New Investment Opportunities for Turkish Companies in Light of Energy Outlook

PETFORM

Energy Investment Conference
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Orhan Duran
Chairman of the Board

About PETFORM

Established in 2000, PETFORM has played a crucial role in the transfer of private sector views to the public authorities regarding to Turkish energy legislation amendments. Member companies mainly have activities in 2 sectors:

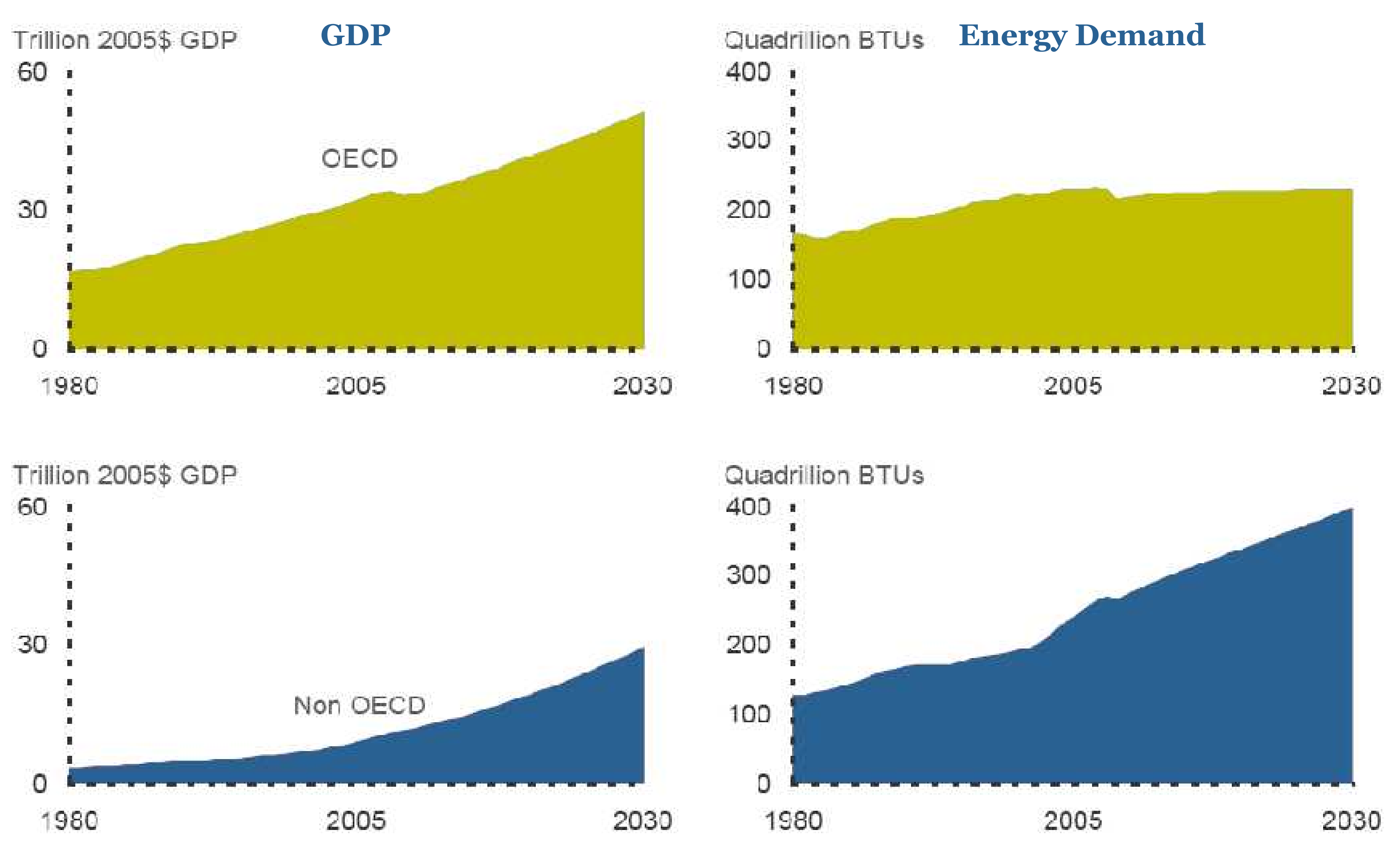
- Exploration & Production Sector
- Natural Gas Market

Member Companies

- AKENERJİ
- AKFEL
- AKSA
- ALADDIN MIDDLE EAST
- ANATOLIA ENERGY
- ANGORAGAZ
- ATTİLA DOĞAN İNŞAAT
- AVRASYA GAZ
- AYGAZ
- BATI HATTI GAZ
- BM HOLDİNG
- BOSPHORUSGAZ
- BP
- ÇALIK ENERJİ
- DEMİRÖREN EGL
- DOĞAL ENERJİ
- DOĞAN ENERJİ
- EDISON
- EGEGAZ
- ENEL
- ENERCO ENERJİ
- ENERJİSA
- ENI
- ERDGAZ
- EWE ENERJİ
- EXXONMOBIL
- GDF SUEZ
- GENEL ENERGY
- GÜNEY YILDIZI PETROL
- HATTUŞA ENERJİ
- IBS RESEARCH
- KİBAR ENERJİ
- MARSA ENERGY
- MEDGAZ
- NATURGAZ
- OMV
- PALMET ENERJİ
- PERENCO
- POLMAK
- POZİTİF DOĞALGAZ
- SHELL ENERJİ
- SOCAR
- STATOIL
- TEKFEN İNŞAAT
- THRACE BASIN
- TIWAY
- TOTAL
- TRANSATLANTIC PETROLEUM
- TURCAS
- VALEURA ENERGY
- VALVITALIA
- ZMB GAZ DEPO
- ZORLU ENERJİ

