



TURKISH INDUSTRIALISTS' AND BUSINESSMEN'S ASSOCIATION

BUSINESSEUROPE



LIBERALIZATION OF THE ENERGY SECTOR: THE CASE OF TURKEY AND THE EU

UPON THE FINDINGS OF

"BOSMIP2 ENERGY AND TRANSPORT SEMINAR"



TUSIAD ENERGY STRATEGY SERIES-4

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PREFACE

TUSIAD (The Turkish Industrialists' and Businessmen's Association) was founded in 1971, according to the rules laid by the Constitution and in the Associations Act, is a nongovernmental organization working for the public interest. Committed to the universal principles of democracy and human rights, together with the freedoms of enterprise, belief and opinion, TUSIAD tries to foster the development of a social structure which conforms to Atatürk's principles and reforms, and strives to fortify the concept of a democratic civil society and a secular state of law in Turkey, where the government primarily attends to its main functional duties.

TUSIAD aims at establishing the legal and institutional framework of the market economy and ensuring the application of internationally accepted business ethics. TUSIAD believes in and works for the idea of integration within the international economic system, by increasing the competitiveness of the Turkish industrial and services sectors, thereby itself of assuring a well-defined and permanent place in the economic arena.

TUSIAD supports all the policies aimed at the establishment of a liberal economic system that uses human and natural resources more efficiently by means of the latest technological innovations and which tries to create the proper conditions for permanent increases in productivity and quality, thus enhancing competitiveness.

TUSIAD, in accordance with its mission and in the context of its activities, initiates public debate by communicating its position supported by scientific research on current issues.

*TUSIAD is a member of BUSINESSEUROPE (Confederation of European Business) since 1987. BUSINESSEUROPE and 25 of its member federations have run and organized the Business Organisations as Single Market Integration Players (BOSMIP) program. BOSMIP2, the second BOSMIP Program is a continuation from the first one realized in 2003-2004. The main aim of the BOSMIP programs is to familiarize the target candidate countries with EU legislation and the *acquis communautaire*.*

This report is prepared by TUSIAD Industry, Services and Agriculture Department Head Hale Altan as a follow-up on the findings of BOSMIP 2 "Energy and Transport" Seminar realized on 20-21 November 2008 in Istanbul. The report analyzes the key issues of liberalization in the electric and natural gas markets of Turkey and the EU. The sections "Liberalization Process of the EU Electricity Market" and "Liberalization of the EU Gas Market" are taken from the presentations of Martin Gram, Advisor at the Confederation of Danish Employers (DI), and "Staying Competitive in a Low Energy Future" from the presentation of Folker Franz, Senior Advisor on Environmental Affairs at BUSINESSEUROPE in the abovementioned seminar.

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November 2009

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ABBREVIATIONS

BOO- Build-Own-Operate
BOT- Build-Own-Transfer
BOTAŞ- Petroleum Pipeline Co.
DSO- Distribution System Operator
DUY- Balancing and Settlement Regulation
EEX- European Energy Exchange
EMRA- Energy Market Regulatory Authority
ETS- Emission Trading Scheme
GHG- Greenhouse Gas Emissions
IEA- International Energy Agency
IMF- International Monetary Fund
ITO- Independent System Operator
MENR- Ministry of Energy and Natural Resources
MS- Member States
OECD- Organization for Economic Cooperation and Development
SPO- State Planning Organization
RES- Renewable Energy Sources
TEDAŞ- Turkish Electricity Distribution Co.
TEİAŞ- Turkish Electricity Transmission Co.
TETAŞ- Turkish Electricity Trading and Distributing Co.
TPA- Third Party Access
TSO- Transmission System Operator
TUSIAD- Turkish Industrialists' and Businessmen's Association
UCTE- Union for Coordination of Transmission of Electricity
VIC- Vertically Integrated Companies

1. INTRODUCTION

Energy sector is a key area of cooperation in the new landscape of the 21st century within which the world's economic regions are dependent on each other for ensuring energy security, economic stability, and effective action against climate change. In order to envision its energy strategy, Turkey has to closely monitor global developments, especially the EU, on the path towards accession.

In the current time period, the economic regions of the world are dependent on each other in order to sustain economic stability and supply security for energy, which is the most important input for virtually all kinds of industries and production sectors. In order to boost the competitive power of the sectors, it is necessary to be able to provide energy with affordable prices and ensure efficient energy use.

According to the estimations of the International Energy Agency (IEA), global energy demand will grow over 50% in the next 25 years. Accordingly, fast growing countries such as India and

China will contribute to more than 40% of the rise in demand. Hence, ensuring security of supply will entail more competition for the diversification of supply than ever. A shortage in the security of primary energy supply will also cause secondary energy resources that use these resources as input to suffer, causing a double burden on industries all over.

Global consumption for primary resources was 3.8% in 2003-2007 period, while this rate has fallen to 2.4% in 2008 due to the global financial crisis. Moreover, the global GDP growth, which was 3% in 2008 is expected to decline to -1.1% according to IMF projections, with a significantly higher impact on the advanced economies by an estimate of -3.4% in 2009.

A quick recovery is not expected for advanced economies in 2010. Accordingly OECD data portrayed -4.7% and -4.6% decline for its economies for the first two quarters of 2009 respectively. Average oil prices per barrel were taken as \$61.5 for 2009 and \$ 76.5 in 2010 in the calculation of these estimations.

This level is much lower than its average level of \$ 97 in 2008, hitting an all-high of \$ 144 in July 2008. Natural gas prices were affected similarly, as exports fell over 10% globally. The fall in energy prices as a result of the financial crisis affected the energy sector investments at a time when the sector is already facing other financial concerns.

Cumulative global energy investment requirement is \$ 26 trillion. Investment requirement for the energy subsectors can be observed in the chart below. Due to the sharp decline in energy demand and energy prices, some of the investments have become infeasible, increasing the possibility of an interruption in energy investments for the upcoming years.

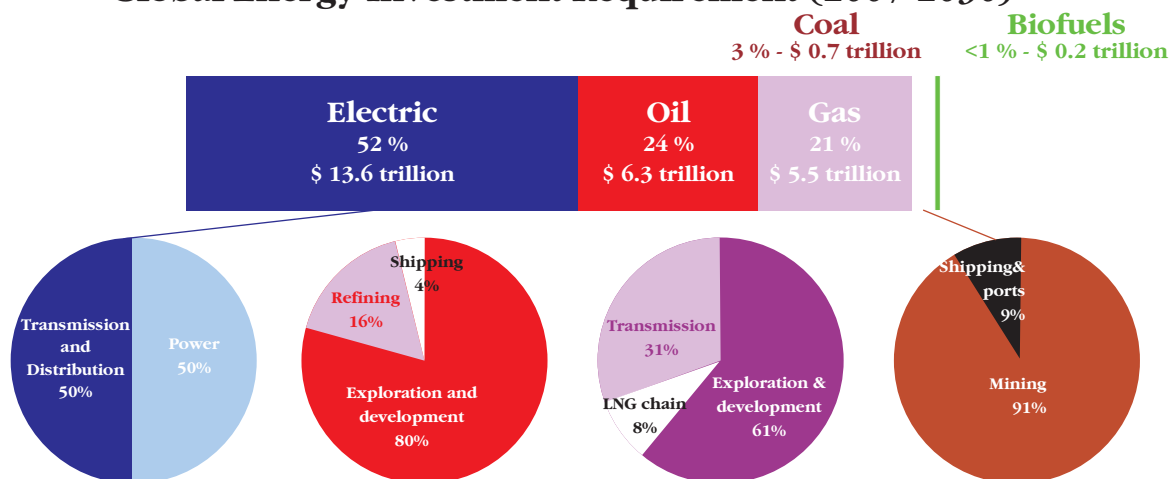
Turkey depicts a similar picture as the demand projections of the Ministry

of Energy and Natural Resources (MENR) indicate over 100% additional capacity building, which would require an investment level of approximately \$130 billion by 2020. As TUSIAD, we believe in the involvement of the private sector in the liberalization process of the energy sector.

Turkish demand projections indicate a possible energy gap in the electric and natural gas sectors by 2017.

Taking into consideration the elapsed time required for the completion of the necessary investments, their launch should be promoted in this period where there is no immediate danger of energy shortage.

Global Energy Investment Requirement (2007-2030)



Source: International Energy Agency

Delay of the investments will ultimately require more costly solutions in the future, and may eventually lead to an energy shortage- the most costly result of all.

It is necessary to improve the investment climate in the energy markets in order to attract private sector investment. Nearly \$ 10 billion of investment per annum is required for Turkey. Energy sector was not included in the incentive package announced in July 2009 for large-scale investments. Considering the critical importance of the sector and the current investment climate, certain incentives should be provided to the sector. These could include measures such as a possible

financing model to be introduced by public banks or Eximbank, export credit bank of Turkey, and the reexamination of the extra costs on the electricity prices (excise duties, contribution to the National Television, charges for the usage of the system, etc.)

Solving the financing problem alone will not be sufficient to attract the required level of private investment to the sector in the long run.

A functioning market, where private sector can make bilateral agreements, needs to be secured.

Turkey's Energy Investment Requirement (2005-2020)

Subsectors	Investment (M\$)
Coal	5,109
Oil	16,000
Natural Gas	2,700
Electricity	104,765
Public Waterworks	6,093
Electricity Generation Co.	458
New Generation Investments	91,276
Transmission	938
Distribution	6,000
TOTAL	128,574

Source: MENR

2. ELECTRIC MARKET LIBERALIZATION

2.1. The Case of Turkey

History

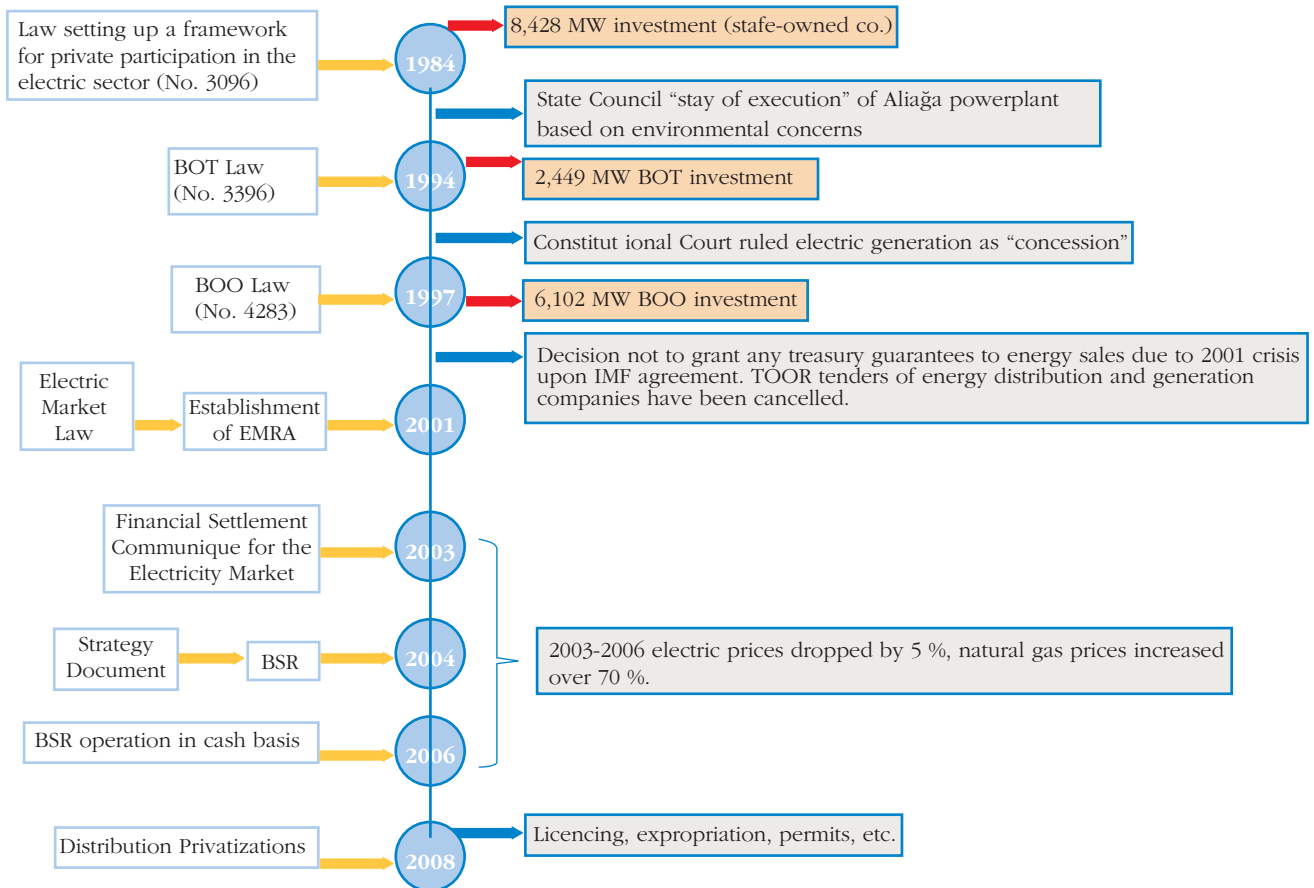
Liberalization process of Turkish electric markets started in 1984 with the Law Setting up A Framework for Private Participation in the Electric Sector. (No. 3096). The law never took effect as the Constitutional Court ruled “stay of execution” for Aliğa power plant based on environmental concerns. In 1994 and 1997 Build-Own-Operate (BOO) and Build-Own-Transfer (BOT) Laws were passed. Despite 8,500 MW worth of BOO and BOT investments, the process was disrupted by the Constitutional Court’s ruling of electric generation as “concession” and liberalization was halted until 2001.

Energy market liberalization has gained momentum in 2001, with the launch of both the Natural Gas Market Law and Electricity Market Law, aiming to reorganize the electricity and natural gas markets through restructuring of the state enterprises into a corporate form operating under market competition.

Turkish Power Sector Liberalization Plan was also introduced laying out a calendar for electric market liberalization. Consequently, generation, transmission and wholesale activities were separated for the first time and a key regulatory body and a system operator were established. Market structure and regulations were defined for the transition period.

Despite certain developments in the process, electric market liberalization process fell short of expectations and the calendar set in 2001. In 2003-2007 period, price of electricity dropped by 5%, whereas natural gas prices increased by 70%, forcing private sector out of the market, eventually leading to a supply-demand imbalance in August 2006. Partly due to the realization of the need for private sector involvement in the market, concrete steps were taken towards liberalization such as the Balancing Settlement Regulation (2006), the start of privatization of electric distribution companies and lowering of the eligible customer threshold.

Turkish Electric Market Liberalization



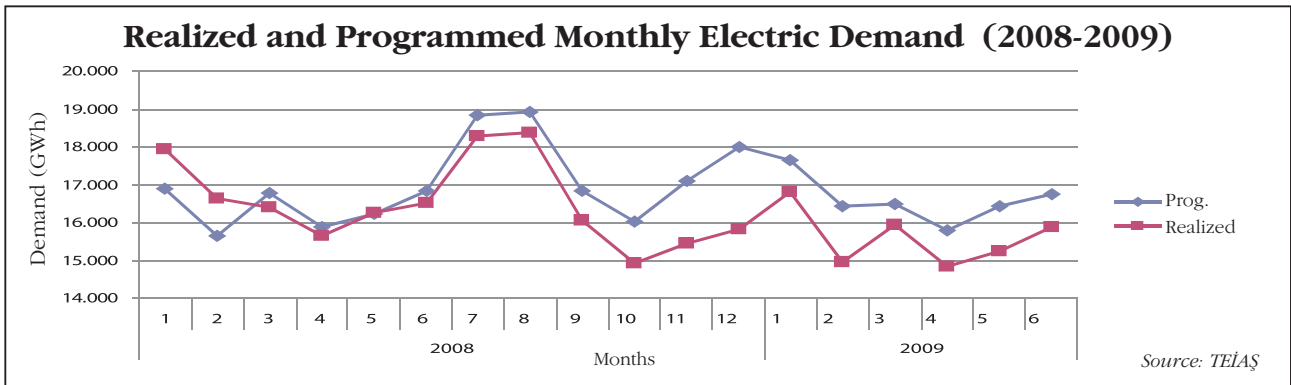
Source: TEDAŞ

Electric Demand

Turkey's installed power capacity is 43.3 GW by the end of 2008. According to the estimates of Energy Ministry, an additional capacity of 13.1 GW will be required to meet the total demand by 2018. Prior to the global economic crisis, projections of Turkish Electricity Transmission Co. (TEİAŞ) indicated that the expected electricity demands according to the project generation capacity will not be covered as of 2013. This date has been pushed back

to 2015, as the demand realized in 2008 fell short of expectations with 198bn kWh. This downward trend continued in 2009 as the demand fell further.

The delay in the power shortage should not lead to complacency, as TEİAŞ's revised scenario still alerts a possible electric gap by 2017 if the required investments are not realized.

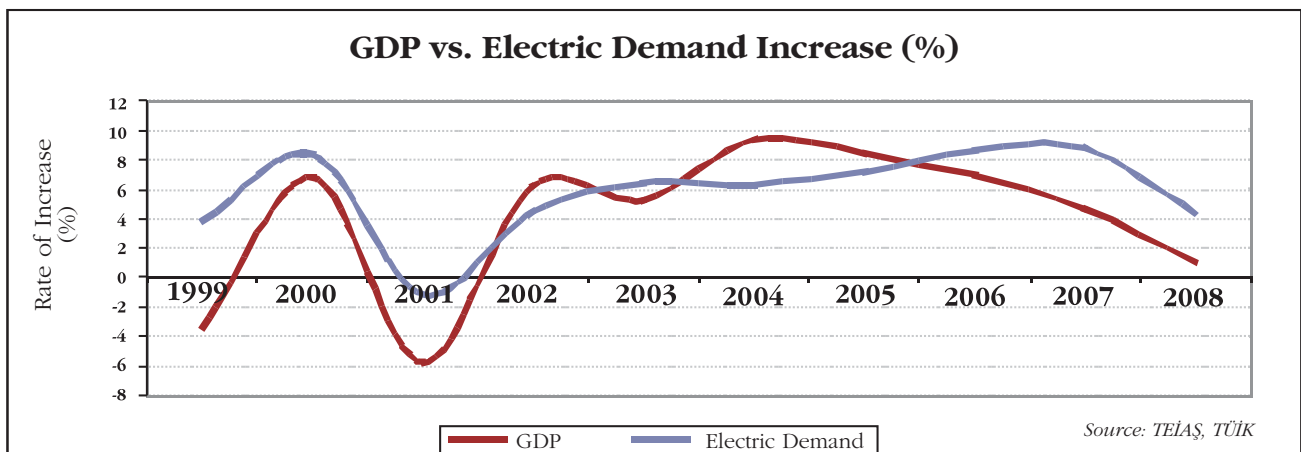


Resurfacing of a supply shortage risk may occur earlier than the predicted date as energy demand of Turkey has a trend of recovering more quickly than that of GDP levels. Despite current power capacity being much higher than the demand of 198bn kWh in 2008, factors such as lack of maintenance and rehabilitation investments and meteorological conditions may affect the safe utilization capacity.

