

REPUBLIC OF TURKEY PRIME MINISTRY
Investment Support and Promotion Agency of Turkey
ISPAT

Electricity Market in Turkey

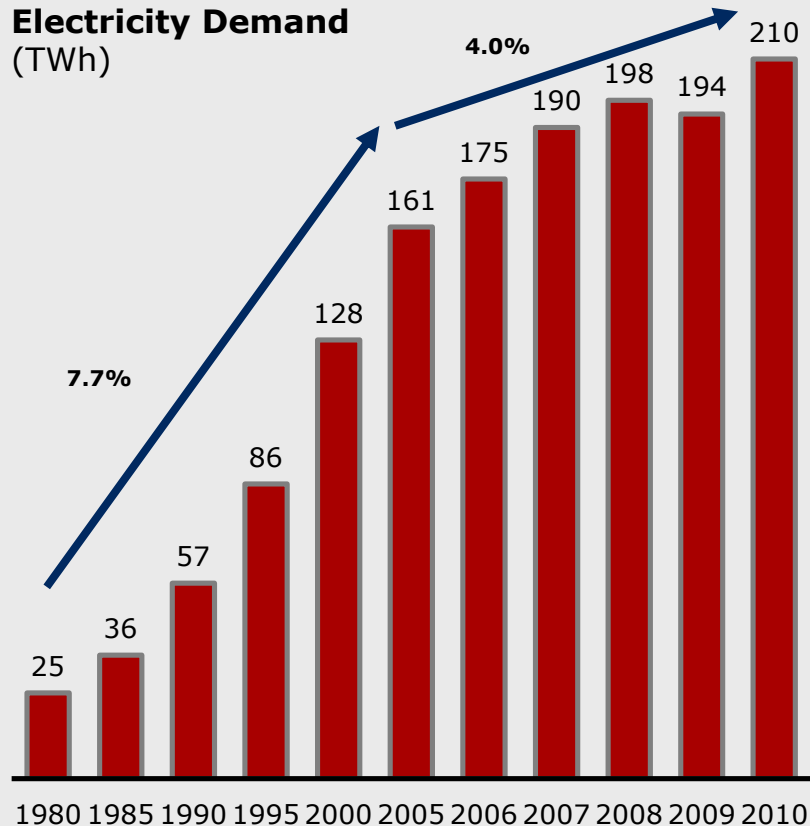
November 2012



Turkish Electricity Market – Growth Potential

6th biggest and one of the fastest growing electricity market in Europe

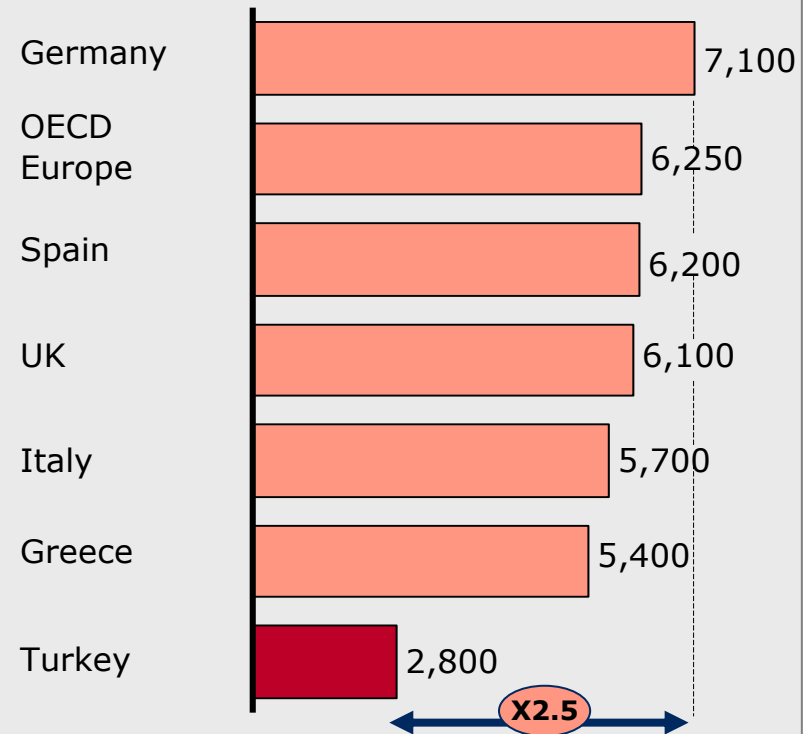
Rapid increase in the electricity demand ...



Source: Privatization Administration of Turkey, MENR

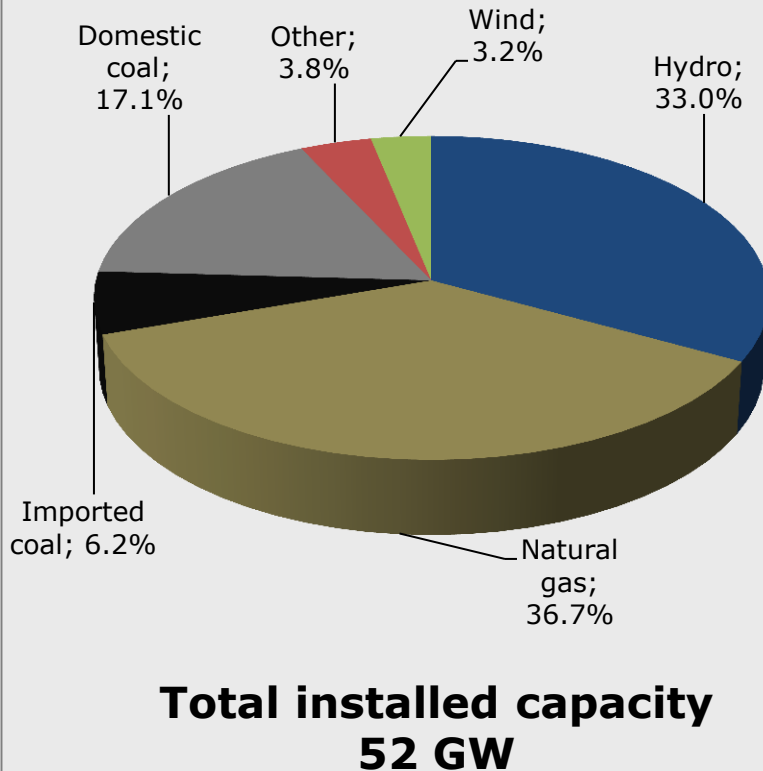
... and significant growth potential

Per capita electricity consumption - 2010 (KWh)