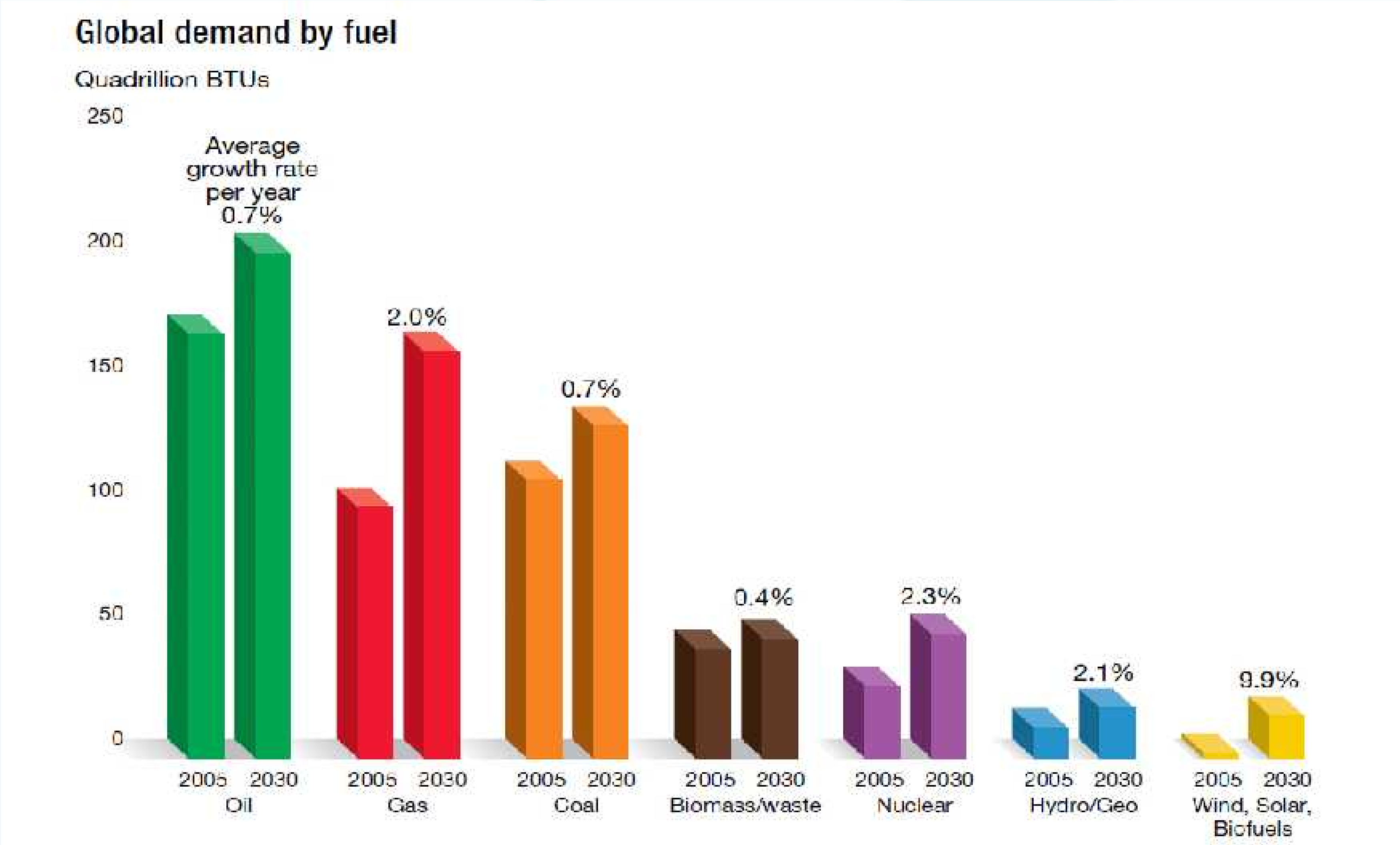
World Energy Outlook

GDP vs. Energy Demand (1980 – 2005 – 2030)



