

ANNEX – 1 : EXISTING SYSTEM (As end of year 2007)

EÜAŞ THERMAL POWER PLANTS					
EÜAŞ	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation (for 2008) GWh
	FUEL OIL	AMBARLI	630,0	4410	3803
		HOPA	50,0	350	83
		TOTAL	680,0	4760	3886
	DIESEL	ALİAĞA-ÇEVİRİM	180,0	1260	652
		HAKKARİ ÇUKURCA	1,0	0	0
		TOTAL	181,0	1260	652
	HARD COAL	ÇATALAĞZI-B	300,0	1950	1683
		TOTAL	300,0	1950	1683
	LIGNITE	ÇAN 1-2	320,0	2080	1882
		ELBİSTAN A	1355,0	8808	3470
		ELBİSTAN B 1-4	1440,0	9360	8608
		KANGAL	457,0	2971	1688
		ORHANELİ	210,0	1365	1250
		SEYİTÖMER	600,0	3900	3422
		TUNÇBİLEK	365,0	2373	1493
		TOTAL	4747,0	30856	21813
	NATURAL GAS	AMBARLI-D.GAZ	1350,9	9456	8544
		BURSA D.GAZ	1432,0	10024	8000
		TOTAL	2782,9	19480	16544
	EÜAŞ THERMAL TOTAL		8690,9	58305,8	44578,0

EÜAŞ AFFILIATED PARTNERSHIPS POWER PLANTS						
EÜAŞ AFFILIATED PARTNERSHIPS	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation (for 2008) GWh	
	LIGNITE	KEMERKÖY	630,0	4095	3037	
		SOMA A	44,0	286	239	
		SOMA B	990,0	6435	4852	
		YATAĞAN	630,0	4095	3134	
		YENİKÖY	420,0	2730	1414	
		TOTAL		2714,0	17641	12676
	NATURAL GAS	HAMİTABAT	1120,0	7840	7796	
		TOTAL		1120,0	7840	7796
	EÜAŞ AFFILIATED PARTNERSHIPS TOTAL		3834,0	25481	20472	

EÜAŞ HYDRO POWER PLANTS					
EÜAŞ	HYDRO	NAME OF THE PLANT	Installed Capacity MW	Project Generation GWh	Firm Generation (for 2008) GWh
		ADIGÜZEL	62,0	150	35
		ALMUS	27,0	100	30
		ALTINKAYA	702,6	1632	1236
		ASLANTAŞ	138,0	569	360
		ATATÜRK	2405,0	8100	7100
		BATMAN	198,0	483	350
		BERKE	510,0	1669	920
		BORÇKA	300,6	1039	600
		ÇATALAN	168,9	596	331
		ÇAMLIGÖZE	32,0	102	68
		DEMİRKÖPRÜ	69,0	80	32
		DERBENT	56,4	257	201
		DİCLE	110,0	298	228
		DOĞANKENT	74,5	314	200
		GEZENDE	159,4	528	130
		GÖKÇEKAYA	278,4	400	300
		HASAN UĞURLU	500,0	1217	820
		HİRFANLI	128,0	300	178
		KAPULUKAYA	54,0	190	150
		KARACAÖREN-1	32,0	142	84
		KARACAÖREN II	46,4	206	90
		KARAKAYA	1800,0	7500	6800
		KARKAMIŞ	189,0	652	462
		KEBAN	1330,0	6600	5820
		KEMER	48,0	80	62
		KESİKKÖPRÜ	76,0	250	110
		KILIÇKAYA	120,0	332	277
		KOÇKÖPRÜ	8,8	20	12
		KÖKLÜCE	90,0	588	343
		KRALKIZI	94,5	146	111
		KÜRTÜN	85,0	198	160
		MANAVGAT	48,0	220	110
		MENZELET	124,0	515	465
		MURATLI	115,0	444	253
		ÖZLÜCE	170,0	413	290
		SARIYAR	160,0	300	228
		SUAT UĞURLU	69,0	350	250
		TORTUM	26,2	100	85
		YENİCE	37,9	122	92
		ZERNEK(HOŞAP)	3,5	13	12
SEYHAN I	60,0	350	212		
SEYHAN II	7,5	33	8		
SİR	283,5	725	600		
KADINCIK I	70,0	315	200		
KADINCIK II	56,0	307	189		
YÜREĞİR	6,0	20	5		
KEPEZ I-II	32,4	170	65		
ŞANLI URFA	51,8	124	100		
DİĞERLERİ	136,1	367	276		
EÜAŞ HYDRO TOTAL			11350,4	39626	31039
EÜAŞ AND AFFILIATED PARTNERSHIPS TOTAL			23875,3	123413	96089

TRANSFER OF OPERATIONAL RIGHT POWER PLANTS					
TOR	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation (for 2008) GWh
		ÇAYIRHAN PARK HOLD.	620,0	3642	3642
		HAZAR 1-2	30,1	0	0
		TOTAL	650,1	3642	3642
TOR TOTAL			650,1	3642	3642

BUILT - OPERATE POWER PLANTS					
BO	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation (for 2008) GWh
	NATURAL GAS	ANKARA	798,0	6334	6334
		GEBZE D.GAZ	1595,4	12829	12829
		ADAPAZARI	797,7	6407	6407
		İZMİR	1590,7	12550	12550
	TOTAL		4781,8	38120	38120
	IMPORT COAL	İSKENDERUN	1320,0	9312	9312
		TOTAL		1320,0	9312
BO TOTAL			6101,8	47432	47432

BUILT – OPERATE – TRANSFER POWER PLANTS					
BOT	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation (for 2008) GWh
	BOT THERMAL	TRAKYA ELEKTRİK ENRON	498,7	3478	3478
		ESENYURT (DOĞA)	188,5	1475	1475
		OVA ELEK.	258,4	2134	2134
		UNİMAR	504,0	3570	3570
		TOTAL	1449,6	10657	10657
	BOT HYDRO	BİRECİK	672,0	1886	1886
		AHIKÖY I-II	4,2	23	23
		AKSU (ÇAYKÖY)	16,0	36	36
		BERDAN (ALARKO)	10,0	47	47
		ÇAL (LİMAK) (Denizli)	2,5	12	12
		ÇAMLICA (AYEN ENERJİ)	84,0	432	432
		DİNAR-II (METAK)	3,0	16	16
		FETHİYE	16,5	90	90
		GAZİLER (İğdir)	11,2	51	51
		GİRLEVİK-II / MERCAN	11,0	41	41
		GÖNEN	10,6	47	47
		HASANLAR (ALARKO)	9,6	40	40
		KISIK (AYEN ENERJİ)	9,6	34	34
		SUÇATI (ERE EN.)	7,0	28	28
		SÜTCÜLER	2,3	12	12
		TOHMA MEDİK (ALARKO)	12,5	58	58
		YAMULA	100,0	148	148
		TOTAL	982,0	3001	3001
	BOT WIND	ARES (ALAÇATI)	7,2	19	19
		BORES (BOZCAADA)	10,2	30	30
TOTAL		17,4	48,8	48,8	
BOT TOTAL		2449,0	13706	13706	

