

# The Energy Sector: A Quick Tour for the Investor



REPUBLIC OF TURKEY PRIME MINISTRY  
INVESTMENT SUPPORT AND  
PROMOTION AGENCY



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**November 2013**



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# Glossary of Terms

Acronym	Definition
<b>BCM</b>	Billion Cubic Meters
<b>BO</b>	Build Operate
<b>BOT</b>	Build Operate Transfer
<b>BOTAŞ</b>	State-Owned Natural Gas and Petroleum Pipeline Corporation
<b>BRIC</b>	Brazil, Russia, India, China
<b>BSR</b>	Balancing and Settlement Regulation
<b>CAGR</b>	Compound Annual Growth Rate
<b>CCGT</b>	Combined Cycle Gas Turbine
<b>DisCo</b>	Distribution Company
<b>EIU</b>	Economist Intelligence Unit
<b>EML</b>	Electricity Market Law
<b>EMRA (EPDK)</b>	Energy Market Regulatory Authority
<b>ENTSO-E</b>	European Network of Transmission System Operators for Electricity

Acronym	Definition
<b>EPIAŞ</b>	Independent Energy Exchange (to be established)
<b>EU</b>	European Union
<b>EÜAŞ</b>	State-Owned Generation Company
<b>FDI</b>	Foreign Direct Investment
<b>GDP</b>	Gross Domestic Product
<b>GW</b>	Gigawatt
<b>GWh</b>	Gigawatt Hours
<b>HEPP</b>	Hydroelectric Power Plant
<b>IEA</b>	International Energy Association
<b>IPP</b>	Independent Power Producer
<b>LNG</b>	Liquefied Natural Gas
<b>LPG</b>	Liquefied Petroleum Gas
<b>M&amp;A</b>	Mergers and Acquisitions



# Glossary of Terms

Acronym	Definition
<b>MENR</b>	Ministry of Energy and Natural Resources
<b>MFSC</b>	Market Financial Settlement Center
<b>MTA</b>	General Directorate of Mineral Research and Exploration
<b>MVA</b>	Megavolt Ampere
<b>NG</b>	Natural Gas
<b>NGML</b>	National Gas Machinery Laboratory
<b>NGO</b>	Non-Governmental Organization
<b>OECD</b>	Organization for Economic Co-operation and Development
<b>OSB</b>	Organized Industrial Zones
<b>PMUM</b>	State-Owned Market Operator within TEİAŞ
<b>R&amp;D</b>	Research and Development
<b>REL</b>	Renewable Energy Law
<b>TCE</b>	Ton Coal Equivalent

Acronym	Definition
<b>TEDAŞ</b>	State-Owned Distribution Company
<b>TEİAŞ</b>	State-Owned Transmission Company
<b>TETAŞ</b>	State-Owned Wholesale Company
<b>TKİ</b>	Turkish Coal Enterprises
<b>TOE</b>	Tons Oil Equivalent
<b>TOR</b>	Transfer of Operating Rights
<b>TPAO</b>	Turkish Petroleum Corporation
<b>TTK</b>	Turkish Hard Coal Authority
<b>TÜBİTAK</b>	Scientific and Technological Research Council of Turkey
<b>TÜİK</b>	Turkish Statistical Institute
<b>US\$</b>	United States Dollar
<b>USDC</b>	Unit Service and Depreciation Charge
<b>VAT</b>	Value Added Tax



# Executive Summary

- This report provides insights into the Turkish energy sector and aims to provide prospective investors with a view of the sector with high-level analyses of sub-sectors.
- Turkey is the 17th largest economy in the world and the 6th largest in Europe with a GDP of approx. USD 786 billion in 2012. With an economic boom of 9.3% and 8.8% in 2010 and 2011 and a slow down to 2.2% in 2012, Turkey is expected to grow by 3.5% in 2013, 4.9% in 2014, 5.1% in 2015, 5.0% in 2016 and 4.9% in 2017.
- As a fast-growing country, energy consumption in Turkey is on the rise. The Turkish electricity market is one of the fastest growing in the world, with approx. 9% annual growth on average, in 2010 and 2011. Natural gas demand is expected to increase with a CAGR of 2.9% until 2020 according to the Ministry of Energy and Resources. This growing demand calls for new investments.
- With the on-going liberalization process, the Turkish energy sector is becoming more vibrant and competitive, attracting the attention of more investors for each component of the value chain in all the energy sub-sectors.
- The investment climate of Turkey has increasingly become more welcoming to international investors, making the country among the most important investment destinations in the world. The energy sector alone has made 32% of the deal volume through privatizations and private sector transactions in 2012.
- Several incentives are available for both CAPEX and OPEX. Moreover, a significant amount of funds are available for possible projects. Major Turkish financial institutions see the value within the energy sector and are eager to invest in profitable new projects.
- The number of skilled labor is increasing as energy-specific vocational schools and university departments (both undergraduate and graduate) are being established in Turkey. The private sector's involvement in the Turkish energy field started about a decade ago, and those in this market are all seasoned professionals with noteworthy experience.
- Investment opportunities exist in almost all components of the value chain for electricity, natural gas, oil and coal.



# B. General Overview

i. Overview of the Global Energy Sector

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ii. Investment Enablers of the Turkish Energy Market

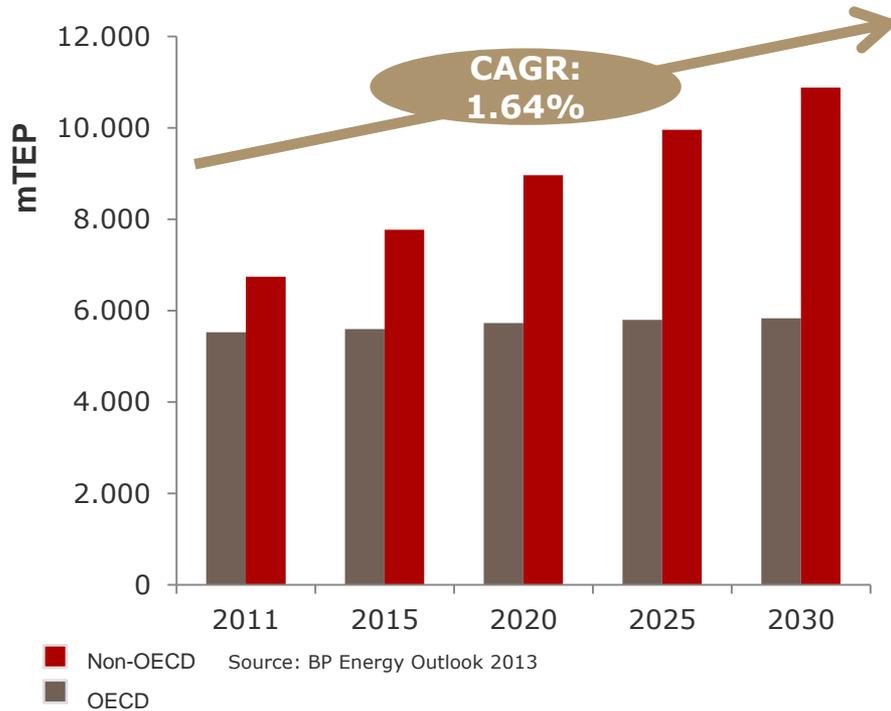
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iii. Market Information



# The demand for energy is constantly growing, keeping secure supplies at the forefront of our global agenda.

## Global Energy Demand (2011-2030)



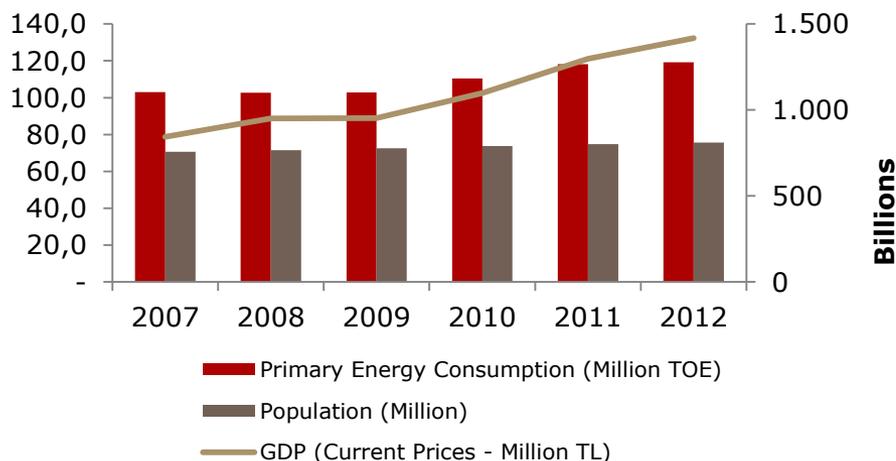
- Population and GDP growth are the two main factors affecting energy demand. The demand on global energy dramatically increased 48% between 1990 and 2010. It is expected that global primary energy demand will increase at a CAGR of 1.64% until 2030, which will keep supply security on the agenda.

- Growing demand - driven by population and industrial growth - in emerging markets calls for an increase in the supply capacity as well as diversity in the energy generation mix. Diversification of primary energy supplies reduces dependency on a single source and contributes to supply security.
- Developing countries, including Turkey are expected to constitute 93% of the growth in demand.
- Global energy consumption will continue to increase, with primary energy consumption having reached 12.4 million tons oil equivalent for an increase of 1.8% in 2012.
- Global oil consumption was 4.1 million tons in 2012 with an increase of 0.9% with respect to the previous year.
- World nuclear generation decreased in 2012: The change in 2012 compared with 2011 was -6.9%. The Fukushima nuclear accident triggered the decrease in nuclear energy generation. This situation also paved the way for renewables and natural gas.
- According to IEA, shale gas caused a decline in gas prices, increasing the demand on natural gas and LNG.



# Turkey's booming economy keeps energy – and the demand for energy - at the top of our agenda.

- Over the past decade, demand in the Turkish electricity market has been growing in line with its economic developments, driven by industrialization and urbanization. This situation together with population growth expectations shows great potential for further growth.
- Primary energy consumption between 2007 and 2012 increased at a CAGR of 2%. According to the Economist Intelligence Unit (EIU), energy demand in Turkey will increase at an annual rate of 4.5% until 2015 in alignment with the growth expected within the GDP.



- The Turkish electricity market is one of the fastest growing in the world, with an average of approx. 9% annual growth in 2010 and 2011.
- Similar to the electricity market, natural gas consumption in Turkey is growing as well. Natural gas consumption in Turkey reached approx. 46 bcm in 2012 demonstrating an increase of 4.7% compared to the previous year. Natural gas demand is expected to grow by 2.9% annually until 2020 according to the Ministry of Energy and Resources.
- Distribution sales of gasoline, diesel oil and fuel oil products increased by 3.8%, which corresponds to 18.2 million tons in 2012. Crude oil imports increased by 7% and reached 19.5 million tons in 2012.
- Turkey is still lagging behind the per capita energy consumption indicator in comparison with the OECD average, which shows that there is still more room for further growth, in alignment with increasing per capita GDP. As of 2012, Turkey is below the OECD average of 62.8 BTU per capita compared to 182 million BTU per capita OECD average.

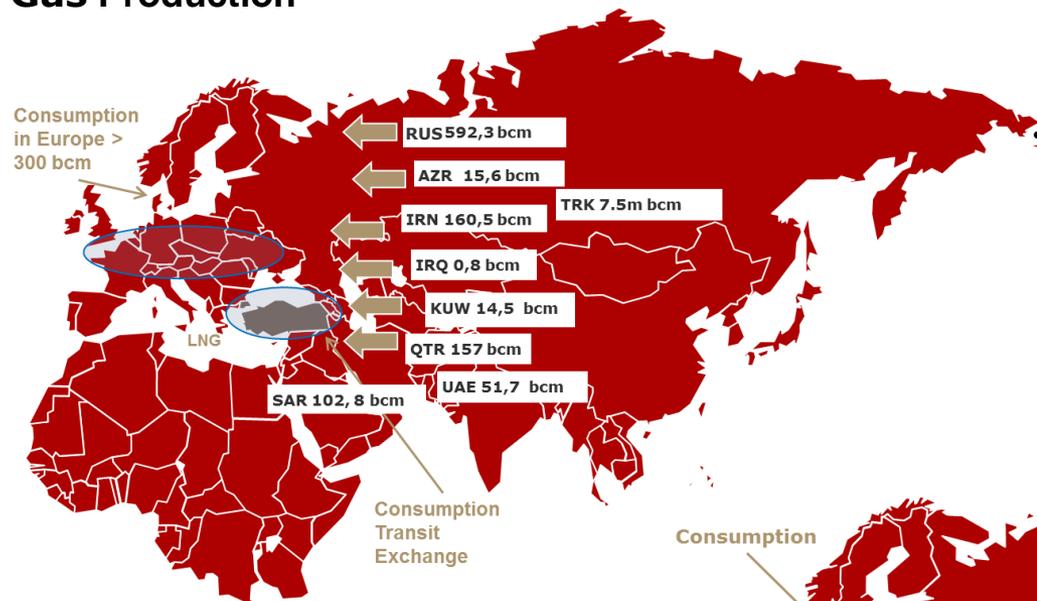
Source: TÜİK, EPDK

Note: 1998 current prices were used for GDP data.



# Turkey is at the crossroads of consumption and production: a natural bridge.

## Gas Production

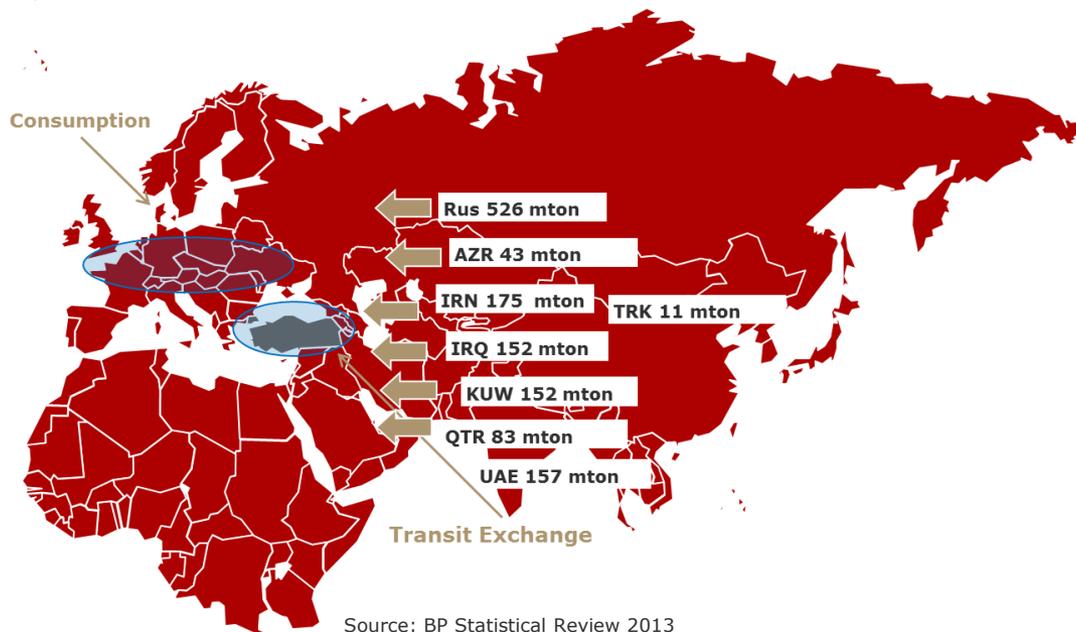


Source: BP Statistical Review 2013

- Turkey's position is critical for the export and import of petroleum as it straddles the demand-rich west to supply-rich east.