Turkish electric market follows the global trends, displaying much larger cycles. Consequently, the electricity demand in Turkey rose by 8.6 % in 2007, and by 4.4 % in 2008. It is expected for

the demand growth to be -2% in 2009, due to reflections of the global financial crisis. The decline in industrial production by 17.8 % in 2009, which uses 46.2 % of the electricity is the main factor contributing to the decrease in demand. It is estimated for the energy consumption growth in Turkey to surpass global average in the long run.

In order to ensure that sectors have constant access to energy with competitive prices, slow down of investments, which could jeopardize liberalization process, should not be allowed.



Electric Generation

Electric generation has been on a rising trend in Turkey since 1984, except for 2001 financial crisis where electric generation has decreased by 1.8% and consumption by 1.2% respectively. 2009 is the second year since the 1980s where Turkey is expected to experience negative growth rates in both electric generation and consumption.

Turkey mainly imports its oil and natural gas. Over 70% of electric consumption is based on foreign resources.

In order to obtain energy security, natural gas, which approximately constitutes 50% of electric production, and is mainly exported, should be diversified as a resource.

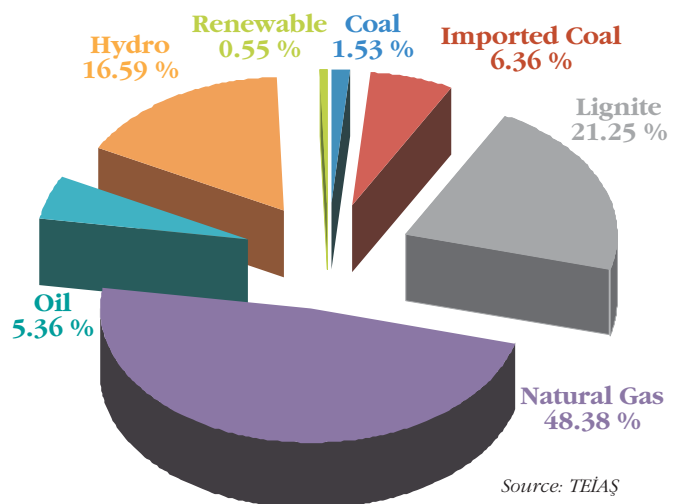
The use of renewables should be promoted consequently. The target share of the MENR of 30% renewable use in the production of electricity in the new Electric Market Strategy Paper is a solid step both in terms of security of supply and environmental considerations.

However, concrete legislative initiatives have to be taken in order to promote the use of renewables.

Establishing a cost based pricing mechanism is essential for the promotion of all generation activities.

A revision on the Renewable Energy Law that could endorse necessary energy investments through upgrading and differentiating the feed-in tariff structure would prove useful for the promotion of renewables.

Primary Sources Used in Electric (2008)



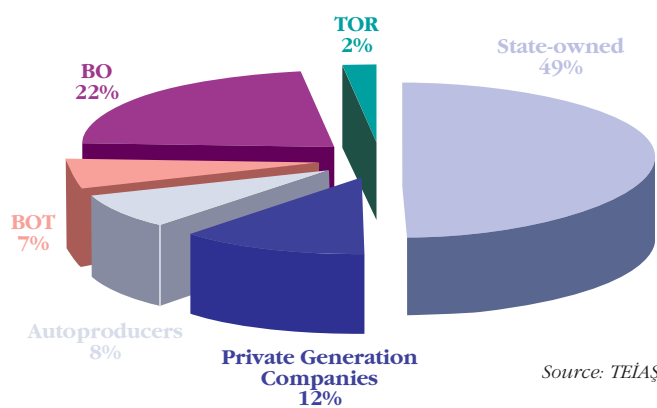
Public sector contributes to 59% of electric generation in Turkey, whereas only 20% of the market is open to competition. Electric Market Law calls for

a restructuring of the market with a target of gradual transfer of generation, distribution and trade activities to the private sector. Accordingly, the share of public sector in electric generation should be lowered maintaining its primary role as a regulatory and supervisory body.

Electric Prices

Electric prices, which remained constant between 2003 and 2008, despite the increases in the natural gas prices, experienced sharp increases since the beginning of 2008. The spot market was established in 2006 through Balancing and Settlement Regulation (DÜY). DÜY market for the first time allowed real-time balancing and enabled producers to reflect increases in their costs (i.e. natural gas) to their price and to lower distribution and transmission charges.

Electric Generation, 2008

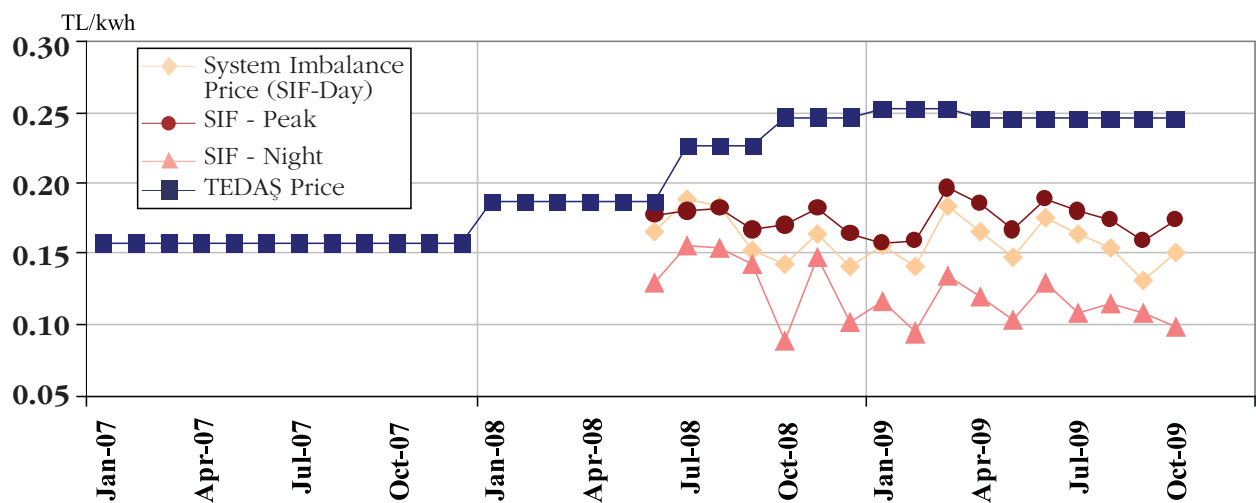


Source: TEİAŞ

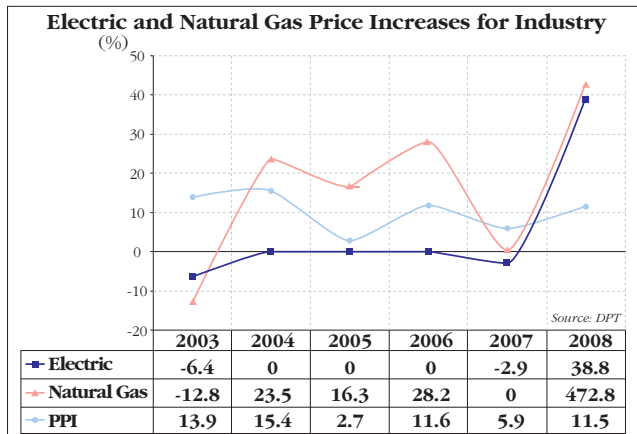
Facilitating investments in the energy sector will contribute to the security of supply vis-à-vis other solutions that harm the liberalization process.

Balance and settlement market produced signals for investment in the market, and average market prices increased steadily. Investors, which had

Electric Prices



Source: TEİAŞ, TETAŞ



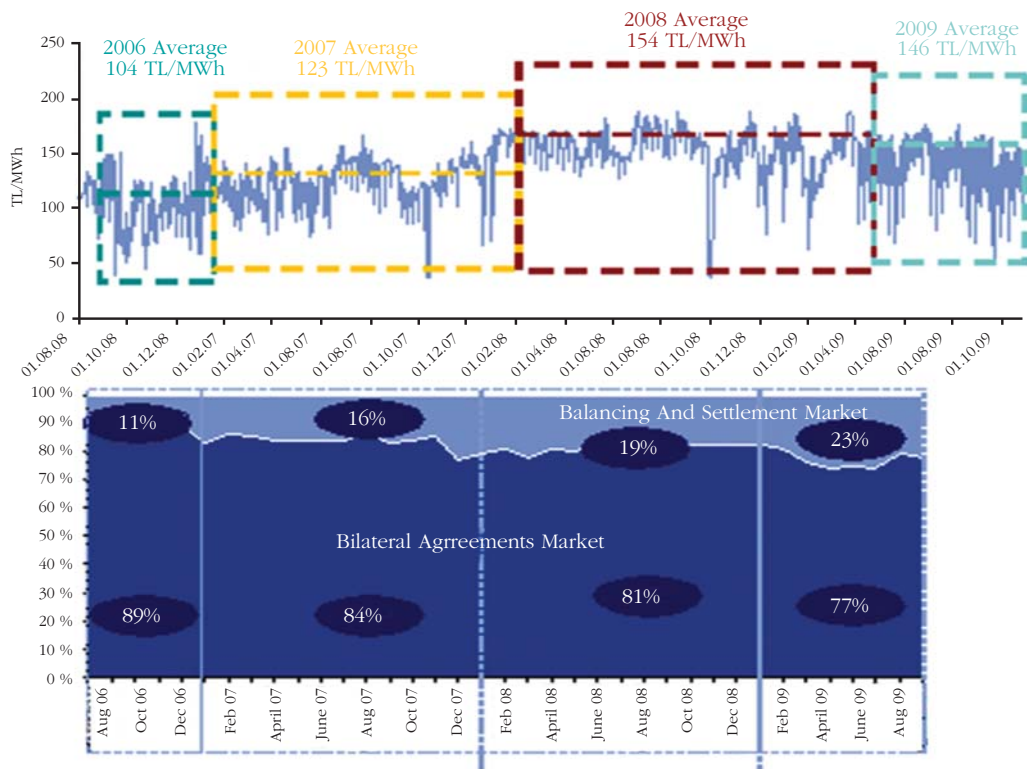
ceased production due to high losses, reentered the market. Consequently, the target market share for the balancing and settlement market of 15-20% was achieved within 6 months after its establishment.

Despite fears and the sharp drop in industrial production, DUY market was only mildly affected by the global

economic crisis and enlarged its portion vis-à-vis the bilateral agreements market. Another factor contributing to the growth of the DUY market is the postponement of Turkish Electricity Trading and Contracting Co. (TETAŞ) tenders for producers that aim to secure long term contracts. The tender was cancelled since producers offered prices well above the TETAŞ threshold.

DUY market of 2006 was an initial step towards the establishment of a market with transparent and reliable pricing mechanism based on costs taking into consideration the supply and demand balance. The liberalization process has to continue with the establishment of the

Balance and Settlement Market Prices



Source: TETAŞ, Deloitte

day ahead market with capacity mechanism, demand side involvement, and futures market, eventually leading to an autonomous Turkish electric exchange market, where active electric energy and derivative products will be exchanged.

Bilateral contracts market needs to be enhanced as a prerequisite for the development of a functioning market mechanism.

Creating a more credible and transparent environment for determining prices, will eventually influence investment decisions of producers. The establishment of a market mechanism where price is set according to the cost based supply and demand balance should be targeted. This will help to reduce uncertainty allowing investors to make long-term forecasts.

Privatizations

Public sector is still the major power controlling electric market. Privatization of electricity production and distribution is crucial for the liberalization of the market.

Turkish Electricity Distribution Corporation (TEDAŞ), a Turkish State-owned joint-stock company engaged in the distribution and retail sale of electricity and provision of retail services to 29.5 million final customers with 126 billion kWh of electricity sales and 98% market share. Privatization process of TEDAŞ took start with the Electricity Sector Reform and Privatization Strategy Paper dated March 17, 2004. Accordingly, privatization of all 20 distribution companies/regions owned by TEDAŞ was to be finalized by 31 December 2006. Privatization of generation companies was to be initiated simultaneously.

The privatization process of both distribution and generation companies suffered from delays. The process for the distribution companies was initiated in 2007 with Başkent and SEDAŞ regions. Privatization tenders of five other regions, Meram, Aras, Çoruh, Osmangazi and Yeşilırmak have been completed, but the hand over process has not yet been finalized. Two regions, Menderes and Göksu have been excluded from the privatization portfolio. Biddings for the tender process for four other regions (Vangölü, Uludağ, Fırat and Çamlıbel

regions) are to take place in February 2010.

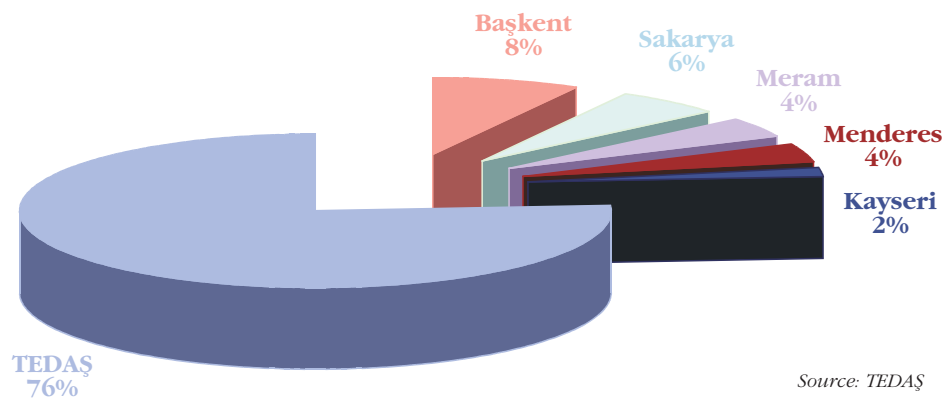
Despite the ongoing economic crisis, the privatization process was not halted in 2009. Four companies that have completed the tender process constitute 24 % of the total net electricity sales of TEDAŞ, their theft-loss rates comprising 14 % of the total.

with a total investment requirement of 2,750 million TL for the transition period.

In electric generation, the first privatization was successfully realized, although it was small in terms of capacity.

Transfer of 9 power plants with approximately 140 MW of installed capacity to private sector was completed.

Electric Distribution Shares of Public vs. Private Sector



Reduction of costs through efficient operation, decline of high theft-loss rates of 27.4 billion kWh, amounting to 14.4% of the total electric generation, and strengthening financial structure of the sector by increasing accrual and collection rates are pronounced among the benefits of the privatization process. Private sector will also be committing to the realization of annual expansion, replacement and improvement investments, which are currently undertaken by the public sector

It is encouraging to see the political willpower to complete the ongoing privatization process by the end of 2010. However, the current strategy is far from its earlier approach of setting up a schedule with concrete deadlines. Only the target date is set for the initiation of the privatization of generation companies.

Legislation should be reformulated according to the requirements of a private market, without leading to any discriminatory implementations.

Accordingly, tariffs should be set reflecting the costs incurred in a competitive market based on definitive terms.

Union for the Coordination of Transmission of Electricity

Union for the Coordination of Transmission of Electricity (UCTE) is announced as a priority project for Turkey by the Ministry of Energy and Natural Resources. Although Turkey has various interconnection projects, it has been involved with the UCTE project since 1970s, intensifying its efforts to become a part of the Union since 2001.

Turkey holds a crucial position in the UCTE network, due to its geographic position for electricity trade and possible contributions to the energy balance with an already installed capacity of 41.8 GW, expected to double by the year 2020. Time difference, albeit 1 hour with most European zones, can contribute to the energy balance if Turkey's interconnection to the grid is established.

Interconnection system will enable a certain amount of savings for the new production facility investments as the

reserve capacity of the parties will be subject to joint usage, minimizing production losses caused by power failures. As it would be possible to minimize costs through electricity trade, the parties will ensure operational savings.

Constraints of Turkish participation remain as the high hydraulic power plant capacity of the Turkish electricity system and the thermal limit of the Serbia-Romania interconnection line. The EU perceives Turkish inclusion in the project as a prerequisite for the realization of the Mediterranean Ring (MEDRING). Addressing the infrastructure deficiencies in order to complete the UCTE project is of critical importance for the opening of the energy chapter in the negotiation process.

As TUSIAD, we support Turkey to take part in international projects on electric generation, transmission and trade, as well as in natural gas and crude oil pipeline projects, in line with the interests of our country. Moreover, we consider this project to be a positive development for the energy producers and a contribution to the liberalization of the Turkish electric market.

The EU Accession Process and Turkish Electric Market

Accession negotiations on the energy chapter are currently blocked due to Greek Cypriot veto. However, in the spirit of facilitating the inevitable accession process, a functional market structure that foresees competition in the electricity sector must be established.