MOBILE POWER PLANTS					
MOBILE	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation (for 2008) GWh
	FUEL OIL	SAMSUN 1	131,3	876	876
		SAMSUN 2	131,3	876	876
		MOBILE TOTAL		262,6	1752

ADÜAŞ POWER PLANTS						
ADÜAŞ	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation (for 2008) GWh	
	HYDRO	BEYKÖY	16,8	87	87	
		KUZGUN	20,9	36	0	
		TERCAN	15,0	51	28	
		ATAKÖY	5,5	8	8	
		ÇILDIR	15,4	30	20	
		İKİZDERE	18,6	110	100	
		MERCAN	19,1	78	48	
		TOTAL		111,3	400	291
	DIESEL	VAN ENGİL GAZ	15,0	0	0	
		TOTAL		15,0	0	0
	GEOTH.	DENİZLİ JEOTERMAL	15,0	105	95	
TOTAL		15,0	105	95		
ADÜAŞ TOTAL		141,3	505,0	386,0		

AUTOPRODUCER POWER PLANTS					
AUTOPRODUCERS	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation GWh
	FUEL OIL	AKSEN (Gaziantep)	21,1	168	168
		AKDENİZ SEKA (Silifke)	20,0		
		AKSU SEKA (MİLDA KAĞIT)	8,0	20	20
		AK TEKSTİL-1(Gaziantep)	13,0	87	87
		ALİAĞA PETKİM	170,0	1357	1357
		ANADOLU EFES BİRA I	3,8	32	32
		BALIKESİR SEKA(ALBAYRAK TURİZM)	9,3	56	56
		BİRKO (Bor)	11,5		
		CAYCUMA SEKA(OYKA KAĞ.)	10,0	70	70
		CAY SEKA (AFYON)(GAP İNŞ:)	8,0	60	60
		ERDEMİR	75,0	450	450
		GÜL ENERJİ (Gaziantep)	25,0	193	193
		HABAŞ (Bilecik)	18,0	144	144
		HABAŞ (İzmir)	36,0	288	288
		HALKALI KAĞIT	5,1	39	39
		ISPARTA MENSUCAT	10,7	85	85
		İZMİT SEKA	18,0	23	23
		KIRKA BORAKS (Kırka)	8,2	32	32
		MED UNION A.Ş. (EBSO)	3,4	27	27
		MOPAK (Dalaman)	26,2	106	106
		ORS (Polatlı)	7,4	52	52
		POLİNAS (Manisa)	10,0	75	75
		SAMUR A.Ş. (Esenboğa)	7,4	60	60
		S.ŞEHİR (ETİ) ALÜMİNYUM	11,9	35	35
		SUPER FİLM	25,3	203	203
		TÜPRAŞ İZMİR (ALİAĞA RAF.)	44,0	306	306
		TÜPRAŞ (Orta Anadolu-Kırıkkale)	24,0	168	168
		TÜPRAŞ (İzmit-Yarımca)	84,1	545	545
		TÜPRAŞ (Batman)	10,3	72	72
		TİRE-KUTSAN (Tire)	8,0	37	37
		DİĞERLERİ (İzole)	62,3	195	195
		TOTAL		795,0	4985
	DIESEL	TÜPRAŞ (Batman)	10,3	72	72
		DİĞERLERİ	8,0	20,0	20,0
		TOTAL		18,3	92
	IMPORT COAL	ÇOLAKOĞLU-2	190,0	1425	1425
		İÇDAŞ ÇELİK	135,0	948	948
		KAHRAMANMARAŞ KAĞIT	6,0	45	45
		TOTAL		331,0	2418
	HARD COAL	İSDEMİR	220,4	772	772
		KARDEMİR	35,0	300	300
		TOTAL		255,4	1072
	LIGNITE	ALKİM (ALKALİ KİMYA) (Dazkırı)	3,4	24	24
		BANDIRMA BORAKS(ETİ MADEN)	10,7	78	78
		PETLAS	6,0	40	40
		MARMARA KAĞIT (Bilorsa)	2,0	9	9
		DİĞERLERİ	157,1	285	285
		TOTAL		179,2	436

AUTOPRODUCER POWER PLANTS					
AUTOPRODUCERS	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation GWh
	LPG	ETİ BOR (EMET)	10,4	82	82
		EGE BİRLEŞİK ENERJİ	12,8	107	107
		GOODYEAR (Adapazarı)	9,6	79	79
		GOODYEAR (İzmit)	4,2	35	35
		MOPAK KAĞIT (Işıklar)	4,6	33	33
		ORTA ANADOLU MENSUCAT	10,0	65	65
		TOTAL		51,6	402
	NAPTHA	AKÇA ENERJİ (MENDERES TEKS.)	18,7	140	140
		ALKİM KAĞIT	5,2	41	41
		ATAER ENERJİ (EBSO)	70,3	398	398
		DENTAŞ (Denizli)	5,0	38	38
		DESA (Işıklar)	10,6	70	70
		MENSA MENSUCAT	10,4	85	85
		TOROS (Ceyhan)	4,7	38	38
		TOROS (Mersin)	12,1	96	96
	SÖKTAŞ Aydın	4,5	38	38	
	TOTAL		141,5	944	944
	NATURAL GAS	ACIBADEM Bursa	1,3	11	11
		ACIBADEM Kadıköy 1	0,5	4	4
		ACIBADEM Kadıköy 2	0,6	5	5
		AKATEKS Çorlu	1,8	14	14
		AKBAŞLAR	8,7	73	73
		AKIN ENERJİ (B.Karıştıran)	4,9	37	37
		AKMAYA (LÜLEBURGAZ)	6,9	48	48
		ALTINYILDIZ (Yenibosna)	4,7	40	40
		ALTINMARKA	3,6	29	29
		AMYLUM NİŞASTA (Adana)	14,3	80	80
		ARÇELİK (Çayırova)	6,5	49	49
		ARÇELİK (Eskişehir)	6,3	48	48
		ARENKO (Denizli)	12,7	101	101
		ATATEKS TEKSTİL	5,6	45	45
		ATLAS HALICILIK (Çorlu)	1,0	7	7
		AYDIN ÖRME	7,5	60	60
		AYKA TEKSTİL	5,5	41	41
		BAHARIYE HALI	1,0	7	7
		BAYDEMİRLER (Beylikdüzü)	9,3	77	77
		BEY ENERJİ (B.Karıştıran)	5,0	36	36
		BİL ENERJİ (Ankara)	36,6	255	255
		CAN TEKSTİL (Çorlu)	5,2	40	40
		ECZACIBAŞI BAXTER	1,0	6	6
		COGNİS (Tuzla)*	1,0	8	8
		ÇİRAĞAN SARAYI	1,3	11	11
		ÇOLAKOĞLU-1	123,4	1047	1047
		DENİZLİ ÇİMENTO	14,0	113	113
		DOĞUŞ (B.Karıştıran)	1,0	8	8
		EDİP İPLİK (B.Karıştıran)	4,9	38	38
		EKOTEN TEKSTİL	1,9	15	15
		ELSE TEKSTİL	3,2	25	25
		ERAK GİYİM	1,4	12	12
		EROĞLU GİYİM	1,2	9	9
		ESKİŞEHİR ENDÜSTRİ ENERJİ(OSB)	59,0	452	452
		ERDEMİR	80,0	480	480
		EVYAP	5,1	30	30