- Even though Turkey is limited in primary energy resources and is dependent on imported energy, it acts as a bridge between the world's crucial supply and demand regions.
- Having a position central to the regions of Europe, the Balkans, the Aegean, the Black Sea, the Caucasus-Caspian Basin and Central Asia, Turkey is a natural transit country for maritime and pipeline transportation of gas and oil.

## Petroleum Production



Source: BP Statistical Review 2013

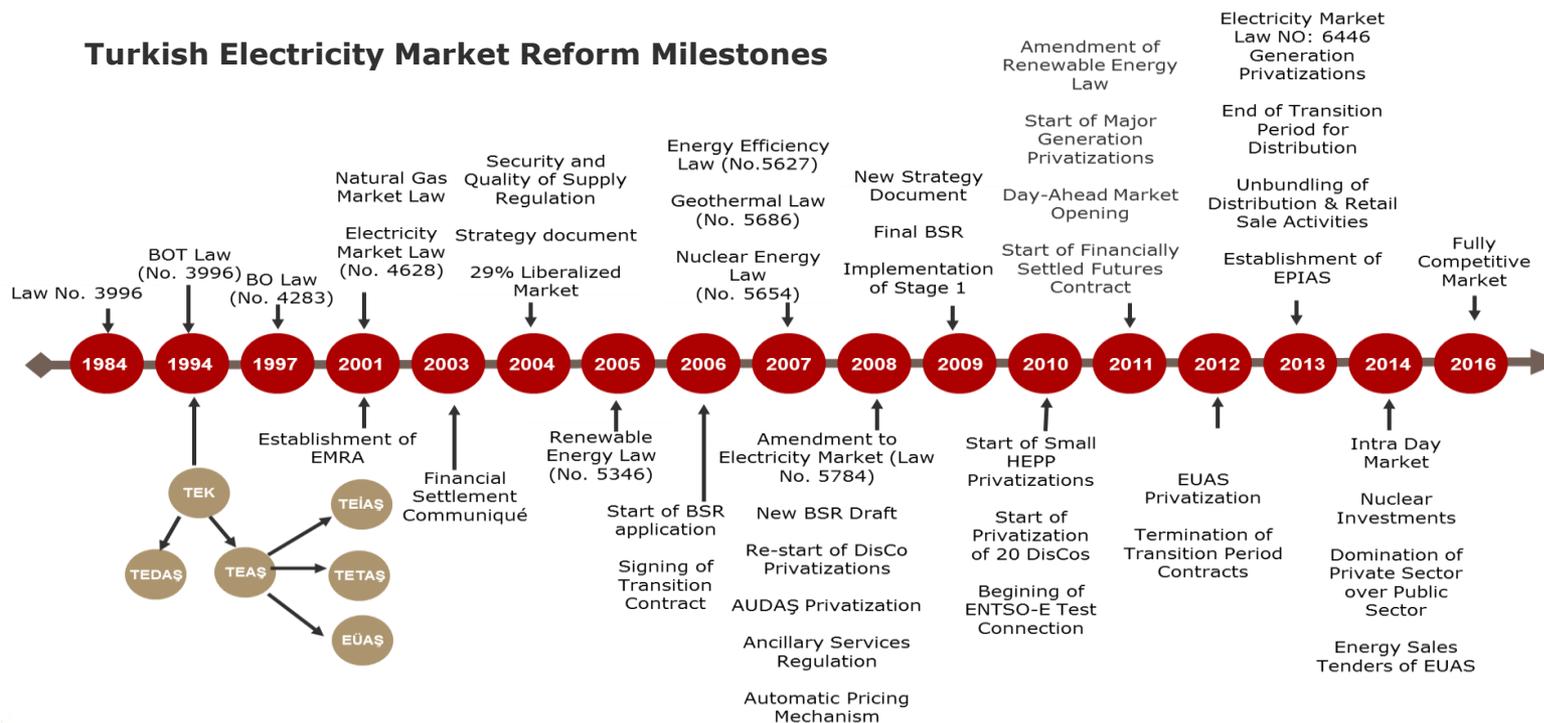


# Turkey's journey to liberalization: from an entirely state-owned energy sector to an entirely competitive one.

## Liberalization & Privatization

- The energy sector in Turkey is exclusively marked by its journey toward liberalization, with the electricity sector holding a leading role. The liberalization of the Turkish electricity market is a rather long and ambitious story, starting in late 1980s and progressing rapidly in the last decade. The transition to a free market has been an obvious necessity with decision-makers well aware of this necessity: it became evident that the ever-increasing demand for electricity could not be met solely by public resources and the additional resources needed to meet this demand required extensive investments.
- The liberalization process constantly increases the competitiveness of the market, while privatizations offer a variety of investment opportunities which also serve the purpose of increasing competitiveness.

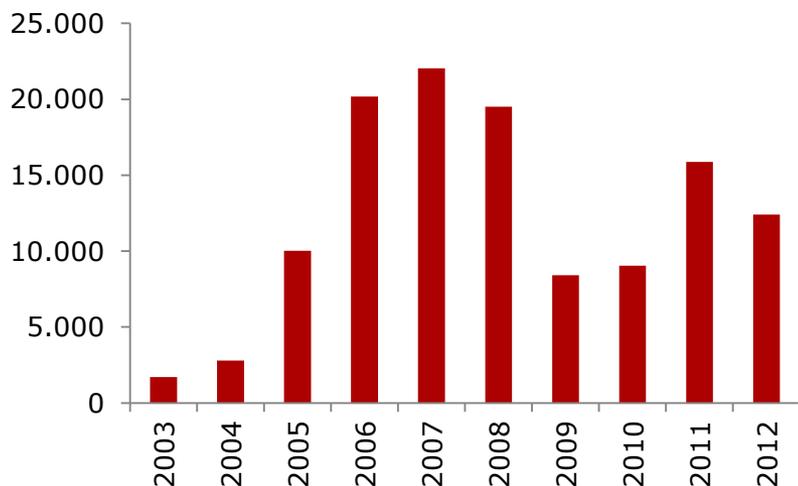
### Turkish Electricity Market Reform Milestones



# Turkey is a sought-after FDI destination and is expected to further attract FDI inflow in the upcoming years.

## FDI Inflows to Turkey

USD Million - Current Prices - Year-on-Year Exchange

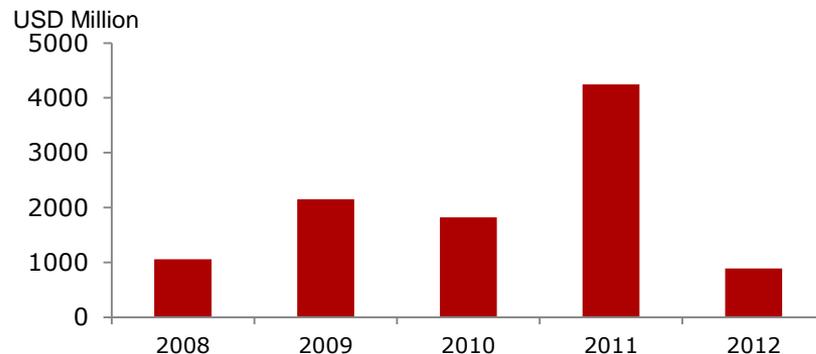


Source: Euromonitor A: Actual

- Turkey has become an attractive destination for FDI. From the weak FDI inflows in 2002, Turkey has experienced a significant increase in recent years, reaching USD 22 billion in 2007.
- Compared with FDI inflows of 2002, the significant addition of USD 11 billion was incurred in 2012.

- The majority of FDI inflows to Turkey come from EU member countries, followed by North America and Asia.
- Turkey had a peak in FDI inflows in 2007 and faced a decrease in inward FDIs in 2008 and 2009 due to the economic crisis. With promising macro-economic figures and underdeveloped potential, forecasts show FDI will steadily increase in upcoming years.
- More than USD 2.3 billion of electricity generation investments were realized between 2004 and 2012. The countries that invested the most were the USA, Canada, Japan and various European countries.

## Total FDI Inflows for the Electricity and Gas Sector

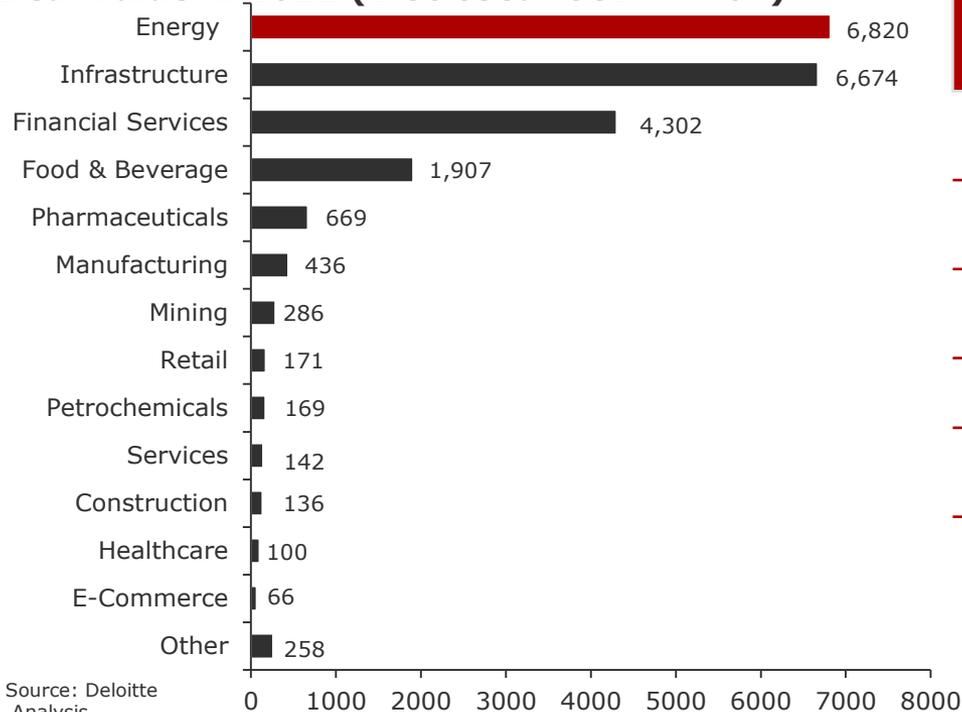


Source: YASED



# The energy sector made up 32% of deal volume through privatizations and private sector transactions.

## Deal Value in 2012 (Disclosed: USD Million)



- Energy along with infrastructure and financial services received the highest sectoral share, with an approx. 74% share in total M&A volume (including estimates for undisclosed values). In terms of number of deals, manufacturing and energy took the lead with 38 and 36 deals, respectively.

## Energy Sector Deals 2012 , Foreign

Acquirer	Origin	Target	Stake (%)
Goldman Sachs	USA	Aksa Enerji	13.3
Aquila Capital	Germany	Karasular Enerji	40 (*)
Tiway Oil	Norway	Petrol Ofisi Exploration	100
E.ON	Germany	Enerjisa	50
Inter RAO	Russia	AEI Enerji Holding	100
Oteko Group	Russia	BP Turkey: LPG Bottle & Tank Filling; Wholesale and Autogas Businesses	100
Samsung	Korea	ACWA Elektrik	N/D
BR Energy	UK	Hayat Enerji	25
SOCAR	Azerbaijan	Petkim	100

Source: Deloitte Analysis  
(\*) Updated as 100 recently

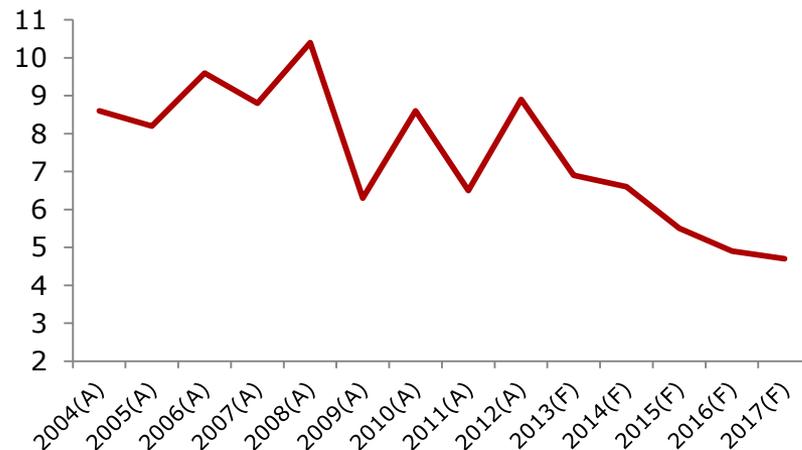


# Turkey's fast-growing economy is expected to attract more investment in the future.

## Macro Outlook

- Turkey is the 17th largest economy in the world and the 6th largest economy in Europe with a GDP of approx. USD 786 billion in 2012.
- Inflation is expected to decline gradually and level out at 4.7% by 2017 from 8.9% in 2012. Turkey's investment climate has been increasingly more welcoming to international investors, which makes the country among the most important investment destinations in the world. With booming economic growth rates of 9.3% and 8.8% in 2010 and 2011 coupled with a slowdown of 2.2% in 2012, Turkey's expected growth is expected to grow 3.5% in 2013, 4.9% in 2014, 5.1% in 2015, 5.0% in 2016 and 4.9% in 2017, as predicted by the EIU.
- The investment grade rating of BBB from Fitch Ratings was announced in November 2012 and BB+ from Standard & Poor's in March 2013, which signal further upgrades and is expected to boost the inflow of institutional funding. Moody's raised the Turkish government bond ratings to Baa3 and revised its outlook to stable from positive in May 2013. The Japan Credit Rating Agency upgraded Turkey's ratings from BB to BBB- in May 2013.

## Declining Inflation (%)



Source: Euromonitor A: Actual F: Forecast

	Rating (Local Currency)	Outlook (Local Currency)	Rating (Foreign Currency)	Outlook (Foreign Currency)
<b>Standard &amp; Poor's</b>	BBB	Stable	BB+	Stable
<b>Fitch</b>	BBB	Stable	BBB-	Stable
<b>Moody's</b>	Baa3	Stable	Ba1	Positive
<b>JCR</b>	BBB-	Stable	BBB-	Stable

Source: Deloitte Analysis



# New investments are needed to meet the demand, especially for electricity and for natural gas.

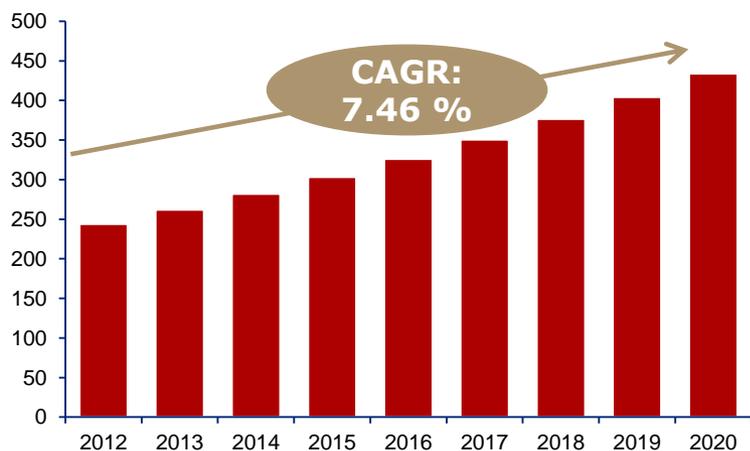
## Electricity

- Installed capacity was 57,058 MW as of 2012. The aim is to have 100 GW of installed capacity by 2023.
- EÜAŞ privatizations of more than 16 GW as well as nuclear power plant investments all require CAPEX and present opportunities for international players.