Turkish Electricity Market – Installed Capacity

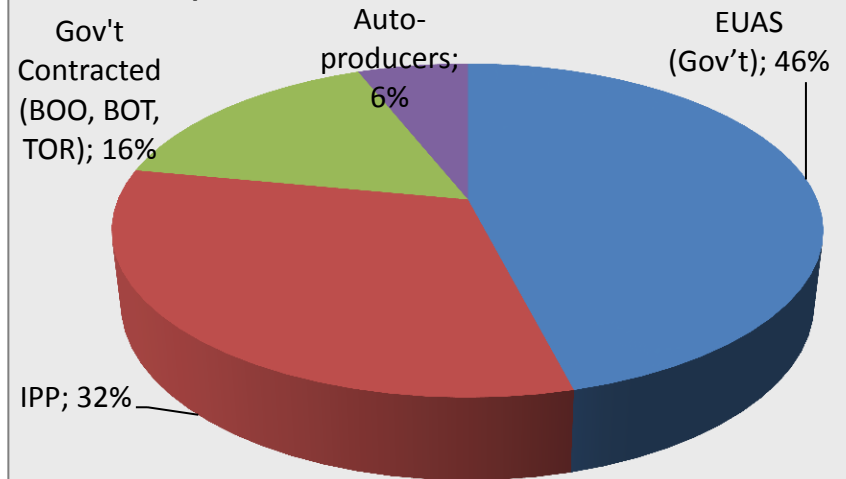
Breakdown of Installed Capacity (by fuel type)*



Breakdown of Installed Capacity (by generator type)*

Starting from 1990's, BOT, TOR and BOO models were adopted and electricity was sold to government entity through long-term contracts.

Since 2001, these models are not used. Private investors can sell generated electricity in market-terms.



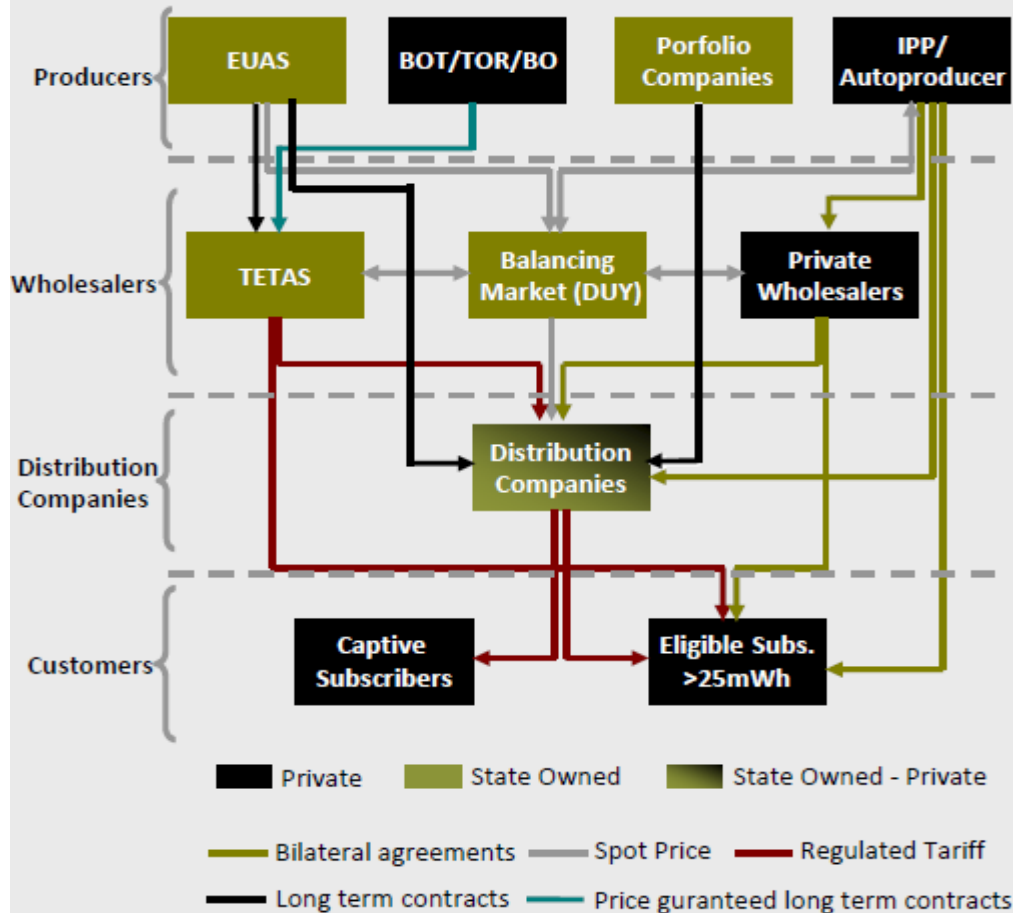
IPP share increased from 18% to 32% in 10 years

* As of October 2011



Turkish Electricity Market – Framework

Turkish Electricity Market is undergoing liberalization efforts to promote private sector investments



Balancing & Settlement Market (DUY)* is initiated in August 2006. It is operated by Turkish Market Financial Settlement Center (PMUM)**.

DUY is divided into Day Ahead Market and Balancing Settlement Market.

IPPs can sell electricity by DUY at the spot market price and/or by bilateral agreements at the contract price.

Eligibility threshold for a bilateral agreement is 25 MWh per year consumption (77% market opening degree). All consumers will become eligible in 2015.