AUTOPRODUCER POWER PLANTS					
	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation GWh
AUTOPRODUCERS		FLOKSER Tekstil (Poliser)	2,1	17	17
		FLOKSER Tekstil (Süetser)	2,1	17	17
		FRİTOLAY GIDA	0,5	4	4
		GÜLLE ENTEGRE (Çorlu)	6,3	47	47
		GRANİSER GRANİT	5,5	42	42
		HABAŞ (Aliağa)	224,5	1796	1796
		HAYAT KAĞIT SAN.	7,5	56	56
		HAYAT KİMYA (İzmit)	5,2	32	32
		HAYAT TEMİZLİK	15,0	94	94
		İGSAŞ (Yarımca)	11,0	76	76
		İSKO (İnegöl)	9,2	63	63
		KALESERAMİK (Çan.seramik+Kalebodur)	21,6	157	157
		KARTONSAN (İzmit)	24,0	192	192
		KASTAMONU ENTEGRE	7,5	48	48
		KIVANÇ TEKSTİL	3,9	33	33
		KİL-SAN	3,2	25	25
		KOMBASSAN AMBALAJ (Konya)	5,5	40	40
		KOMBASSAN AMBALAJ (Tekirdağ)	5,5	38	38
		KORUMA KLOR	9,6	77	77
		KÜÇÜKÇALIK TEKSTİL	8,0	64	64
		MANİSA O.S.B.	84,8	434	434
		MAKSİ ENERJİ (HAMOĞLU)	7,7	62	62
		MARMARA PAMUK	8,7	71	71
		MERCEDES BENZ	8,3	68	68
		MODERN ENERJİ	87,3	650	650
		NUH ENERJİ 2 (Nuh Çimento)	73,0	514	514
		NUR YILDIZ (GEM-TA)	1,4	7	7
		ÖZAKIM ENERJİ (Gürsu)	7,0	60	60
		PAKGIDA (Düzce-Köseköy)	6,9	55	55
		PAKGIDA (Kemalpaşa)	5,7	43	43
		PAKMAYA (İzmit)	6,9	55	55
		SARKUYSAN (Tuzla)	7,7	60	60
		SİMKO (Kartal)	2,1	14	14
		STANDARD PROFİL	6,7	49	49
		SÜPERBOY BOYA	1,0	8	8
		SÖNMEZ FLAMENT	4,1	29	29
		ŞAHİNLER ENERJİ (B.Karıştıran)	26,0	180	180
		ŞİK MAKAS	1,6	13	13
		SWISS OTEL (İstanbul)	1,6	11	11
		TAV Esenboğa	3,9	33	33
		TANRIVERDİ	4,7	39	39
		TEKBOY TEKSTİL	2,2	16	16
		TERMAL SERAMİK (Söğüt)	4,6	34	34
		TEZCAN GALVANİZ GR I-II	3,7	29	29
		TOPRAK ENERJİ (Eskişehir)	9,0		
		TRAKYA İPLİK (Çerkezköy)	4,2	29	29
	TÜBAŞ	1,4	9	9	
	YILDIZ ENTEGRE	6,2	40	40	
	YILFERT (TÜGSAŞ GEMLİK GÜB.)	8,0	50	50	
	TÜP MERSERİZE (B.Karıştıran)	5,7	46	46	
	YALOVA ELYAF	12,3			
	YILDIZ SUNTA (Köseköy)	5,2	41	41	
	YONGAPAN (Kastamonu)	9,7	61	61	
	YURTBAY (Eskişehir)	7,8	62	62	
	ZEYNEP GİYİM	1,2	9	9	
	DİĞERLERİ	104,7	275	275	
	TOTAL	1368,6	9430,3	9430,3	

AUTOPRODUCER POWER PLANTS						
AUTOPRODUCERS	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation GWh	
	BIO GAS	BELKA (Ankara)	3,2	22	22	
		İZAYDAŞ (İzmit çöp)	5,2	37	37	
		KEMERBURGAZ	4,0	7	7	
		ADANA ATIK	0,8	6	6	
		TOTAL		13,2	72	72
		OTHERS	BANDIRMA ASİT(ETİ MADEN)	11,5	88	88
	BANDIRMA BAĞFAŞ		10,0	57	57	
	TOTAL		21,5	145	145	
	WIND		SUNJÜT	1,2	2	2
		TOTAL		1,2	2	2
		HYDRO (DAM)	OYMAPINAR (ETİ ALİMİNYUM)	540,0	1620	1170
	TOTAL		540,0	1620	1170	
	RUN OF RIVER		BAĞCI SU ÜRÜNLERİ	0,3	1,7	1,7
		KAREL (PAMUKOVA)	9,3	55,0	40,0	
		MOLU	3,4	10,6	10,6	
		MURGUL BAKIR	4,7	7,5	7,5	
		YEŞİLLİLER (Kırşehir)	0,5	1,0	1,0	
		TOTAL		18,2	76	61
	HYDRO TOTAL		558,2	1696	1231	
	AUTOPRODUCERS TOTAL		3.734,6	21.693,7	21.228,3	