## Natural Gas

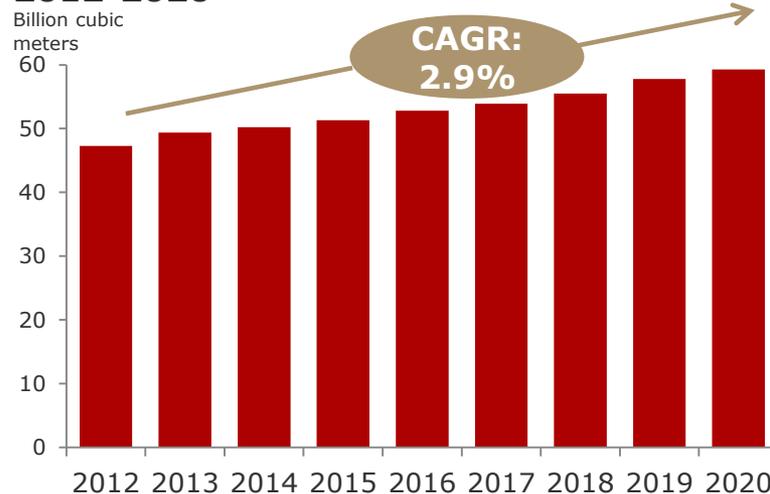
- According to MENR estimates, demand for natural gas will grow an average of 1 bcm annually until 2017. From 2018 to 2020, this demand for growth will reach 2 bcm/year, which means a CAGR of 2.9% from 2012 to 2020. Import is the most critical component in the value chain as Turkey's natural gas production is very limited. There are ample opportunities for investment in the import market.

**Turkish Gross Domestic Electricity Consumption Forecast (TWh) 2012-2020**



Source: EIU

**Turkish Natural Gas Demand Forecast from 2012-2020**



Source: Ministry of Energy and Resources



# The last few years were marked by the entry of major international players in the Turkish energy sector.

The energy sector in Turkey has become one of the most important sectors in regards to foreign direct investment. Noteworthy investments in the sector include:

- Austrian OMV Company which acquired shares from Petrol Ofisi and became one of the leading players in downstream.
- US-based AES partnered with Koç Entek. (2010)
- EDF entered a joint venture with Polat, a leading wind-energy company. (2008)
- German RWE invested in a greenfield CCGT. (2009)
- Swedish Statkraft invested in hydropower. (2009)
- Azeri SOCAR invested in a new refinery with Turcas. (2011)
- Chinese energy giant Harbin entered into a joint venture with the Hattat Group of Turkey to operate a coal mine and a coal-fired power plant. (2012)
- GDF Suez invested in natural gas distribution and is operating a CCGT.

- New joint ventures in generation and distribution companies include:
  - E.ON – Enerjisa (2013)
  - Goldman Sachs – Akxa Enerji (2012)
  - Inter RAO – AEI (2012)
  - EÜAŞ – TAQA (2013)
- Akkuyu NGS and its Russian partner are now important investors in the field with over USD 700 million in investments. (2012)
- A French-Japanese consortium is planning to build a second nuclear plant in Sinop. (2013)

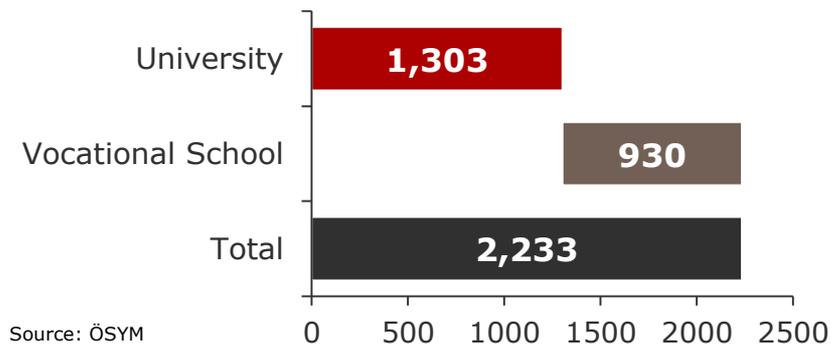


# The availability of skilled labor increases the overall attractiveness of the Turkish energy sector

## Skilled Labor

- Expertise in the energy sector is dramatically increasing with the continuous expansion and liberalization of the energy sector.
- According to the Engineering News Record, Turkish contractors are second to Chinese contractors on a global scale, and have been gaining credibility by adopting western construction standards and project management expertise.
- The number of skilled labor is increasing as energy-specific vocational schools and university departments (both undergraduate and graduate) are established in Turkey. The private sector's involvement in the Turkish energy sector started about a decade ago, and the players in the field have gained noteworthy experience.
- There are more than a dozen companies and NGOs (EÜD, ETD, etc.) that provide energy-specific training along with graduate and certification programs. Most importantly, these programs are highly popular with students and professionals.

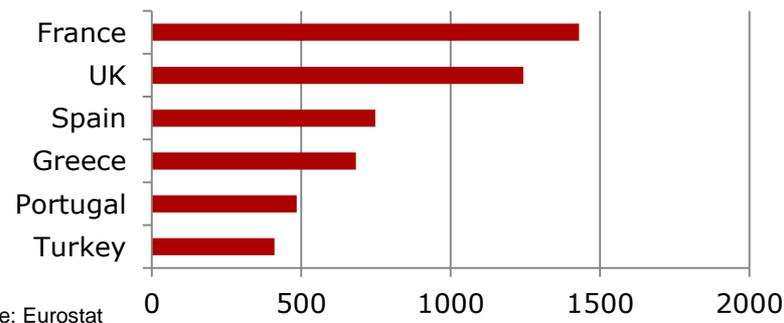
## Energy-Specific Departments in 2012



## Cost of Labor

- Turkey's young and educated population has relatively lower wage rates than those of the EU or the US. The average monthly gross wage in this sector was TL 2,510 in 2010 according to Turkstat.

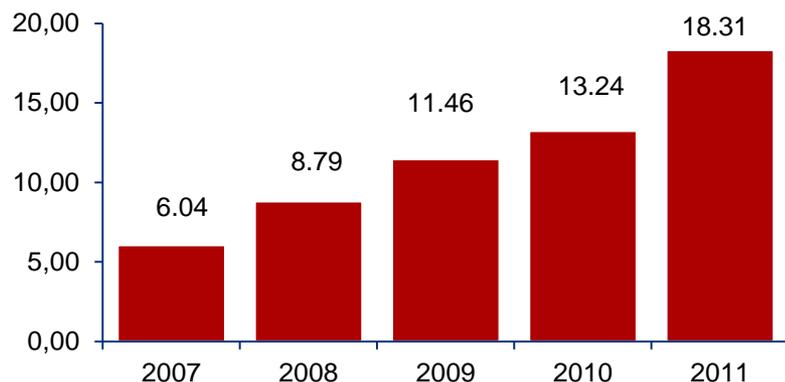
### Minimum Monthly Wage (EUR)



# A positive environment for funding means there are considerable funds available for possible projects.

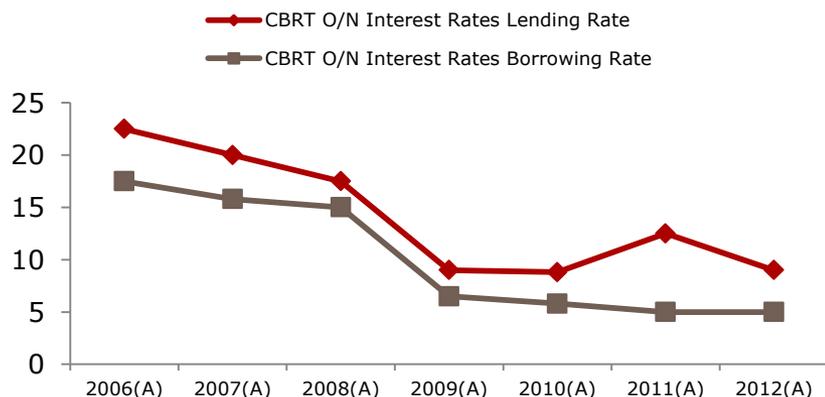
## Financing Capital

### Loans Provided to the Energy Sector (Billion TL)



Source: The Central Bank of the Republic of Turkey

### CBRT O/N Interest Rates



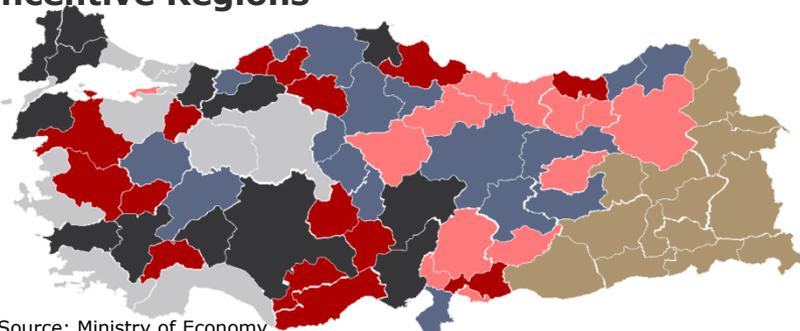
Source: The Central Bank of the Republic of Turkey

- Major financial institutions are very eager to finance profitable projects. Turkey's well regulated and strong banking sector with high capitalization and toxic asset absence has helped the country stay out of the global economic downturn.
- Among the major Turkish banks, Yapı Kredi provided a USD 4 billion fund for 138 different energy projects as of 2012. Garanti Bank provided USD 800 million funding for 15 new projects during 2012 which meant a total of USD 6.2 billion allocated to the energy sector.
- International players always have a certain advantage in project finance because of international know-how in commercial due diligence and financing activities.
- Interest rates have been experiencing a decrease since credit rating agencies increased Turkey's ratings. The Central Bank's interest rates mirror this decreasing trend in recent years. Investors are able to receive credit directly from local banks with an Eximbank guarantee or from overseas banks.



# Several incentives are available for both CAPEX and OPEX: Turkish Republic Investment Incentives Program

## Incentive Regions



Source: Ministry of Economy



## Supported Measures by Type of Investment

- All investment types, except ones that are excluded from investment incentives program, will be supported by the General Investment Incentives Program if the minimum fixed investment is 1 million TL in Region 1 and 2 and 500 thousand TL in Regions 3, 4, 5 and 6.
- Mining investments are defined as priority investments which will benefit from terms and rates of the support Region 5 even they are made in Regions 1, 2, 3, and 4.
- Petroleum Refinery investments are defined as large scale investments and will benefit from the incentive program if the minimum amount of investment is one billion TL. According to addendum 4, clause II of the Incentive Law; natural gas or oil filling, and storage facilities and pipeline transportation investments will be supported. The Incentive will only cover the fixed facility expenses.

## Support Measures

Support Measures	General Investment	Regional Investment	Large Scale Investment	Strategic Investment
Vat Exception	✓	✓	✓	✓
Customs Duty Exemption	✓	✓	✓	✓
Tax Deduction	☒	✓	✓	✓
Land Allocation	☒	✓	✓	✓
Interest Support	☒	✓	☒	✓
Vat Refund	☒	☒	☒	✓
Employer's Social Security Premium Support	☒	✓	✓	✓
<b>Only For Region 6</b>				
Income Tax Withholding Support	✓	✓	✓	✓
Supports for National Insurance Contribution of Employer	☒	✓	✓	✓

## Region

1	2	3	4	5	6
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## Regional Incentive Applications

### Tax Reduction

### Investment Contribution Rate

15%	20%	25%	30%	40%	50%
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## Incentive for Large Scale Investments

### Tax Reduction

### Investment Contribution Rate

25%	30%	35%	40%	50%	60%
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### Supports for National Insurance Contribution of Employer

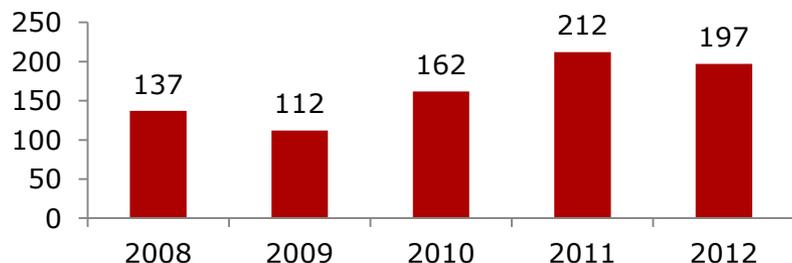
2 Year	3 Year	5 Year	6 Year	7 Year	10 Year
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Source: Ministry of Economy



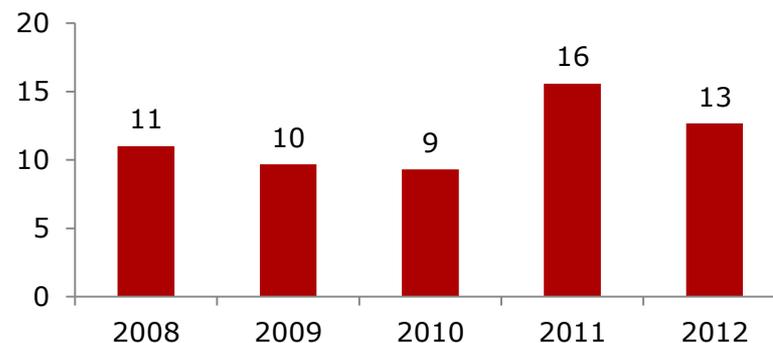
# Investors benefit from available incentives.

**Number of Incentive Documents (Indicative of Number of Incentive Applications)**



Source: Ministry of Economy

**Amount of Incentives Provided (Billion TL)**



Source: Ministry of Economy

## Further advantages can be achieved in Free Zones & Organized Industrial Zones

- Free Zones offer a variety of advantages for equipment manufacturing firms: sale revenues from manufactured products are exempt from income or corporate tax until Turkey becomes a European Union member state. Revenues generated in free zones can be transferred overseas. Incentives and advantages offered in free zones are equally applicable to both local and international firms.
- As of 2012, there are 174 OSBs in Turkey. The completed infrastructure and create financial and technological advantages for enterprises.
- The regulatory framework that allows OSB's to have their own generation licenses (which are responsible for a significant portion of costs) create an advantage for OSBs.
- Additionally, easy access to industrial consumers as possible busbar clients would present opportunities for selling steam for thermal power plants and is another advantage of these organized industrial zones.