Source: Garanti Securities

*DUY: Dengeleme ve Uzlaştırma Yönetmeliği

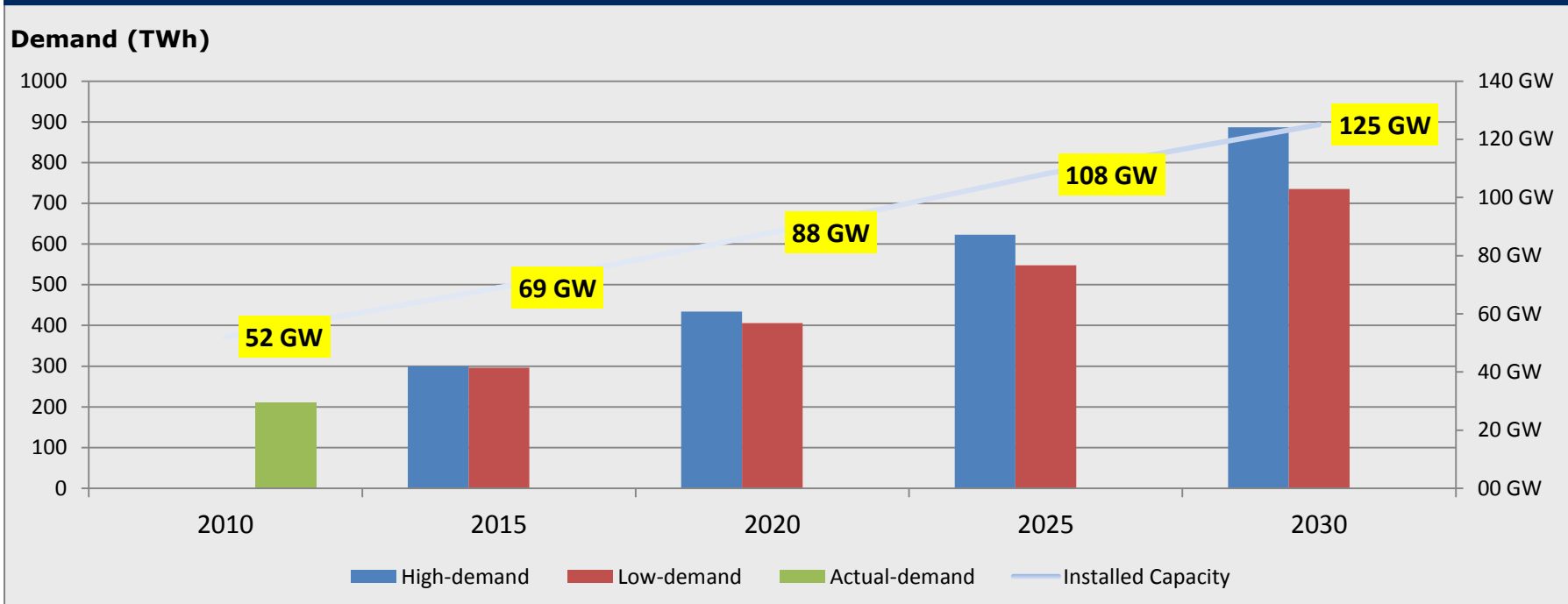
**PMUM: Piyasa Mali Uzlaştırma Merkezi



Turkish Electricity Market – Demand and Capacity Forecast

- Current total installed capacity is 52 GW. Installed capacity will be doubled by 2023 with 6% CAGR.
- Investment requirement on the generation side is estimated to be between \$180 and 210 billion until 2030.

Projections of High-Demand and Low-Demand (TWh) and Installed Capacity (GW)

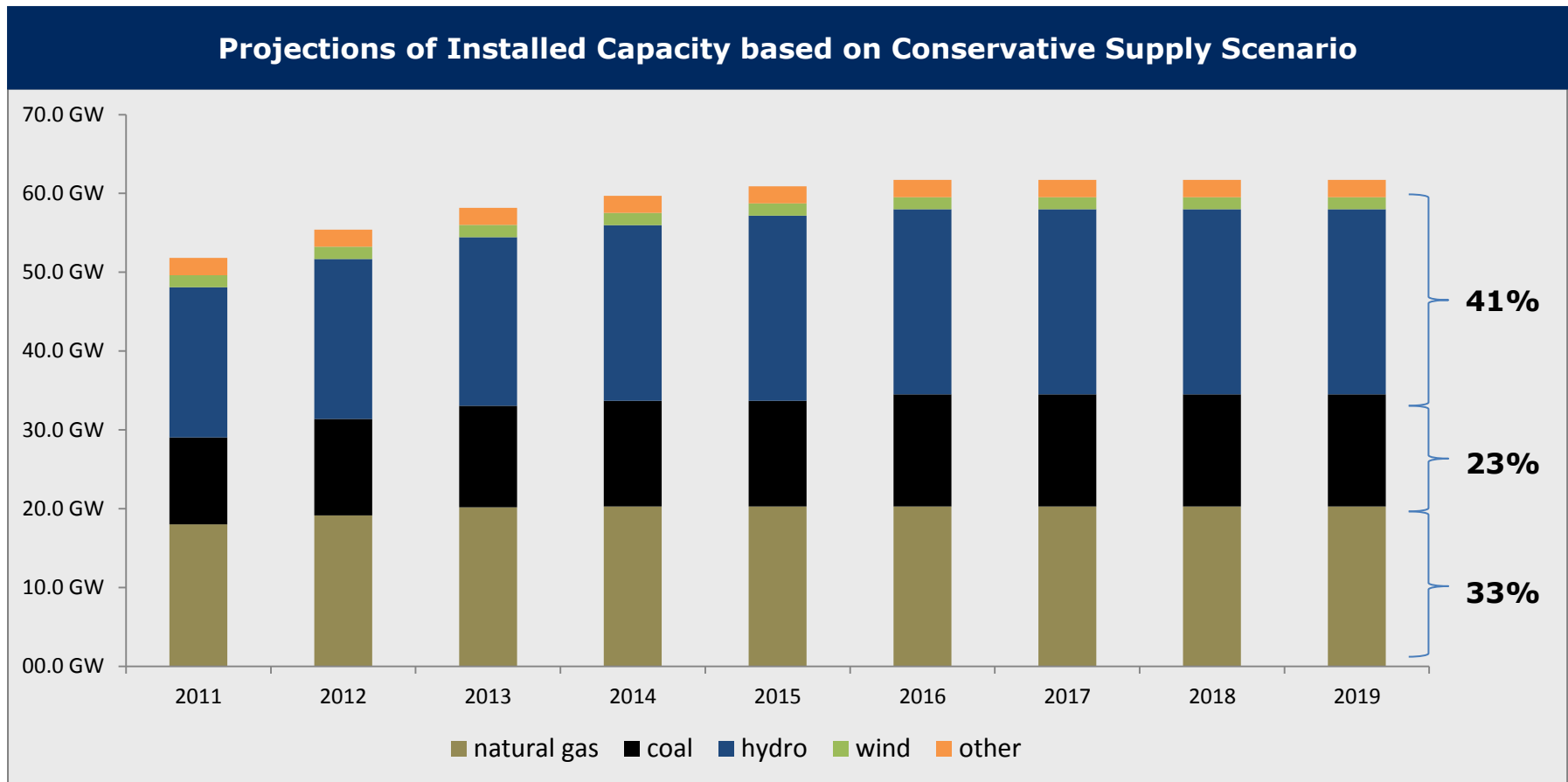


Source: TEIAS



Turkish Electricity Market –Capacity Forecast (with Licenses)

Installed capacity is forecasted based on power plants that are under construction and/or granted by license and expected to be in service on proposed time.