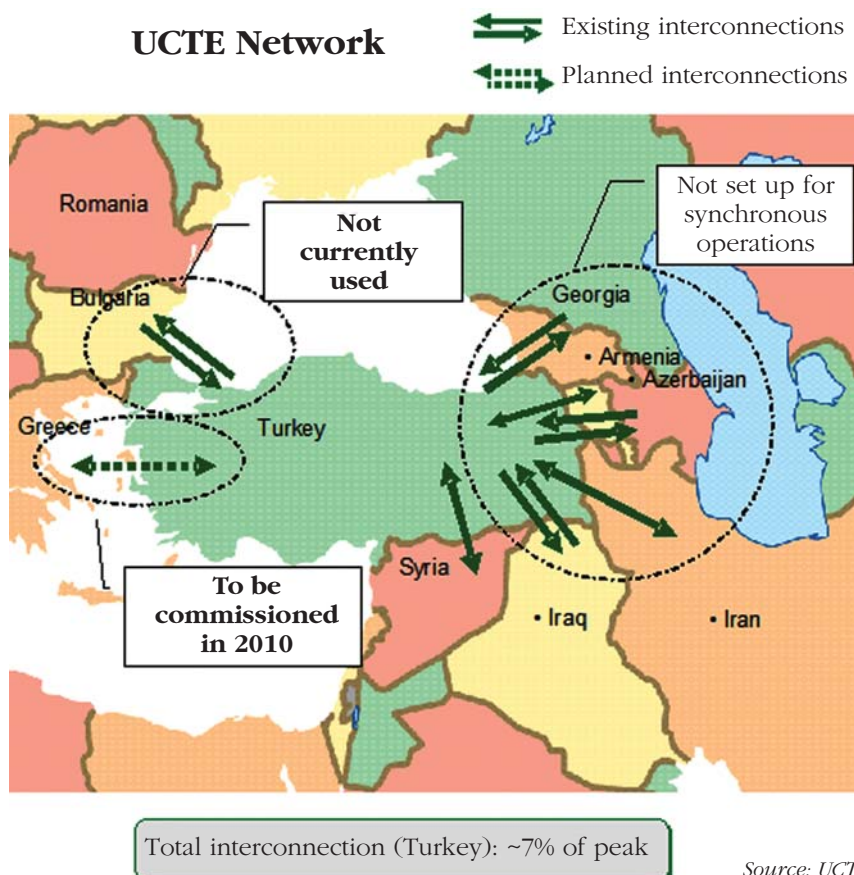
With regards to ensuring the security of supply and procurement of energy on competitive prices, the European Energy Policy foresees decreasing the market dominance of the national public administration for the sake of transparency

in the market. It is also essential for the bilateral contracts market to be established in terms of improving the functionality of the liberalization process.

Once the effect of the current financial crisis is over, Turkey will face the risk of energy shortages if the liberalization of the electric markets is delayed.

In order to ensure the uninterrupted access of industrial sectors to energy with competitive prices, the liberalization process should not be allowed to run out of steam and the privatizations in the distribution and production sectors should continue.

UCTE Network



2.2. EU Electric Markets in view of BOSMIP Conference¹

EU Energy Liberalisation-First Steps

Timeline:

- Commission promotes liberalising the national electricity markets in its 1988 working paper
- Puts forward a proposal for a directive in 1991/92
- Council and EP adopt the final directive in 1996
- Directive 96/20/EC: first step towards a liberalised electricity market based on minimum harmonisation
- MS were to gradually open the market, could choose between access regimes and were only required to an administrative unbundling
- Result was that all member states applied different liberalisation regimes: no level playing field and no internal electricity market

EU Energy Liberalisation - Second Step

Timeline:

- The Commission starts working on the second directive in 2001 after evaluations suggest that malfunctions in the markets still exist

- Commission sends a proposal for a revised directive to Council and EP in 2002 and a draft regulation on cross-border electricity trade
- Council and EP agree on the revised directive and the regulation in 2003
- Directive 2003/54/EC aims at further liberalisation and integration.
- Requirement for legal unbundling, regulated third party access and the establishment of an independent regulator
- Regulation 1228/2003 aims at improving cross-border trade and regulates tariff systems and congestion management
- Directive 2005/89/EC takes into account the issue of security of supply, i.e. the establishment of a supplier of last resort

2nd Directive

Content:

- Strengthened provisions on *unbundling* of the TSO/DSO: now legal unbundling as a minimum. However, the directive stresses that legal unbundling is not the same as ownership unbundling
- New rules on *third party access* to the networks, which leans on the regulated TPA model of the first directive

¹ Taken from the presentation of Martin Gram, Advisor at the Confederation of Danish Employers (DI), made at Bosmip 2 "Energy and Transportation" seminar, 20 November 2008.

Extended and reinforced role of national *regulatory authorities*

- The directive is supplemented by a *regulation* concerning rules on cross-border trade

EU Energy Liberalisation - 3rd Energy Package

- Proposals for amending existing Electricity and Gas Directive as well as the Electricity and Gas Regulation
- Proposal to establish an Agency for the Cooperation of Energy Regulators
- The aim is to increase the level of competition and to establish one integrated EU energy market instead of 27 national liberalised markets
- We note a further integration of networks and harmonization of network regulation

Content

- Provisions on either full ownership unbundling or an Independent System Operator (ISO) in which Vertical Integrated Companies (VIC) can maintain ownership, but not control, over its network assets.
- Enhanced powers and independence of national regulators

- Stronger cooperation between national TSOs

- Draft regulation on cross-border exchanges in electricity amending the regulation of 2003

- Draft regulation on establishing an agency for the cooperation of energy regulators

Independent Network Operators

- A non-discriminatory and fair access to the grid is a sine qua non for creating a liberalised market
- A prerequisite for such regime is an independent network operator, i.e. independent from production and supply
- In order to achieve more independence, the network operators will be further unbundled
- Whereas Directive 96/20/EC required a minimum level of unbundling, the 3rd energy package aims at the fullest degree of unbundling

EU Energy Liberalisation - 3rd Energy Package (draft directive)

Timeline:

- Commission works out yearly progress reports and sector inquiry on the implementation of the directive and the

function of the markets. They show that further reforms are needed.

- Commission presents yet another draft proposal for a revised directive in 2007, proposals for regulations to form a European regulator function and a regulation on cross-border exchanges in electricity.

Types of Unbundling

- *Accounting unbundling*: separate accounts.
- *Functional unbundling*: independent organisation and decision making, for example, through using Chinese Walls.
- *Legal unbundling*: separate legal entity is responsible for network activities. The entity is usually established as a daughter company.
- *Ownership unbundling*: network and supply companies are separated on shareholder level.

Ownership unbundling

- In order to achieve a true liberalised market the EU Commission favours ownership unbundling. An alternative would be an independent system operator.
- About 10 memberstates (MS) have already implemented ownership

unbundling on transmission level on a voluntary basis. The result is increased transparency and a more independent network operator.

- The Netherlands is introducing ownership unbundling on distribution level. Reason is that legal unbundling did not provide sufficient transparency.

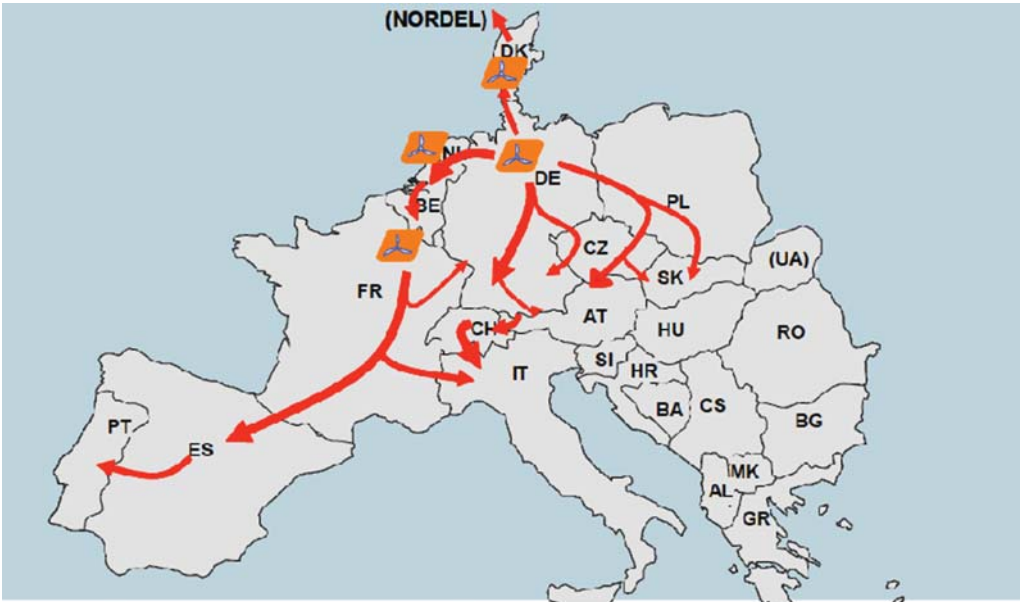
Unbundling and Privatisation

- There seems to be a link between unbundling and privatisation. Independent supply companies can be or are privatised. Shares in network companies may be held by the state.
- Ownership unbundling requires less regulation and facilitates supervision by regulatory authorities
- Question: does ownership unbundling facilitate the establishment of one integrated EU network operator supervised by one integrated regulator?

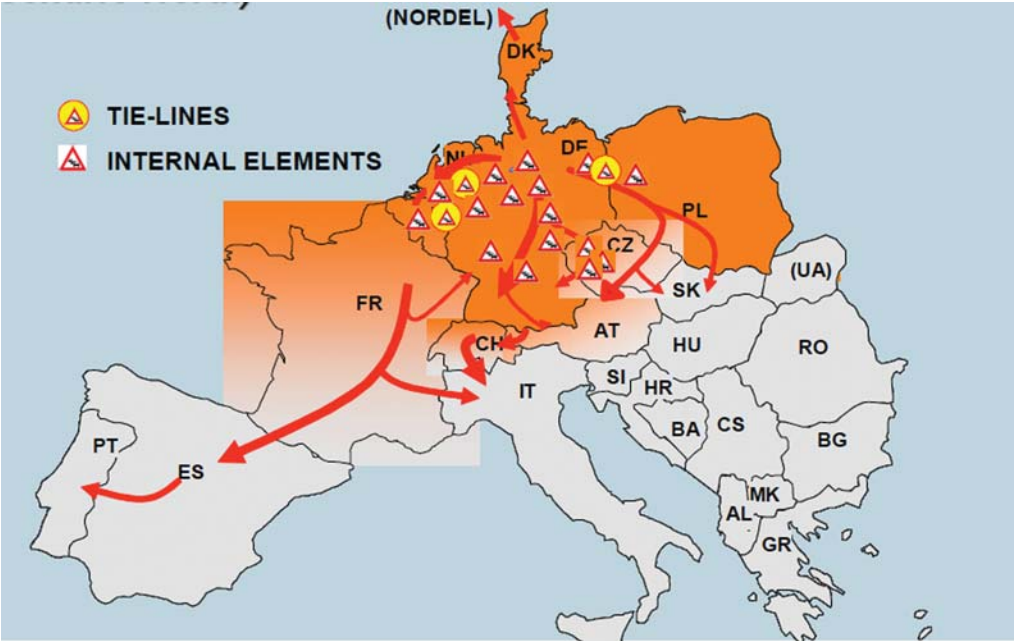
Remarks

- Ownership unbundling is a precondition for market liberalisation
- Ownership unbundling may result in network companies being more active
- Ownership unbundling is another step in the process of market liberalisation.

Challenges in practice



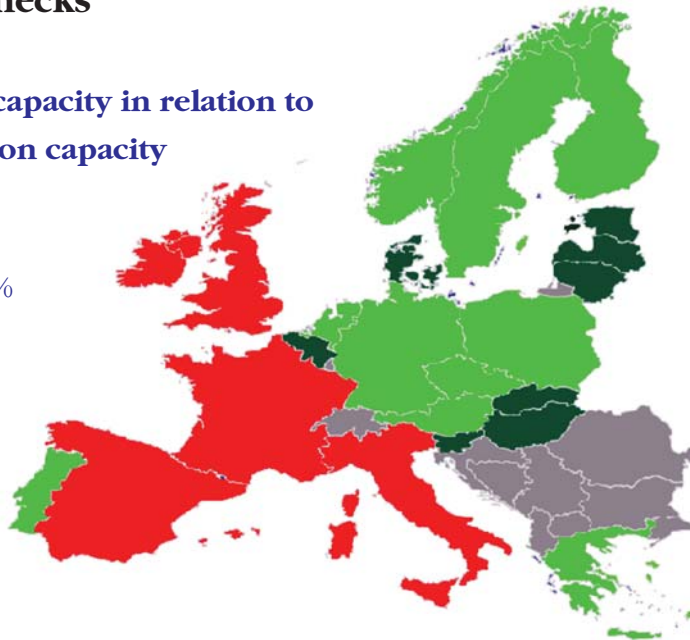
Detected Bottlenecks



Detected Bottlenecks

Interconnection capacity in relation to installed generation capacity

- Under 10%
- 10-30%
- Over 30%

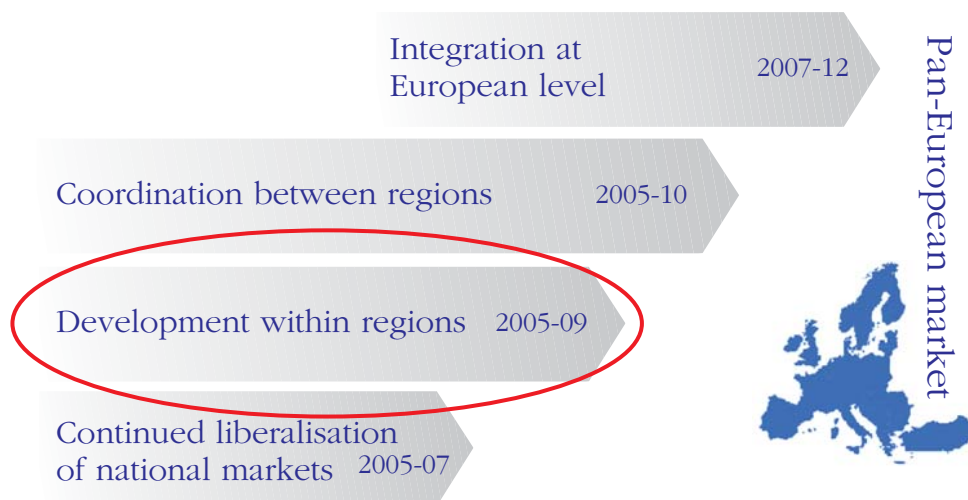


How Do We Get to a Pan-European Electricity Market?

If we could start from scratch...

- Same market design
- One European TSO
- One European regulator
- A consistent and predictable framework ... but we have to live with the realities and complexities of diverse electricity markets!

The way towards a European Electricity Market



Source: "Integrating Electricity Markets through Wholesale Markets: EURELECTRIC Road Map to a Pan-European Market" (June 2005)

Development within Regions

ERGER ERI Coherence and Convergence Report

Target model - January 2008

- One common capacity calculation model
 - Single auction platform with harmonized rules
 - Market coupling for the Day-ahead time frame
 - Implicit intra-day allocation mechanism (ie. towards a continuous intra-day trading platform)
 - Cross-border balancing
 - TSOs play a pivotal role in integrating electricity markets
- TSOs will be linking up their activities in regional markets (e.g. Calculation of grid capacity, capacity allocation, secondary market, cross-border intraday, etc):
- This process will act as an essential driver in bringing markets together;
- This process will be able to deliver market integration whilst at the same time ensuring fair access to the networks;

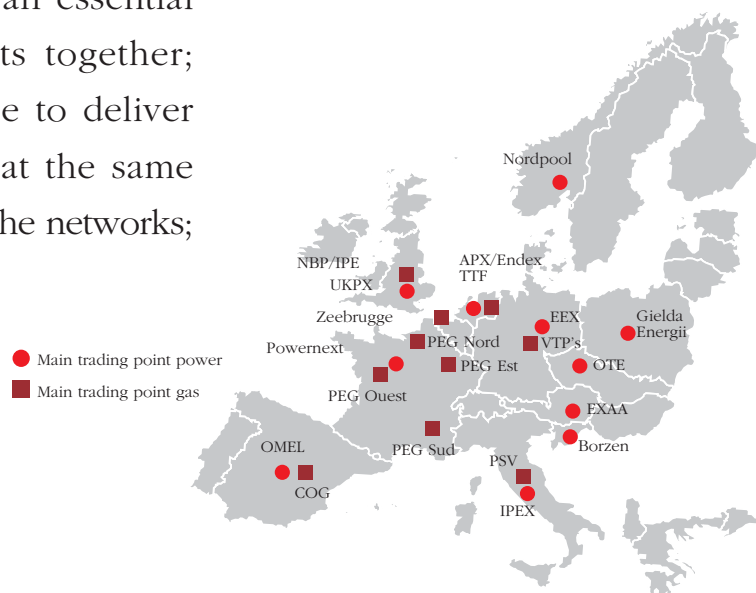
Much will depend on its implementation!

- Ability for TSOs to move towards regional system operation and regional grid planning
- Ability for national regulators to develop regional regulatory supervision and act as one within the region
- Transparency process and early involvement of market stakeholders







The Marketplace is important

- Increase social welfare
- Optimal flow between the price areas.
- Integrated wholesale markets will increase market liquidity
- Increased liquidity on the power exchanges leads to improved pricing and better opportunities to hedge risk.

Can there be too many Exchanges?