# A well-built regulatory structure: a quick look at the regulatory environment and relevant public institutions.

- The regulatory structure of the Turkish energy market is as follows: Law sets the general principles. The Council of Ministers and/or High Planning Council makes decisions in line with the spirit of the law, such as Strategy Papers, secondary regulations (both regulations and communiqués) which set the detailed rules. Lastly, the EMRA Board Decisions define operational details as often as needed regarding the changing market conditions. All regulations are easily accessible on the EMRA website. The main laws are as follows:

- 1 Electricity Market Law (EML) No: 6446
- 2 Natural Gas Market Law No: 4646
- 3 Petroleum Market Law No: 5015
- 4 LPG Market Law No: 5307
- 5 Renewable Energy Law (REL) No: 5346
- 6 Nuclear Power Plant Law No: 5654
- 7 Geothermal Law No: 5686

## EPDK – Regulatory Body

- Regulating and monitoring the energy markets
- Issuing licenses
- Drafting, amending, enforcing and auditing performance standards; distribution and customer services codes
- Setting out the pricing principles indicated in the law
- Ensuring the development and implementation of an infrastructure

## EÜAŞ – State-Owned Generation Company

- Operating the generation facilities which have not been transferred to private sector
- EÜAŞ has several affiliates which operate specific thermal power plants in the privatization portfolio

## TEDAŞ

- Operator of state-owned DisCos, Owner of DisCo assets
- Expropriation activities for distribution

## TKİ – State Coal Enterprise

- Producing and usage of raw materials of energy such as lignite, asphaltite, oil shale, peat, etc.

## Ministry of Energy and Resources

- General energy policy making

## TEİAŞ – TSO and Market Operator

- Conducting transmission activities as a state monopoly.
- Operating Balancing Power Market and Ancillary Services with its market operation license
- Operating Day-Ahead Market until the establishment of EPIAŞ

## TETAŞ – State-Owned Wholesale Company

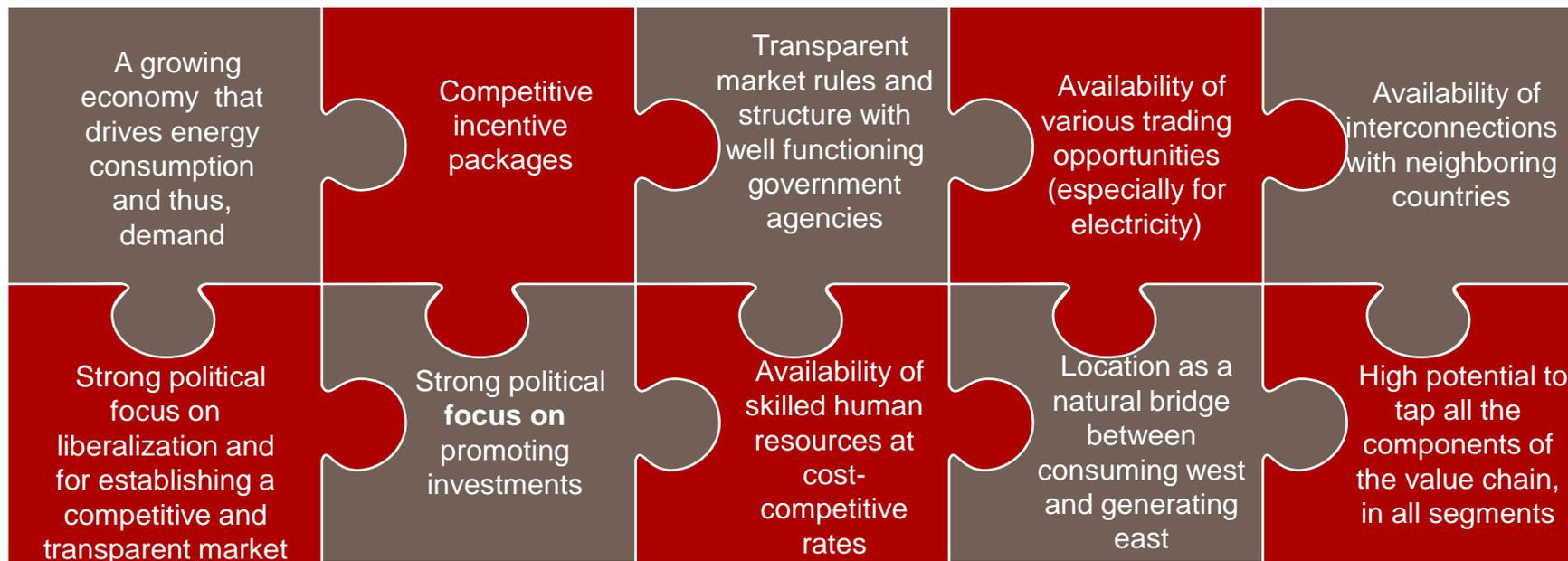
- Carrying out sale and purchase agreements within the scope of its contracts
- Engaging organized wholesale markets for sale and purchase agreements and conducting bilateral agreements
- Selling electricity to incumbent supply companies for regulated tariff consumers

## BOTAŞ – NG Trans & Trading

- Carrying out natural gas import, transmission, distribution, storage, marketing, import and export



# Several reasons drive investment in the Turkish energy sector. The most important are:



- Due to its geographical position and its central location to the regions of Europe, the Balkans, the Aegean, the Black Sea, the Caucasus-Khazar Basin, Central Asia, the East Mediterranean Sea and the Middle East, Turkey is a transit country in the field of energy. Turkey's position of being an energy corridor for transporting energy resources from the Middle East and Khazar regions to Europe is critical to the emergence of new opportunities. Even though Turkey has limited generation in primary energy resources and is dependent on foreign countries for energy, it acts as a bridge between the world's crucial supply and demand regions. Turkey's international effectiveness in this framework continues to flourish. Further, this strategic position is also critical for export and import of electricity. With the ENTSO-E connection, Turkey enabled energy transmission integration with Europe.
- Progress in the liberalization process allowed Turkey to be a part of European markets where political integration exists. After Norway, Russia, and Algeria, Turkey aims to become the fourth artery in energy imports. Successful implementation of energy-related action plans will enable Turkey to achieve a strategic position in the EU.



# C. Sub-Sectors

***i. Electricity***

ii. Petroleum

iii. Natural Gas & LNG

iv. Coal

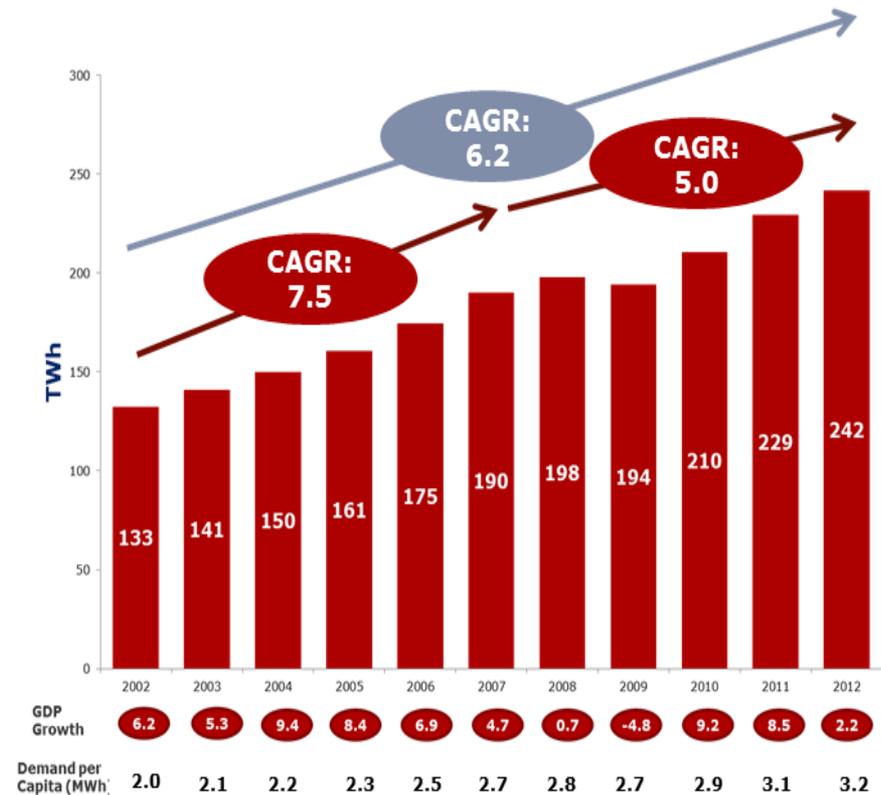


# Electricity demand is ever increasing.

## Growth in Electricity Demand in Turkey

- In 2012, approx. 242 TWh of electricity was supplied to the domestic market, corresponding to approx. 5.1% annual growth from the 2011 figure of 229 TWh in gross electricity consumption. The CAGR for the ten-year period of 2002-2012 was 6.2% on average and for the years between 2002-2007 this ratio was 7.5 % while for the last five years (2007-2012) it was 5.0%.
- This also demonstrates the increase in the demand growth rate. This growth depends on economic developments and even exceeds gross domestic product (GDP) growth rates as shown in the figure. Electricity demand has been growing impressively in line with economic developments, driven by industrialization and urbanization. This, together with population growth expectations, indicates a great potential for further electricity demand growth.
- Demand per capita is also on the rise in recent years and in line with growth. Compared to the EU figures there is still room for further increase, in alignment with the increase in per capita GDP. For Turkey's per capita household electricity consumption of 596 kWh, the EU average is 1,786 kWh per capita.

## Historical Yearly Demand Growth



Source: TEİAŞ, TurkStat, Deloitte Analysis



# A look at the value chain of the electricity sector: competitive and regulated activities

Competitive  
Regulated



- Installed capacity approx. 57 GW at the end of 2012
  - EÜAŞ 44%
  - BO/BOT/TOR 16%
  - Private Sector 40%
- 20% market share limitation (on generation)
- EÜAŞ privatizations in the pipeline

- State-owned monopoly
  - Market Financial Settlement Center (market operator) is a part of TEİAŞ
  - National Load Dispatch Center (system operator) is a part of TEİAŞ

- Contracts between EÜAŞ-TETAŞ and TETAŞ-DisCos account for the major part of the bilateral contracts
  - TETAŞ has take-or-pay contracts w/ BO/BOT/TOR plants
- 20% market share limitation

- TEDAŞ was divided into 21 different distribution regions, which are separate DisCos
- Total privatization revenue will reach approx. USD 12.7 billion if current bids progress to financial closing
- DisCo privatizations are complete, the transfer process is continuing in some regions

- As per the EMRA Board Decision No. 4250 of February 1, 2013, the eligible consumer (Consumers who are free to choose their suppliers because their yearly consumption is above the regulated threshold.) limit is currently 5,000 kWh (targeted to be zero by the end of 2015) The market opening rate was 77% as of 2012.
- As of December 31, 2012, distribution and retail sales operations have been separated and DisCos have been legally unbundled.



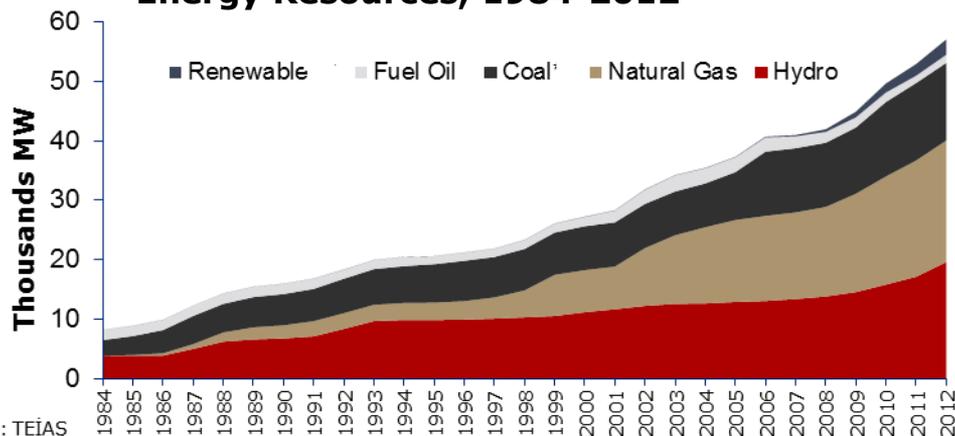
# Driven by growing demand, installed capacity is continuously increasing and diversifying.

## Historical Supply Development

- Installed capacity in Turkey is five times larger now than it was in 1984. Thermal capacity has increased gradually in the last decades. However, the stable increase in natural gas-fired power plants resulted in their currently holding the highest share among all technologies. Existence of long term natural gas import contracts, cheaper per MW investment costs compared to other technologies, flexibility in site selection, and technological fit for cycling operation have allowed natural gas installed capacity to expand faster than any of its rivals.
- The hydro-potential of Turkey is approx. 130 TWh/year and approx. 36,000 MW of capacity according to MENR. According to an EMRA progress report dated July 2012, 446 hydro projects are under construction with a total capacity of over 12 GW.

- As of 1st quarter of 2013, approx. 36% of the total installed capacity is natural gas, approx. 35% is hydro power, approx. 23% is coal (lignite, imported coal and hard coal), approx. 2% is fuel oil and approx. 5% of installed capacity is renewable.
- In 2010, an agreement between the Turkish Republic and the Russian Federation was signed to build and operate a nuclear power plant in Akkuyu, Mersin. According to the Electricity Energy Market And Supply Security Strategy Document, by the year 2020 at least 5% of total electricity consumption will be provided by nuclear resources and this share will increase in the long term. Furthermore, Turkey plans to construct two more NPPs with a capacity of up to 5GW each.

## Historical Installed Capacity by Primary Energy Resources, 1984-2012



Source: TEİAŞ



# Investors who consider participating in energy generation activities can choose among a variety of options.

## Brownfield Investment

- ➔ Opportunity to choose from the existing project stock of:
  - Over **52 GW** of licensed projects ready for investment
  - Over **57 GW** operating capacity, including BO/BOT/TOR contracted plants and EÜAŞ generation portfolio
  - Over **66 GW** of projects in the licensing process (application, assessment or approval phases of the process, see annex 1 for technology breakdown)  
(figures from the end of 2012)
- ➔ Opportunity to choose from the BOT/TOR contracted power plants which will be returned to public sector when their contracts expire, which will be privatized (see annex 2 for full list with contract end dates)
- ➔ Opportunity to choose from the privatization portfolio of over 16 GW (see annex 3 for full list)

## Greenfield Development

- ➔ on-going significant opportunity for new investments, given the increasing demand, available investment incentives and available resources
- **Investment Tip: Expected growth in demand calls for an addition of approx. 4,000-5,000 MWs of annual installed capacity. Meeting this annual installed capacity target corresponds to USD 6-7 billion investment. Barriers to entry are low-to-moderate and the investment environment is quite favorable as indicated in previous slides.**



# Transmission infrastructure is the critical link for investments

- TEİAŞ is a state-owned monopoly, for 10 years it has been responsible for load dispatch & frequency control, interconnections and generation capacity projection. The Market Financial Settlement Center (market operator) and The National Load Dispatch Center (system operator) are parts of TEİAŞ.
- Establishment of an independent Energy Exchange has been created by the recent Electricity Market Law (6446). Therefore, market operations will soon be handed over from TEİAŞ to energy exchange (EPIAŞ).
- Due to the fact that both supply and demand are not equally distributed among regions, transmission constraints and congestion can occur. However, these are managed by the NLDC and related curtailments are very rare. Emphasis is given to ancillary services: primary frequency control and secondary frequency control have been procured commercially as of 2009 and 2010, respectively, extensively enhancing system reliability.

## Expected Important Investments

- A 380 kV Bandırma CCGT – İçdas 2 – Lapseki underwater transmission line is under construction to transmit electricity from Bandırma to İkitelli LDC region.
- TEİAŞ has tendered this project and the work is currently on-going. It is expected that the establishment of this connection will relieve an important portion of the constraints witnessed in the region of Thrace.