Source: TEIAS Capacity Projection Report 2010



Turkish Electricity Market – Strategy

Strategy

- To ensure supply security and increase supply quality
- To keep costs and prices at a competitive level to support economical growth
- To minimize the negative effects on the environment

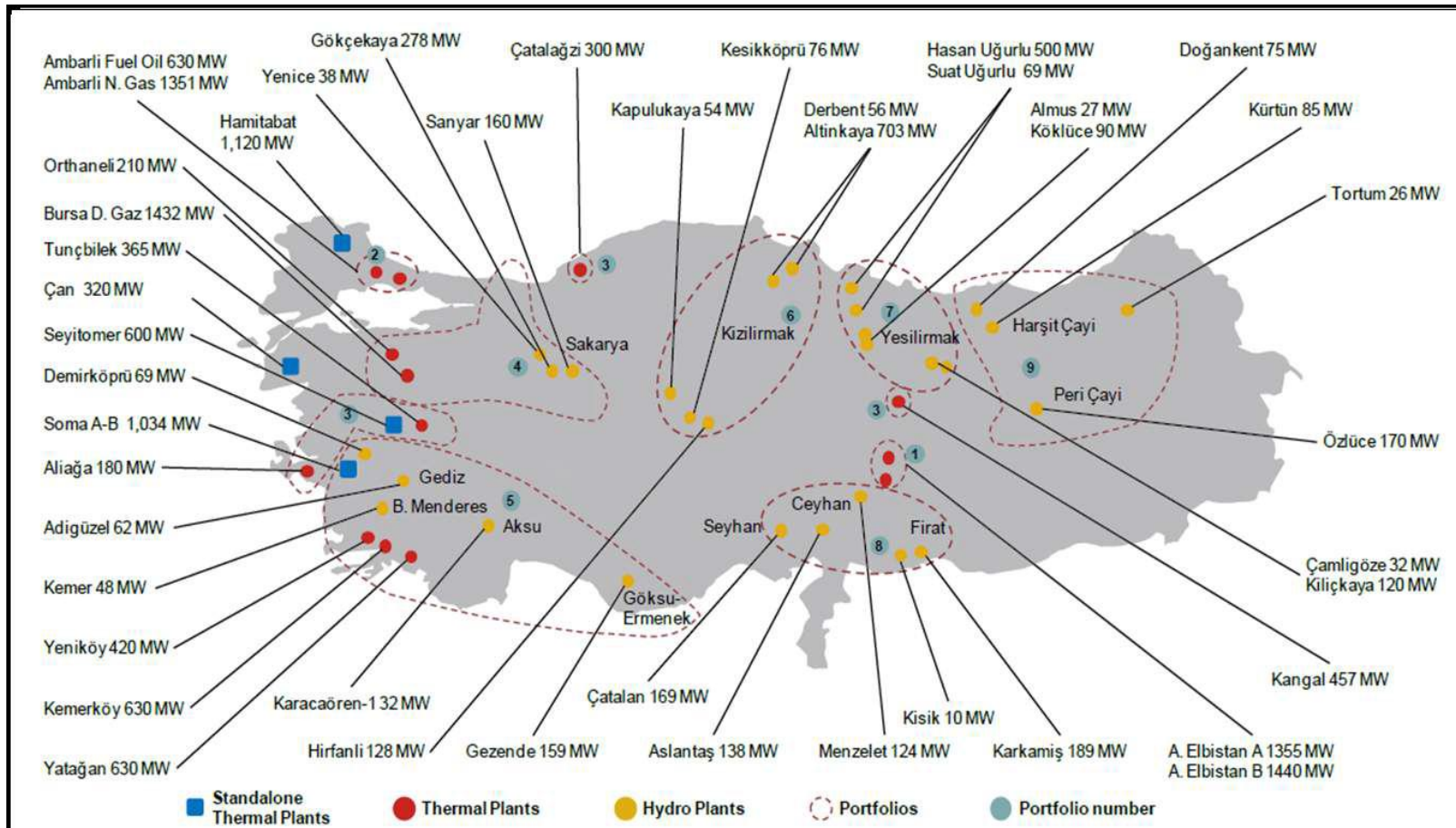
2023 Targets

- Full utilization of economically and technically feasible hydraulic potential and indigeneous coal reserves to decrease the share of gas in generation mix below 30%.
- Utilization of renewable energy potential in a cost effective manner and achieving below targets:
 - Share of renewables in generation mix will be increased to at least 30%.
 - Installed wind capacity target is 20,000 MW.
 - Installed geothermal capacity is 600 MW.
 - Installed solar capacity target is 3,000 MW.
- Introduction of nuclear energy



Privatization of Generation Assets – Map of Portfolios

Privatization of state generation assets includes 17 thermal and 28 hydro power plants that are owned by EUAS*. Total installed capacity for the power plants is 16 GW (out of 24 GW).



*EUAS: Elektrik Üretim AŞ - State Electricity Generation Company



Privatization of Generation Assets - Stand-Alone

4 out of 17 thermal power plants (**3,211 MW**) that are owned by EUAS are planned to be privatized on a stand-alone basis. This is 28.5% of EUAS's total thermal power generation.

Privatization of the stand-alone assets is expected to be completed in 2013.

The Privatization Administration's preference is to privatize the generation assets via share sale. Coal reserves will be privatized via through TOR (Transfer of Operating Rights) Agreements.

No	Plant Name	Fuel Type	Location	Age	Installed Capacity	2010 Generation	Tender Date
					(MW)	(GWh)	
1	Hamitabat	Natural Gas	Kirklareli	26	1,120	5,750	November 2012
2	Kangal	Lignite	Sivas	20	457	2,313	January 2013
3	Seyitömer	Lignite	Kütahya	38	600	3,623	December 2012
4	Soma	Lignite	Manisa	30	1,034	3,897	2013 (expected)



Privatization of Generation Assets – Portfolios 1 to 4

13 thermal power plants and 28 hydro power plants (**13,138 MW**) that are owned by EUAS are planned to be privatized under 9 portfolios.

Privatization timeline is not certain. Tenders are expected after the stand-alone assets are fully privatized.

Hydro power plants will be privatized through TOR (Transfer of Operating Rights) Agreements.

Portfolio No	Plant Name	Fuel Type	Location / River	Age	Installed Capacity (MW)	Total MW	2010 Generation (GWh)	Total GWh
1	A. Elbistan A	Lignite	Afşin, K.Maraş	27	1,355	2,795	2,042	9,736
	A. Elbistan B	Lignite	Afşin, K.Maraş	7	1,440		7,694	
2	Ambarlı D.Gaz	Natural gas	Ambarlı, İstanbul	23	1,351	1,981	7,941	8,003
	Ambarlı F.Oil	Fuel-oil	Ambarlı, İstanbul	44	630		62	
3	Aliağa	Natural Gas	Aliağa, İzmir	36	180	865	251	5,934
	Çan	Lignite	Çan, Çanakkale	8	320		2,141	
	Tunçbilek	Lignite	Tunçbilek, Kütahya	55	365		1,659	
	Çatalağzı	Hard Coal	Işıkveren, Zonguldak	22	300		1,883	
4	Bursa D.gaz	Natural Gas	Ovaakça, Bursa	13	1,432	2,118	7,098	9,271
	Orhaneli	Lignite	Orhaneli, Bursa	19	210		1,174	
	Gökçekaya	Hydro	Sakarya	38	278		505	
	Sarıyar	Hydro	Sakarya	55	160		366	
	Yenice	Hydro	Sakarya	10	38		128	