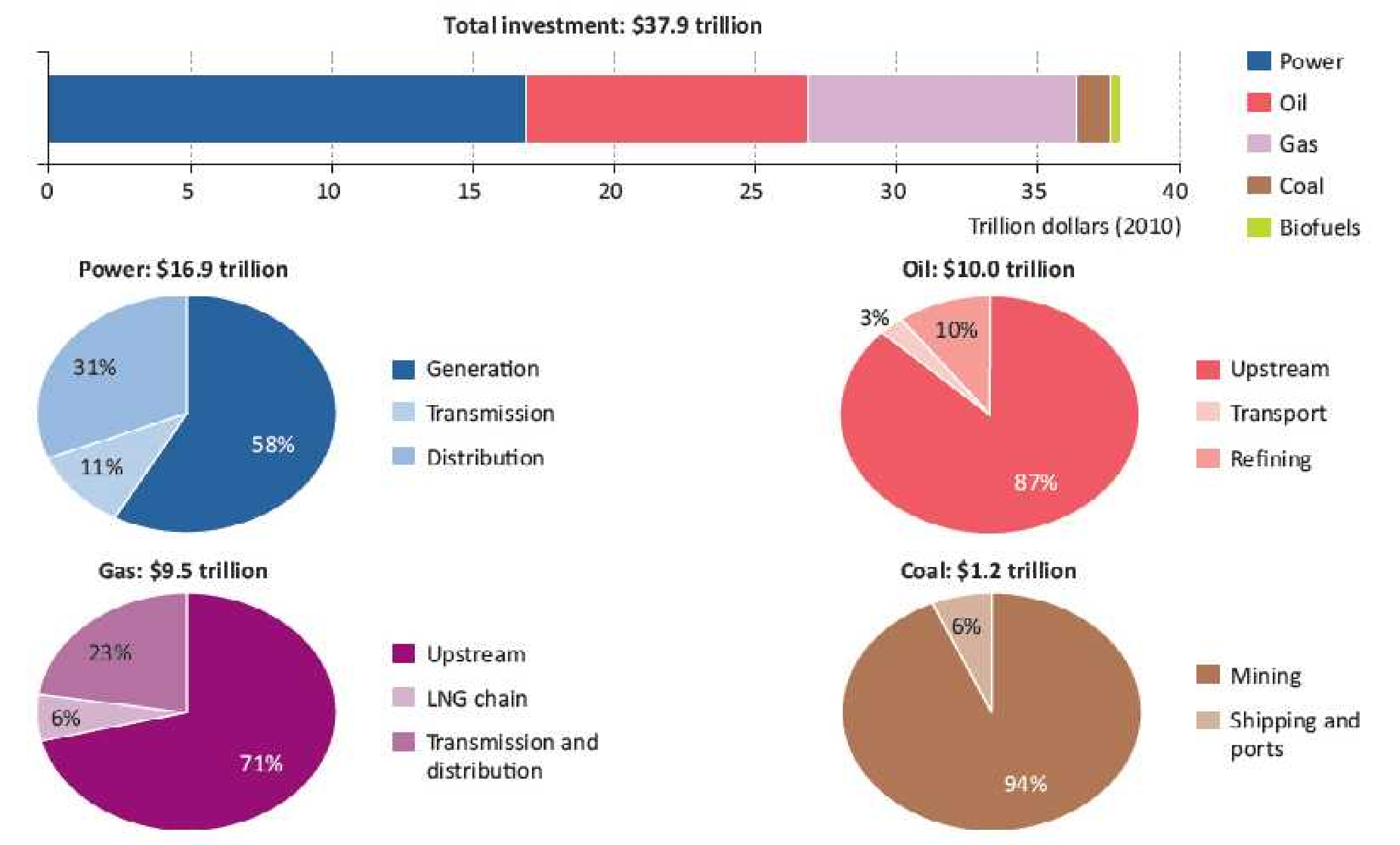
Source: ExxonMobil

Primary Energy Demand by Fuel (2005 – 2030)