## Length of Transmission Lines and Number of Transformers, 2011

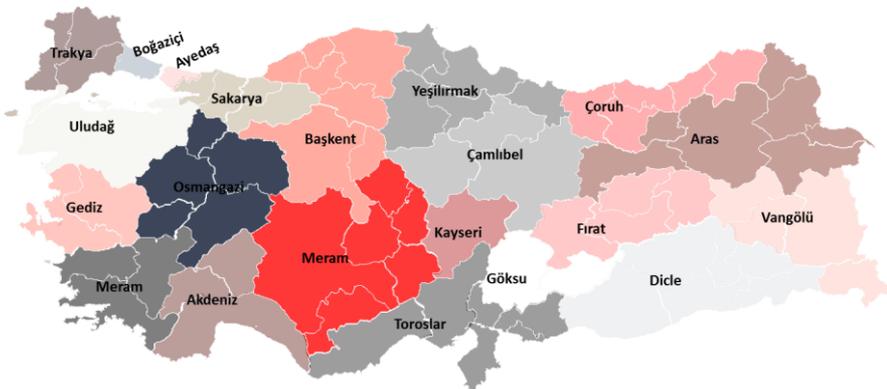
Voltage Level	Overhead Transmission Lines (km)	Underground Transmission Lines (km)	Transformer Centers
380 kV	15,978	35.9	203
220 kV	85	-	-
154 kV	32,878	184	1105
66 kV*	509	3.2	49
Total	49,451	211	1357 (104,658MVA)

Source: TEİAŞ

- **Investment Tip: The transmission system is a state-owned monopoly, but the company provides an interesting prospect for energy infrastructure service providers and vendors (among these: grid, transformation center/equipment, automation, other equipment and implementation, etc.)**



# All distribution companies were recently privatized.



DisCo	Current Status	Investors
<b>Başkent</b>	Transferred	Enerjisa (Sabancı – E-on)
<b>Sakarya</b>	Transferred	Akkök-Akenerji-CEZ
<b>Meram</b>	Transferred	Alarko-Cengiz
<b>Kayseri</b>	Transferred	KCETAŞ
<b>Aras</b>	Transferred	Kiler Holding – Çalık Enerji
<b>Osmangazi</b>	Transferred	Yıldızlar SSS Holding
<b>Yeşilirmak</b>	Transferred	Calık Enerji
<b>Çoruh</b>	Transferred	Aksa Elektrik
<b>Vangölü</b>	On-going	Türkerler
<b>Fırat</b>	Transferred	Aksa Elektrik
<b>Çamlıbel</b>	Transferred	Kolin-Limak-Cengiz
<b>Uludağ</b>	Transferred	Kolin-Limak-Cengiz
<b>Boğaziçi</b>	Transferred	Kolin-Limak-Cengiz
<b>Gediz</b>	Transferred	Elsan-Tümaş- Karaçak
<b>Trakya</b>	Transferred	IC Holding
<b>Gökusu</b>	Transferred	AKEDAS
<b>Aydem</b>	Transferred	Bereket Enerji
<b>Dicle</b>	Transferred	İş Kaya
<b>Ayedaş</b>	On-going	Enerjisa (Sabancı – E-on)
<b>Toroslar</b>	On-going	Enerjisa (Sabancı – E-on)
<b>Akdeniz</b>	Transferred	Kolin-Limak-Cengiz

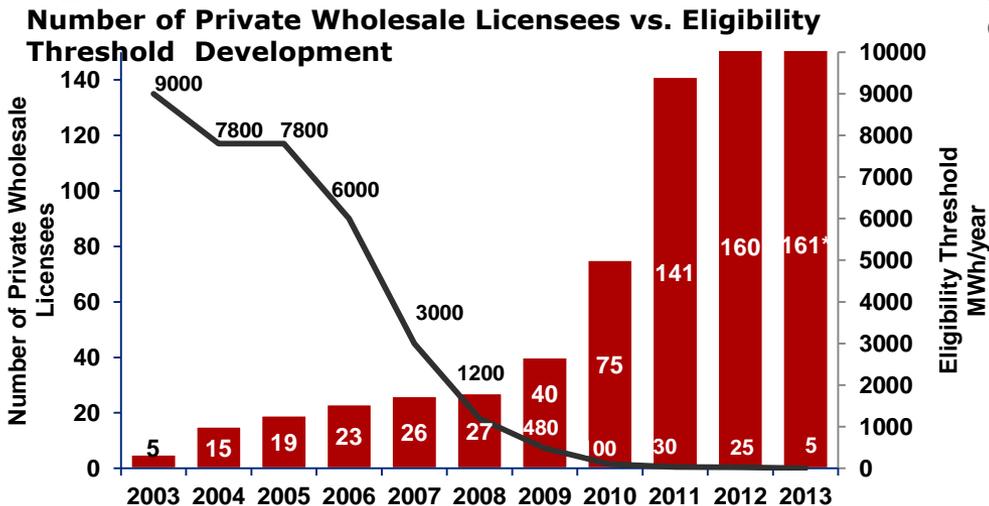
- Turkey is divided into 21 distribution regions. In 2005, 20 out of 21 distribution companies (DisCo) were established as a subsidiary of TEDAŞ. Each DisCo has the right to operate the distribution system that is actually owned by TEDAŞ for 30 years. Each DisCo holds a monopoly in its region in terms of the distribution system operator, and also holds a retail sales license, which has been recently subject to unbundling, meaning that the DisCo is not a monopoly in terms of retail activities.
- Privatizations of DisCos have been finalized as of the second quarter of 2013 and 13 regions are being operated by the private sector while the transfer process in the other 8 regions is on-going.

**Investment Tip: Opportunities are available within energy infrastructure (grid, transformation center/equipment, automation, other equipment and implementation, etc.) including take over or merger with an existing distribution company, especially for those companies who have operational experience and who can create synergies to achieve economies of scale. Electricity distribution companies invest a certain amount determined by EMRA each year. Evaluation of approved distribution and retail sales budgets between 2011 and 2015 demonstrate an annual investment of approximately USD 1.1 Million.**



# Eligibility limits are continuously diminishing to enable a higher degree of market opening and competition.

- Private wholesalers can sell energy to eligible customers and can export or import energy.
- The number of private wholesale companies are increasing parallel to market development. For example in 2012, 19 companies acquired licenses to perform wholesale activities.
- With the new Electricity Market Law No. 6446, wholesale and retail activities are united under «Supply License».
- The eligible consumer limit decreased to 5,000 kWh/year in the beginning of 2013. Turkey is aiming to become a fully competitive retail market by the end of 2015, with zero kWh/year as the eligibility limit.
- When project announcements and the completion dates are analyzed; targets have been reached before the anticipated deadlines announced by the Electricity Sector Reform and Privatization Strategy Paper, dated 2004. At the of end 2012 the market opening ratio, an indicator of the liberalization level, is 77% as compared to 23% in 2003.
- In 2004 the market was approx. 29% liberalized and the eligible consumer limit decreased gradually from 2006 to 2012.
- It is expected that the market for supply companies will grow more competitive in the upcoming years. Suppliers will have to develop strategies for various segments with different consumption profiles.



***Investment Tip: Full competition is expected by the end of 2015 to cover households, but intense competition has already started in other segments.***



Source: TEİAŞ \* As of the first 3 months of 2013

# Cross-border trade increases trading options with possibly higher profitability for the generator.

- In September 2010 Turkey synchronously connected to ENTSO-E. Turkey is currently in the trial phase of its ENTSO-E connection and if Turkey is proven to be adequate by autumn 2013, it will become a full member of ENTSO-E.
- In 2012, Turkey imported 5.8 TWh and exported 2.9 TWh of electricity. The map on the right illustrates the existing interconnection of Turkey with neighboring countries. The interconnection between Turkey and Bulgaria and between Turkey and Greece are working synchronously. 250 MW of 500 MW capacity has been allocated to Turkey, 65% of the remaining 250 MW has been allocated to Bulgaria and the remaining amount has been allocated to Greece. At the moment, other possibilities have not been approved by ENTSO-E.



- **Investment Tip: Transmission operators of Turkey, Bulgaria and Greece are regularly auctioning interconnection capacity on the Greek and Bulgarian borders of Turkey. Private sector players have shown great interest resulting in a boost in trade as compared to previous years. The existing interconnection between Turkey and neighboring countries, such as Syria and Iraq, presents profitable opportunities as well.**



# Some Major Players



\* Companies with installed capacity over 600 MWh and/or having a distribution region



# C. Sub-Sectors

i. Electricity

***ii. Petroleum***

iii. Natural Gas & LNG

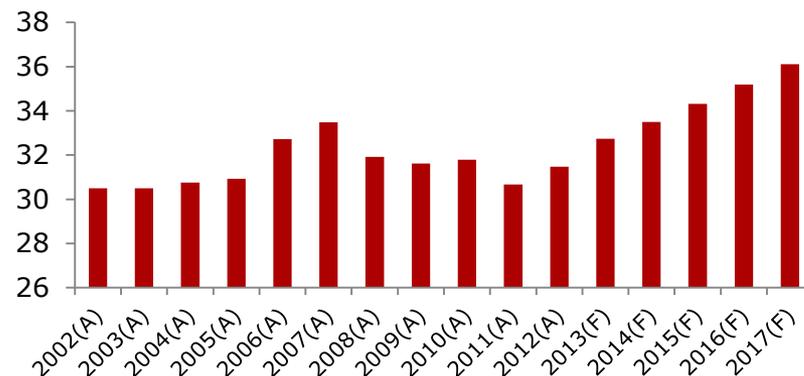
iv. Coal



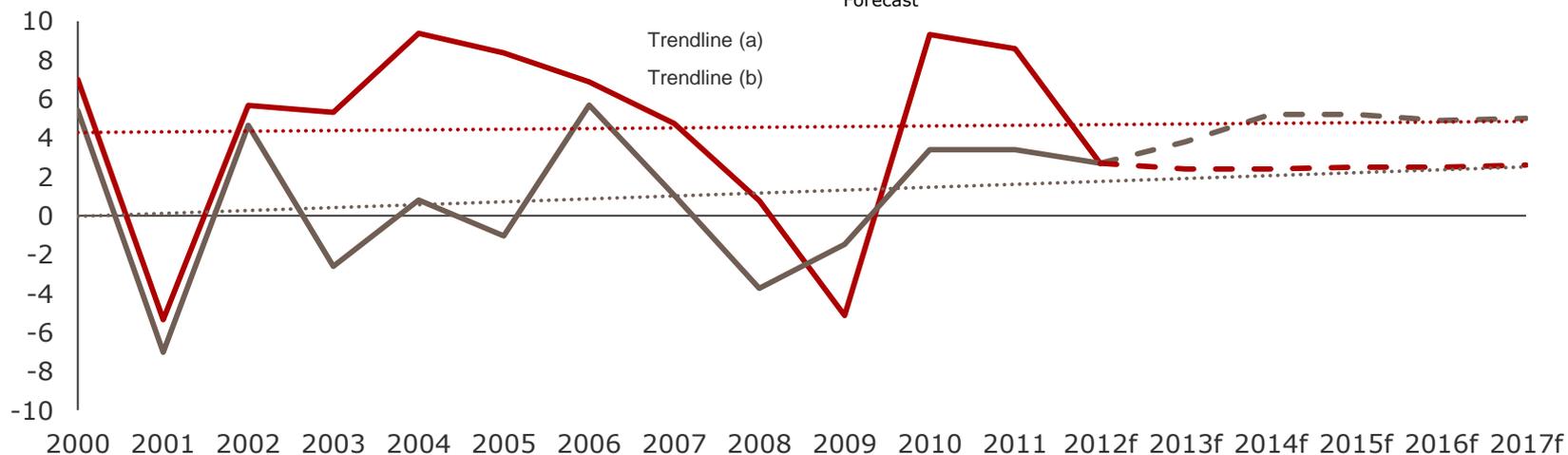
# Turkey has limited oil production so it relies on imported oil to meet demand.

- Oil consumption in 2012 was approx. 31.5 million tons and is expected to increase in upcoming years. Given the very limited amount of oil production, which was 2.3 million tons (less than 0.8% of total demand) in Turkey in 2012, this demand is being met by imported oil to a great extent. Difference between supply and demand demonstrates potential growth and this difference is expected to decrease.
- It is expected that demand for oil will grow in alignment with GDP Growth at a rate somewhere between 2%-3%.

**Oil Consumption Million Tons**



Source: BP Statistical Review (Actual), EIU (Forecast) A: Actual F: Forecast



Source: EIU

— GDP Growth Rate (a) — Gross Domestic Petroleum Products Consumption % Change (b)



# Petroleum exploration activities are limited, though promising.

- Currently, the Turkish Petroleum Company (TPAO) is a major player in the oil exploration process. The liberalization of the petroleum sector is continuing. In line with liberalization, the Petroleum Market Law has just been accepted in the Parliament which introduces several incentives for oil exploration as well as for distribution and retail. The new law is expected to liberalize especially upstream by limiting the dominant market position of the Turkish Petroleum Co. Exploration activities are currently taking place in the regions of Southeastern Anatolia, the Black Sea and the Mediterranean. Exploration is led by the Turkish Petroleum Co. and joint ventures with international companies.
- Oil exploration in the seas has been underway in Turkey for over 50 years. These activities have accelerated even further by business partnerships under the leadership of TPAO.
- The limit in the number of licenses per region has been diminished by the new law in order to increase private sector investments in the sector. There has been global interest by experienced international exploration firms. These firms are expected to sign contracts for new joint projects with firms in Turkey that also have experience in exploration. In line with economic stabilization, opportunities exist for international investors.
- SE Anatolia is ranked number one with respect to oil production wells and has 92% of the shares. Most of the exploration activities in the Southeastern Anatolia region is carried out in the city of Diyarbakır.
- ***Investment Tip: Even though Turkey has limited reserves compared to its neighbors, there are many planned and also on-going exploration activities that will allow Turkey to utilize its reserves more effectively. This potential will be evaluated through the business models of global energy companies and national oil companies.***



# Protection of existing and potential investors is ensured with the new Petroleum Market Law.

## Purpose & Major Changes

- The objective of this Law regulates and allows for guidance, surveillance and supervision in order to ensure the transparent, non-discriminatory and stable performance of market activities pertaining to the delivery of petroleum supplied from domestic and foreign resources to consumers, directly or after processing, in a reliable, cost-effective manner within a competitive environment.

- 18 petroleum regions that are recognized by the former law will be simplified by being divided into land and sea.
- License durations are arranged as 5+2+2 years on land and 8+3+3 years on sea. The applicant has to give 2% of the investment amount of the business model that he or she proposes in the license application or petition to extend the timetable. This ratio shall be 1% on the sea. It is obligatory to have a sound business plan for obtaining a license with the New Turkish Petroleum Act. These new regulations are meant to protect existing and potential investors in the sector.
- The stimulus concerning drilling activities will be designed by the cabinet. The sum of taxes that rightful owners of the petroleum have to pay over their net profit and of the income tax deduction they make on behalf of the stakeholders cannot exceed 55%. An inflation accountancy system will be brought in when the new law makes it easier to transfer capital and profit. Offshore investors can transfer their net profits to offshore accounts every three months.
- According to the old system concerning tax, the rightful owners of the petroleum have the right to choose whether they want to bookkeep exploration expenses, drilling expenses and the expenses of covering/uncovering oil wells that are not economically feasible. The title holders can either activate or write off these expenses as direct operating expenses.