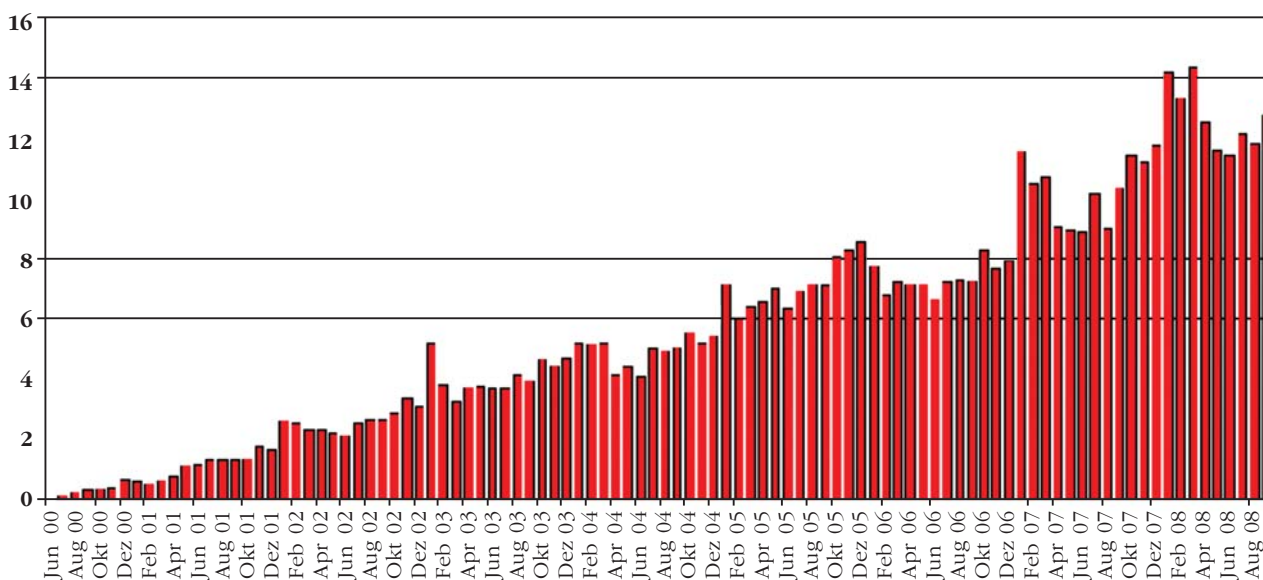


EEX exchange

1998	Liberalization of the European Energy Markets in 1998	
2002	Merger of the former Leipzig Power Exchange LPX and the EEX, Frankfurt, to the European Energy Exchange AG	
2005	Start of Trading of Emission Allowances within the European Emmission Trading System (EU ETS)	
2006	Spin-off of the EEX Clearing business into the subsidiary European Commodity Clearing AG	
2007	Launch of the German Gas Exchange; EEX covers 60% of the German H-gas market volume with the market areas NCG and GUD	
2007+	Further spin-offs within the European Growth Strategy of EEX Spot market (Power): EEX Power Spot GmbH Derivatives market (Power): EEX Power Derivatives GmbH	

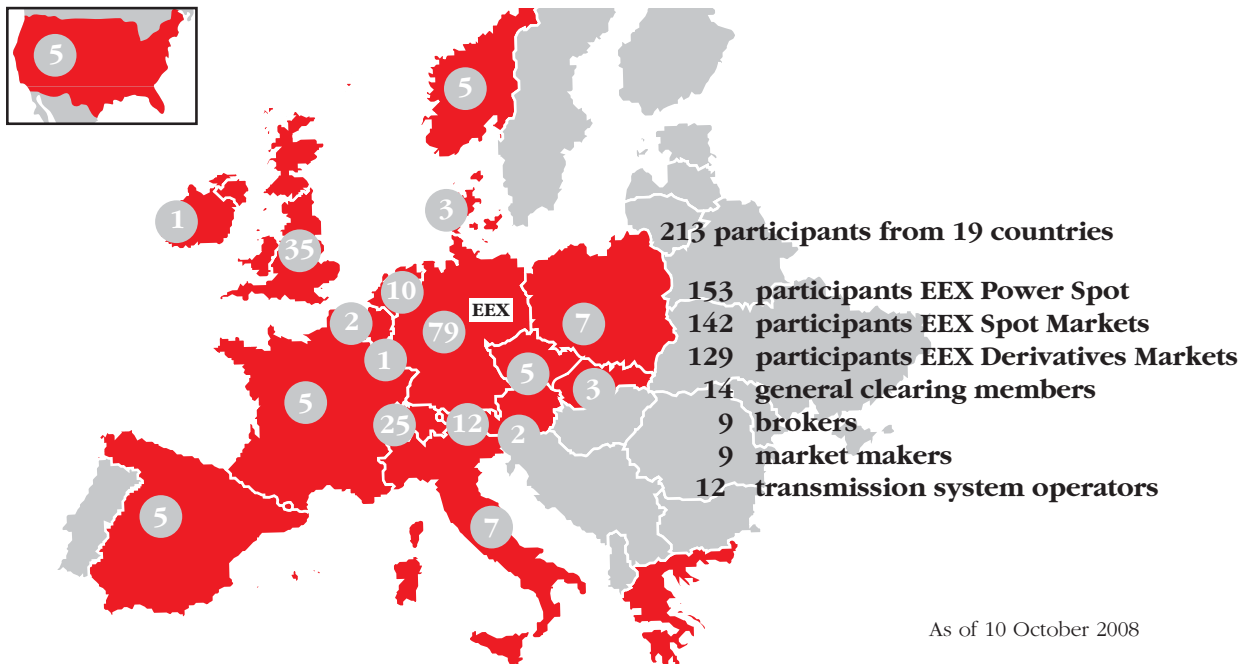
A liquid spot market creates a reference price

TWh/Month



In 2007 a total volume of 124 TWh - 23% of the German power consumption - was traded on the EEX spot market.

Stakeholders at EEX



The role of the Exchanges

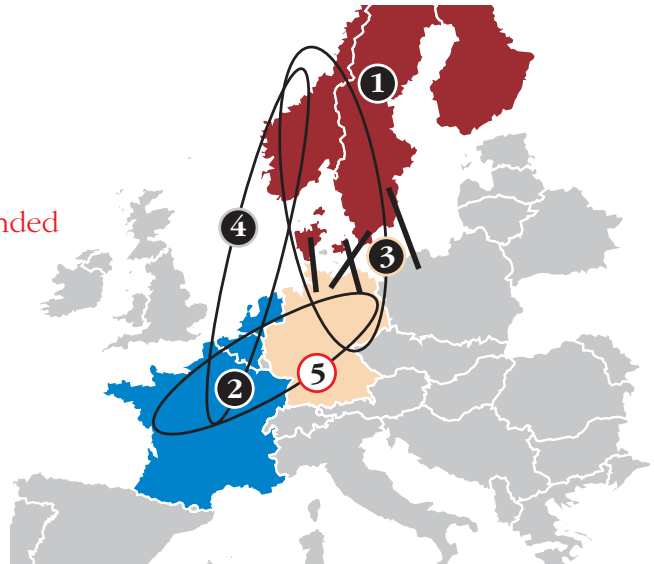
Spot Market	Short term portfolio optimization
	Provide transparent prices
	Serve as a reference price
	Reduces transaction costs due to straight through processing
	Liquidity through standardisation
Futures Market	Basis for risk management/risk mitigation/security of investment
	Enhanced market efficiency as an arbitrage and speculation platform
	Serves as basis of valuation for open positions
	Clearing minimises default risk of competitors
	Futures market supports liquidity of spot market

Via exchanges market participants are able to take advantage of central trading places

The way to one European market place

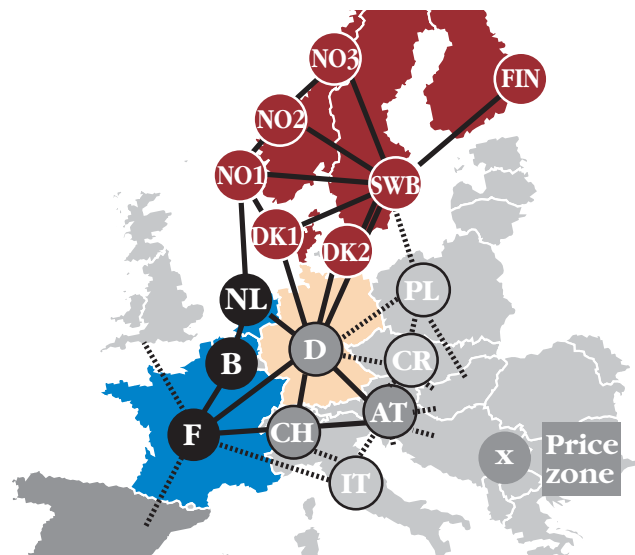
Implicit auctions in Europe

- | | |
|-------------------------------|--|
| 1. Nordpool | Since 1996 |
| 2. Powernext/Belpex/APX (TLC) | Since Nov. 2006 |
| 3. EEX - Nordpool | Since 29.9.2008
Since 9.10.2008
Temporarily suspended
planned Q4/2009 |
| 4. Nordpool-APX (TLC) | planned Q4/2009 |
| 5. EEX-Powernext (TLC) | planned Q4/2009 |

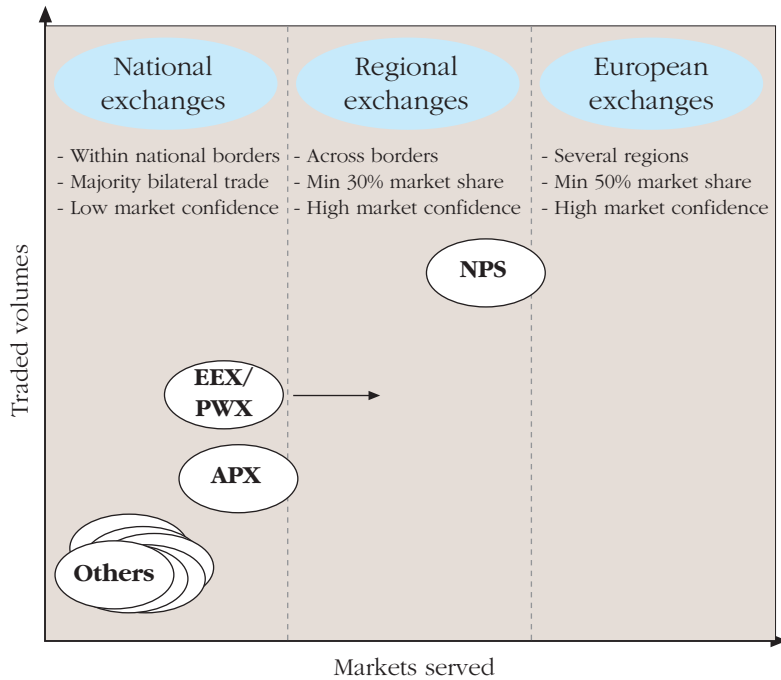


Complexity of Price areas and flows

- Is a Dome Coupler realistic?
- Central optimisation or close cooperation?
- Monopoly position?
- Open for new countries/exchanges?



From National to European exchanges



- Most of Nord Pool Spot's European competitors are National exchanges
- A few exchanges are in the process of developing into Regional players, primarily EEX/PWX and APX
- NPS is the only truly Regional exchange, developing towards becoming a European exchange

3. NATURAL GAS MARKET LIBERALIZATION

3.1. The Case for Turkey

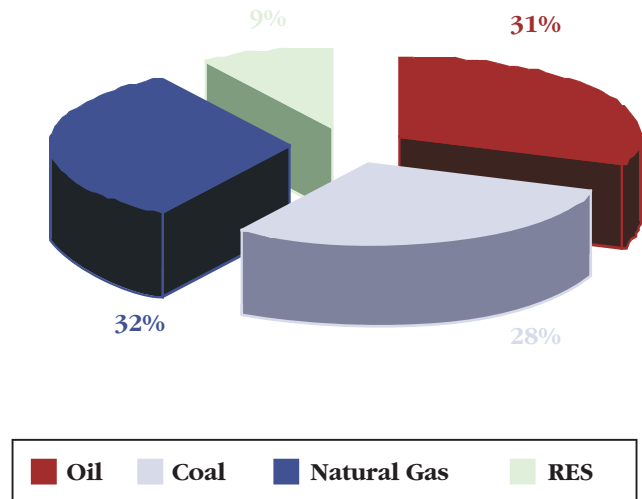
In order to provide a competitive advantage for the industrial sectors, it is essential to guarantee their access to energy with competitive prices. According to MENR projections, by 2020, the demand in primary resources will exceed 222 million TEP.

Natural Gas Demand

Natural gas transportation and trade started in 1987 from the Russian Federation with 500 million m³. Consumption of natural gas increased to 37.5 billion m³ by 2008 and has become the primary source of energy.

22% of natural gas is used by household consumption and another 22% in industry, while the remaining 56% is used in electric generation. Turkey is only second to China in terms of the growth level of its electric and natural gas demand. By 2020, natural gas demand is forecasted to reach 66 billion m³.

Energy Consumption by
Primary Resources (2008)



Source: BOTAS

Turkey ranks fourth among the OECD countries in terms of low prices in household consumption, whereas it ranks eleventh for industry prices.

For a well functioning market structure, a system where certain consumers are subsidized through margins obtained by others should be avoided.

A pricing structure parallel to capacity investments should be established.

Natural Gas Prices in OECD Countries

		Price (10 million kcal GCV)	
		Industry	Households
1	Canada	357.00	512.68
2	Hungary	369.11	525.28
3	USA	372.25	520.61
4	Finland	433.14	736.07
5	Mexico	445.98	825.82
6	UK	486.59	1026.80
7	Spain	499.53	633.96
8	S.Korea	531.71	933.26
9	Poland	531.92	1066.38
10	Portugal	572.88	659.24
11	Turkey	582.62	538.45
12	China	607.28	920.40
13	France	614.12	848.87
14	Czech Republic	616.23	1033.95
15	Ireland	622.70	785.56
16	Slovakia	643.89	1214.18
17	Greece	646.48	1152.69
18	Italy	745.36	1093.51
19	Switzerland	753.00	748.76
20	Austria		1024.28
21	Netherlands		1239.93

Source: IEA

Natural Gas Supply

Turkey is an importer of primary resources with limited oil and natural gas resources. In 2006, more than 70% of the energy demand was met via imports. Accordingly, security of supply must be ensured and a competitive market established. The right to choose suppliers and to secure economic and uninterrupted

flow of natural gas will play an important role in the restructuring of the sector.

As of 2008, the remaining total producible gas reserve of Turkey is around 8 billion m³. This is approximately one fifth of the consumption level for the same year. Starting with 1990s, Turkey has engaged in take or pay contracts. Countries from which Turkey imports natural gas on a contractual are as follows:

Natural Gas Contracts of Turkey

Agreement	Date of Signature	Operational Date	Duration (Year)	Quantity (Plato-billion m ³ /year)	End Date
Russia (West)	February 1986	June 1987	25	6	2012
Algeria (LNG)	April 1988	August 1994	20	4	2014
Nigeria (LNG)	November 1995	November 1999	22	1.2	2021
Iran	August 1996	December 2001	25	10	2026
Russia (Blue Stream)	December 1997	February 2003	25	16	2028
Russia (West)	February 1998	March 1998	23	8	2021
Turkmenistan	May 1999	30	16
Azerbaijan	March 2001	15	6.6

Source: BOTAŞ

In 1990s Turkey's natural gas consumption forecasts were higher than the realized levels. Accordingly, Turkey has signed take or pay contracts over the required limits. As can be seen in the chart above, Turkey's current natural gas contracts will begin to expire as early as 2012. Moreover, natural gas consumption is expected to rise particularly due to its use in electric generation and rapid expansion of natural gas networks for heating purposes.

In the short run, imports by Petroleum Pipeline Co. (BOTAŞ) cover demand, with no risk of supply shortages. Hence, for the liberalization process to continue and reach the desired competitive structure, contract and quantity transfers

have to be pursued as anticipated by Law.

In the medium to long run, however Turkey will be faced with possible supply shortages. A supply shortage was foreseen as early as 2012 by MENR projections before the financial crisis. However, decrease in the consumption level of natural gas due to the crisis has shifted this date further.

Expired contracts should be renewed by private sector companies according to the set criteria.

Private sector holds the necessary knowledge, experience and financial power to realize these contracts.

The Liberalization Process

Within the context of liberalization process, Energy Market Regulatory Authority (EMRA) was established in 2001 as provided by the Natural Gas Market Law. The law entailed reforms in terms of restructuring of the natural gas market by the termination of the monopolistic status of Petroleum Pipeline Corporation (BOTAŞ).

Natural Gas Distribution

Concrete steps were taken with the law to liberalize the energy distribution markets. Whereas 6 cities had access to natural gas in 2003, distribution licences were given to 60 regions by 2009.

Private sector participation is the key in the expansion of the natural gas use to different regions. There is high private sector participation to the tenders according to the rules and procedures defined by EMRA. The distribution costs in these areas are lowered and some tenders have resulted in zero distribution costs, as EMRA has allowed distributor companies to charge “transmission costs” to the eligible consumers

Natural Gas Imports

According to the Natural Gas Market Law, BOTAŞ contracts were to be transferred to the private companies, allowing them to import natural gas. Moreover, BOTAŞ was to execute transfer of contract and transfer of quantity tenders, until the aggregate of its annual imports decrease to 20% of annual national consumption until 2009. BOTAŞ would not be allowed to execute a new natural gas purchase contract until its import levels fell to the said level.

As is the case with the electric sector, the liberalization process has also been interrupted in the natural gas sector. 20% market share target set for BOTAŞ in 2001 is approximately 90% in 2009. BOTAŞ issued tenders for purchase agreements to transfer the existing natural gas sale and purchase agreements for 16 billion m³ in 2005. The finalization of the tender procedures and the transfer to four private companies were completed as follows in 2008.

Transfer of Contracts

	Company	Quantity (million Cm³/year)
1	Shell Enerji A.Ş.	250
2	Bosphorus Gaz Corp. A.Ş.	750
3	Enerco Enerji Sanayi ve Ticaret A.Ş.	2,500
4	Avrasya Gaz A.Ş.	500

Source: EMRA

This was the only transfer of contract/Quantity tender conducted by MENR. Moreover legislation was passed this year allowing BOTAŞ to execute new natural gas contracts. In order to continue the ongoing liberalization process as suggested by the Law, private sector should renew the expiring contracts.

Unbundling

Natural Gas Market Law foresees BOTAŞ to separate its accounts according to the requirements of the EU acquis. This entails accounting, functional and legal unbundling by the year 2009. Consequently, export, storage, transmission and distribution functions should be conducted in different companies as provided by Law.

This long overdue process, which would provide some transparency in the market, is a prerequisite of the establishment a competitive market structure. An applicable schedule should be set and announced accordingly.

Natural Gas Storage

Natural gas storage capacity of Turkey is limited. The only storage facility today is established in Silivri in 2006 with a capacity of 1.6 billion m³, 18 days worth of Turkish consumption. Especially faced with growing demand, this capacity remains insufficient. Other alternatives such as Tuz Gölü Underground Storage Project to commence operations in 2010 should be realized without delay to ensure security of supply.

Companies conducting imports and wholesale of natural gas are required to hold 10% of the amount in the storage facilities according to the Natural Gas Market Law. These companies have to negotiate to reach an agreement to gain an access to storage facilities. This remains a critical issue from the competition perspective.

In order to establish a competitive natural gas market, it is essential for the vertically integrated legal entity of BOTAŞ to be terminated by the creation of separate companies with separate financial structures for the different functions of BOTAŞ.

3.2. Energy Security

Ensuring supply security in energy requires diversification of both source countries and transport routes. Turkey imports over 60% of its natural gas resources from Russia.