Privatization of Generation Assets – Portfolios 5 to 9

Portfolio No	Plant Name	Fuel Type	Location / River	Age	Installed Capacity (MW)	Total MW	2010 Generation (GWh)	Total GWh
5	Kemerköy	Lignite	Milas, Muğla	18	630	2,050	2,720	7,218
	Yatağan	Lignite	Yatağan, Muğla	29	630		2,599	
	Yeniköy	Lignite	Milas, Muğla	25	420		1,308	
	Demirköprü	Hydro	Gediz	51	69		138	
	Adigüzel	Hydro	Büyük Menderes	15	62		129	
	Kemer	Hydro	Büyük Menderes	53	48		122	
	Karacaören-1	Hydro	Aksu	21	32		149	
	Gezende	Hydro	Göksu, Ermenek	17	159		53	
6	Altınkaya	Hydro	Kızılırmak	24	703	1,017	1,372	2,267
	Derbent	Hydro	Kızılırmak	20	56		300	
	Hirfanlı	Hydro	Kızılırmak	51	128		274	
	Kesikköprü	Hydro	Kızılırmak	44	76		171	
	Kapulukaya	Hydro	Kızılırmak	22	54		150	
7	Hasan Uğurlu	Hydro	Yeşilirmak	32	500	838	1,722	3,380
	Suat Uğurlu	Hydro	Yeşilirmak	29	69		434	
	Almuş	Hydro	Yeşilirmak	45	27		117	
	Köklüce	Hydro	Yeşilirmak	23	90		480	
	Kılıçkaya	Hydro	Yeşilirmak – Kelkit	21	120		488	
	Çamlıgöze	Hydro	Yeşilirmak – Kelkit	11	32		199	
8	Çatalan	Hydro	Seyhan	14	169	620	497	2,379
	Aslantaş	Hydro	Ceyhan	27	138		763	
	Menzelet	Hydro	Ceyhan	19	124		658	
	Karkamış	Hydro	Fırat	12	189		461	
9	Doğankent	Hydro	Harşit Çayı	40	75	356	312	1,279
	Kürtün	Hydro	Harşit Çayı	8	85		189	
	Tortum	Hydro	Tortum Gölü	51	26		128	
	Özlüce	Hydro	Peri Suyu	12	170		650	

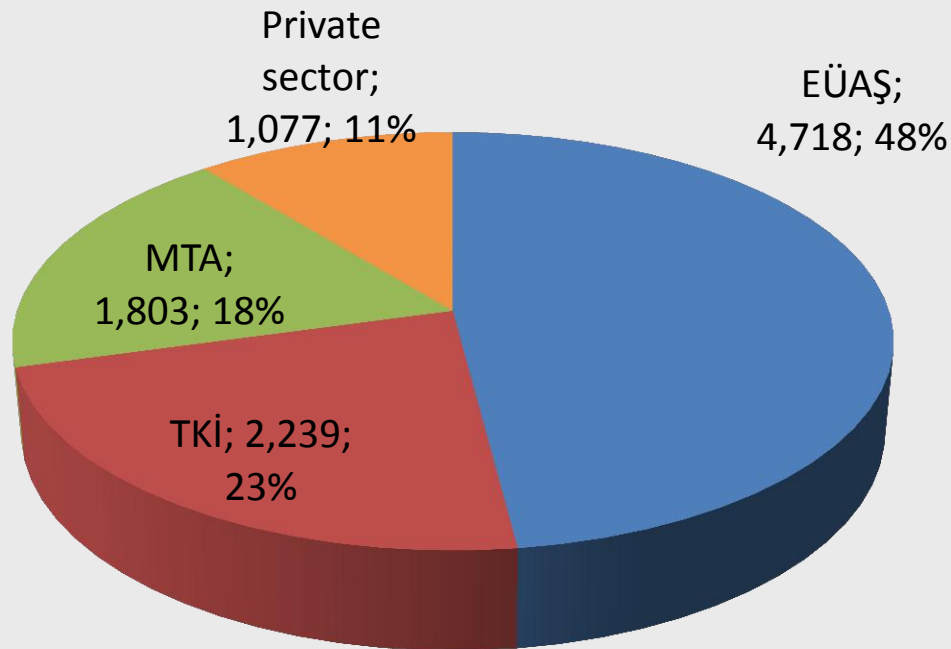


Lignite - Overview

Turkey's lignite reserves amount to **11.5 billion tonnes** → 6% of world's lignite reserves

86% of lignite reserves are operated by public sector

Proven Lignite Reserves by Operating Entity as of 2009 (million tonnes)



EÜAŞ: Elektrik Üretim AŞ - State Electricity Generation Company

TKİ: Türkiye Kömür İşletmeleri - Turkish Coal Enterprises

MTA: Maden Tetkik Arama - State Mineral Research and Exploration Directorate General



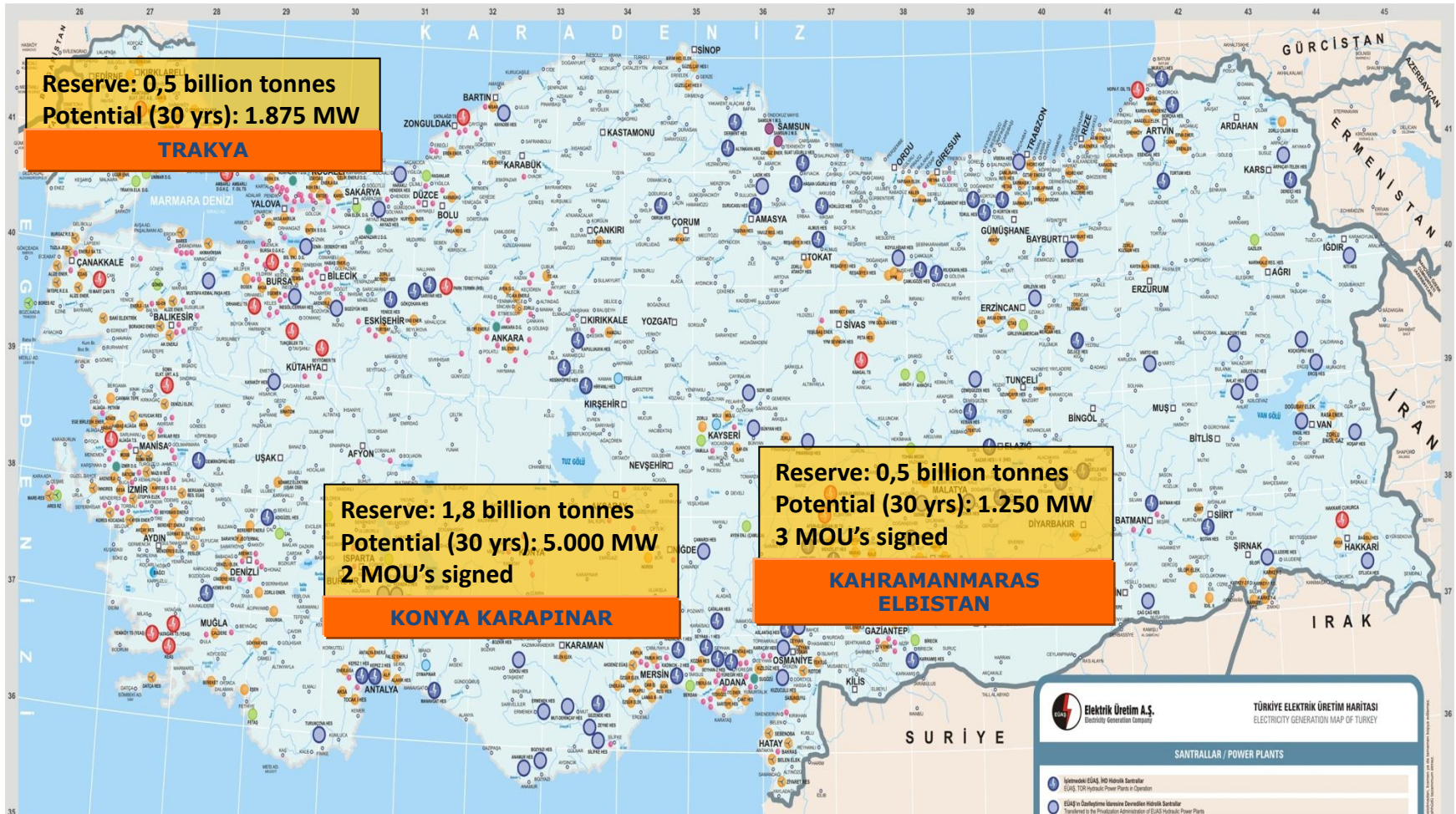
Lignite - TKI Reserves and Power Plant Tenders