# 60% of the total oil demand is imported as crude oil and refined in Turkey.

- Turkey mainly imports from Iran and Russia for raw refinery materials. TÜPRAŞ, the market leader in the refinery business currently has four different refineries in Izmit, Izmir, Kırıkkale and Batman. The refineries in Izmit and Izmir are the largest according to generation capacity. A private investment, SOCAR Star Refinery, will produce diesel, jet fuel, LPG and petroleum products. The refinery is expected to be commissioned in 2017.
- The aggregated capacity utilization ratio of the refineries increased from 74.7% in 2011 to 78.7 % in 2012, which indicates the importance of refinery capacity in the coming years.

	City	Status
STAR Refinery	İzmir	Under Construction
Doğu Akdeniz Petrochemicals and Refinery	Adana	Under Construction
TÜPRAŞ	Batman	Active
TÜPRAŞ	Kırıkkale	Active
TÜPRAŞ	İzmir	Active
TÜPRAŞ	Kocaeli	Active

## TÜPRAŞ Refinery Production – 2012 (Thousand Tons)

LPG	783
Gasoline & Naphtha	4,826
Jet fuel/Kerosene	3,329
Gasoil	388
Diesel	5,173
Fuel Oil	3,477
Bitumen	2,810
Lubricating Oil	266
Other	815
<b>Total</b>	<b>21,867</b>

Source: TÜPRAŞ

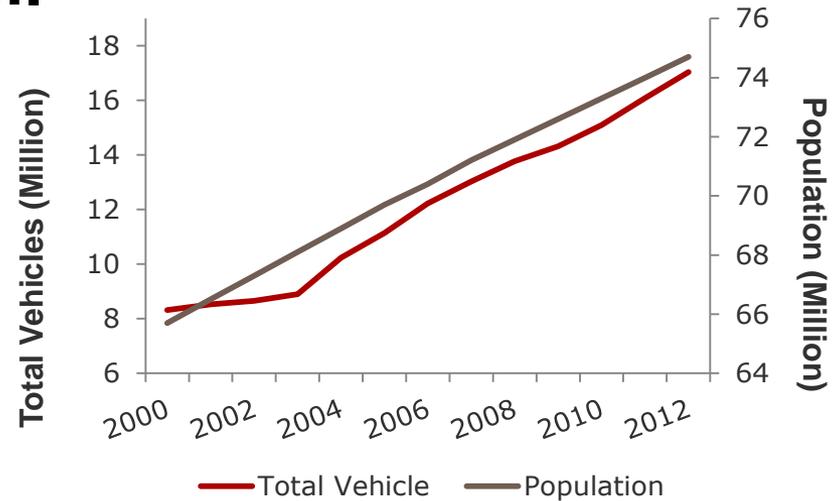
- **Investment Tip: Given that 60% of the total oil demand is refined in Turkey and that demand is growing, there is ample room for refinery investments, although the market entry barriers are high in light of the very high CAPEX requirements. A similar situation applies for opportunities in importing finished petroleum products.**



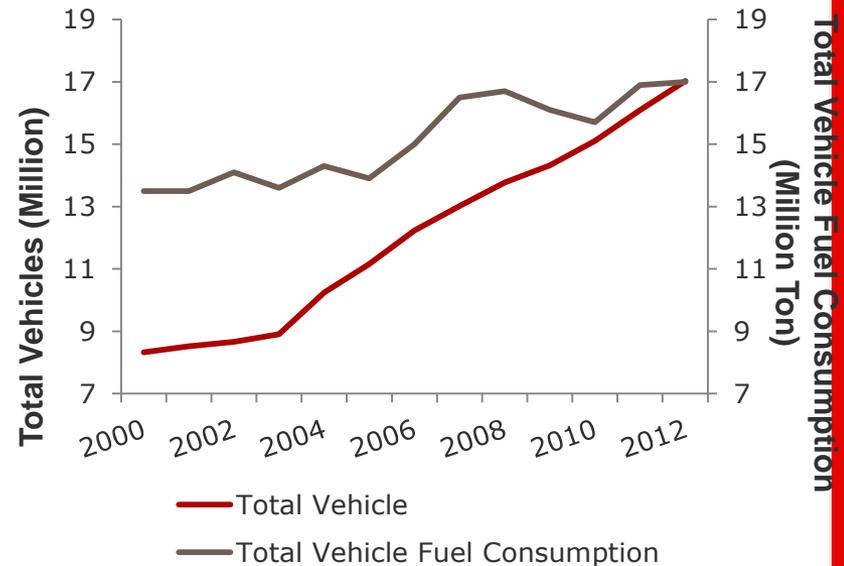
# Petroleum distribution and their retail components experience intense competition.

- EMRA, as the regulatory authority, has been actively involved in creating precautions to ensure a competitive and fair oil sector, e.g. taking important action in order to mitigate oil theft and increase oil quality. The Competition Authority has also taken action in order to increase competition in the distribution and retail sector of the oil and gas industry.
- Distribution activity is licensed by EMRA. With 58 licensees at the end of 2012, the distribution market is highly fragmented dominated by 5 top players, namely BP, Shell, Opet, Total and OMW-POAS. According to EMRA at the end of 2012, the top 10 companies made 83% of the total distributed volume.
- In the Turkish market, the 3 main products of the players in the field are LPG, diesel and gasoline; diesel being the most consumed product with the increase of diesel vehicles and the regulation that were applied in 2011. With this regulation, diesel fuel is standardized according to EU criteria. Currently, diesel fuel is subsidized and is preferred by the consumers due to its price advantage over gasoline. As the number of diesel fuel passenger cars increase, the demand for diesel fuel increases as well and more investment is expected in this field.

**• Investment Tip: According to EMRA, approx. 86% of oil is used in transportation. The total number of vehicles has steadily increased since 2000 along with population growth. Expansion in domestic production and the discount of the special consumption tax also affected the growth in number of vehicles. Parallel to the vehicle increase, fuel consumption has also significantly increased in recent years.**



Source: EGM, TÜİK, PETDER Report 2011, EPDK and EIU



Source: EGM, TÜİK, PETDER Report 2011, EPDK and EIU



# Major Players



**AKPET + LUKOIL**  
Market Share: 3.3%



Shell & Turcas Petrol A.Ş.

**Shell & Turcas**  
Market Share: 17.2%



**TOTAL**  
Market Share: 5.4%



**BALPET**  
Market Share: 1.5%



**POAŞ**  
Market Share:  
26.5%



**ALPET**  
Market Share: 2.5%



**M OIL**  
Market Share: 2.2%



**OPET**  
Market Share: 18.4%



**AYTEMİZ**  
Market Share: 1.9%



**KADOIL**  
Market Share: 1.5%



**TURKUAZ**  
Market Share: 1.2%



**BP**  
Market Share: 9.1%



Source: PETDER

**Investment Support and  
Promotion Agency of Turkey**

# C. Sub-Sectors

i. Electricity

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ii. Petroleum

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***iii. Natural Gas & LNG***

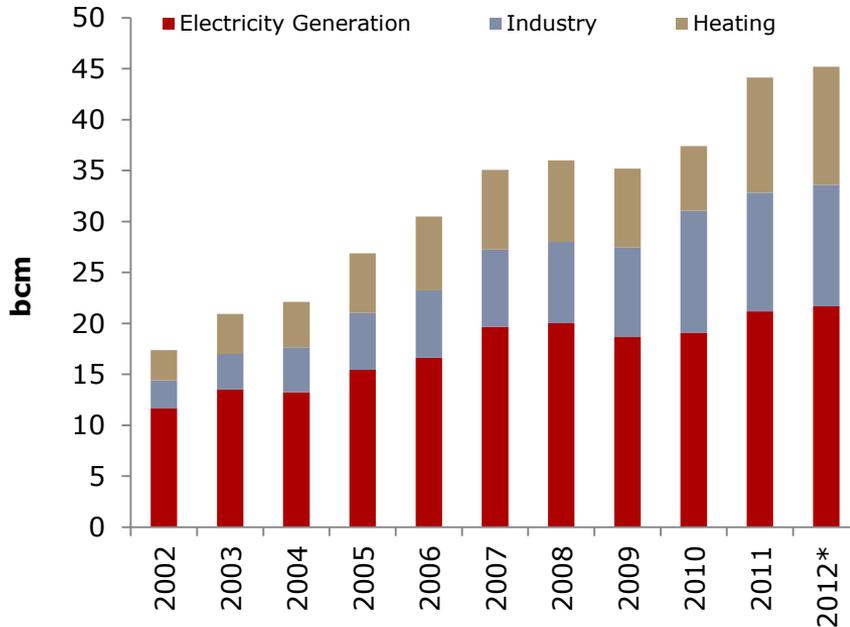
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iv. Coal



# Demand for natural gas is increasing.

## Gas Consumption by Sectors

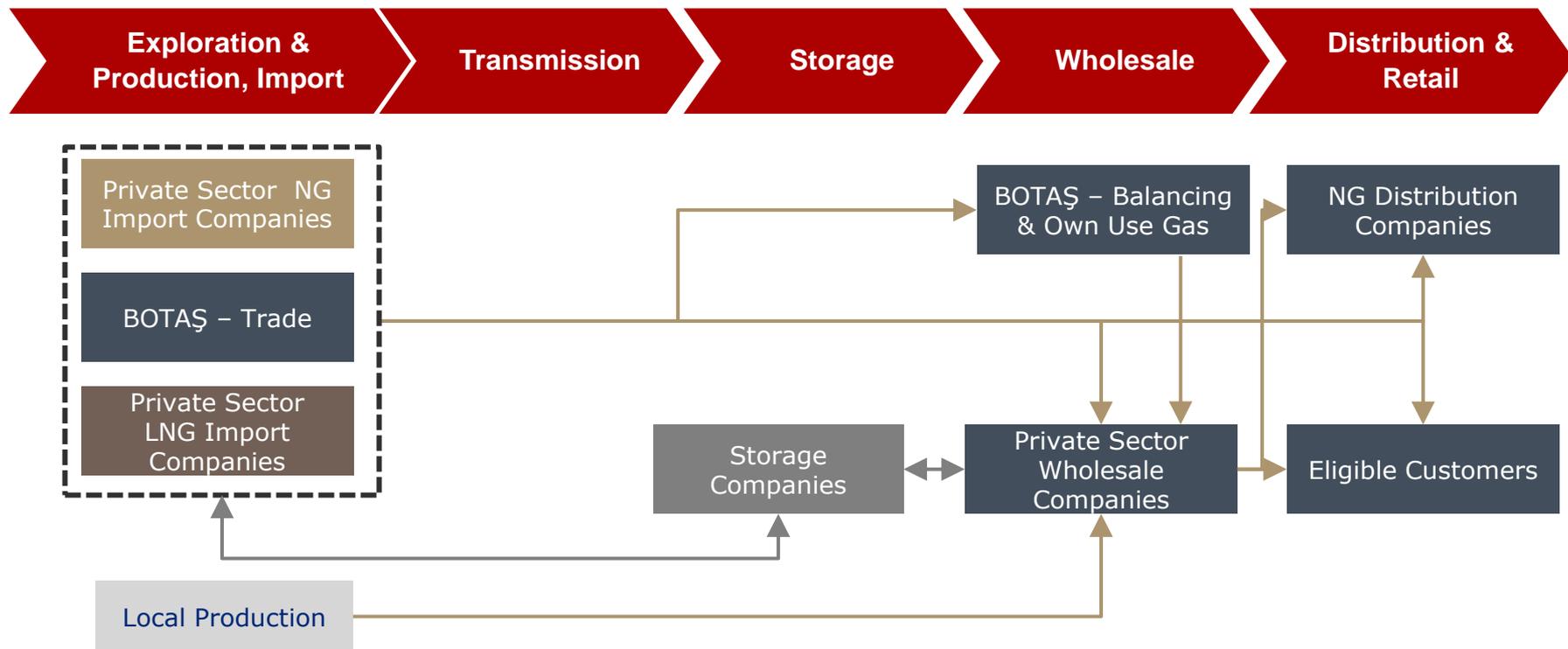


Source: BOTAŞ

- The use of natural gas increased significantly in the last 15 years, both in industry and within households.
- Increased gas utilization in households have gone hand-in-hand with the growing number of natural gas power plants.
- Natural gas demand has the potential to grow rapidly in upcoming years due to natural gas power plants waiting in the pipeline giving the provinces access to natural gas.
- Natural gas demand in Turkey forms a predictable pattern, where consumption downturns during the summer and is highest in the winter months. This pattern is shaped by household demand for heating in the winter months. Another driver is electricity demand which increases in summer months.
- The main difference between the monthly fluctuation is explained by the change in weather conditions and electricity demands covered by natural gas plants.



# A quick overview of the natural gas value chain.



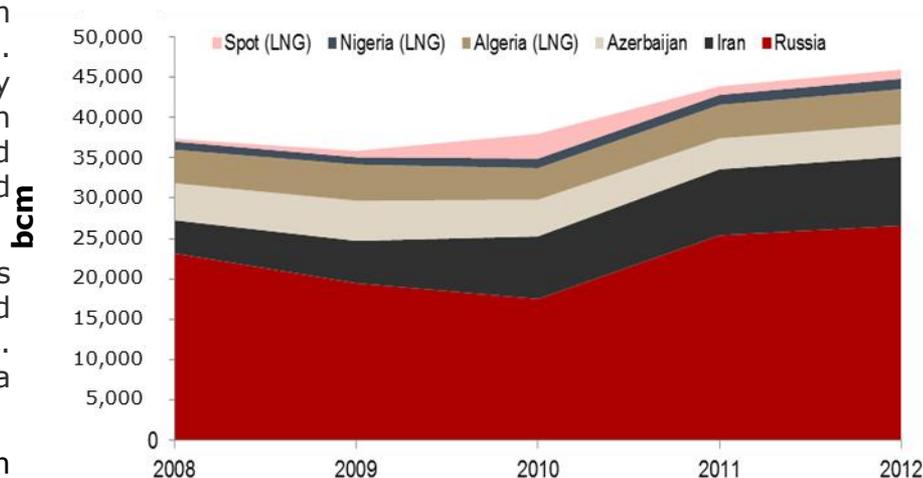
- The geographical region surrounding Turkey contains 70% of the world’s oil and gas reserves. Considering the importance of these fossil fuels and their contribution to energy generation, Turkey clearly has a critical position as a transit country between the supply-rich countries of the Middle East and the Caspian Sea and the high-demand countries of Europe. This strategic positioning also allows for opportunities as a natural gas hub with all its physical and market components.
- Natural gas is supplied to end users (eligible or non-eligible) via the value chain. The chain consists of exploration & production, import, transmission, storage, wholesale, distribution and retail activities. Import and wholesale license owners can engage in wholesale activities. Wholesale companies supply natural gas to eligible consumers, distribution companies and/or other wholesalers.