PRIVATE GENERATION COMPANY POWER PLANTS					
PRIVATE GENERATION COMPANIES	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation GWh
	NAPTHA	AK ENERJİ (Yalova)	21,0	173	173
		AK ENERJİ (Denizli)	15,6		
	TOTAL		36,6	173	173
NATURAL GAS	AK ENERJİ (Akai)		10,4	85	85
	AK ENERJİ (Alaplı)		5,2	42	42
	AK ENERJİ (İzmir-Batıçım)		45,0	370	370
	AK ENERJİ (Bozüyük)		126,6	817	817
	AK ENERJİ (Çerkezköy)		98,0	805	805
	AK ENERJİ (B.Karıştırıran)		10,4	85	85
	AK ENERJİ (Yalova)		38,5	317	317
	AK ENERJİ (Kemalpaşa)		127,2	1044	1044
	AK ENERJİ (Uşak OSB)		15,2		
	ALARKO ALTEK		82,0	567	567
	ALİAĞA Çakmaktepe Enerji		34,8	278	278
	ANTALYA ENERJİ		34,9	279	279
	AYEN OSTİM		41,0	348	348
	BERK ENERJİ (BESLER)		23,1	157	157
	BİS ENERJİ (Bursa San.)		410,0	3383	3383
	BOSEN (Bursa San.)		142,8	1071	1071
	BOZ ENERJİ		8,7	60	60
	BURGAZ ELEKTRİK		6,9	55	55
	CAM İŞ ELEKTRİK (Tuzla)		12,2	95	95
	CAM İŞ ELEKTRİK (Mersin)		126,1	1008	1008
	CAM İŞ ELEKTRİK (B.Karıştırıran)		32,9	270	270
	CAN ENERJİ		3,9	30	30
	ÇEBİ ENERJİ		64,4	505	505
	ÇELİK ENERJİ (Uzunçiftlik)		2,4	19	19
	ÇERKEZKÖY ENERJİ		49,2	403	403
	ENERJİ-SA (Adana)		130,2	850	850
	ENERJİ-SA (Mersin)		64,5	520	520
	ENERJİ-SA (Çanakkale)		64,1	520	520
	ENERJİ-SA (KENTSA)Köseköy		120,0	930	930
	ENTEK (Köseköy-Iztek)		144,8	1251	1251
	ENTEK (KOÇ Üniversitesi)		2,3	19	19
	ENTEK Demirtaş		145,9	1259	1259
	KAREGE ARGES		44,3	348	348
	METEM ENERJİ (Hacışiramat)		7,8	58	58
	METEM ENERJİ (Peliklik)		11,7	89	89
	NOREN ENERJİ		8,7	70	70
	NUH ENERJİ 1 (Nuh Çimento)		38,0	326	326
	SAYENERJİ (Kayseri OSB)		5,9	47	47
	SÖNMEZ ELEKTRİK		17,5	141	141
	T ENERJİ TURCAS		1,6	13	13
	ZORLU ENERJİ (Bursa)		90,0	752	752
	ZORLU ENERJİ (B. Karıştırıran)		65,8	525	525
ZORLU ENERJİ (Sincan)		50,3	429	429	
ZORLU ENERJİ (Kayseri)		188,5	1439	1439	
ZORLU ENERJİ (Pınarbaşı/Kayseri)		7,2	59	59	
ZORLU ENERJİ (Yalova)		15,9	122	122	
TOTAL		2776,8	21860	21860	

PRIVATE GENERATION COMPANY POWER PLANTS						
PRIVATE GENERATION COMPANIES	NAME OF THE PLANT		Installed Capacity MW	Project Generation GWh	Firm Generation GWh	
	WASTE	AKSA	1,4	10	10	
		ITC-KA ENERJİ MAMAK	5,7	45	45	
		EKOLOJİK ENERJİ (Kemerburgaz)	1,0	8	8	
	TOTAL		8,1	62	62	
	FUEL OIL	AKSA ENERJİ (Hakkari)	24,0	175	175	
		KAREN I-II	24,3	180	180	
		KIZILTEPE	34,1	250	250	
		KARKEY (SİLOPİ)	157,2	1044	1044	
		PS3-A -1	11,4	80	80	
		PS3-A -2 (İDİL)	24,4	180	180	
		SİİRT	25,6	190	190	
		TOTAL		301,0	2099,2	2099,2
	THERMAL TOTAL			3122,5	24194,1	24194,1
	HYDRO	BEREKET (DENİZLİ)	3,7	12	12	
		BEREKET (DALAMAN)	37,5	179	179	
		BEREKET (FESLEK)	9,5	41	25	
		BEREKET (GÖKYAR)	11,6	43	23	
		BEREKET (MENTAŞ)	39,9	163	140	
		EKİN ENERJİ (BAŞARAN HES)	0,6	5	0	
		ERE-BİRKAPILI	48,5	171	17	
		ERE- AKSU- ŞAHMALLAR	14,0	45	7	
		ERE- SUGÖZÜ -KIZILDÜZ	15,4	55	8	
		EŞEN-II (GÖLTAŞ)	43,4	170	0	
		ELTA (DODURGA)	4,1	12	12	
		İÇTAŞ YUKARI MERCAN	14,2	44	20	
		İSKUR (SÜLEYMANLI HES)	4,6	18	4	
		KURTEKS Karasu Andırın HES	2,4	19	19	
		MOLU ENERJİ (BAHÇELİK HES)	4,2	30	30	
		ÖZGÜR ELEK. K.MARAŞ Tahta HES	12,5	54	54	
		PAMUK (Toroslar)	23,3	112	28	
		SU ENERJİ (ÇAYGÖREN HES)	4,6	19	4	
		TEKTUĞ-KARGILIK	23,9	83	19	
		TEKTUĞ-KALEALTI HES	15,0	52	11	
		TEKTUĞ-KEBANDERESİ	5,0	32	20	
		YAPISAN HACILAR	13,3	90	54	
		YPM ALTINTEPE HES	4,0	18	10	
		YPM BEYPINAR HES	3,6	18	9	
		YPM KONAK HES	4,0	19	10	
	HYDRO TOTAL		362,8	1503	714	
	WIND	ALİZE ENERJİ (Delta Plastik)	1,5	5	4	
		ANEMON ENERJİ (İNTEPE)	30,4	92	83	
		BARES (BANDIRMA)	30,0	105	95	
		DOĞAL ENERJİ (BURGAZ)	14,9	48	48	
		DENİZLİ ELK. (Karakurt-Akhisar)	10,8	28	24	
		ERTÜRK ELK. (TEPE)	0,9	3	2	
		MARE MANASTIR	39,2	129	129	
TOTAL		127,7	410	384		
GEOTH.	MENDERES JEOTERMAL	8,0	56	56		
TOTAL		8,0	56	56		
PRIVATE GENERATION COMPANY TOTAL		3621,0	26162,5	25348,0		