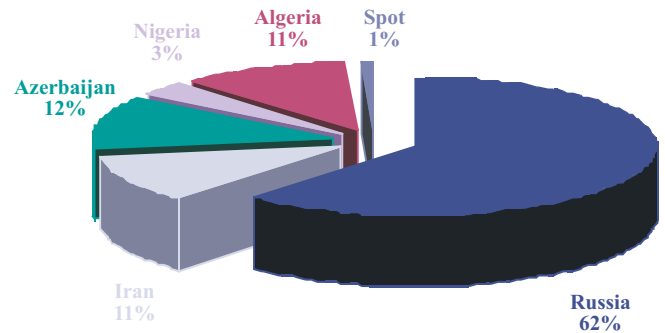
Dependency on a single producer or a route harbors both an economic and a political risk for all energy sources.

The very same risk was materialized for Europe both in 2006 and in 2009 with the conflict between Russia and Ukraine.

It is foreseen that within the next 20 to 30 years, over 70% of the Union's energy requirements, compared to 50% today will be met by imported products – some from regions threatened by insecurity.

Turkey faces similar concerns, as the country is currently 72% dependent on imports for energy products. This ratio is expected to rise to 80% by the year 2020. Hence, strengthening of energy security is one of the key common interests of Turkey and the EU.

Turkey's Natural Gas Imports (2008)



Source: BOTAŞ

Diversification of supply is one of the fundamental components in attaining security of supply. Turkey is the ideal candidate to become an energy bridge and a potential energy hub for the diversification of energy resources as 73% of the crude oil and 72% of the natural gas reserves of the world lie in the Caspian, Middle Eastern regions and Russia, surrounding the country.

Turkey has already taken on certain initiatives in this direction within the framework of East-West Energy corridor, completing approximately 4,000 km crude oil and 10,000 km natural gas pipelines carrying over 130 million tonnes per annum. Turkey's completed international oil and gas projects include:

- Blue Stream Natural Gas Pipeline
- Baku-Tblisi-Ceyhan Crude Oil Pipeline
- Baku-Tblisi-Erzurum Natural Gas Pipeline
- Kirkuk-Yumurtalik Crude Oil Pipeline
- Turkey-Greece Natural Gas Pipelines
- Iran-Turkey Natural Gas Pipeline
- Russian West Natural Gas Pipeline

The common challenge today is to guarantee affordable, secure and uninterrupted flow of hydrocarbon resources. Cooperation in this realm strengthens energy security for all parties.

There are specific initiatives designed to carry the Caspian and Middle Eastern oil

and natural gas to Europe. South European Gas Ring and the Nabucco Project are the first fruits of cooperation between the parties.

The other potential oil and gas projects of Turkey include:

- Blue Stream 2 with a possible extension to Israel
- Samsun-Ceyhan crude oil pipeline to bypass Bosphorus
- Iraq-Turkey Natural Gas Pipeline
- Trans Adriatic Natural Gas Pipeline

Turkey is a promising new and secure market with strong growth rate predictions and a reliable partner of the EU, to be the main contributor to the security of



Source: Ministry of Foreign Affairs

supply of Europe. Due to its geographical location and growing, liberalizing and deregulating gas market, Turkey is likely to become a key country for new suppliers to the EU market.

Turkey is a major consumer with 38 bcm annual gas consumption in 2008 and has growing demand expected to reach a level of 10% of the EU market by 2020.

With existing and planned pipelines, Turkey is a key energy partner for Europe, since an important portion of the incremental European supplies from new sources may flow across the country.

Nabucco Project

Nabucco Natural Gas Pipeline was deemed critically important to the vision of a secure Eurasian energy market. Nabucco Pipeline, running through Turkey via Bulgaria, Romania and Hungary into Austria, could carry gas from Iran, Azerbaijan, Iraq, Kazakhstan and Turkmenistan into the EU, with its full capacity reaching 31 bcm per annum. The full capacity of the pipeline is

expected to meet up to 10% of the EU demand in 2015 and 5-6% in 2030.

TUSIAD believes that Nabucco Project holds the opportunity for mutual gains both for Turkey and the EU. Nabucco is a key asset for Turkey to become a secure and reliable energy bridge and eventually a hub for its region. The EU, on the other hand, seeks to diversify its gas resources and secure adequate import capacity where 70% of its gas needs is expected to come from outside the European Union.

The full capacity of the pipeline is far from meeting the EU's energy need, however, the mere existence of an alternative route could give the EU the leverage in its negotiations with other countries and prevent the Union from experiencing interruptions in its resources as was the case in 2006 and 2009.

Nabucco Project has not been sufficiently progressive so far. Due to setbacks and delays, initiation of its construction has been postponed from the set date of 2007. This delay is partly due to the lack of political will, despite all parties' nominal dedication, and partly

due to the fact that a supplier ensuring gas flows to the project has not yet been secured. For the project to become a reality, supply for the line has to be ascertained.

Financial strength to the project has been enhanced by the inclusion of German RWE as the sixth partner to the project on February 5, 2008. Moreover, financing from European Investment Bank has been offered to initiate the project. As the business community of Turkey, we welcome the financial support the EU is giving to the project, however, political support is needed for Nabucco Pipeline to happen.

In this respect, Nabucco Intergovernmental Agreement was signed in July 2009. The legal framework of the Nabucco gas pipeline was established with the agreement. Accordingly, the pipeline is provided with the legal basis for gas transit and the certainty to conclude supply contracts. The agreement also enables the EU to invest the €200 million set aside for the project as part of its €5 billion economic recovery package.

The intergovernmental agreement is still a first step towards the completion of the pipeline.

Continuous political support is needed to conclude Nabucco, which serves as a real alternative to diversify both the supply routes and source countries for Europe.

The common challenge today is to guarantee security and sustainability of energy supply. Cooperation between Turkey and the European Union will be beneficial for both parties in overcoming their common challenges.

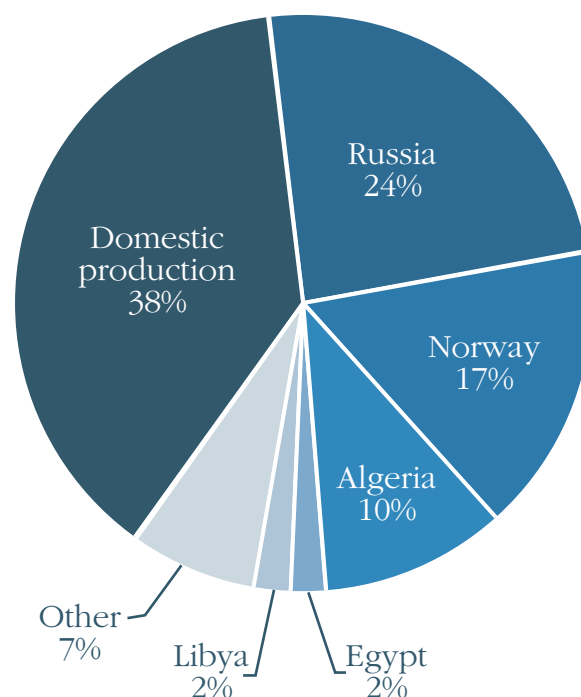
3.3. EU Natural Gas Markets in view of BOSMIP Conference²

What is specific to Natural Gas?

- 1- Natural gas has no captive uses
It has to be competitive with the substitutes
- 2- We store natural gas
Consequently: gas price volatility is lower than electricity price volatility
- 3- Natural gas transmission is costly
- 4- The rate of gas imports is often high
96 % in France in 2007 and 62 % in the European Union (EU-25)
- 5- The gas network is less meshed than the electricity network
- 6- All consumers are not connected to the gas network
- 7- The upstream of the gas chain (production) has been opened to competition for a long time
- 8- The upstream of the gas chain is not regulated by the Commission but WTO rules are applied
- 9- Natural gas is imported by long term contracts (20 years) including take or pay clauses (netback) and escalator clauses (with oil prices)

10- Compared to the USA, the part of the natural gas spot market (hums) is low in Europe

Natural Gas supply in the EU in 2006

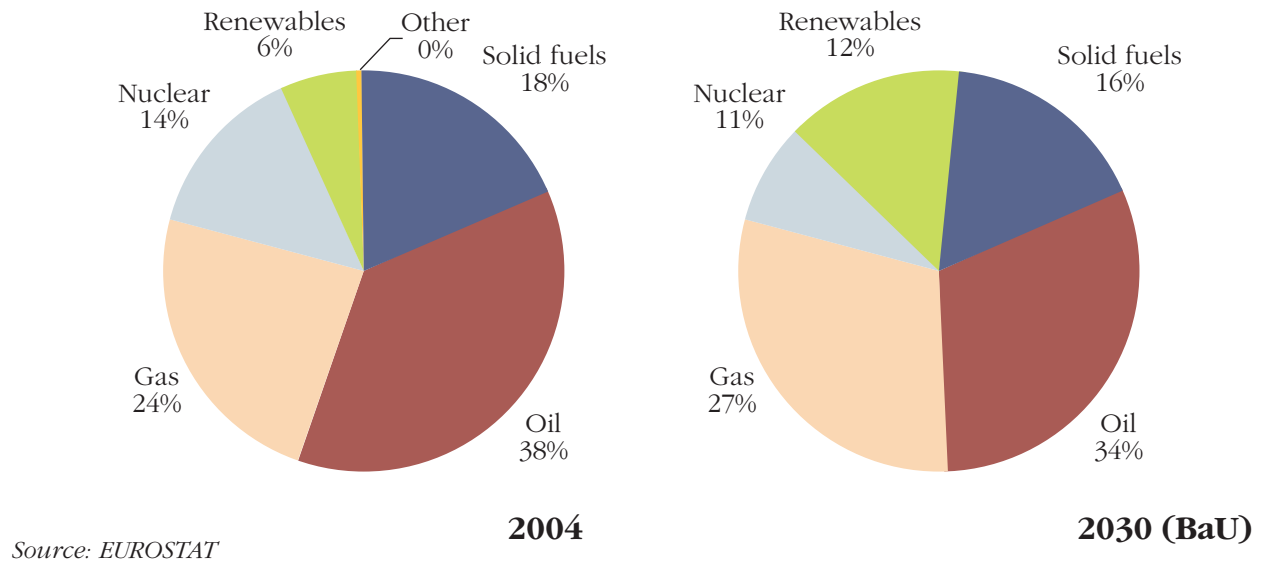


- In 2006, the EU imported 62 % of the gas consumed in Europe (82 % for oil)
- The rate of dependency will rise to 84 % for natural gas in 2030 (93 % for oil)
- The rate of total energy dependency is 56 % in 2006 in the European Union and will be 65% in 2030
- 62 % of the gas consumed in Europe crosses at least one border (compared to less than 10 % for electricity)

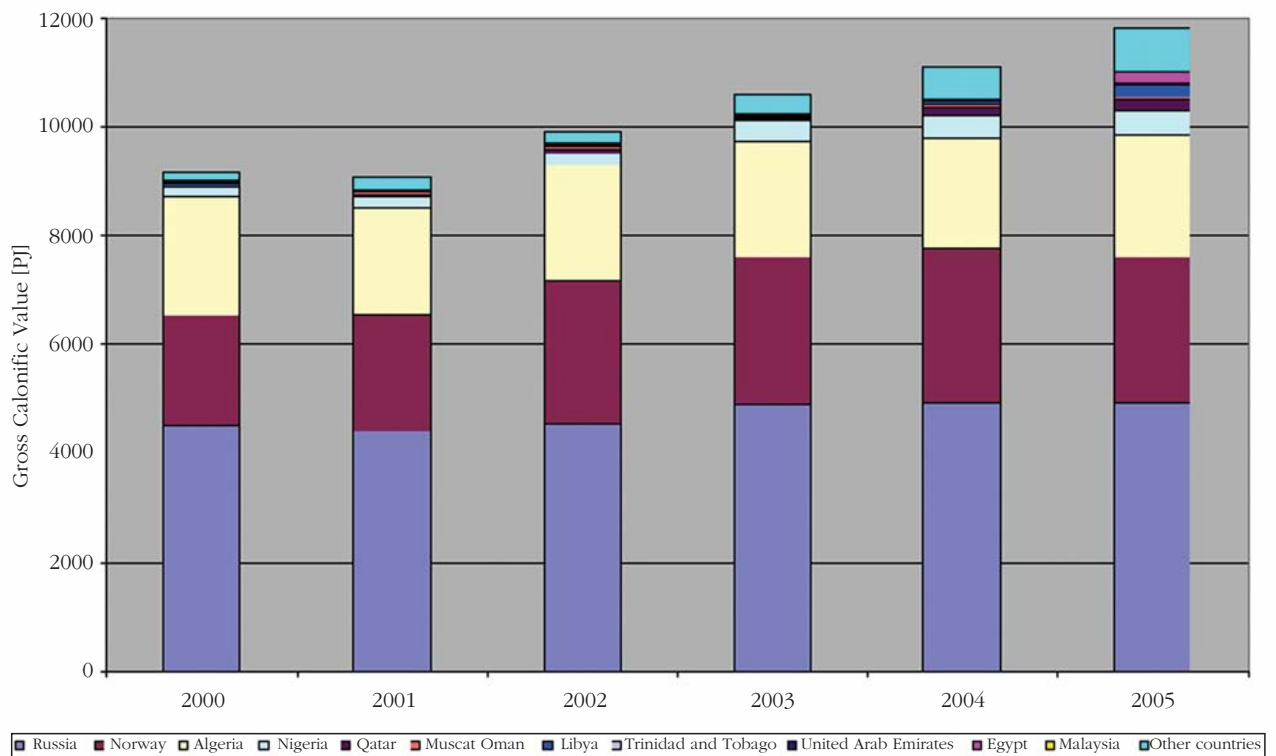
² Presented by Martin Gram, Advisor at the Confederation of Danish Employers (DI), at BOSMIP2 "Energy and Transport Seminar", 20 November 2008

EU-27 Energy Mix-High dependence on fossil fuels

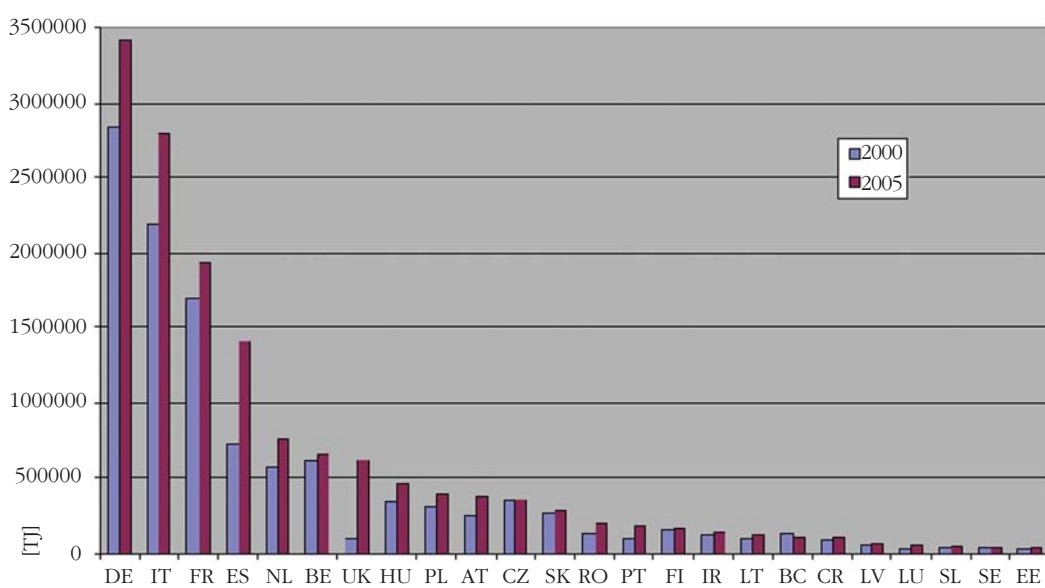
Business as usual is **NOT SUSTAINABLE**



EU-27 Import of Natural Gas Imports



Large differences in dependency of gas



1st and 2nd EU Gas Directives (1998 and 2003)



1st EU Directive 1998

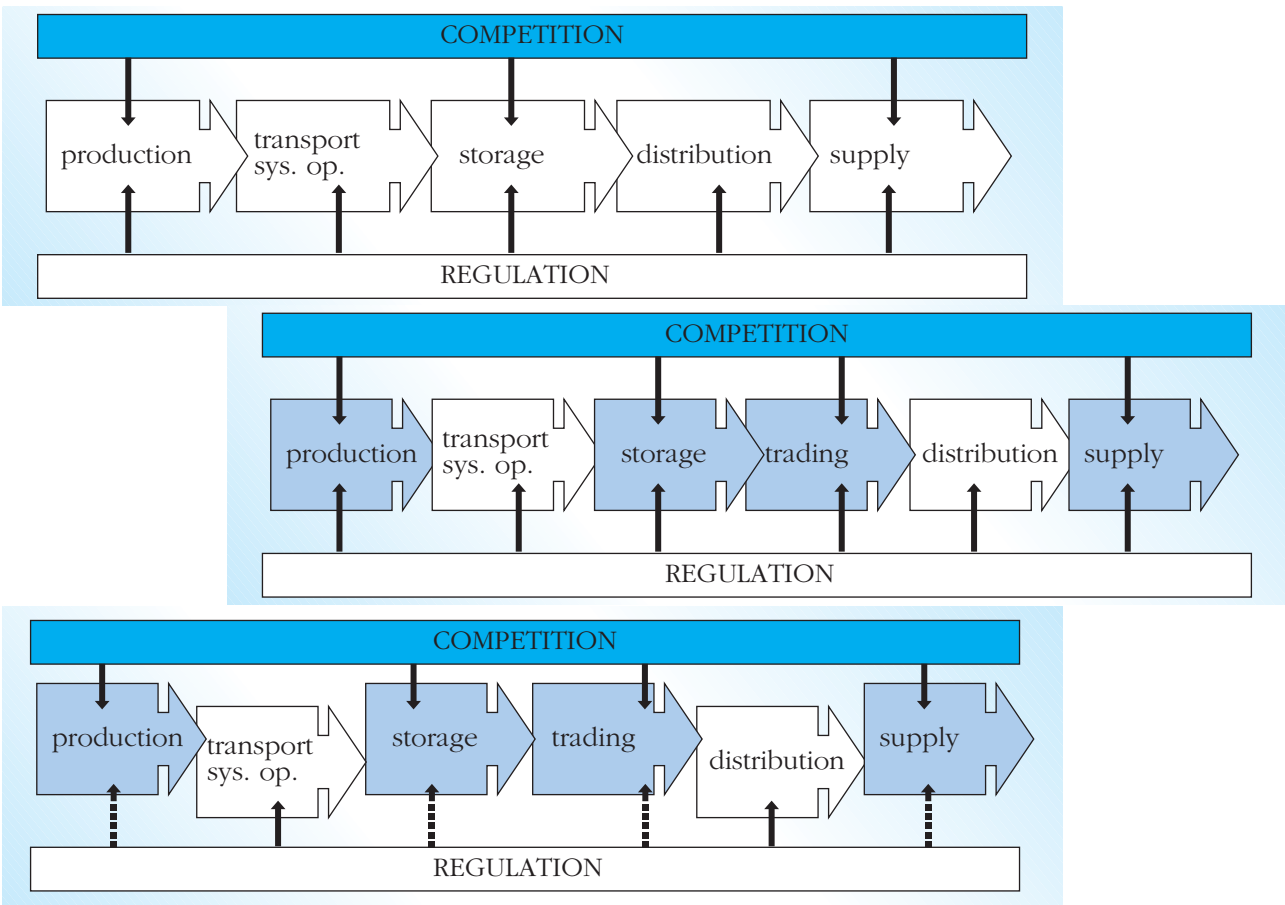
Separate gas directive (2 years behind electricity)