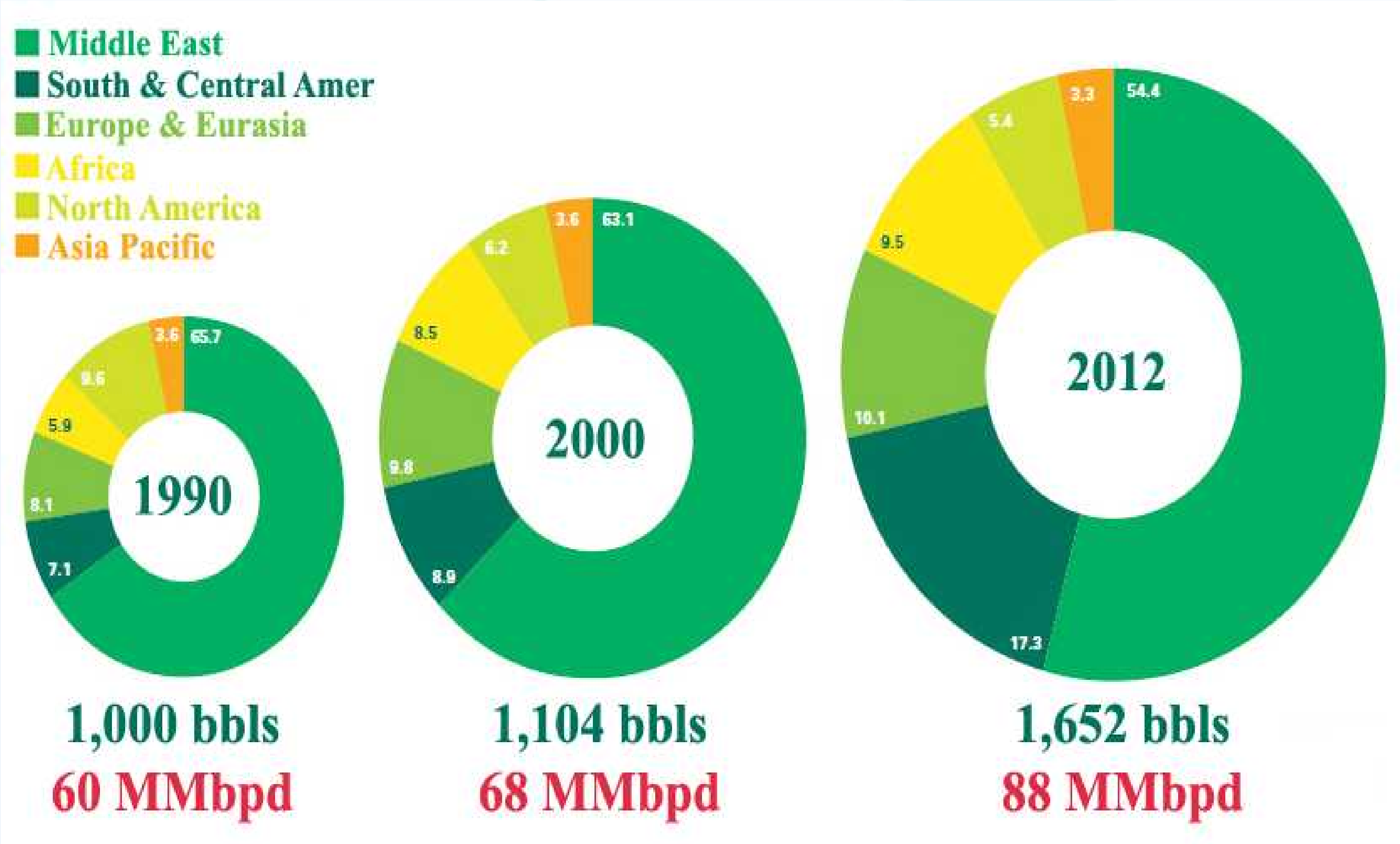
Source: ExxonMobil

Global Energy Investment Requirement (2011 – 2035)



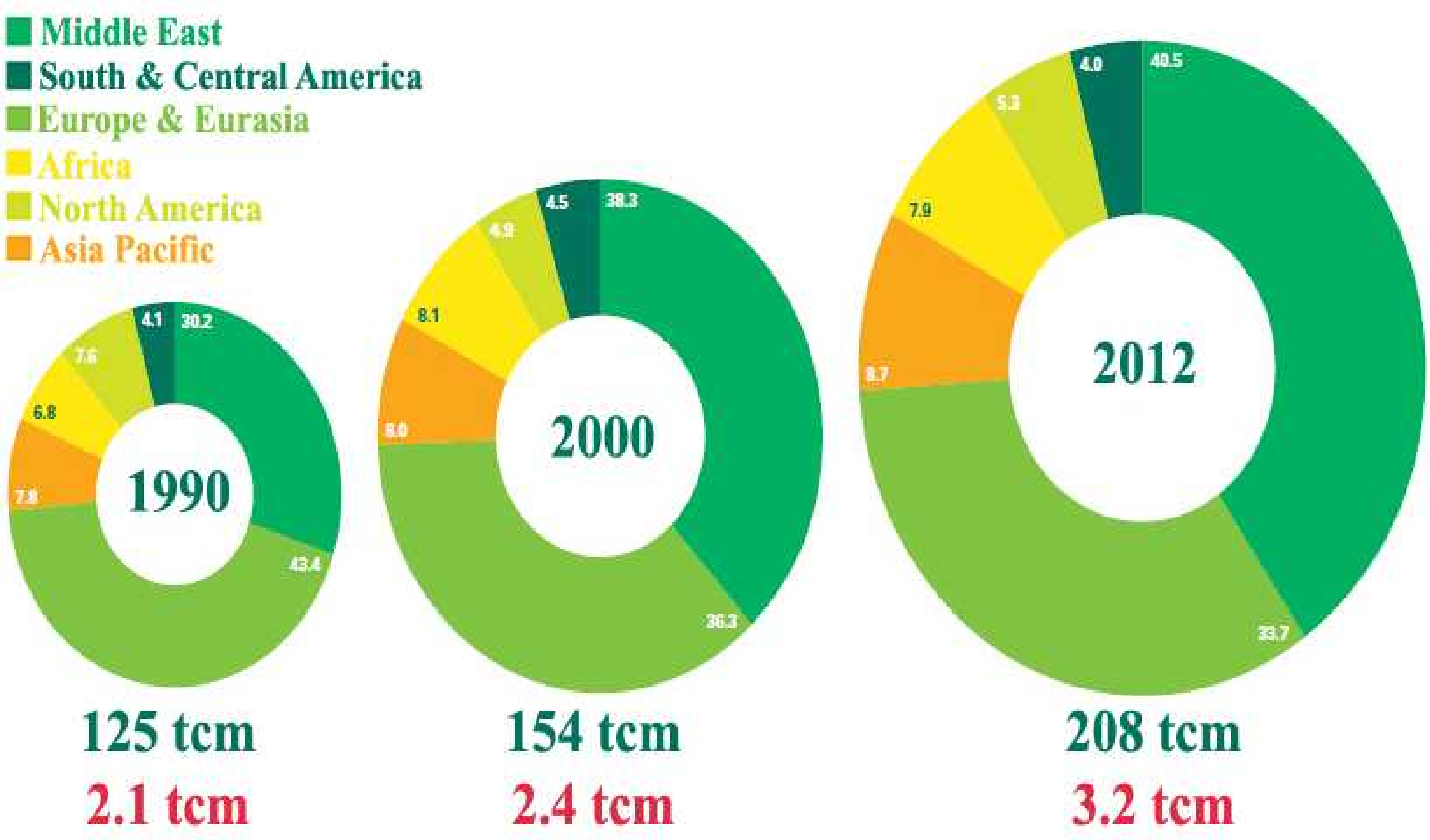
Source: IEA

Regional Breakdown of Oil Reserves (1990 – 2012)