ANNEX – 2 : POWER PLANTS CONNECTED TO AND DISCONNECTED FROM THE POWER SYSTEM IN 2007

NAME OF UNIT	UNIT CAPACITY MW	SITUATION	FUEL TYPE	COMMISSIONING DATE
KONYA ŞEKER SAN.VE TİC.AŞ.	16,0	AUTOPRODUCER	LIGNITE	12.01.2007
ZORLU EN.(*)Kayseri (İlave 1 GT)	7,2	GENERATION COMPANY	NATURAL GAS	18.01.2007
BOSEN ENERJİ ELEKTRİK AŞ.	14,7	GENERATION COMPANY	NATURAL GAS	19.01.2007
FRITOLAY GIDA SAN.VE TİC. AŞ.	0,5	AUTOPRODUCER	NATURAL GAS	24.01.2007
KİL-SAN KİL SAN.VE TİC. A.Ş.	3,2	AUTOPRODUCER	NATURAL GAS	20.02.2007
KIVANÇ TEKSTİL SAN.ve TİC.A.Ş.	3,9	AUTOPRODUCER	NATURAL GAS	21.03.2007
ORS ORTADOĞU RULMAN SAN.ve TİC.A.Ş.	12,1	AUTOPRODUCER	NATURAL GAS	23.03.2007
T ENERJİ ÜRETİM AŞ.(İSTANBUL)	1,6	GENERATION COMPANY	NATURAL GAS	05.04.2007
ISPARTA MOBİL SANTRALI	-27,9	MOBILE	FUEL-OİL	17.05.2007
HABAŞ (Aliğa-İlave)	23,0	AUTOPRODUCER	NATURAL GAS	03.05.2007
ITC-KA Enerji Üretim Aş.(Mamak)(İlave)	1,4	GENERATION COMPANY	ÇÖP GAZI	23.05.2007
BİS Enerji Üretim AŞ.(Bursa)(İlave)	43,0	GENERATION COMPANY	NATURAL GAS	31.05.2007
ENTEK Elektrik Üretim A.Ş.(Bursa/Osmangazi-İlave)	10,8	GENERATION COMPANY	NATURAL GAS	15.06.2007
Acıbadem Sağlık Hiz.ve Tic.A.Ş.(Kadıköy Hastanesi)(İstanbul)	0,5	AUTOPRODUCER	NATURAL GAS	20.06.2007
AKENERJİ Elektrik Üretim A.Ş.(Zonguldak/Alaplı-İlave)	5,2	GENERATION COMPANY	NATURAL GAS	04.07.2007
SAYENERJİ ELEKTRİK ÜRETİM AŞ. (Kayseri/OSB)	5,9	GENERATION COMPANY	NATURAL GAS	04.07.2007
AKATEKS Tekstil Sanayi ve Ticaret A.Ş.	1,8	AUTOPRODUCER	NATURAL GAS	31.07.2007
SWISS OTEL(Anadolu Japan Turizm A.Ş. (İstanbul)	1,6	AUTOPRODUCER	NATURAL GAS	02.08.2007
Batman,Esenboğa,Kırıkkale Mobil Santral	-325,5	MOBILE	FUEL-OİL	15.08.2007
Acıbadem Sağlık Hiz.ve Tic.A.Ş.(Nilüfer/BURSA)	1,3	AUTOPRODUCER	NATURAL GAS	29.08.2007
BİS Enerji Üretim AŞ.(Bursa)(İlave)	48,0	GENERATION COMPANY	NATURAL GAS	31.08.2007
BİS Enerji Üretim AŞ.(Bursa)(Düzeltilme))	28,3	GENERATION COMPANY	NATURAL GAS	12.09.2007
Hakkari 2 Mobil Santral	-24,8	MOBILE	FUEL-OİL	21.09.2007
Camiş Elektrik (Topkapı)	-12,2	GENERATION COMPANY	LIQ.+NATURAL GAS	06.08.2007
Aliğa Çakmaktepe Enerji A.Ş.(Aliğa/İZMİR)	34,8	GENERATION COMPANY	NATURAL GAS	14.09.2007
TAV Esenboğa Yatırım Yapım ve İşletme AŞ./ANKARA	3,9	AUTOPRODUCER	NATURAL GAS	20.09.2007
Mamara Elektrik Üretim A.Ş.	-8,7	GENERATION COMPANY	NATURAL GAS	26.09.2007
Starwood Orman Ürünleri Sanayi A.Ş.	-17,3	AUTOPRODUCER	NATURAL GAS	03.10.2007
AK EN (GÜRSU)(DG+N)(Otosansit)	-15,6	GENERATION COMPANY	NATURAL GAS	03.01.2007
AK EN (DG+N)(Orhangazi)	-5,1	GENERATION COMPANY	LIQ.+NATURAL GAS	09.08.2007
AK EN (DG+N)(Alaplı-Zonguldak)	-6,3	GENERATION COMPANY	LIQ.+NATURAL GAS	09.08.2007
AKSA ENERJİ ÜRETİM AŞ.(AKSA)(Hakkari)	24,0	GENERATION COMPANY	FUEL-OİL	18.10.2007
Acıbadem Sağlık Hiz.ve Tic.A.Ş.(Kozyatağı Hastanesi)(İstanbul)	0,6	AUTOPRODUCER	NATURAL GAS	24.10.2007
AKBAŞLAR (İzole) (DÜZELTME)	-4,1	AUTOPRODUCER	NATURAL GAS	04.12.2007
FLOKSER TEKSTİL SAN.AŞ.(Çatalça/İstanbul)(Poliser)	2,1	AUTOPRODUCER	NATURAL GAS	04.12.2007
FLOKSER TEKSTİL SAN.AŞ.(Çatalça/İstanbul)(Süetser)	2,1	AUTOPRODUCER	NATURAL GAS	04.12.2007
SÜPERBOY BOYA KASAR SAN.ve Tic.Ltd.Şti.(İstanbul)	1,0	AUTOPRODUCER	NATURAL GAS	06.12.2007
CAM-İŞ ELEKTRİK (ÇAYIROVA)	-12,2	GENERATION COMPANY	LIQ.+NATURAL GAS	27.12.2007
KARKEY(SİLOPİ-1) (33 kV) (Düzeltilme)	-3,5	GENERATION COMPANY	FUEL-OİL	28.12.2007
KARKEY(SİLOPİ-2) (6,3 kV) (Düzeltilme)	-1,0	GENERATION COMPANY	FUEL-OİL	28.12.2007
KARKEY(SİLOPİ-3) (154 kV) (Düzeltilme)	-2,6	GENERATION COMPANY	FUEL-OİL	28.12.2007
KARKEY(SİLOPİ-4) (154 kV) (Düzeltilme)	-8,6	GENERATION COMPANY	FUEL-OİL	28.12.2007
KARKEY(SİLOPİ-5) (154 kV) (Düzeltilme)	5,2	GENERATION COMPANY	FUEL-OİL	28.12.2007
PS3A-2 (İDL)	24,4	GENERATION COMPANY	FUEL-OİL	31.12.2007
TÜPRAŞ RAFİNERİ(Yarımca/İzmit)(İzole)(Düzeltilme)	39,1	AUTOPRODUCER	LIQ.+NATURAL GAS	31.12.2007
BOSEN EN. ELK.ÜRET.AŞ.(Bursa)(Düzeltilme)	-2,9	GENERATION COMPANY	NATURAL GAS	31.12.2007
NUH ENERJİ-2(Nuh Çim.)	-73,0	GENERATION COMPANY	NATURAL GAS	31.12.2007
NUH ENERJİ-2(Nuh Çim.)	73,0	AUTOPRODUCER	NATURAL GAS	31.12.2007
CAM-İŞ ELEKTRİK (ÇAYIROVA)	12,2	GENERATION COMPANY	LIQ.+NATURAL GAS	31.12.2007
SÜPER FİLM (G.antep)(Düzeltilme)	0,1	AUTOPRODUCER	FUEL-OİL	31.12.2007
FUEL-OİL (İzole) (Düzeltilme)	-8,4	AUTOPRODUCER	FUEL-OİL	31.12.2007
MOTORİN (İzole) (Düzeltilme)	-7,9	AUTOPRODUCER	DIESEL	31.12.2007
LIGNITE (İzole) (Düzeltilme)	-115,9	AUTOPRODUCER	LIGNITE	31.12.2007
KATI+SIVI (İzole) (Düzeltilme)	106,5	AUTOPRODUCER	SOLID+LIQ/	31.12.2007
SIVI+D. GAZ (İzole) (Düzeltilme)	38,9	AUTOPRODUCER	LIQ.+NATURAL GAS	31.12.2007
THERMAL TOTAL	-85,6			