- Gradual market opening for larger customers
- Administrative unbundling network/trading
- Negotiated TPA

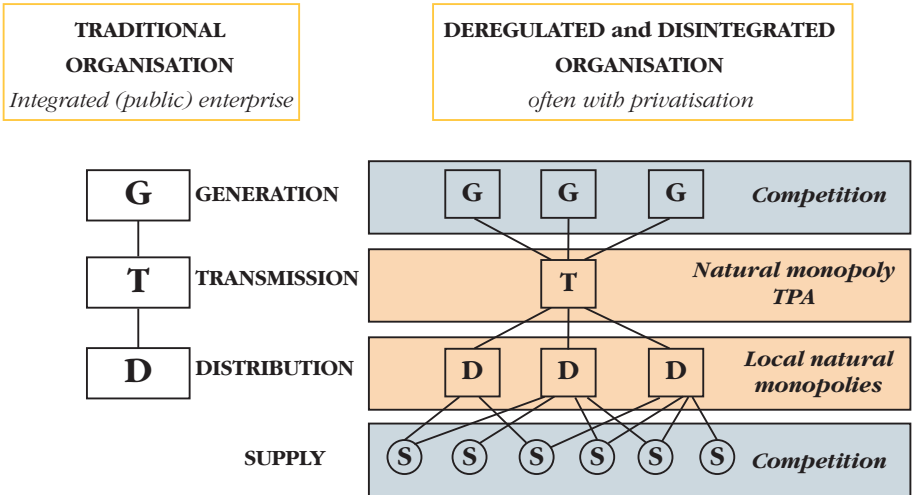
2nd EU Directive 2003

- Full market opening 2007
- Legal unbundling TSO
- Regulated TPA for TSO (storage also nTPA)
- Harmonised responsibilities regulatory bodies
- TPA exemptions for major new investments

Liberalisation of the Gas market



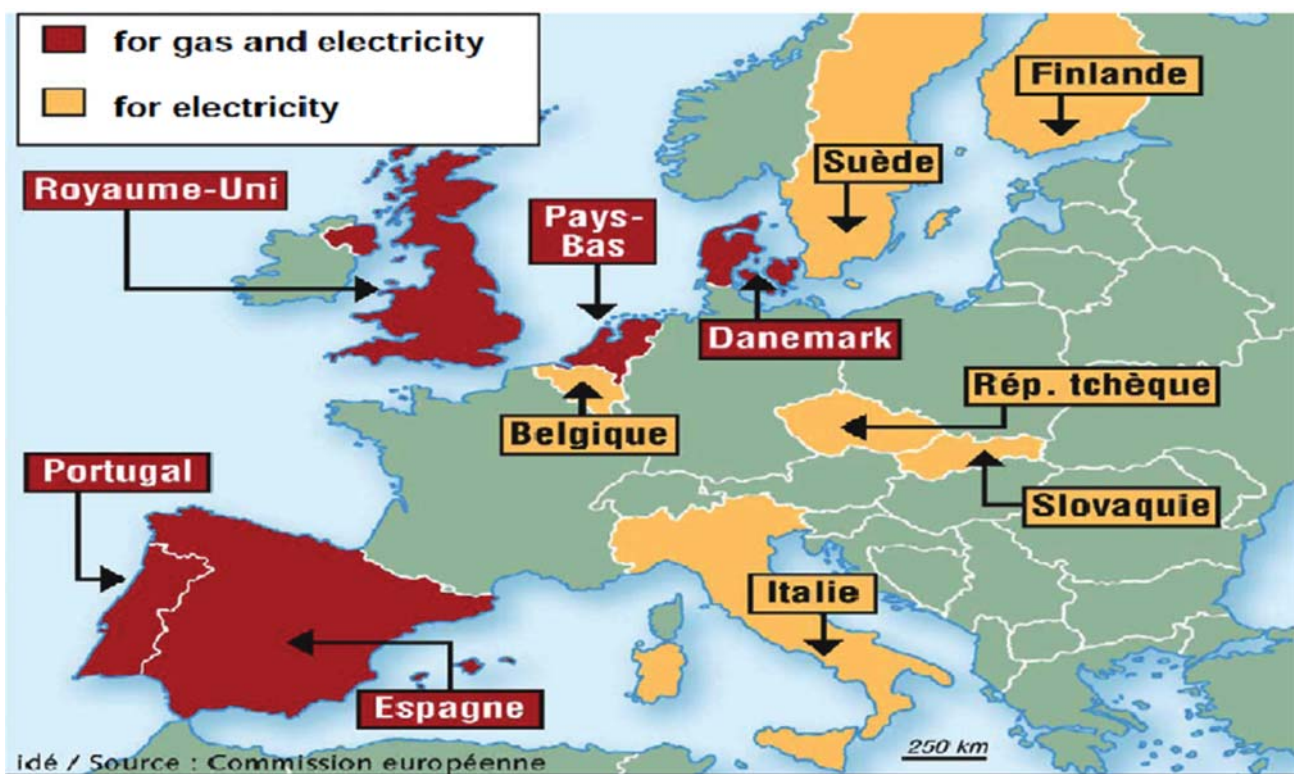
Value chain is divided into regulated and commercial activities



Four Necessary Steps for successful liberalisation

General Treaty or European Directive	1- Access to the customers Eligibility of the customers
	2 - Access to the transmission networks Implementation of an efficient TPA tariff ie transparent and non discriminatory
States' choice	3 - Access to the power stations and to natural gas Gas release (free gas) To make power generation capacities available to the new party
	4 - Access to flexibility Development of spot markets (hubs), short term contracts,...
Free market	

Ownership unbundling for the TRANSMISSION NETWORK in EUROPE (gas and electricity)



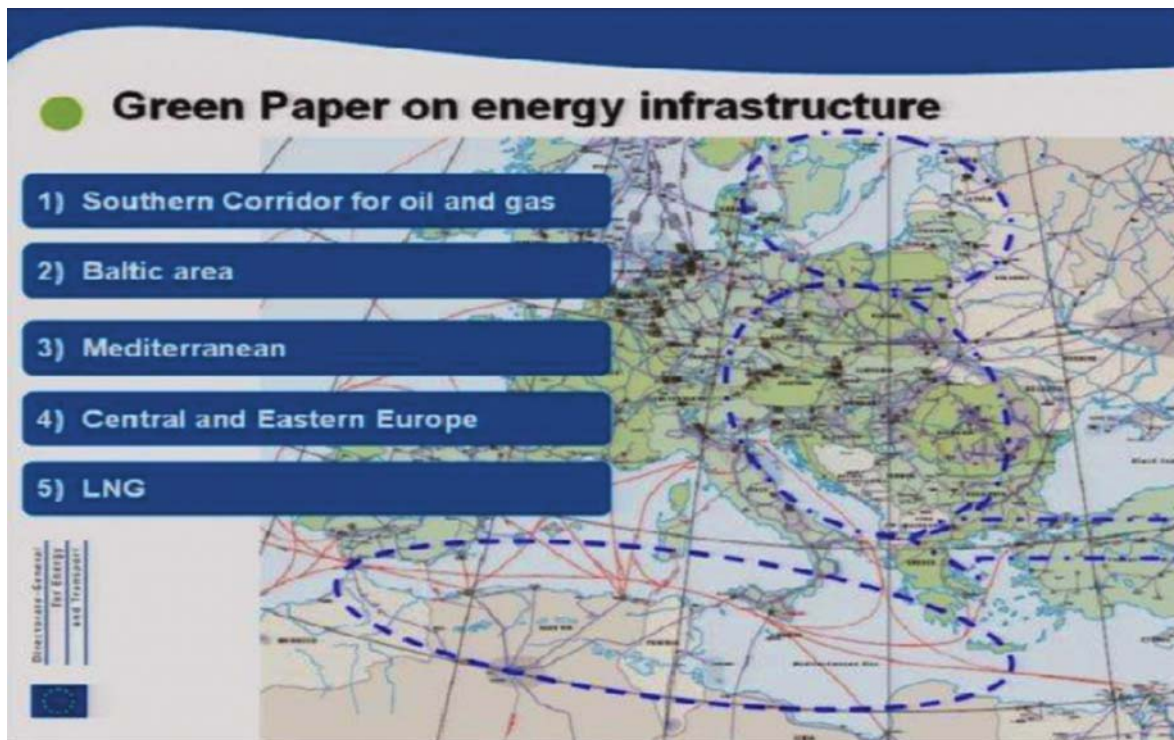
The Commission's Goal

- 1 - The European Commission wishes to implement ownership unbundling
 - Now: ownership unbundling for the transmission networks
 - In the end: ownership unbundling for the distribution networks
 - Alternative solution: Independent System Operator (ISO)
- 2 - The European Commission wishes more «transparency » concerning the access to the European networks
 - Congestions are sometimes questionable
 - Necessity to implement the rule « use it or lose it» and to implement auctions when congestions are really observed
- 3 - The system must be the same for gas and electricity.
- 4 - The European Commission wishes to implement « European leaders » and not « national leaders » in the energy sector
- 5 - We may observe connections between the market price of natural gas and the market price of electricity even in France where the share of electricity generated from natural gas is very low.

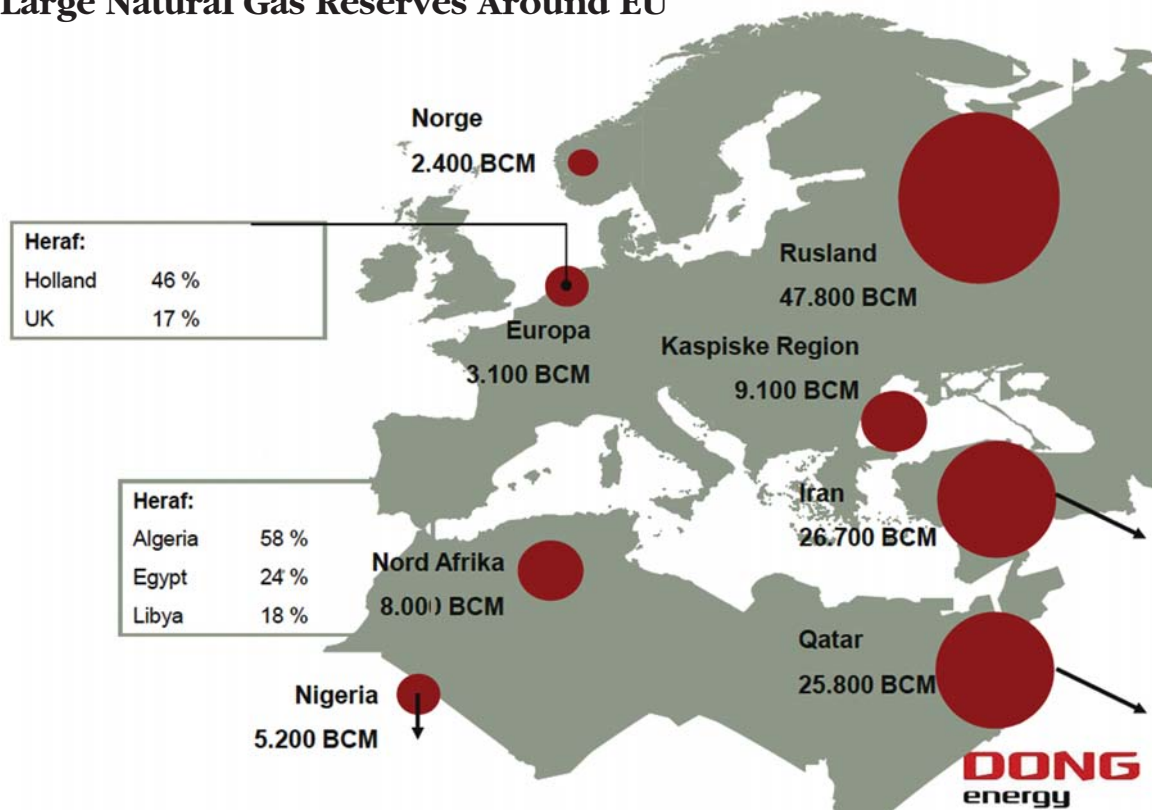
It is due to the interconnection between the French and the German market electricity prices. In Germany, the price of electricity is equal to the cost of the marginal power station which is generally a gas turbine power station.

But the upstream of natural gas chain is not controlled by the European Commission (Gazprom, Sonatrach and Statoil are public firms of the European Union)

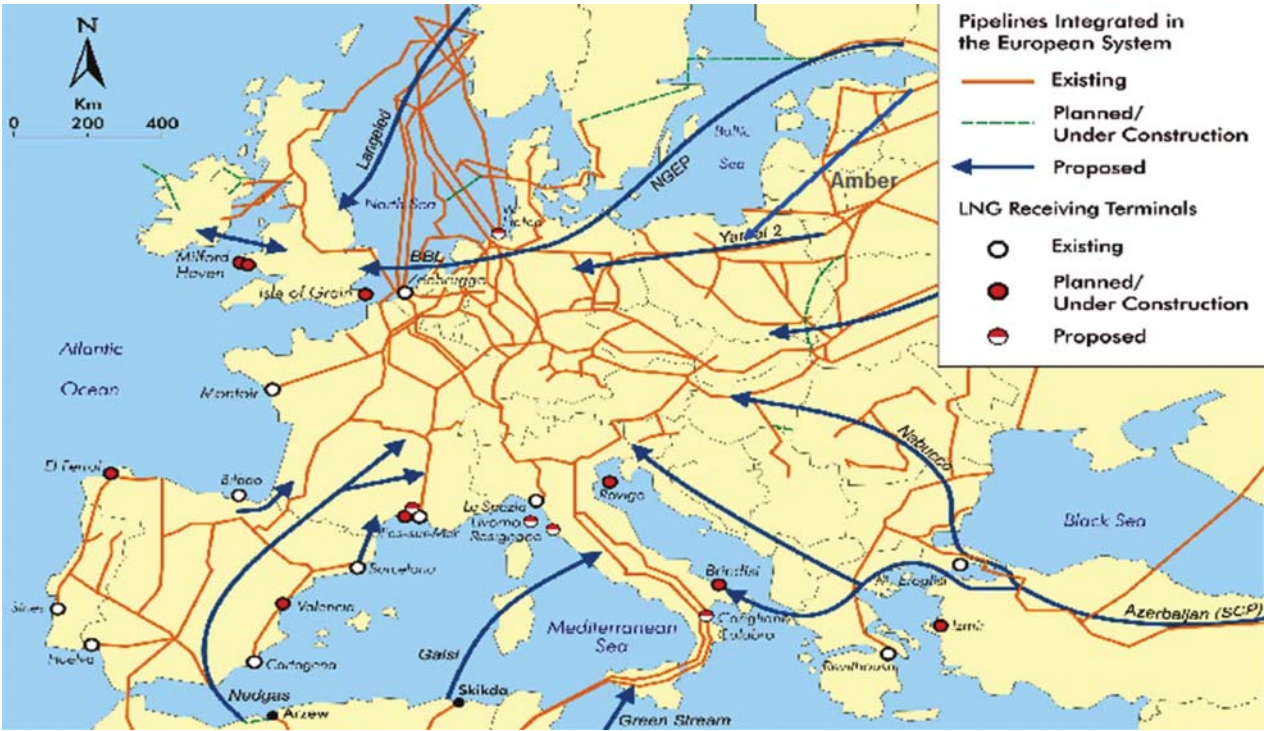
EU Focus Areas For Natural Gas Infrastructure



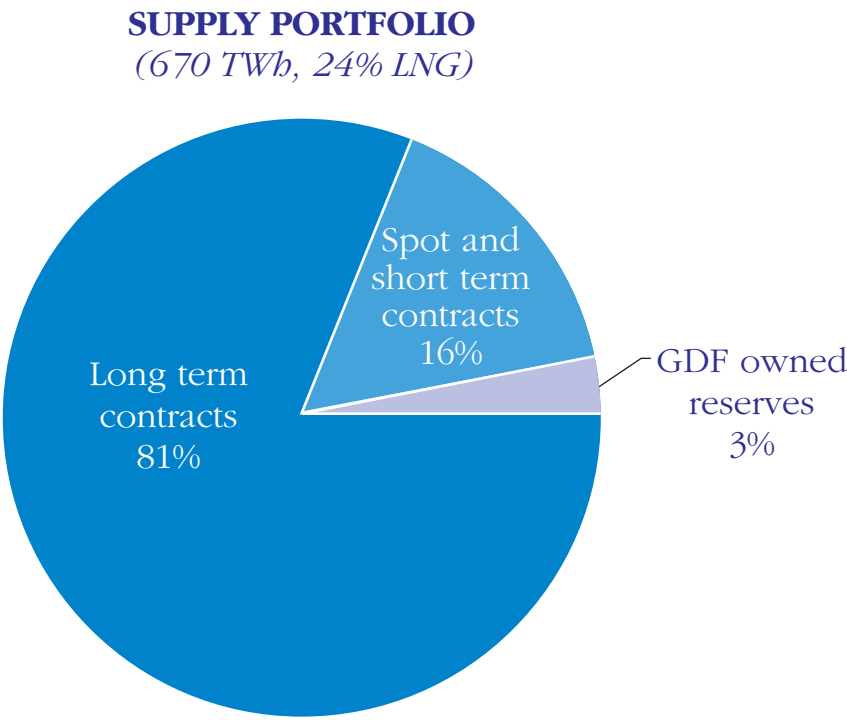
Large Natural Gas Reserves Around EU



Major Pipelines And LNG Projects (IEA source)