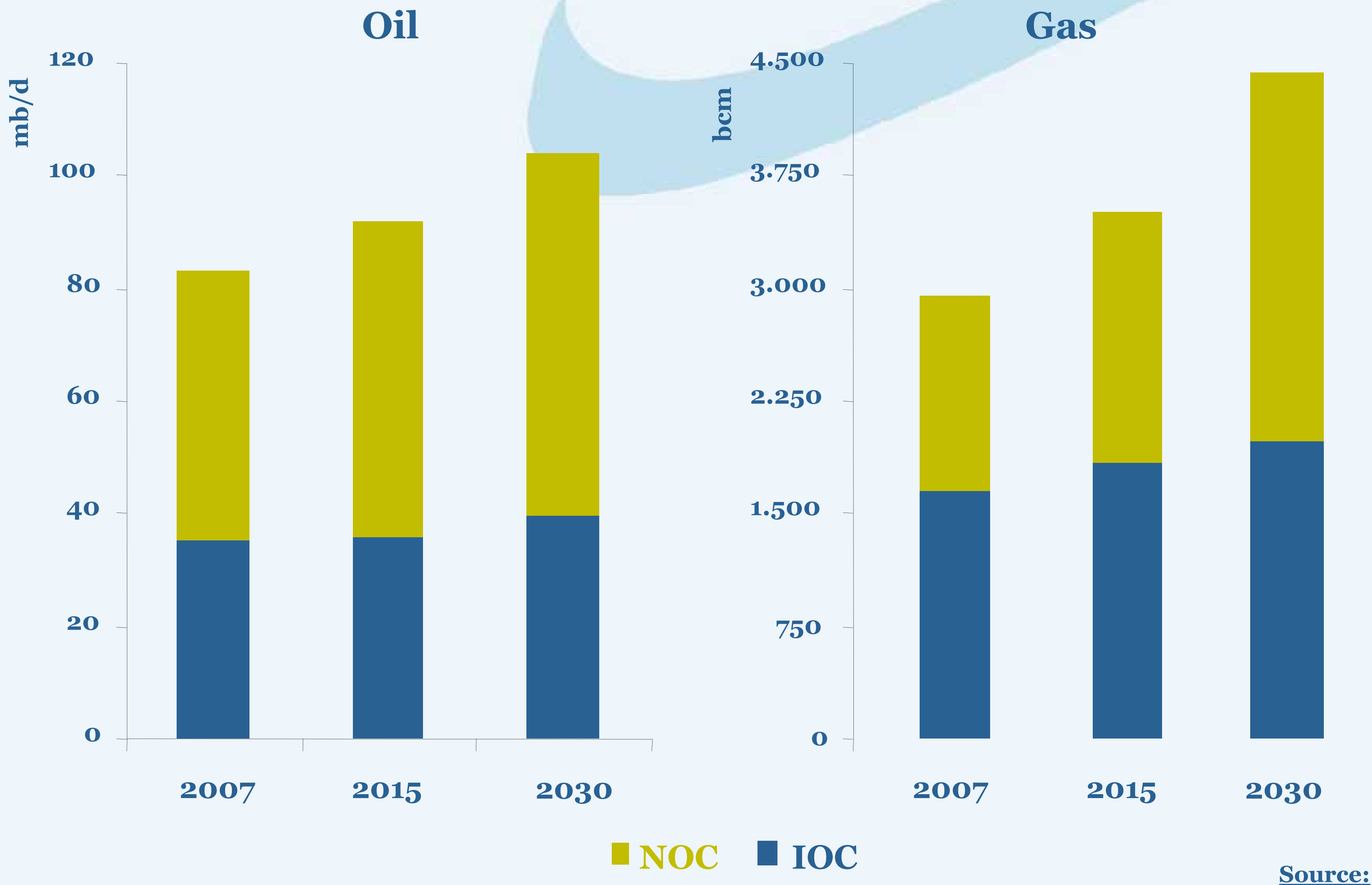
Source: BP

Regional Breakdown of Gas Reserves (1990 – 2012)