Pursuant to a Royalty Agreement, private company will build a power plant in exchange for getting permission to use the lignite reserve that is owned by TKI. Tenders are done based on a royalty fee (krş/kWh) for the generated electricity.

Location	Reserve (tonnes)	Cal. Value (Kcal/kg)	Plant Min. Cap. (MW)	Tender Date
Tufanbeyli, ADANA	323 million	1300-1400	600	May 2012 – Teo Group
Soma-Deniş, MANİSA	150 million	1250-1400	450	Aug 2012 - Kolin
Keleş-Davutlar, BURSA	55 million	2100-2200	270	Nov 2012 - Çelikler
Tunçbilek, KÜTAHYA	117 million	2200-2650	450	Feb/Mar 2013 (expected)
Yeniköy, MUĞLA	50-60 million	2400	420 (2x210)	May 2013 (expected)
Çan, ÇANAKKALE	45 million	2650	210	2013 (expected)
Soma, MANİSA		1800	640 (2x320)	TBD
Soma, MANİSA	1.6 billion m3 SNG	8300	1500	TBD
Total	1 billion		4,540 MW	

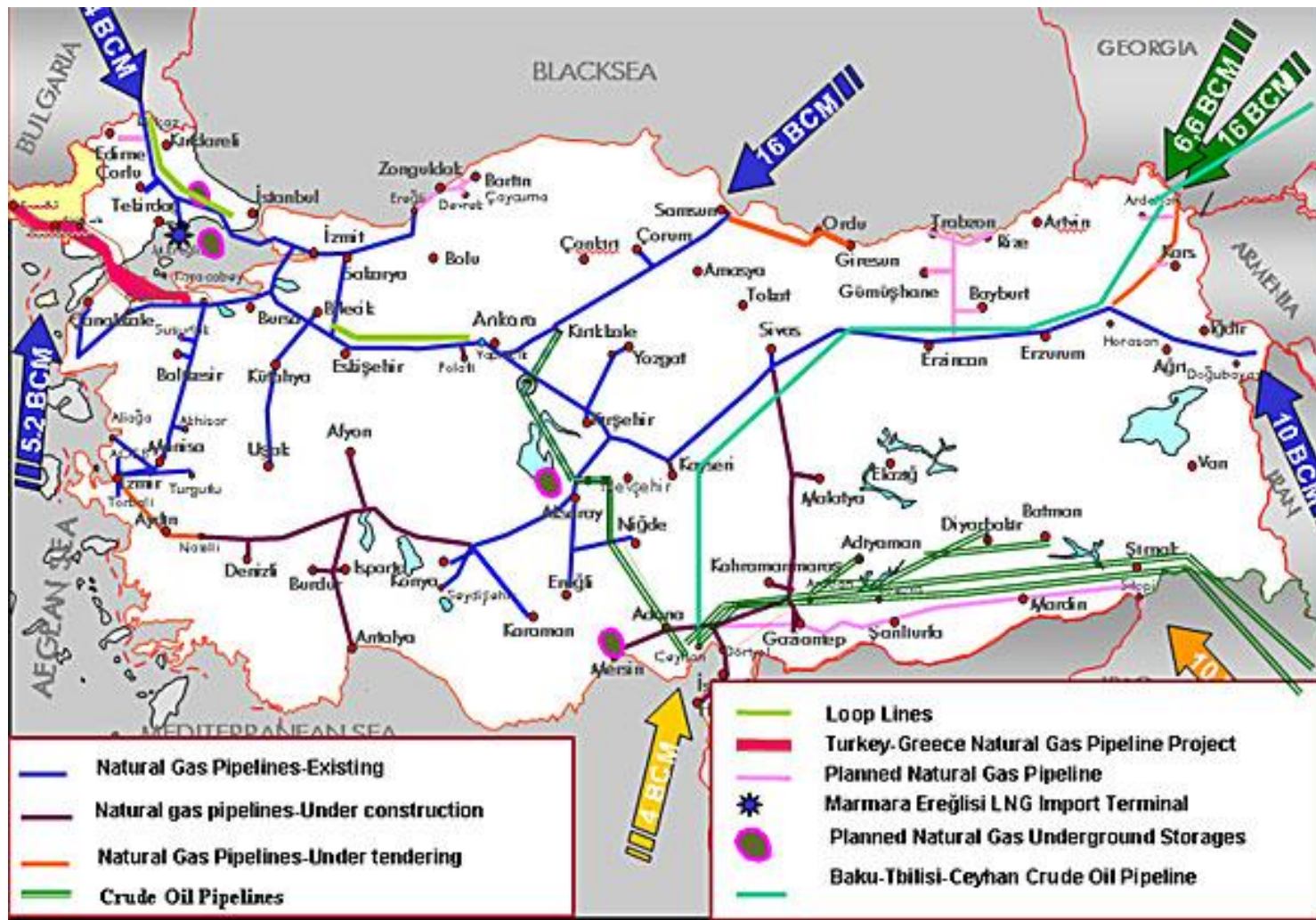


Lignite – Newly Found Reserves



Oil & Natural Gas - Turkey as an Energy Corridor and Terminal

Turkey is located in close proximity to 71.8% of world's proven gas and 72.7% of oil reserves