# With approx. only 2% local production, natural gas importation is a critical link in the value chain.

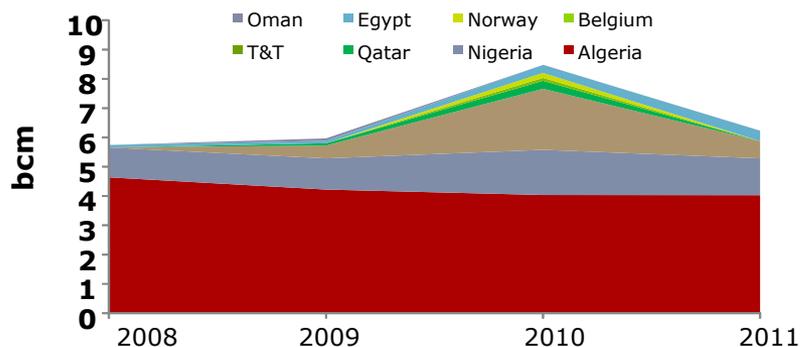
- Local production in Turkey is quite limited, covering approx. 2% of total consumption. In 2011, 0.76 bcm was produced, of which 42% was by TPAO. Exploration attempts are on-going in many locations. TPAO and Shell signed joint operation agreements in 2011 to start exploration and extraction in the Mediterranean Sea and Southeastern Anatolia.
- Turkey is an import-dependent country due to its limited production capacity. Natural gas is imported from Russia, Iran and Azerbaijan through pipelines. In addition, LNG is imported from Nigeria, Algeria and spot markets.
- The construction of the strategic Trans-Anatolian Pipeline (TANAP) project, designed to carry Azeri gas to Turkey and Europe, is set to begin in 2014. The pipeline will carry 16 billion bcm of gas per year when operational by 2018, with 6 billion bcm to be delivered to Turkey and rest to Europe.
- There are developments in the establishment of an organized energy market place including a gas market supported by a robust trading platform.
- The spread of natural gas usage throughout the country as a result of successful greenfield investments in natural gas distribution coupled with privatizations support the increasing use of natural gas for households, industry and for electricity generation.

Historical Development of Natural Gas Imports 2005 - 2012



Source: BOTAŞ

Historical Development of LNG Import Figures 2008-2012



Source: BOTAŞ



# Opportunities for various investments exist in importing, and also exploration.

- **Investment Tip: Turkey is heavily dependent on import to meet its increasing gas demand which opens opportunities in both gas exploration and gas import.**
- **Further, Turkey needs to diversify its gas supply sources for better security of supply and to achieve its goal in becoming a regional gas trading hub.**
- **This creates opportunities for large-scale international investors – in light of the moderate/high market entry barriers – who consider entering the import and trade business in Turkey.**
- **Natural gas import through a pipeline from neighboring countries or in the form of LNG is an important opportunity area.**

A new supply channel - an Iraqi import pipeline - is to be commissioned in 2016. This project will provide opportunities in pipeline construction, wholesale and import.

Natural gas usage is spreading throughout the country as a result of successful greenfield investments in natural gas distribution coupled with privatizations support, increasing the use of natural gas in households, industry and for electricity generation.

Developments in the establishment of an organized energy market place including a gas market supported by a robust trading platform to support trading activities.

Privatization of İGDAŞ upcoming (there will be two distribution regions that will be privatized as two separate entities)

Opportunities exist in the upstream side with undiscovered resources of unconventional natural gas (offshore and shale etc.)

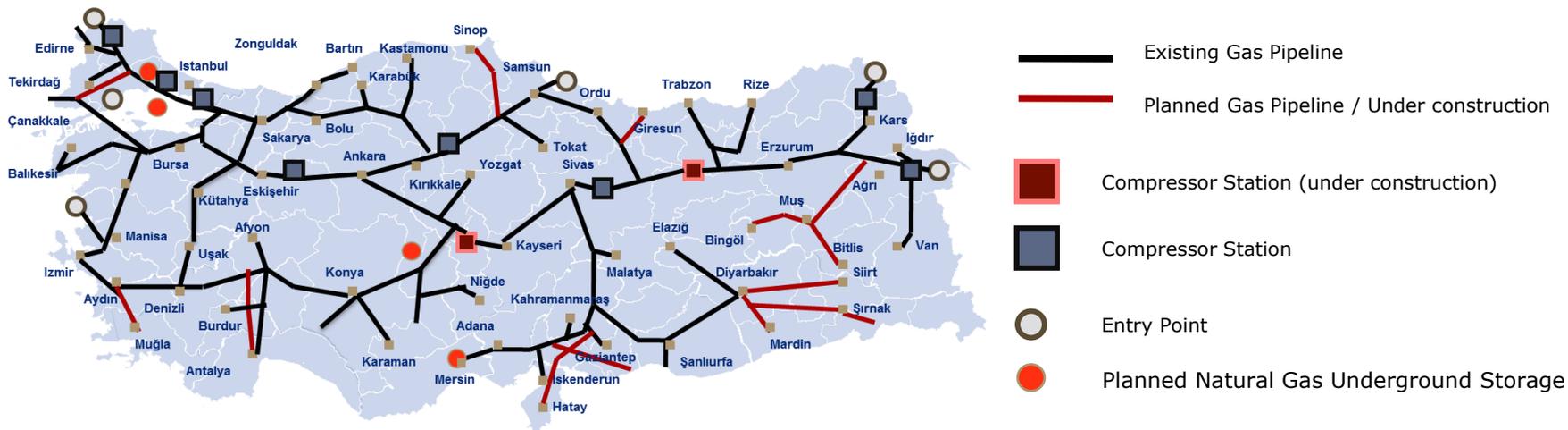
LNG Terminal investments to meet increasing demand as well as for peak demand management.

4 bcm long-term contract of BOTAŞ expected to be transferred to private market players, which will increase market share of private companies in natural gas trade.



# Future investments in the transmission network will increase gas dispatch capacity.

**BOTAŞ Natural Gas Transmission System**



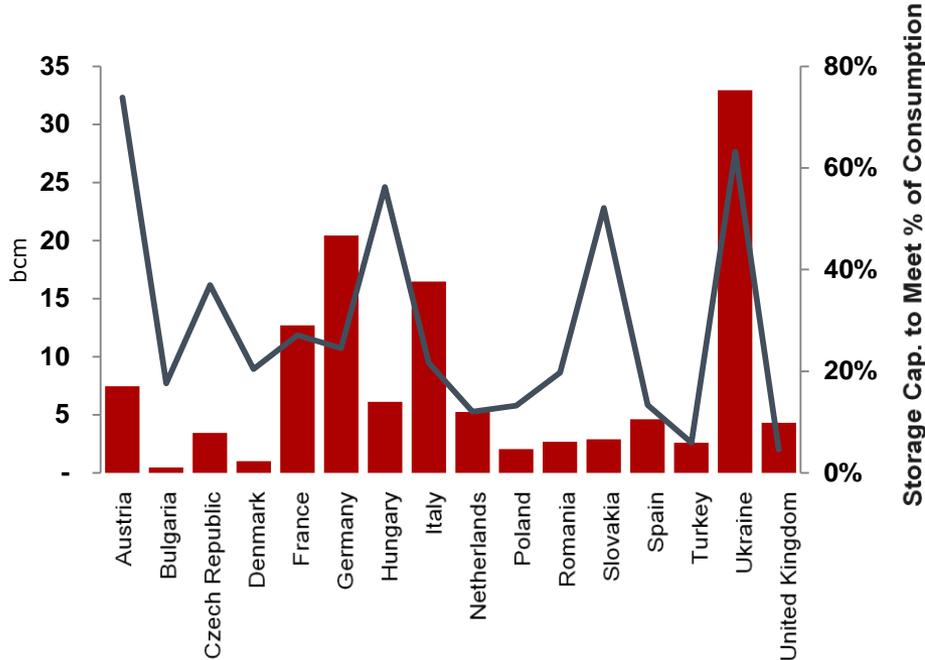
Source: BOTAŞ

- The National Transmission System is composed of high-pressure pipelines in aggregate of 13,000 km, 8 compressor stations (totaling 200 MW), 1 mobile compressor station, more than 300 Pressure Reduction and Metering Stations (Exit Points) directly connected to the high-pressure grid and 9 entry points, of which there are 4 foreign pipeline interconnections, 2 LNG Terminals, 2 local production sites and one underground storage facility.
- Future investments in the transmission network are expected to be focused mainly on the construction of loop lines and the installation of new compressor stations to increase gas dispatch capacity.
- Aside from PNG transmission, another important value chain component is LNG transmission. Currently, LNG transmission is made by BOTAŞ via its LNG terminal in Marmara Ereğlisi and Egegaz via its terminal in Aliağa. The LNG terminals which includes dispatches to the transmission network through re-gasification, approx. 1.5% (2010) of total consumption was dispatched through overland tankers to areas where the gas network does not reach.



# Storage has just become a liability for importers, and an opportunity for investors.

## Natural Gas Storage Capacity

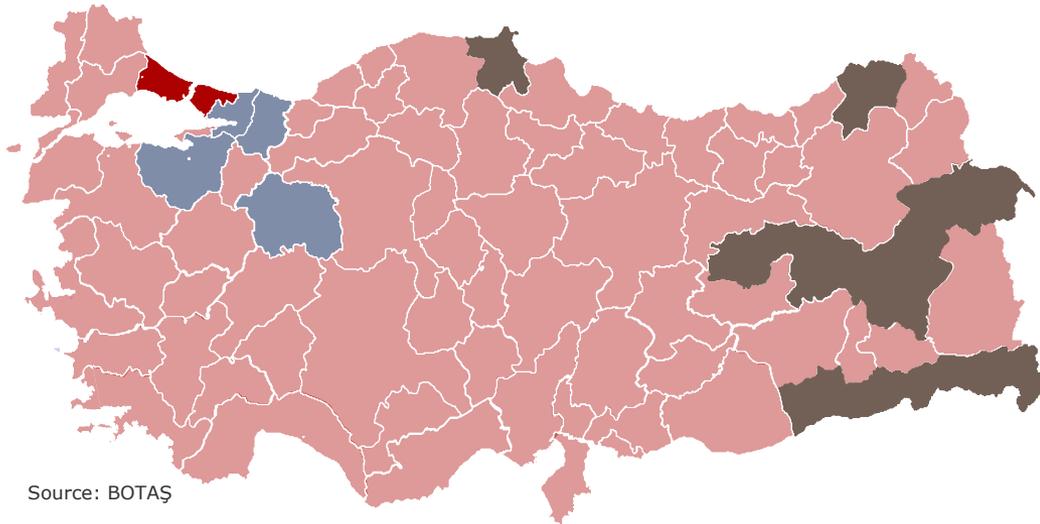


Source: BP, GSE May 2012

- The total storage capacity of the Turkish natural gas market is approx. 2.6 bcm.
- Projects exist to improve Turkey's storage capacity. The main project is BOTAŞ's Tuz Gölü underground storage facility.
- In November 2011, a contract was signed with China Tianchen Engineering Corporation to build a new facility. The project has a completion date of 2018 with a storage capacity of 1 bcm.
- Some private companies are conducting studies to determine the possibility of converting depleted fields in Thrace into storage facilities as well as carrying out studies for underground storage facilities near Tarsus.
- **Investment Tip: Importers have a legal liability to store 10% of their gas imports. This creates an investment opportunity for storage facilities, which currently only covers 5 bcm in Turkey.**



## ... and for distribution and retail sectors as well.



Source: BOTAS

- Natural Gas Supplied before Law No. 4646, not yet privatized
- Natural Gas Supplied before Law No. 4646 and privatizations are finalized
- Privatizations are finalized
- Tender announcements are made, not yet privatized

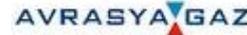
- Natural gas availability in terms of distribution of natural gas to end users across the country has increased significantly in recent years. In 2003, the number of cities having access to natural gas was 6; this number is 72 today.
- Distribution tenders have been successfully completed by EMRA and are up to date. Companies satisfying the financial criteria attended the tenders. The bidding criterion was to offer the lowest distribution tariff, which was defined as “Unit Service and Depreciation Charge (USDC)”. The USDC offered in the tender was valid for 8 years. As of today, this 8-year process is complete for 9 distribution regions.
- Currently, while eligible consumers could supply gas from distribution companies or wholesalers, non-eligible customers can only buy from gas distribution companies.

- **Investment tips: In natural gas distribution, there are limited number of opportunities however potential partnership / acquisition opportunities may arise for the privatized regions. Major examples include:**
  - **Brownfield: Igdas (Istanbul region) privatization**
  - **Greenfield: Artvin, Iğdır, Agri, Bitlis-Bingöl-Mus, Hakkari, Sırnak, Mardin, Tunceli, Sinop,**
- **Potential partnership / acquisition opportunities for privatized regions exists.**



# Major Players

## Exploration, Production , Import & Wholesale



## Wholesale, Distribution & Retail



## Distribution



## Wholesale



# C. Sub-Sectors

i. Electricity

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ii. Petroleum

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iii. Natural Gas & LNG

***iv. Coal***



# An Overview of Coal: The importance it poses for the electricity generation sector.

- The continuous rise in energy demand and prices makes it imperative for Turkey to meet the growing share of its energy needs from indigenous resources. Lignite-fired power plants offer various advantages such as in price advantage, sustainable supply, employment, reduction of foreign trade deficit and regional development. These reasons justify the prioritization of lignite fired-power plants in terms of investments. In light of these reasons, Turkey will offer appropriate incentives for utilization of indigenous resources.
- Turkey is rich in lignite reserves. Use of these reserves would make many positive contributions in line with development objectives, such as regional development, reduction of foreign trade deficit, supply security, reduction of electricity costs, employment, keeping value added in the country and creating a competitive industry.
- Policy goals such as utilizing indigenous resources, ensuring resource diversification, reducing import dependency, etc. are constantly expressed in official strategy papers. Mining sector investments have always been subsidized to the maximum level under both the existing Decree and the previous decrees. Under the current effective Decree no. 2009/15199, the mining sector is among the sectors that are subsidized throughout the entire country.

## Different Models for Operation

### Transfer of Operating Rights

- Direct investments by the public sector and the transfer of operating rights to fields held by TKİ will be transferred to the private sector on the condition that they build power plants within the framework of the royalty model.

### Long-Term Contracts

- TKİ offers coal sales to interested investors under long-term contracts.

### Power Plant Construction by the Public Sector

- The public sector has the option to undertake investment as it deems necessary to ensure supply security, pursuant to Additional Article 3 of Law No. 4628. However, this option can only be applied through the Council of Ministers' Decree when all options have been exhausted and it is acknowledged that the supply shortage cannot be eliminated.

Source: Deloitte Report



# Coal fields are being privatized.

- Turkish Coal Enterprises holds several small-scale lignite fields that are waiting to be utilized. In order to make these projects come to life, a Royalty Tender mechanism was introduced in 2012. The tenders concluded so far are:

Location	Plant min. capacity MW	Reserve Mtons	Company	Tender Amount kr/kWh
Tufanbeyli Adana	600	323	Teyo Group	2.57
Soma-Deniş Manisa	450	150	Kolin İnşaat	4.69
Keleş-Davutlar Bursa	270	55	Çelikler İnşaat	5.61
Domanıç Kütahya	300	114	Çelikler İnşaat	5.03
Yeniköy Muğla	420	50-60	-	-
Karabalçık Karlıova Bingöl	150	89	Aksa	3.2
Can Çanakkale	210	45	-	-

- Tenders are done based on a royalty fee for the generated electricity indexed to the CPI. The investment period is 6 years, whereas the operation period is 30 years. Contracts can be extended under the same conditions if reserves are not depleted.

- Afşin-Elbistan Coal Field is owned by EÜAŞ and has strategic importance for Turkey due to its large coal reserves that could resolve Turkey's import dependency concerns.
- The Afşin-Elbistan Coal Field is a joint development operation currently under consideration intergovernmental agreements with the United Arab Emirates. EÜAŞ is now in negotiations with TAQA regarding the privatization model which allows for securing project income streams without disrupting the free market mechanism.
- The scope of privatization includes the development of B, C, D and E sites, which are the parts of Afşin-Elbistan Lignite Site, and include construction and operation of B, C, D, and E power plants whose installed capacity are planned to be 360 MW, building an expansion plant near the existing B plant and obtaining operating rights of the existing B plant on a lease or similar basis.