NAME OF UNIT	UNIT CAPACITY MW	SITUATION	FUEL TYPE	COMMISSIONING DATE
BORÇKA HES	300,6	EÜAŞ	HYDRO	28.02.2007
TEKTUĞ(Keban Deresi)	5,0	GENERATION COMPANY	HYDRO	09.05.2007
ÖZGÜR ELK.AŞ.(K.MARAŞ)(Tahta)	6,3	GENERATION COMPANY	HYDRO	04.05.2007
ÖZGÜR ELK.AŞ.(K.MARAŞ)(Tahta)(İlave)	6,3	GENERATION COMPANY	HYDRO	25.05.2007
YPM Ener.Yat.AŞ.(Beypınar Hidro.)(Sivas/Suşehir)	3,6	GENERATION COMPANY	HYDRO	07.06.2007
YPM Ener.Yat.AŞ.(Altıntepe Hidro.)(Sivas/Suşehir)	4,0	GENERATION COMPANY	HYDRO	07.06.2007
YPM Ener.Yat.AŞ.(Konak Hidro.)(Sivas/Suşehir)	4,0	GENERATION COMPANY	HYDRO	20.07.2007
KURTEKS Tekstil A.Ş./Kahramanmaraş (KARASU HES-Andırın)	2,4	GENERATION COMPANY	HYDRO	29.11.2007
İSKUR TEKSTİL (SÜLEYMANLI HES)	-4,6	AUTOPRODUCER	HYDRO	31.12.2007
İSKUR TEKSTİL (SÜLEYMANLI HES)	4,6	GENERATION COMPANY	HYDRO	31.12.2007
HYDRO TOTAL	332,1			
MARE MANASTIR WIND ENERJİ(İlave)	11,2	GENERATION COMPANY	WIND	26.01.2007
ANEMON EN.ELEK.ÜRETİM.AŞ.	8,0	GENERATION COMPANY	WIND	22.02.2007
MARE MANASTIR WIND ENERJİ(İlave)	20,0	GENERATION COMPANY	WIND	13.04.2007
DENİZLİ ÜRETİM ELEK.Ltd.Şti.(karakurt)	10,8	GENERATION COMPANY	WIND	28.05.2007
BURGAZ RES (Doğal Enerji Üretim A.Ş.)	4,0	GENERATION COMPANY	WIND	15.08.2007
ANEMON EN.ELEK.ÜRETİM.AŞ.(İlave)	15,2	GENERATION COMPANY	WIND	17.08.2007
ANEMON EN.ELEK.ÜRETİM.AŞ.(İlave)	7,2	GENERATION COMPANY	WIND	22.11.2007
BURGAZ RES (Doğal Enerji Üretim A.Ş.)	10,9	GENERATION COMPANY	WIND	31.12.2007
WIND TOTAL	87,3			
GRAND TOTAL	333,9			

ANNEX – 3 : POWER PLANTS EXPECTED TO BE IN SERVICE BETWEEN 2008-2015 UNDER CONSTRUCTION AND GRANTED BY LICENCE

(According to January 2008 Progress Report Published by EPDK – **Scenario 1**)