Source: BP

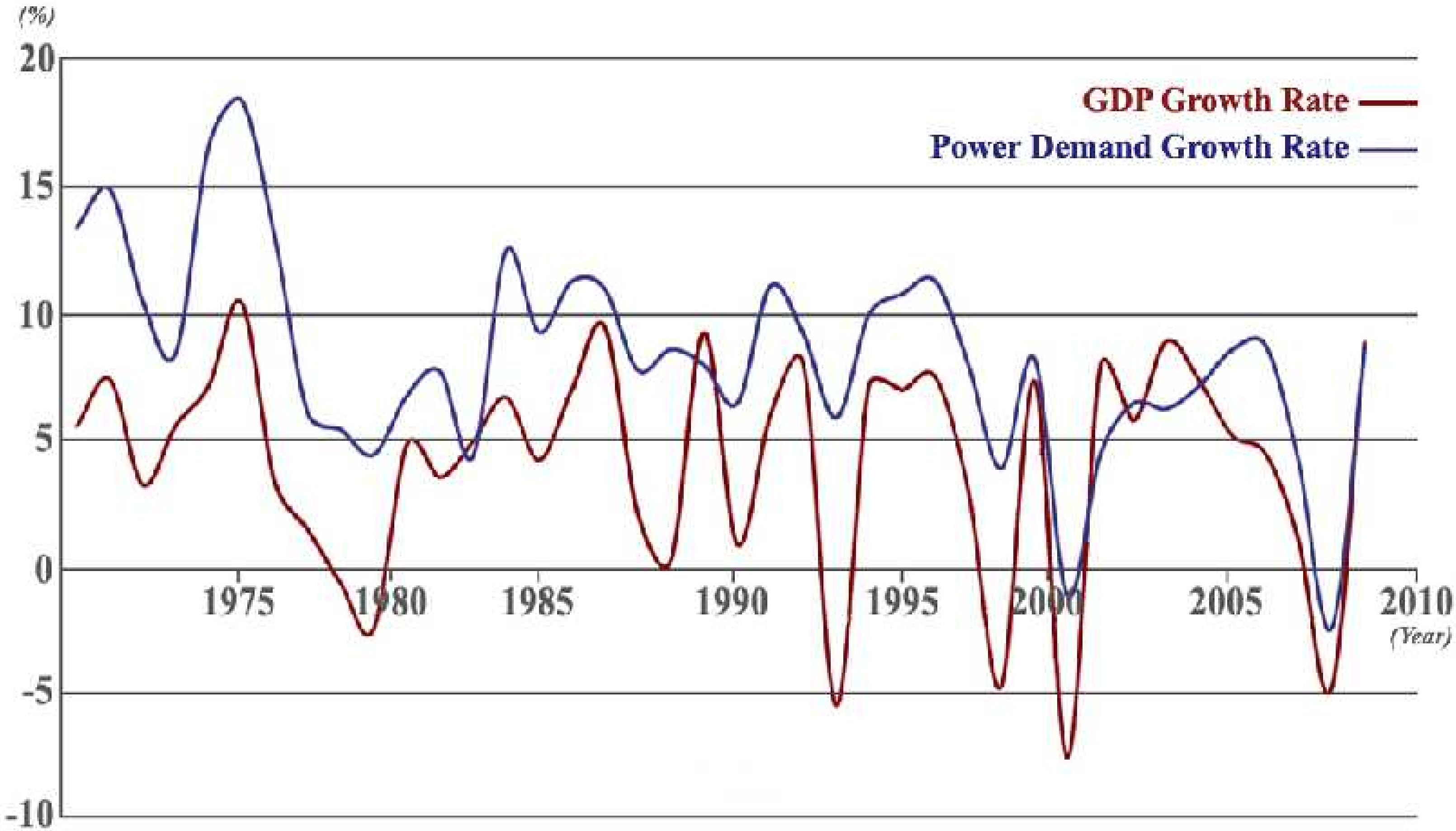
NOC vs. IOC Production Trends (2007 – 2015 – 2030)



Source: IEA

Turkish Energy Outlook

GDP vs. Power Demand Growth (1970 – 2010)



Source: Energy Market Regulatory Authority

Turkey's Overall Energy Balance (1990 – 2011)

	1990	2011	Change
Total Energy Demand *(million toe)*	52.9	114.4	↑ 116% ↑
Total Domestic Production *(million toe)*	25.6	32.2	↑ 26% ↑
Total Energy Imports *(million toe)*	30.9	90.2	↑ 192% ↑
Coverage of Domestic Production to Total Consumption	48%	28%	↓ - 42% ↓