France as an example



Debate on Long Term (LT) Contracts

ARGUMENTS AGAINST LT CONTRACTS

- 1 - The European Commission considers such contracts to be an obstacle to competition (barriers to entry) and urges the implementation of spot markets
- 2 - Growing part of LNG is a factor of flexibility on the gas market
- 3 - A meshed network reduces the preference for LT contracts (because several routes are available)
- 4 - Price volatility is higher on the spot than with LT contracts but derivatives (forwards, futures, options) are available to hedge against such price risks

ARGUMENTS IN FAVOUR OF LT CONTRACTS

- 1 - LT contracts are necessary to make production and transmission activities profitable (for the seller)
- 2 - LT contracts are necessary to secure energy supply (for the buyer)
- 3 - More flexibility in the long term contracts is possible and profitable

for the two parties (shorter period, more flexible take or pay clauses)

- 4 - Opening to competition is compatible with long term contracts if gas release is introduced

The Debate on Long Term (LT) Contracts

- Need for clear allocation of responsibilities of different market players
 - for secure and efficient operation of infrastructures and
 - for sufficient long term development of infrastructures
- Long term gas supply is strongly influenced by long distance transmission investments
- Need for a clear, stable and incentivising investment climate for transmission, storage and LNG
- Need for long term commitments, notably between TSOs, SSOs, TOs and the gas suppliers
- Regulation should foster entrepreneurship: stability, predictability, simplicity
- Granting of exemptions from TPA provisions of the IGM Directive is a crucial point

4. TRANSFORMATION TO A LOW CARBON ECONOMY

4.1. Global Trends and the Case of Turkey

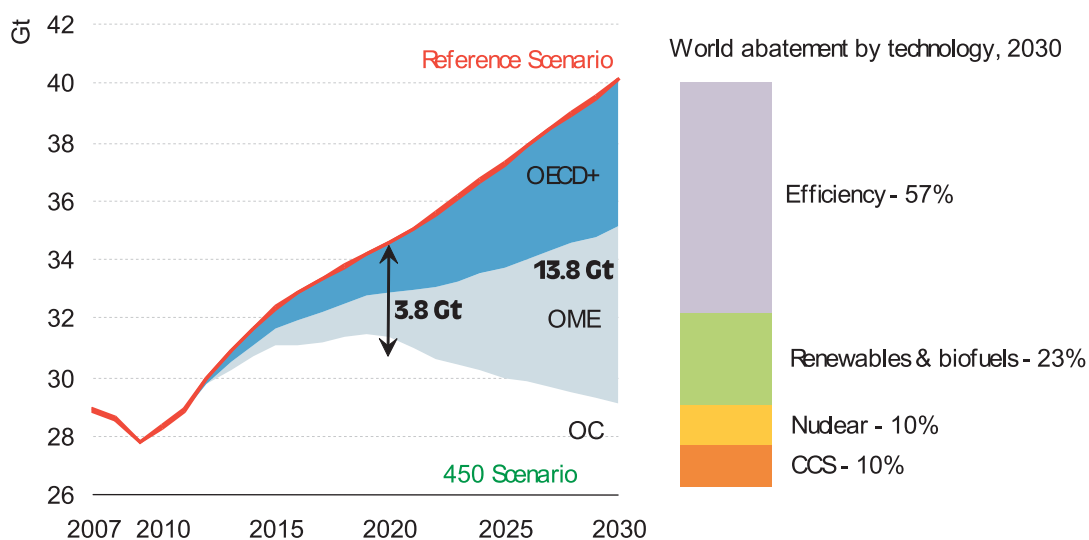
Scientific reports warn us that global temperature will increase 4-6°C and the global economic activity may incur losses up to 20% by 2050 if no action is taken against climate change. On the other hand, cost of taking action is calculated as 1% of annual world GDP.

Energy use is the leading contributor to global greenhouse gas emissions. According to International Energy Agency forecasts, in 2030 energy demand will be 45 % higher than 2006 figures, with an average annual growth of 1.6 %.

As global energy demand increases, climate and energy policies should be integrated into long-term, market oriented, cost effective, and harmonious policies that foster innovation and commercialization of technologies.

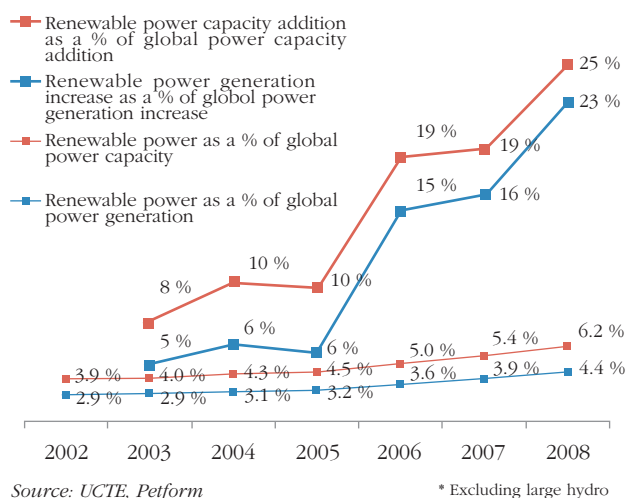
With the desired 2°C temperature increase (450 ppm) scenario, renewable sources, nuclear and carbon capture and storage power plants are to produce 80% of the power generated in the EU in 2030, almost doubling their current share of 44%. This will require an additional global investment level of \$ 10.5 trillion.

Global Energy Related CO₂ Emission Reductions



Source: IEA

RES in Power Generation



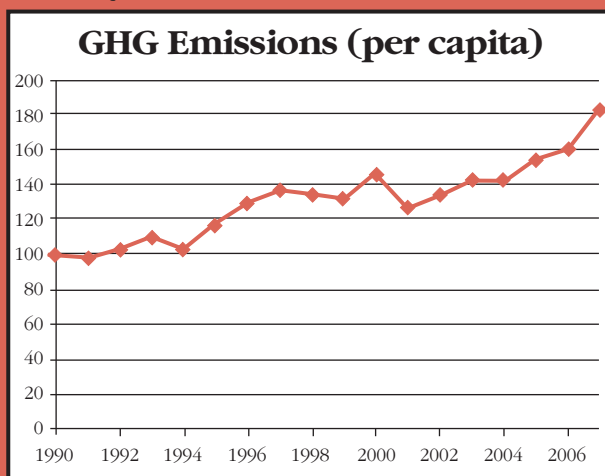
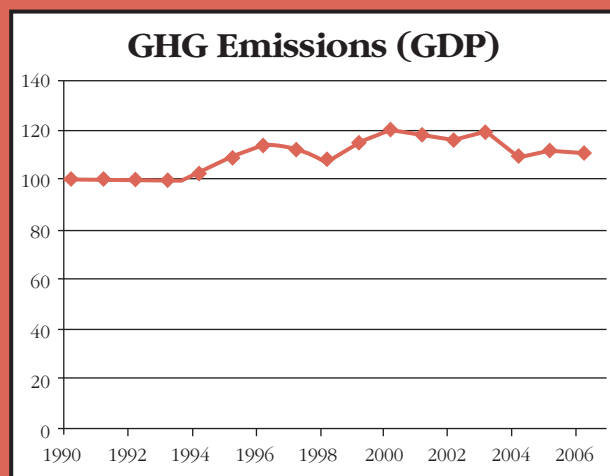
Total GHG emissions of Turkey increased by 119% between the years 1990 and 2007 due to the country's steady population growth and intensive industrialization process. Turkey ranks 23rd among countries with the highest GHG emissions, contributing 1% of the global total.

Turkey and the Climate Change

Turkey has become a party to the Kyoto Protocol in 2009. Since the ratification was subsequent to the beginning of the first commitment period, Turkey was not required to adopt any target for limitation or stabilization of greenhouse gas emissions for the 2008-2012 period.

Turkish economy needs to grow 5-6% annually, in order to increase social and economic welfare. In this respect, Turkey faces a great challenge of achieving economic and industrial development, while controlling and minimizing its emissions. This will only be possible through defined policies of transition to a low carbon economy.

Emission Indices for Turkey (1990=100)



Source: SPO

Taking into consideration the level of economic development and industrialization needed in Turkey as well as her historical responsibility, she should not be assigned a role to take emission reduction targets in line with the developed countries. Turkey's special circumstances have been recognized at the 7th Conference of the Parties in Marrakech. Consequently, the country's name was removed from Annex-2.

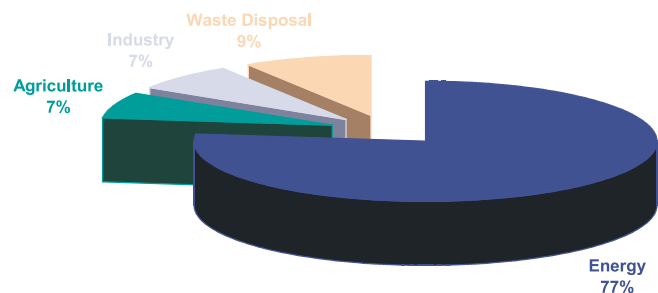
In the Post-2012 Climate Regime, commitments of the countries should be differentiated based on their national circumstances, historical responsibilities, development levels, economic and social indicators; such as GDP per capita, energy consumption, emissions per capita, population growth rate, import dependency, foreign debt, and human development index.

Developed countries should assist developing and less-developed countries in adaptation to climate change in terms of finance and technology transfer.

Climate Change and Energy Sector

In 2007, energy sector constitutes the largest share of the total GHG emissions in Turkey with 77%. Parallel with the global trend and in accordance with the economic growth in the country, the main factor contributing to the increased emissions is increased fuel consumption in industries and transport, and high growth rate in electricity demand.

GHG Emissions by Sector (2007)



Source: TURKSTAT

Out of 43.3 GW of installed capacity in power generation, 83% is provided by fossil fuels. Coal, despite being the most carbon intensive fuel, provides an alternative for the security of supply as Turkey has abundant resources thereof. The share of coal used for power generation (30%) is comparable to the EU-27 level of 27%.

Policy making for transition to a low carbon economy in the medium term through the increased use of renewables and nuclear energy should be given further attention.

Despite policies supporting energy efficiency and renewables, it would still be not viable to eliminate coal as a significant energy resource, both due to economic and security related concerns.

Energy Efficiency

Adoption of measures improving energy efficiency is the most plausible tool both in terms of securing energy supply and for economic growth in transition to a low carbon economy. According to the data provided by MENR, there is 7.5 Billion TL worth of energy saving potential. Construction sector would constitute 30%, industry sector 20% and transportation another 15% in order to realize the said potential.

Energy efficiency in power generation sector especially in the fossil fuel burning thermal plants can be improved.

Through modification towards energy saving appliances, carbon efficient technologies, and reduction of transmission and distribution losses, energy efficiency of the sector can be advanced.

TUSIAD supports the formation of appropriate mitigation action to create a national energy vision promoting energy efficiency measures and sustainable development principles.

Renewable Energy Sources

Currently, 17.5% of power generation is supplied through renewable energy sources.

Dependency on fossil fuels by 80% in power generation is alarming for a nation that is trying to increase diversification of its energy resources, reduce greenhouse gas emissions, and develop related manufacturing sector to realize these objectives.

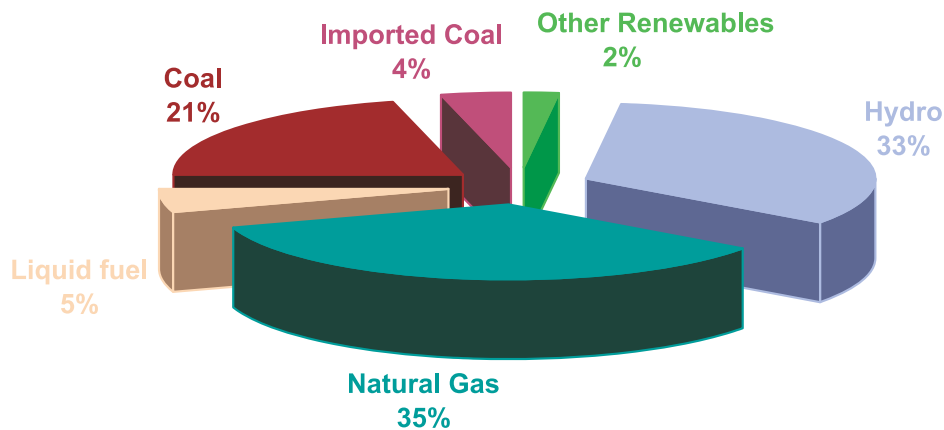
In 2008, over 70% of the energy consumption was supplied through exports. This fact coupled with the need

to turn to greener energy investments makes renewables an important alternative in providing energy through domestic sources. Within this context MENR has set its target as 30% power generation from renewable sources. This target, however, includes large hydro power plants, which are not consistent with the EU “renewable energy sources” definition. TUSIAD believes that large hydro power

plants should be realized with an environmental friendly vision.

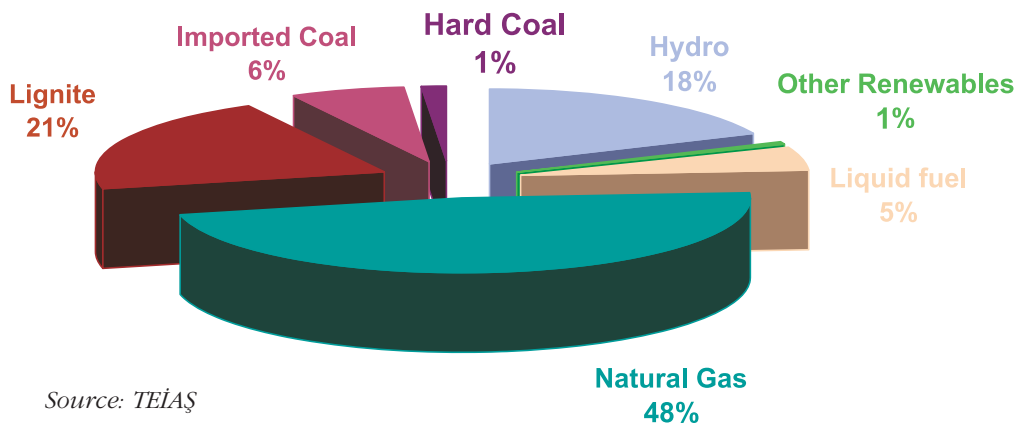
In order to boost the use of renewable energy sources, it is essential to improve the investment climate. There have been certain steps taken in this regard. In 2007, Law on Utilization of Renewable Energy Resources for Electricity Production (Renewables Law) was passed.

Installed Capacity Breakdown (2008)



Source: TEİAŞ

Power Generation (2008)



Source: TEİAŞ

Renewables Law allowed electric producers from RES to become eligible to sell their output through feed-in-tariff system, with a cap between 5-5.5 Eurocent. They could also sell their product above these rates to the spot market or through bilateral contracts.

With some improvement in the investment climate, there was a rise both in the number of applications and the capacity of the granted licences for the renewable resources. Out of the 239 electric production licences in 2008, 87% are for hydraulic and wind power plants, whereas these two resources constitute only 41% of 12 GW total capacity granted.

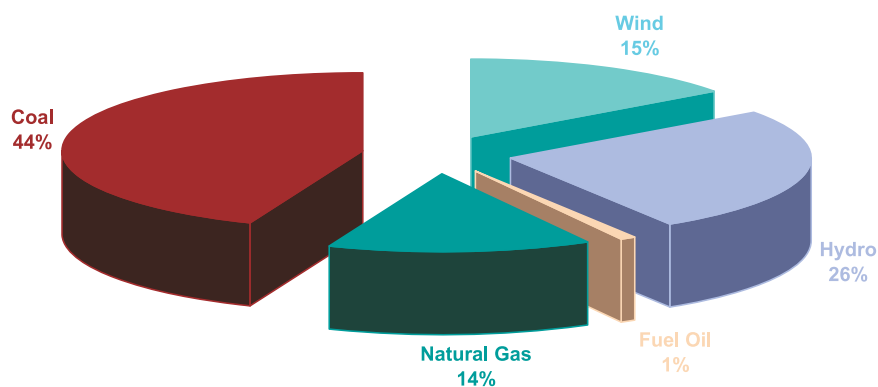
It can be observed that a great majority of the extra capacity are hydrocarbon investments. Especially coal's high share

in the granted capacity demonstrates it as an indispensable option for electric production. Hence, a significant policy option for the reduction of GHG emissions would be to promote cleaner technologies for coal and to improve the infrastructure of thermal plants.

In order to increase renewable investments as targeted by both the Renewable Energy Law and the Energy Market Strategy Paper, it is essential to improve the investment climate.

Within this context, Renewable Energy Law should be updated based on a feasibility analysis regarding cost based pricing and technological differentiation. Such legislative action would promote renewable energy investments.

Capacity Breakdown of the Granted Licences (12 GW, 2008)



Source: TEİAŞ, PWC

Currently 22% of the licenced wind projects, and 8% of the licenced hydro projects are in production. With the increased investment of renewable energy sources, global price fluctuations of fossil fuels would have less of an effect on the national economy. There are certain factors such as lengthy bureaucratic procedures, and the difficulty to find financing that hinder the investment climate for RES.

Besides the tightened credits due to the global financial crisis, Turkish renewable investments are faced with inadequate “guarantees of purchase” and detailed reporting requirements to be eligible for international credit. Legislation improving the market requirements for

financial instruments should be implemented. Within that context, subsidies provided to the energy sector should be in line with the Post-2012 mechanisms.