YEAR	NAME OF THE PLANT	FUEL TYPE	TOTAL INSTALLED CAPACITY (MW)	PROJECT GENERATION (GWh)	FIRM GENERATION (GWh)
2008					
EPDK	GRANTED BY LICENCE	LIGNITE	1,7	8,4	8,4
EPDK	GRANTED BY LICENCE	F. OIL	110,6	712,9	712,9
EPDK	GRANTED BY LICENCE	D. GAZ	176,4	1025,8	1025,8
	THERMAL TOTAL		288,7	1747,1	1747,1
EPDK	GRANTED BY LICENCE	BIOGAS	1,1	6,9	6,9
EPDK	GRANTED BY LICENCE	GEOTH.	45,0	306,6	207,1
EPDK	GRANTED BY LICENCE	WIND	483,2	1797,1	1586,7
	RENEWABLE(WIND+GEOTH.)		529,3	2110,6	1800,7
DSİ	ALPASLAN-I	HYDRO	160,0	488,0	418,0
DSİ	OBRUK	HYDRO	200,0	473,0	337,0
DSİ	TORUL	HYDRO	103,0	322,0	131,0
DSİ	KILAVUZLU	HYDRO	57,2	100,0	7,0
DSİ	MANYAS 1	HYDRO	6,8	20,0	15,0
EPDK	GRANTED BY LICENCE	HYDRO	121,4	477,9	300,8
	HYDRO TOTAL		648,4	1880,9	1208,8
	YEAR TOTAL		1466,4	5738,6	4756,6
2009					
EPDK	GRANTED BY LICENCE	ASPHALTIT	137,8	972,0	972,0
EPDK	GRANTED BY LICENCE	N. GAS	103,4	769,2	769,2
EPDK	GRANTED BY LICENCE	IMP. COAL	165,0	1064,3	1064,3
	THERMAL TOTAL		406,2	2805,5	2805,5
EPDK	GRANTED BY LICENCE	WASTE	9,3	71,6	58,4
EPDK	GRANTED BY LICENCE	GEOTH.	7,5	63,0	63,0
EPDK	GRANTED BY LICENCE	WIND	360,7	1288,7	1121,4
	RENEWABLE(WIND+GEOTH.)		377,5	1423,3	1242,8
DSİ	AKKÖPRÜ	HYDRO	115,0	343,0	176,0
DSİ	MANYAS 2-3	HYDRO	13,5	39,0	29,0
DSİ	DERİNER	HYDRO	670,0	2118,0	1212,0
DSİ	ERMENEK	HYDRO	308,9	1187,0	837,0
EPDK	LİSANS ALMIŞ PROJELER	HYDRO	576,7	2238,6	1362,4
	HYDRO TOTAL		1684,1	5925,6	3616,4
	YEAR TOTAL		2467,8	10154,4	7664,7

YEAR	NAME OF THE PLANT	FUEL TYPE	TOTAL INSTALLED CAPACITY (MW)	PROJECT GENERATION (GWh)	FIRM GENERATION (GWh)
2010					
EPDK	GRANTED BY LICENCE	N. GAS	881,3	6684,5	6684,5
	THERMAL TOTAL		881,3	6684,5	6684,5
EPDK	GRANTED BY LICENCE	WASTE	14,3	110,0	90,4
	RENEWABLE(WIND+GEOTH.)		14,3	110,0	90,4
DSİ	ÇİNE	HYDRO	39,5	118,0	18,0
DSİ	TOPÇAM	HYDRO	64,8	200,0	146,0
EPDK	GRANTED BY LICENCE	HYDRO	2385,3	9042,3	5097,6
	HYDRO TOTAL		2489,6	9360,3	5261,6
	YEAR TOTAL		3385,2	16154,8	12036,5
2011					
EPDK	GRANTED BY LICENCE	LIGNITE	474,7	3082,5	3082,5
EPDK	GRANTED BY LICENCE	IMP.COAL.	887,6	7094,8	7094,8
	THERMAL TOTAL		1362,3	10177,3	10177,3
EPDK	GRANTED BY LICENCE	GEOTH.	9,5	70,0	55,5
	RENEWABLE(WIND+GEOTH.)		9,5	70,0	55,5
EPDK	GRANTED BY LICENCE	HYDRO	2632,8	9461,5	5370,3
	HYDRO TOTAL		2632,8	9461,5	5370,3
	YEAR TOTAL		4004,6	19708,8	15603,1
2012					
EPDK	GRANTED BY LICENCE	IMP.COAL	744,7	5292,0	5292,0
EÜAŞ	AMBARLI - B DGKÇ	N. GAS	840,0	5880,0	5606,4
	THERMAL TOTAL		1584,7	11172,0	10898,4
	RENEWABLE(WIND+GEOTH.)		0,0	0,0	0,0
EPDK	GRANTED BY LICENCE	HYDRO	1353,7	4758,1	2685,1
	HYDRO TOTAL		1353,7	4758,1	2685,1
	YEAR TOTAL		2938,4	15930,1	13583,5

YEAR	NAME OF THE PLANT	FUEL TYPE	TOTAL INSTALLED CAPACITY (MW)	PROJECT GENERATION (GWh)	FIRM GENERATION (GWh)
2013	<i>THERMAL TOTAL</i>		0,0	0,0	0,0
	<i>RENEWABLE(WIND+GEOTH.)</i>		0,0	0,0	0,0
	EPDK GRANTED BY LICENCE	HYDRO	1133,8	4663,1	2627,7
	<i>HYDRO TOTAL</i>		1133,8	4663,1	2627,7
	<i>YEAR TOTAL</i>		1133,8	4663,1	2627,7
2014	<i>THERMAL TOTAL</i>		0,0	0,0	0,0
	<i>RENEWABLE(WIND+GEOTH.)</i>		0,0	0,0	0,0
	DSİ ILISU	HYDRO	1200,0	3833,0	2459,0
	<i>HYDRO TOTAL</i>		1200,0	3833,0	2459,0
	<i>YEAR TOTAL</i>		1200,0	3833,0	2459,0
2015	<i>THERMAL TOTAL</i>		0,0	0,0	0,0
	<i>RENEWABLE(WIND+GEOTH.)</i>		0,0	0,0	0,0
	DSİ YUSUFELİ	HYDRO	540,0	1705,0	1129,0
	<i>HYDRO TOTAL</i>		540,0	1705,0	1129,0
	<i>YEAR TOTAL</i>		540,0	1705,0	1129,0

Note: DSI projects and Ambarlı-B N.G.C.C Power Plant constructed by EÜAŞ are currently under construction and remaining projects are granted by licence.