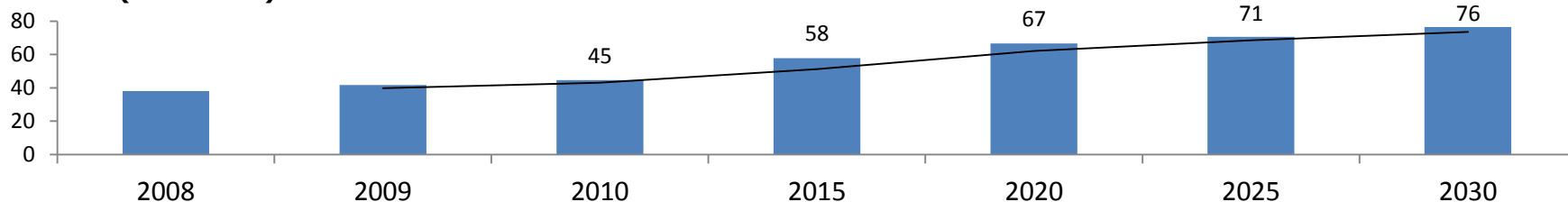
Oil & Natural Gas – Existing Natural Gas Supply Contracts

Turkey's Existing Natural Gas Supply Contracts

Countries	Volume (bcm/yr)	Date of Signature	Duration (yrs)	Status
Russian Fed. (West)	6	14 Feb 1986	25	In operation (extended)
Algeria (LNG)	4	14 Apr 1988	20	In operation
Nigeria (LNG)	1,2	9 Nov 1995	22	In operation
Iran	10	8 Aug 1996	25	In operation
Russian Fed. (Black Sea)	16	15 Dec 1997	25	In operation
Russian Fed. (Blue Stream)	8	18 Feb 1998	23	In operation
Turkmenistan	16	12 May 1999	30	-
Azerbaijan	6,6	12 Mar 2001	15	In operation

Projections of Total Demand for Natural Gas

Demand (billion m3)



Source: BOTAŞ

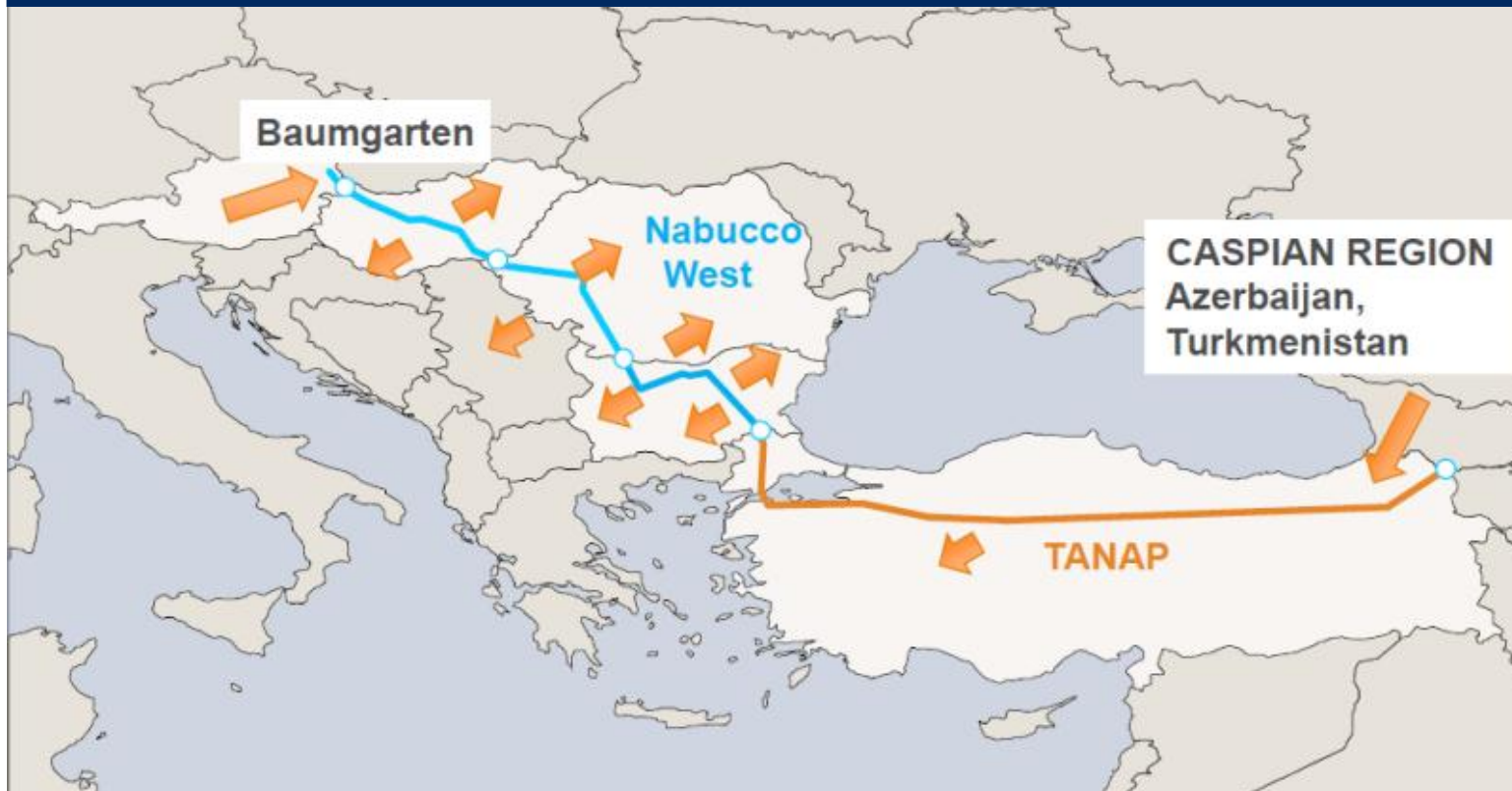


Oil & Natural Gas - Diversification of Gas Supply Resources

TANAP is \$7 billion natural gas pipeline project that will transport gas from Shah Deniz II.

Planned capacity of the pipeline is 16 billion m³ gas in 2020 (6 billion to Turkey), 23 billion in 2023 and 31 billion in 2026.