# Turkey's coal consumption in various sectors has been growing faster than its production.

- Coal consumption has doubled since 1990. Turkey's coal consumption has been growing faster than its production, thus increasing the country's reliance on energy imports. The installed capacity of coal-fired power plants reached 13 GW which includes imported coal, local hard coal, lignite and asphaltite plants.
- In 2011 total coal consumption amounted to 104.127 Mt. Electricity generation accounted for 68% of total consumption in 2011, while household heating accounted for 14%. The remaining 18% fell under industrial usage.
- Turkey consumed 70.8 Mt coal for electricity generation, 14.2 Mt for household heating and 19.2 Mt for industrial use in 2011. The use of coal for electricity generation is crucial as coal plants provided almost 29% of total electricity production in 2011. This figure was 27.4% in 2012.

## Total Coal Consumption by Use

TYPE	2007	2008	2009	2010	2011	2012
	Mt	Mt	Mt	Mt	Mt	Mt
<b>Household Heating</b>	7.998	11.806	14.362	13.988	14.114	11.786
<b>Electricity Generation</b>	66.448	71.882	69.255	63.485	70.785	65.420
<b>Steel Industry</b>	3.693	4.408	4.319	6.072	5.937	7.286*
<b>Cement Industry</b>	5.650	6.656	6.459	6.792	7.679	n/a*
<b>Other Industry</b>	16552	6.141	7.922	8.391	5.612	8.277*
<b>TOTAL</b>	100.341	100.893	102.317	98.728	104.127	n/a*

Note: The difference between consumed hard coal to produce coking coal adds to industrial usage

\*Incomplete data due to Law no: 5429

Source: Ministry of Energy and Natural Resources, Energy Balance Reports & Turkish Statistical Institute, Deloitte Analysis



# Coal is in short supply for meeting overall demand.

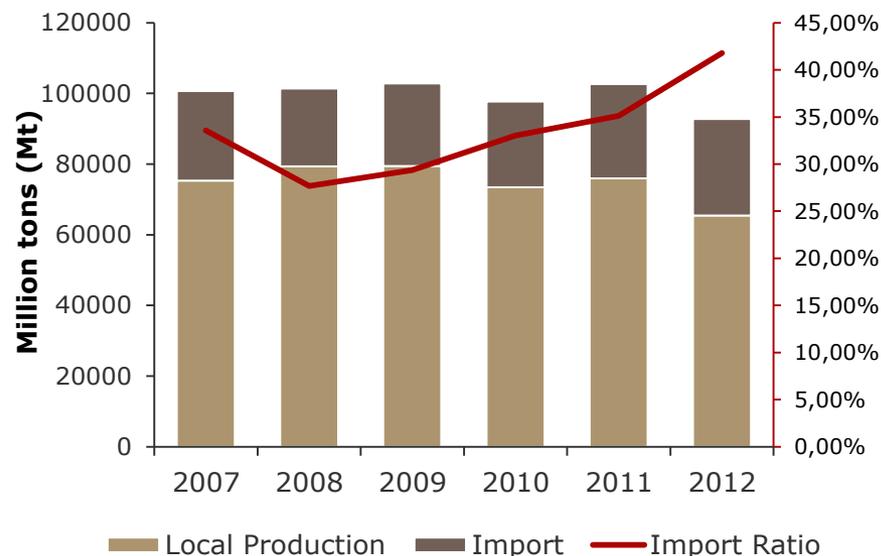
- Coal production in Turkey increased by approximately 10 million tons in the last ten years and reached a volume of 75.9 million tons in 2011. At present only a small power station with a capacity of 300 MW (Çatalağzı) and Kardemir's former 35MW plants are fuelled with domestic hard coal from the Zonguldak basin while lignite-fired power plants have a total capacity of 8,140 MW.
- Local production increased by 3.5 Mt in 2011, yet still remained below the growing rate of total consumption. Coal imports to Turkey increased by 2.5 Mt and reached 26.3 Mt in 2011. Thermal coal and coking coal imports constituted 90% of total imports, while the remaining 10% included petcoke. Coal imports to Turkey are expected to increase in upcoming years while export is to remain at zero. Coal-fired power plants using imported coal had a total capacity of 3,984 MW at the end of 2012.

## Total Coal Supply/Consumption Balance

	2007	2008	2009	2010	2011	2012
	Mt	Mt	Mt	Mt	Mt	Mt
<b>Local Production</b>	75.30	79.40	79.49	73.40	75.98	65.43
<b>Import</b>	25.30	21.90	23.34	24.30	26.67	27.34
<b>Total Supply</b>	100.34	100.89	102.32	98.73	104.13	N/A

Note: Total supply might not be equal to total local production and import due to inventory changes, internal consumption and losses

Source: Ministry of Energy and Natural Resources, Turkish Coal Enterprises & Turkish Statistical Institute  
Deloitte Analysis



Source: Deloitte Analysis



# Production is under the control of public institutions.

- Turkey has around 11.7 billion tons of lignite reserves and 1.3 billion tons of hard coal reserves of which 9.8 billion tons and 0.5 billion tons respectively are in the proven category.
- Major lignite producers are the state-owned General Directorate of Turkish Coal Enterprises (TKİ), which produced 33.4 Mt of lignite in 2011 and the state-owned Electricity Generation Co. Inc. (EÜAŞ), which produced 31.6 Mt of lignite in 2011.
- The most prominent hard coal producer is the state-owned Turkish Hard Coal Enterprises (TTK) which operates five underground mines in the Zonguldak coal basin in the Black Sea region. TTK produced approximately 1.6 Mt of hard coal in 2011.
- In 2011, local lignite and hard coal production totaled 76.9 million tons. Nearly 90% of total coal production was from state-owned enterprises in 2011. However, about 35% of coal production reported by the state enterprises was mined by private companies under subcontracts.

## Major Local Coal Supply by Enterprise

	2007	2008	2009	2010	2011
Name of Enterprise	Mt	Mt	Mt	Mt	Mt
TKİ	29.8	35.9	32.5	29.8	33.4
EÜAŞ	23.4	31.9	33.5	32.1	31.6
TTK	1.6	1.59	1.88	1.71	1.59
Private Companies*	20.5	10.01	11.61	9.79	9.39
<b>Total Local Production</b>	<b>75.3</b>	<b>79.4</b>	<b>79.49</b>	<b>73.4</b>	<b>75.98</b>

\* Since public data for all private sector players is limited, the figures are formed from the difference between the announced values of total production and production of TKİ, EÜAŞ, TTK

Source: Turkish Coal Enterprises & Turkish Hard Coal Institute, 2011 Annual Report, Turkish Statistical Institute, Deloitte Analysis



# Annex 1: Projects in licensing process (by EMRA)

FUEL/RESOURCE TYPE	Application Phase		Examination Evaluation		Approved		TOTAL	
	Number	Installed Power (MW)	Number	Installed Power (MW)	Number	Installed power (MW)	Number	Installed power (MW)
Wind	2	47.2	9	408,6	33	1,701.90	44	2,157.70
Hydro	68	1171	76	1,346.71	295	3,707.66	439	6,225.37
Fuel Oil	0	0	0	0	0	0	0	0
Natural Gas	63	10,007.9	40	12,100.12	45	11,050.23	148	33,158.25
Lignite	2	1147	0	0	1	135	3	1,282.00
Anthracite Coal	14	10,369.6	8	3,550	4	2,295.00	26	16,214.60
Asphaltite	0	0	0	0	1	135	1	135
Waste	0	0	0	0	0	0	0	0
Geothermal	10	264	8	105.95	2	155	20	524.95
Landfill Gas	1	4.02	0	0	1	1,2	2	5.22
Biogas	3	3.73	5	11.01	6	19.96	14	34,7
Biomass	8	31.18	6	55.88	4	35.96	18	123.02
Solar	0	0	0	0	0	0	0	0
Nuclear	0	0	1	4,800	0	0	1	4,800.00
<b>TOTAL</b>	<b>171</b>	<b>23,046.00</b>	<b>153</b>	<b>22,378.00</b>	<b>392</b>	<b>19,237.00</b>	<b>716</b>	<b>64,660.81</b>



## Annex 2:

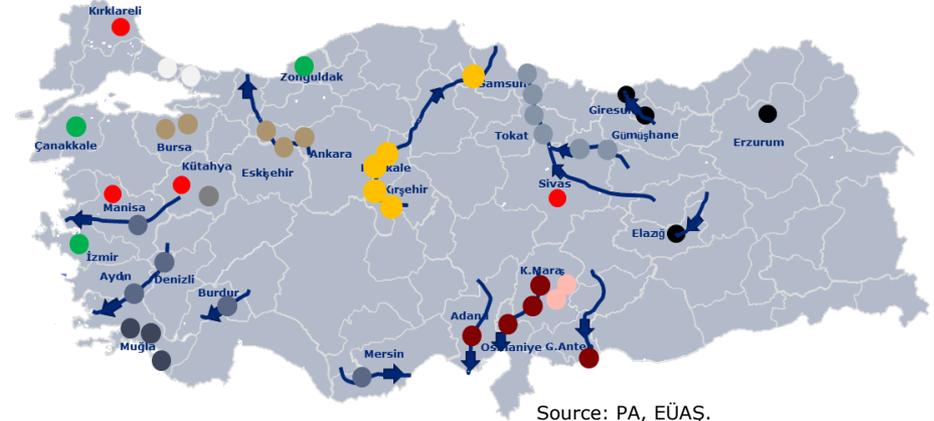
**Opportunities for Brownfield Investment: Contracts for BO/BOT/TOR plants will expire and be privatized by 2025 at the latest.**

	Power Plant	Fuel	Capacity (MW)	Commissioning Date	Contract Termination Date
BUILD OPERATE	Intergen Gebze	Natural Gas	1,595	2002	2018
	Intergen Adapazarı	Natural Gas	798	2002	2018
	Intergen İzmir	Natural Gas	1,591	2003	2019
	Baymina	Natural Gas	798	2004	2020
	Isken	Imported Gas	1,320	2003	2019
	Trakya Elektrik	Natural Gas	499	1999	2019
	UNIMAR	Natural Gas	504	1999	2019
	Esenyurt	Natural Gas	189	1999	2019
	Ova Elektrik	Natural Gas	258	1997	2017
	Bireecik HES	Hdyro	672	2001	2016
BUILD OPERATE TRANSFER	Yamula Hes	Hdyro	100	2005	2025
	Çamlıca-I HES	Hdyro	84	1998	2013
	Ahiköy-I HES	Hdyro	2	1999	2019
	Ahiköy-II HES	Hdyro	2	1999	2019
	Aksu-Çayköy HES	Hdyro	16	1999	2019
	Berdan HES	Hdyro	10	1996	2011
	Çal HES	Hdyro	3	2001	2021
	Dinar-II HES	Hdyro	3	2000	2015
	Fethiye HES	Hdyro	17	1999	2014
	Girlevik-II Mercan HES	Hdyro	11	2001	2021
	Gönen HES	Hdyro	11	1998	2019
	Hasanlar HES	Hdyro	10	1991	2011
	Suçatı HES	Hdyro	7	2000	2015
	Sütçüler HES	Hdyro	2	1998	2018
	Tohma-Medik HES	Hdyro	13	1998	2018
	Gaziler HES	Hdyro	11	2002	2022
	Alaçatı RES	Wind	7	1998	2019
	Bozcaada RES	Wind	10	2000	2020
TRANSFER of OPERATING RIGHTS	Çayırhan	Lignite	620	2000	2020
	Hazar I-II HES	Hydro	30	1996	2022
<b>TOTAL</b>			<b>9,191</b>		



## Annex 3:

# Opportunity for brownfield investment: privatization portfolio of EÜAŞ over 16 GW (1/2)



Source: PA, EÜAŞ.  
Plants coded in red are not within the portfolio, but are planned to be privatized separately.

Portfolio	Thermal (MW)	Hydro (MW)	Total (MW)
Portfolio 1	2,795	-	2,795
Portfolio 2	1,981	-	1,982
Portfolio 3	1,165	-	1,165
Portfolio 4	1,642	476	2,128
Portfolio 5	1,680	360	2,040
Portfolio 6	-	1,017	1,017
Portfolio 7	-	838	838
Portfolio 8	-	630	630
Portfolio 9	-	356	356
Total	9,263	3,677	12,940

### Generation Privatizations

- The privatization of more than 16 GW of 25 GW installed capacity belonging to EÜAŞ and its subsidiaries are planned.
- Aside from these portfolios, some power plants have been privatized singly:
  - The Hamitabat plant (1,156 MW, Natural Gas) was acquired by a local conglomerate, Limak Holding, with a bid of USD 105 million.
  - The Seyitömer plant (600 MW, Lignite) was acquired by another local conglomerate, Çelikler Holding with a bid of USD 2.2 billion.
  - The Kangal plant (457 MW, Lignite) was acquired in a joint venture by Konya Şeker – Siyahkalem with a bid of USD 985 million.
  - The next plant to be privatized is Çatalağzı (300 MW, Hard Coal). Tenders for Soma (1034 MW, Lignite) and Portfolio 9 (356 MW, Hydro) have also been announced and will start before the end of 2013 by the Privatization Authority.



# Annex 3:

## Opportunity for brownfield investment: Privatization portfolio of EUAS of over 16 GW (2/2)

Portfolio	Share	Name	Fuel Type	Installed Cap (MW)	Total Cap (MW)	Portfolio	Share	Name	Fuel Type	Installed Cap (MW)	Total Cap (MW)
1		Afşin-Elbistan A	Lignite	1,355	2,795	6		Altinkaya	Dam	702.55	1,016
		Afşin-Elbistan B	Lignite	1,440				Hirfanlı	Dam	128	
2		Ambarlı D.Gaz	Natural Gas	1,350.9	2,521			Kesikköprü	Dam	76	
		Ambarlı F.Oil	Fuel Oil	1,170				Derbent	Dam	56.4	
									Kapulukaya	Dam	
3		Aliağa	Natural Gas	180	865			7		Hasan Uğurlu	
		Çan	Lignite	320		Kılıçkaya	Dam			120	
		Tunçbilek	Lignite	365		Köklüce	Dam			90	
4		Bursa D.Gaz	Natural Gas	1,432	2,118	Suat Uğurlu	Dam			69	
		Orhaneli	Lignite	210		Çamlığöze	Dam			32	
		Gökçekaya	Dam	278.4		Almus	Dam	27			
		Sarıyar	Dam	160		8		Karkamis	Dam	189	
Yenice	Dam	37.89	Çatalan	Dam	168.9						
5		Kemerköy	Lignite	630	2,050			Aslantas	Dam	138	
		Yatağan	Lignite	630				Menzelet	Dam	124	
		Yeniköy	Lignite	420		9		Özlüce	Dam	170	
		Gezende	Dam	159.4				Kürtün	Dam	85	
		Demirköprü	Dam	69				Tortum	Lake	26.2	
		Adıgüzel	Dam	62				Doğankent	Run of river	74.5	
Kemer	Dam	48									
Karacaören-1	Dam	32									

■ Natural Gas 
 ■ Lignite 
 ■ Dam 
 ■ Run of river 
 ■ Fuel Oil 
 ■ Coal 
 ■ Lake

Source: PA, EÜAŞ.

Please note that this portfolio structure is currently under re-consideration.



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