Improvement of the investment climate will foster the liberalization of the sector, encouraging private sector investments. It would not be possible to realize the desired level of investments and reach the targets set by the MENR without the involvement of the private sector. Hence, it carries utmost importance for all stakeholders to be a part of the decision making process in order to ensure applicable policy solutions to realize the necessary investments given the RES potential of the country.

RES in Turkey

	Current ¹	Target ²	Potential
Hydro	14.418 MW	30.000 MW (2023)	130 bilion kWh ³
		11.000 MW (2013)	
Wind	754 MW	15.000 (2015)	48.000 MW ³
		20.000 MW (2020)	
Solar	<1	N/A	380 bilion kWh ³
Geothermal	77 MW	600 MW (2020)	2000 MW ⁴
Biomass	81 MW	N/A	N/A
RES/Total Generation	% 20	>%25 (2020)	

¹ TEİAŞ, December 2009

² Energy Market Strategy Paper

³ General Directorate of Electrical Power Resources

⁴ Turkish Geothermal Association

Source: Danışman, Ahmet Ümit, “Küresel Kriz Sonrası Düşük Karbonlu Enerji Sistemine Geçişte Fırsatlar ve Tehditler” presentation, 9 December 2009.

4.2. Staying Competitive in a Low-Carbon Energy Future³

Competitiveness in a low-carbon energy future

EU energy policy

- 2007 - new energy policy for Europe:
 - competitiveness dimension
 - climate dimension
 - energy security dimension
- EU 2020 targets:
 - 20% reduction of greenhouse gases
 - 20% share of renewables in energy mix
 - 20% increase in energy-efficiency

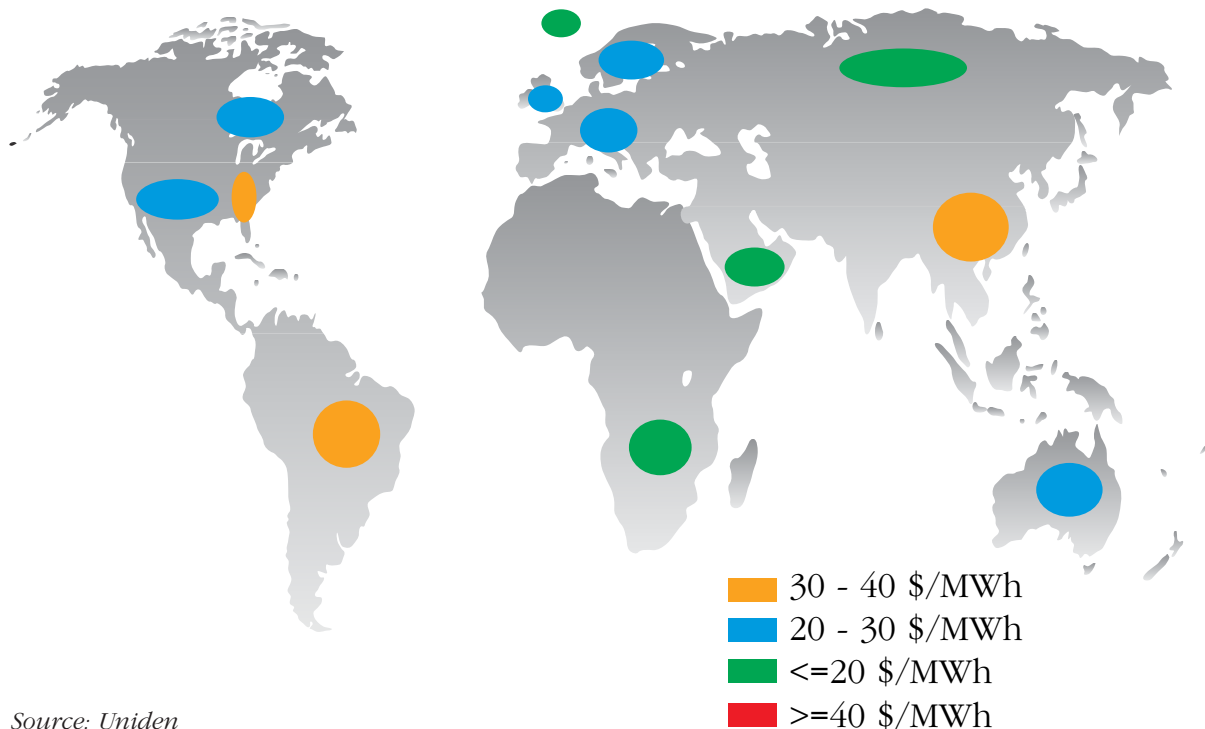
1. Energy prices

2. Alternative energy solutions

- Energy efficiency
- Renewables
- Nuclear energy
- ...

World electricity prices

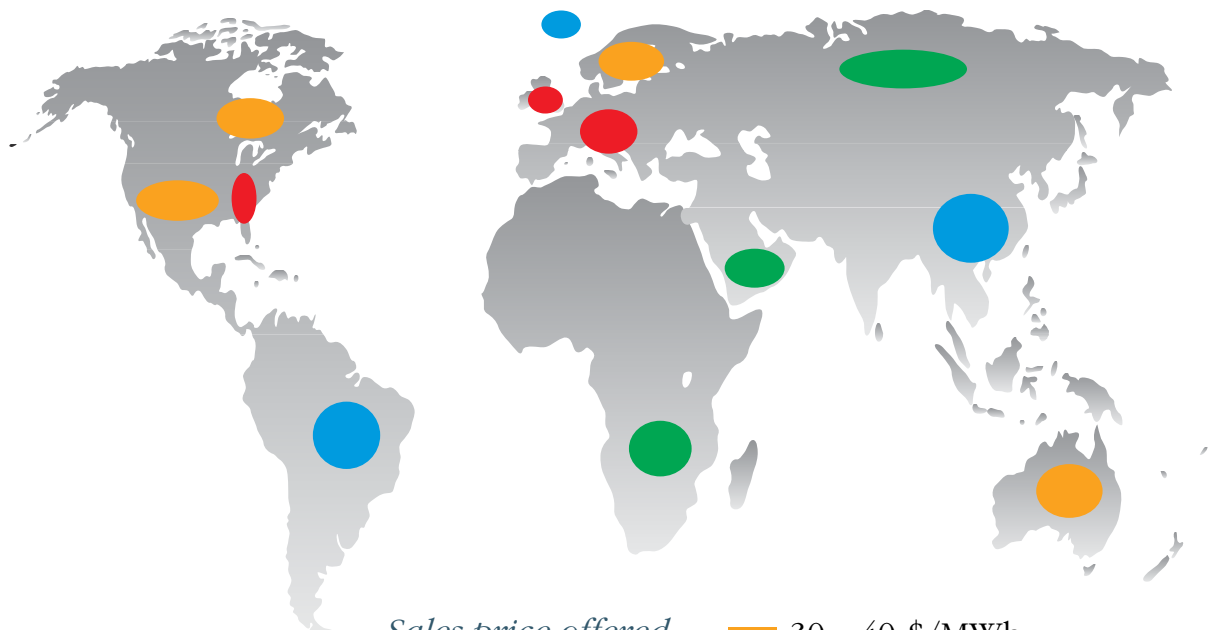
Sales price offered to big industrial consumers in 2002, all taxes excluded



Source: Uniden

³ Presented by Folker Franz, Senior Advisor on Environmental Affairs at BUSINESSEUROPE, at BOSMIP2 "Energy and Transport Seminar", 20 November 2008

Three years later

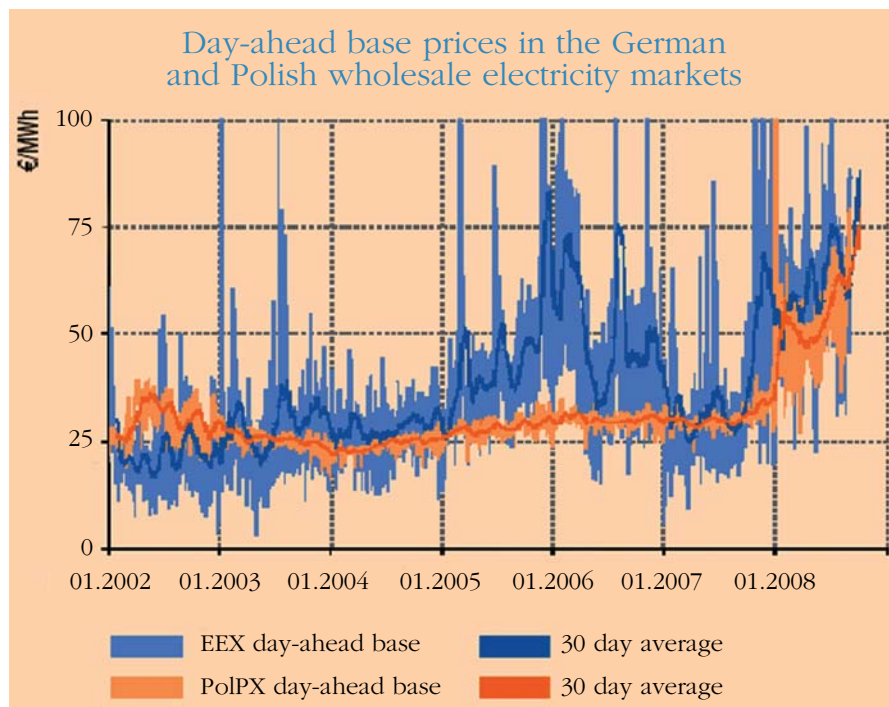


Source: Uniden

*Sales price offered
to big industrial
consumers in 2005,
all taxes excluded*

30 - 40 \$/MWh
20 - 30 \$/MWh
≤20 \$/MWh
≥40 \$/MWh

EU energy prices and CO₂ price

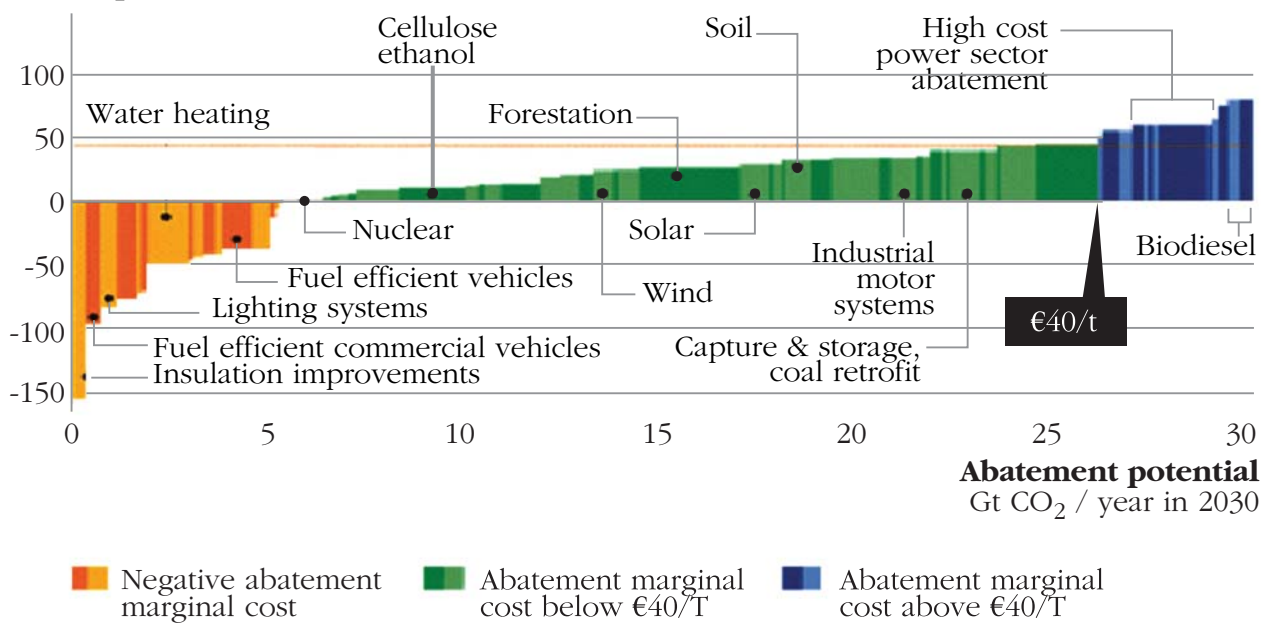


Source: European Energy Exchange, Towarowa Gielda Energii (Polish Power Exchange), Öko-Institut calculations

Alternative Energy Solutions

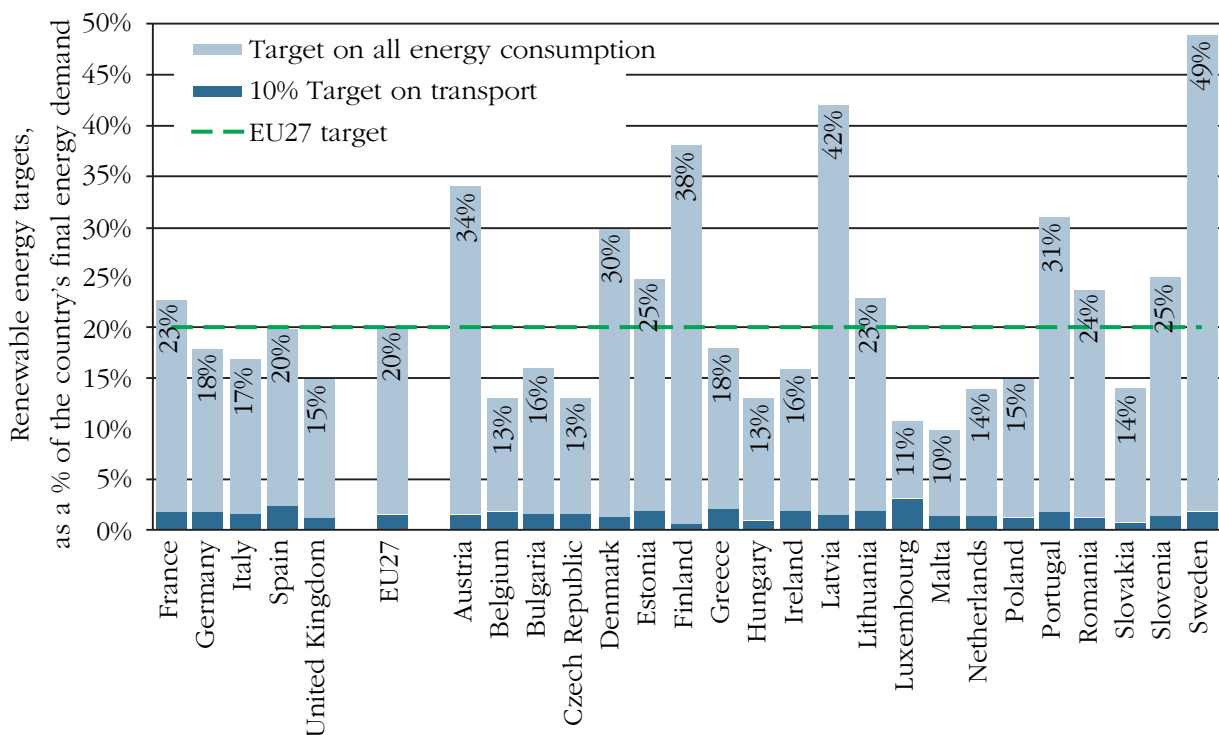
Global cost curve

Marginal cost of abatement - examples
€/t CO₂

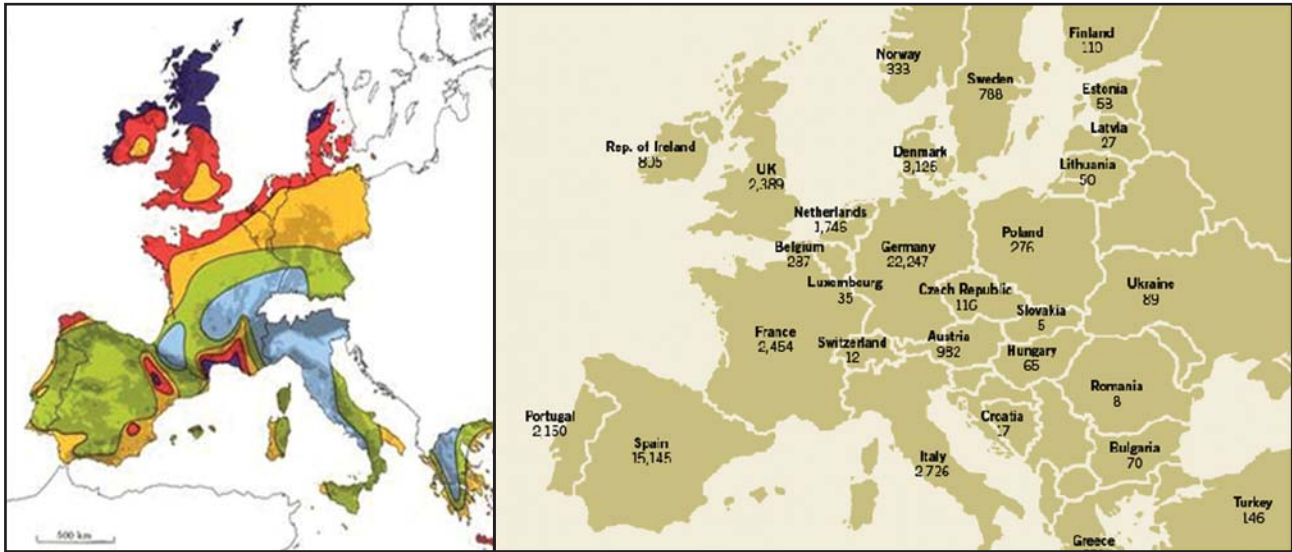


Source: McKinsey/Vattenfall 2007

2020 Renewable Energy Targets



Wind resourcesand installed capacity



Source: VGB PowerTech

Source: EWEA

Nuclear: example of win-win schemes

Energy intensive industrial consumers are looking for:

- Competitive prices (at worldwide benchmark level)
- Long term visibility

Win-win schemes

(ex: FENNOVOIMA (Fin.),
EXELTIUM (Fra.))

Producers' needs:

- Find project finance mechanisms coupled with a minimisation of the risk by securing baseload outputs

Why are Long-term Contracts (LTCs) important?

- LTCs facilitate major energy investments by giving guarantees for their long-term viability
- LTCs give visibility of the economic conditions for future supplies, because they are based on long-term economics
- LTCs can help reflecting cost-competitiveness of i.e. nuclear in electricity prices

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