ANNEX – 3 (Cont.) : POWER PLANTS EXPECTED TO BE IN SERVICE BETWEEN 2008-2015 UNDER CONSTRUCTION AND GRANTED BY LICENCE

(According to January 2008 Progress Report Published by EPDK – **Scenario 2**)

YEAR	NAME OF THE PLANT	FUEL TYPE	TOTAL INSTALLED CAPACITY (MW)	PROJECT GENERATION (GWh)	FIRM GENERATION (GWh)
2008					
EPDK	GRANTED BY LICENCE	F. OIL	70,6	459,3	459,3
EPDK	GRANTED BY LICENCE	N. GAS	90,9	467,1	467,1
	THERMAL TOTAL		161,5	926,4	926,4
EPDK	GRANTED BY LICENCE	BIOGAS	1,1	6,9	6,9
EPDK	GRANTED BY LICENCE	GEOTH.	45,0	306,6	207,1
EPDK	GRANTED BY LICENCE	WIND	404,2	1463,0	1201,2
	RENEWABLE(WIND+GEOTH.)		450,3	1776,5	1415,2
DSİ	ALPASLAN-I	HYDRO	160,0	488,0	418,0
DSİ	OBRUK	HYDRO	200,0	473,0	337,0
DSİ	TORUL	HYDRO	103,0	322,0	131,0
DSİ	KILAVUZLU	HYDRO	57,2	100,0	7,0
DSİ	MANYAS 1	HYDRO	6,8	20,0	15,0
EPDK	GRANTED BY LICENCE	HYDRO	130,9	687,7	445,2
	HYDRO TOTAL		657,9	2090,7	1353,2
	YEAR TOTAL		1269,7	4793,6	3694,8
2009					
EPDK	GRANTED BY LICENCE	ASPHALTIT	137,8	972,0	972,0
EPDK	GRANTED BY LICENCE	N. GAS	167,2	1157,2	1157,2
EPDK	GRANTED BY LICENCE	IMP.COAL	165,0	1064,3	1064,3
	THERMAL TOTAL		470,0	3193,5	3193,5
EPDK	GRANTED BY LICENCE	GEOTH.	7,5	63,0	63,0
EPDK	GRANTED BY LICENCE	WIND	30,0	103,6	92,7
	RENEWABLE(WIND+GEOTH.)		37,5	166,6	155,7
DSİ	AKKÖPRÜ	HYDRO	115,0	343,0	176,0
DSİ	MANYAS 2-3	HYDRO	13,5	39,0	29,0
DSİ	DERİNER	HYDRO	670,0	2118,0	1212,0
DSİ	ERMENEK	HYDRO	308,9	1187,0	837,0
EPDK	GRANTED BY LICENCE	HYDRO	289,5	1050,4	673,3
	HYDRO TOTAL		1396,9	4737,4	2927,3
	YEAR TOTAL		1904,4	8097,5	6276,5

YEAR	NAME OF THE PLANT	FUEL TYPE	TOTAL INSTALLED CAPACITY (MW)	PROJECT GENERATION (GWh)	FIRM GENERATION (GWh)
2010					
	THERMAL TOTAL		0,0	0,0	0,0
EPDK	GRANTED BY LICENCE	WASTE	1,5	11,6	11,6
	RENEWABLE(WIND+GEOTH.))		1,5	11,6	11,6
DSİ	ÇİNE	HYDRO	39,5	118,0	18,0
DSİ	TOPÇAM	HYDRO	64,8	200,0	146,0
EPDK	GRANTED BY LICENCE	HYDRO	280,2	885,8	525,2
	HYDRO TOTAL		384,5	1203,8	689,2
	YEAR TOTAL		386,0	1215,4	700,8
2011					
EPDK	GRANTED BY LICENCE	LIGNITE	170,0	1300,0	1300,0
EPDK	GRANTED BY LICENCE	IMP.COAL	887,6	7094,8	7094,8
	THERMAL TOTAL		1057,6	8394,8	8394,8
EPDK	GRANTED BY LICENCE	GEOTH.	9,5	70,0	55,5
	RENEWABLE(WIND+GEOTH.)		9,5	70,0	55,5
EPDK	GRANTED BY LICENCE	HYDRO	2640,8	8554,8	4849,7
	HYDRO TOTAL		2640,8	8554,8	4849,7
	YEAR TOTAL		3707,9	17019,6	13300,0
2012					
EPDK	GRANTED BY LICENCE	IMP.COAL	607,9	4320,0	4320,0
EPDK	GRANTED BY LICENCE	H.COAL	654,5	4480,0	4480,0
EÜAŞ	AMBARLI - B DGKÇ	N. GAS	840,0	5880,0	5606,4
	THERMAL TOTAL		2102,4	14680,0	14406,4
	RENEWABLE(WIND+GEOTH.)		0,0	0,0	0,0
EPDK	GRANTED BY LICENCE	HYDRO	1275,9	5220,1	2943,6
	HYDRO TOTAL		1275,9	5220,1	2943,6
	YEAR TOTAL		3378,3	19900,1	17350,0

YEAR	NAME OF THE PLANT	FUEL TYPE	TOTAL INSTALLED CAPACITY (MW)	PROJECT GENERATION (GWh)	FIRM GENERATION (GWh)
2013	THERMAL TOTAL		0,0	0,0	0,0
	RENEWABLE(WIND+GEOTH.)		0,0	0,0	0,0
	EPDK GRANTED BY LICENCE	HYDRO	531,2	2110,7	1191,9
	HYDRO TOTAL		531,2	2110,7	1191,9
	YEAR TOTAL		531,2	2110,7	1191,9
2014	THERMAL TOTAL		0,0	0,0	0,0
	RENEWABLE(WIND+GEOTH.)		0,0	0,0	0,0
	DSİ ILISU	HYDRO	1200,0	3833,0	2459,0
	HYDRO TOTAL		1200,0	3833,0	2459,0
	YEAR TOTAL		1200,0	3833,0	2459,0
2015	THERMAL TOTAL		0,0	0,0	0,0
	RENEWABLE(WIND+GEOTH.)		0,0	0,0	0,0
	DSİ YUSUFELİ	HYDRO	540,0	1705,0	1129,0
	HYDRO TOTAL		540,0	1705,0	1129,0
	YEAR TOTAL		540,0	1705,0	1129,0

Note: DSI projects and Ambarlı-B N.G.C.C Power Plant constructed by EÜAŞ are currently under construction and remaining projects are granted by licence.

Abbreviations

TEİAŞ	Turkish Electricity Transmission Company
TETAŞ	Turkish Electricity Trading Company
EÜAŞ	Electricity Generation Company (State owned)
ETKB	Ministry of Energy and Natural Resources
EİGM	General Directorate of Energy Affairs
ÇEAŞ	Former Private Company (Transferred to EÜAŞ)
KEPEZ	Former Private Company (Transferred to EÜAŞ)
MYTM	National Load Dispatching Center
TEDAŞ	Turkish Electricity Distribution Company
EPDK	Energy Market Regulatory Authority
EPK	Electricity Market Law N0:4628
DSİ	State Hydraulic Works
ADÜAŞ	Private Generation Company
DTP	State Planning Organization
GDP	Gross Domestic Product
WASP	Wien Automatic System Planning (Planning Model to use for Electricity Generation Expansion Planning)
MAED	Model for Analysis of Energy Demand
BOT	Built-Operate-Transfer
BOO	Built-Operate-Own
TOR	Transfer of Operational Right