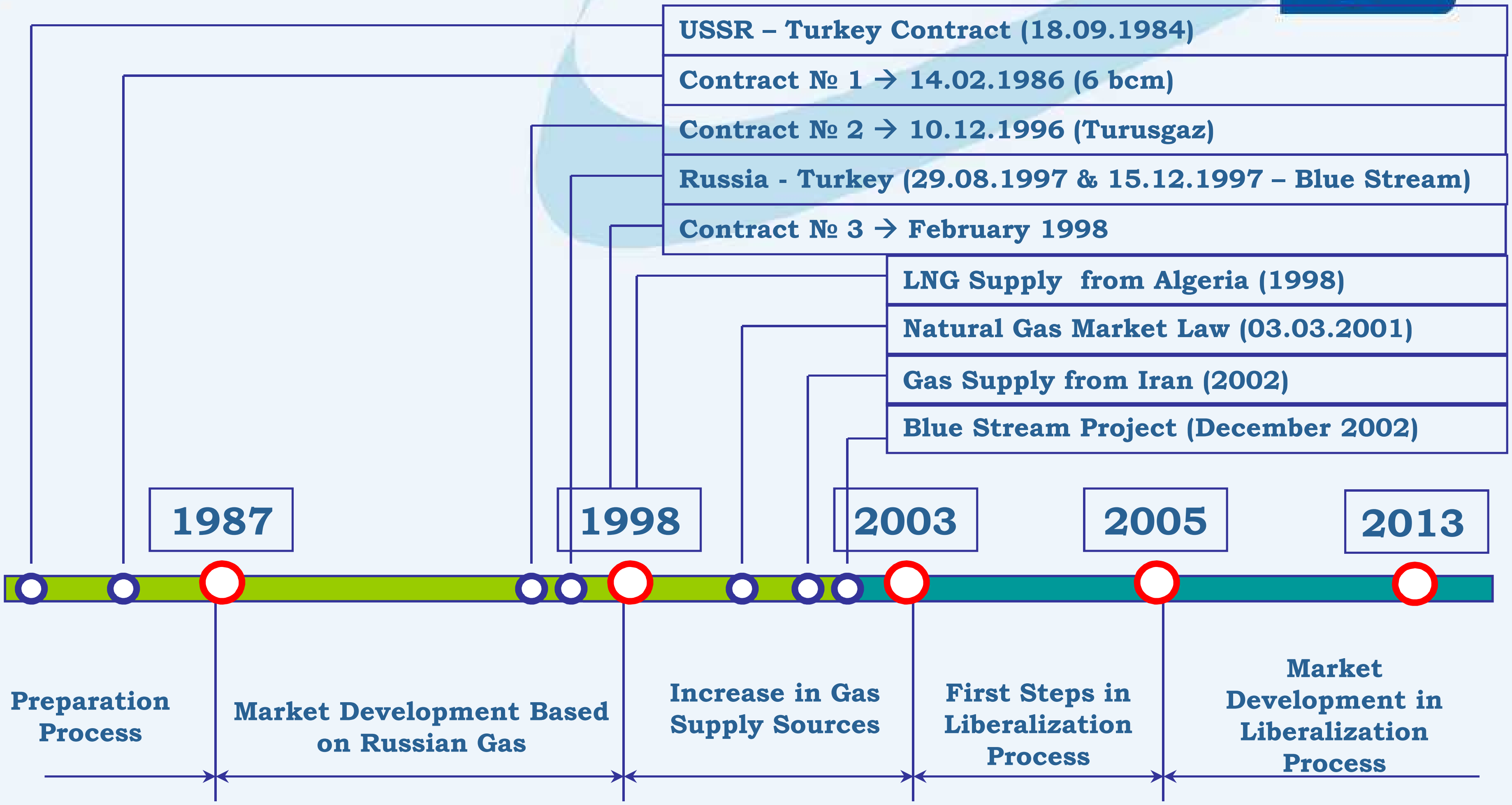
Source: MENR

Share of Energy in Turkey's Total Imports (2009 – 2012)

(billion USD)	2009	2010	2011	2012
Crude Oil & Petroleum Products	14,9	20,6	29,2	31,5
Natural Gas	11,6	14,1	20,2	23,2
Coal	3,1	3,3	4,1	4,6
Total Energy Imports	29,9	38,5	54,1	60,1
Turkey's Total Imports	140,9	185,5	240,8	236,5
Share of Oil & Gas in Turkey's Total Imports	%18,8	%18,7	%20,5	%23,1