TANAP (Trans Anatolian Gas Pipeline) - from Azerbaijan through Turkey to Europe

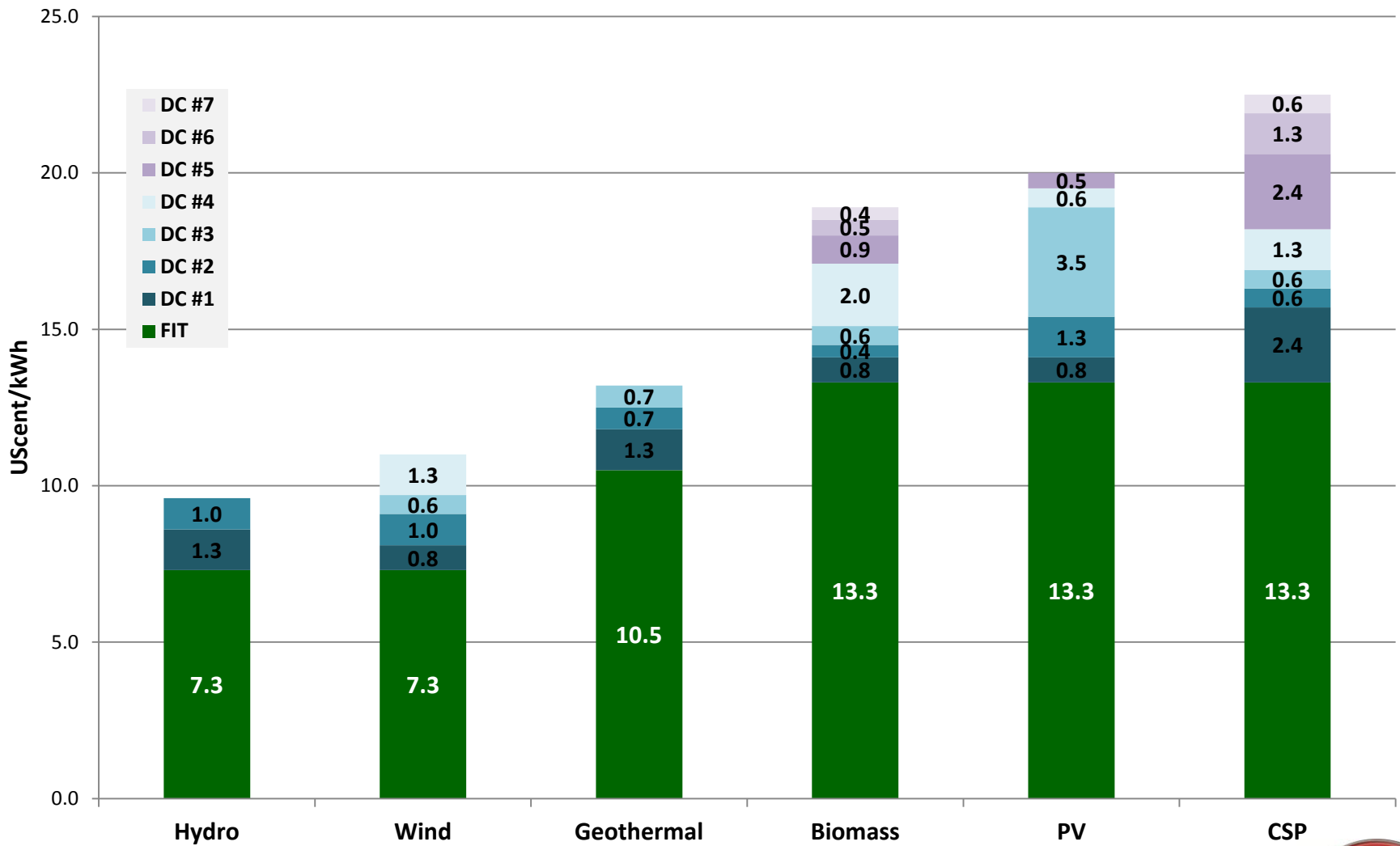


Renewables –Incentives

- FIT scheme
 - Differentiated FIT scheme based on RER type (Table I)
 - Extra premiums for domestic components (Table II)
- Connection priorities
- Lower license fees:
 - Only 1% of licensing fee
 - Exemption to pay annual license fee for 8 years in operation
- License exemptions in exceptional circumstances, and
- Various practical conveniences in project preparation and land acquisition.



Renewables – FIT Scheme



Renewables – Local Content Example for Wind

PART (aksam)	ADDITIONAL FIT FOR THE PARTS	COMPONENT (aksamı oluşturan parçalar)	RATIO OF DOMESTIC PARTS	ADDITIONAL FIT FOR THE COMPONENTS
Blade	0.8 USDc/kWh	Blade and rotor hub fittings	100%	$0.8 * 100\% = 0.8 \text{ USDc/kWh}$
Generator and power electronics	1.0 USDc/kWh	Generator	55%	$1.0 * 55\% = 0.55 \text{ USDc/kWh}$
		Power Electronics	45%	$1.0 * 45\% = 0.45 \text{ USDc/kWh}$

Firma hangi durumlarda Additional FIT'ten faydalanabilir?

Firmanın additional FIT'ten faydalanabilmesi için aksamın %55'inin Türkiye'de üretilmiş olması gerekiyor. Aksamın %55'ini bulmak için aksamı oluşturan parçalara bakıyoruz. Türkiye'de üretilen parçaların oranları toplamı %55'e ulaşıyor ya da ondan fazlaysa o aksam Türkiye'de üretilmiş sayılıyor.

Örnek 1: Firma sadece jeneratörü Türkiye'den alıyor. Jeneratör parçasının oranı %55 olduğu için, firma jeneratör ve güç elektroniği aksamına verilen 1.0 USDc/kWh FIT'ten yararlanabilir. Yararlanma miktarı ise $1.0 * 55\% = 0.55 \text{ USDc/kWh}$ olacaktır.

Örnek 2: Firma jeneratörü Türkiye'den almıyor, sadece güç elektroniğini Türkiye'den alıyor. Güç elektroniği parçasının oranı %45 olduğu için, firma jeneratör ve güç elektroniği aksamına verilen 1.0 USDc/kWh FIT'ten yararlanamaz.

Örnek 3: Firma jeneratör ve güç elektroniği parçalarını Türkiye'den alıyor. Jeneratör ve güç elektroniği parçalarının oranı $\%55 + \%45 = \%100$ olduğu için, firma jeneratör ve güç elektroniği aksamına verilen 1.0 USDc/kWh FIT'ten yararlanabilir. Yararlanma miktarı ise $(1.0 * 55\%) + (1.0 * 45\%) = 0.55 + 0.45 = 1.0 \text{ USDc/kWh}$ olacaktır.

Örnek 4: Kanadı oluşturan tek bir parça tanımlanmış: Kanat ve rotor göbeği bağlantı elemanları. Bu parça Türkiye'de üretilirse aksam Türkiye'de üretilmiş sayılıyor. Dolayısıyla kanat Türkiye'de üretilirse firma $0.8 * 100\% = 0.8 \text{ USDc/kWh}$ kadar additional FIT'ten yararlanabilir.



Renewables – Investment Opportunities and Timeline

Resource	Targets and Timeline
Hydro	40 GW potential; about 18 GW operational, 20 GW is expected to be developed by IPP's by 2023
Wind	48 GW potential; 2 GW operational, about 11 GW licensed; new license applications expected to start from 2013
Solar	380 billion kWh/y potential; 3 GW target; License applications for 600 MW in June 2013
Biomass	8.6 MTOE; 15.6 MW operational.
Geothermal	600 MW target; 94.2 MW operational and another 127.5 MW under construction.