Source: Ministry of Economy

Development Process of Turkish Natural Gas Market

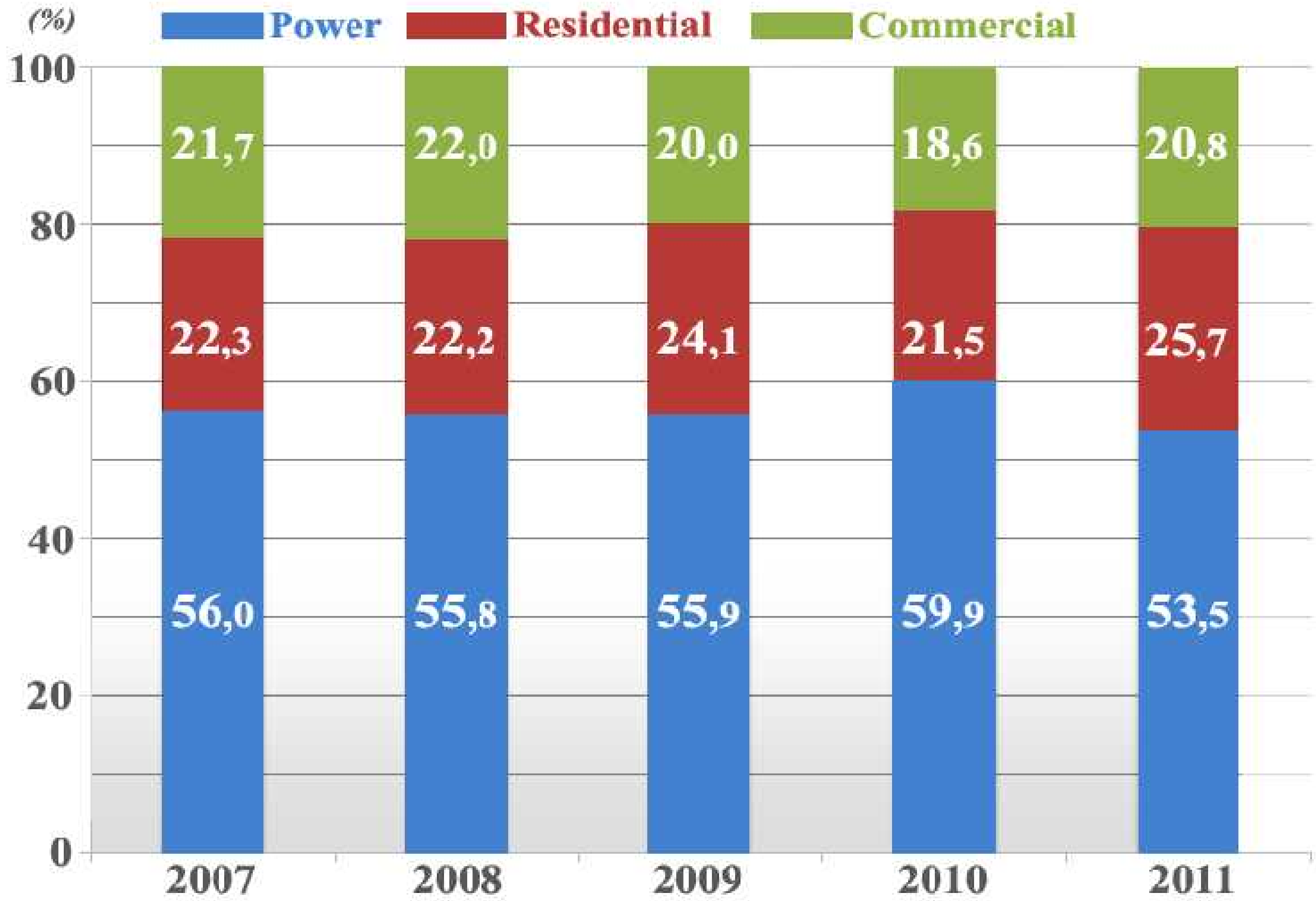


Gas Purchase Agreements

Contract	Date of Signature	Date of Operation	Duration (Years)	Volume (Plateau bcma)	Date of Expiration
Russia (West)	Feb 1986	Jun 1987	25	6	2012
Algeria (LNG)	Apr 1988	Aug 1994	20	4	2014
Nigeria (LNG)	Nov 1995	Nov 1999	22	1.2	2021
Iran	Aug 1996	Dec 2001	25	10	2026
Russia (B.Stream)	Dec 1997	Feb 2003	25	16	2028
Russia (West)	Feb 1998	Mar 1998	23	8	2021
Azerbaijan	Mar 2001	Jul 2007	15	6.6	2022

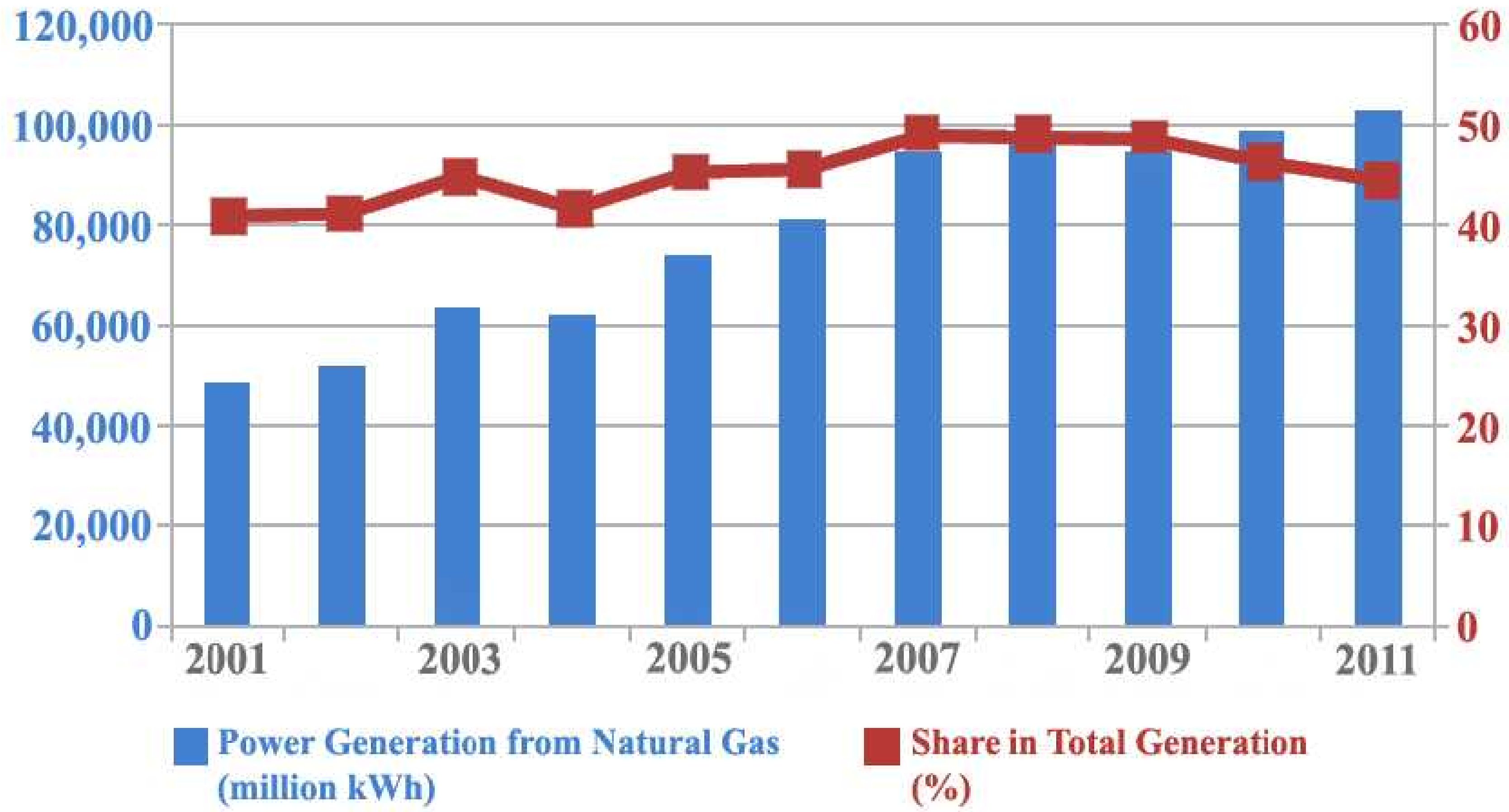
Source: Energy Market Regulatory Authority

Sectoral Breakdown of Gas Consumption (2007 – 2011)



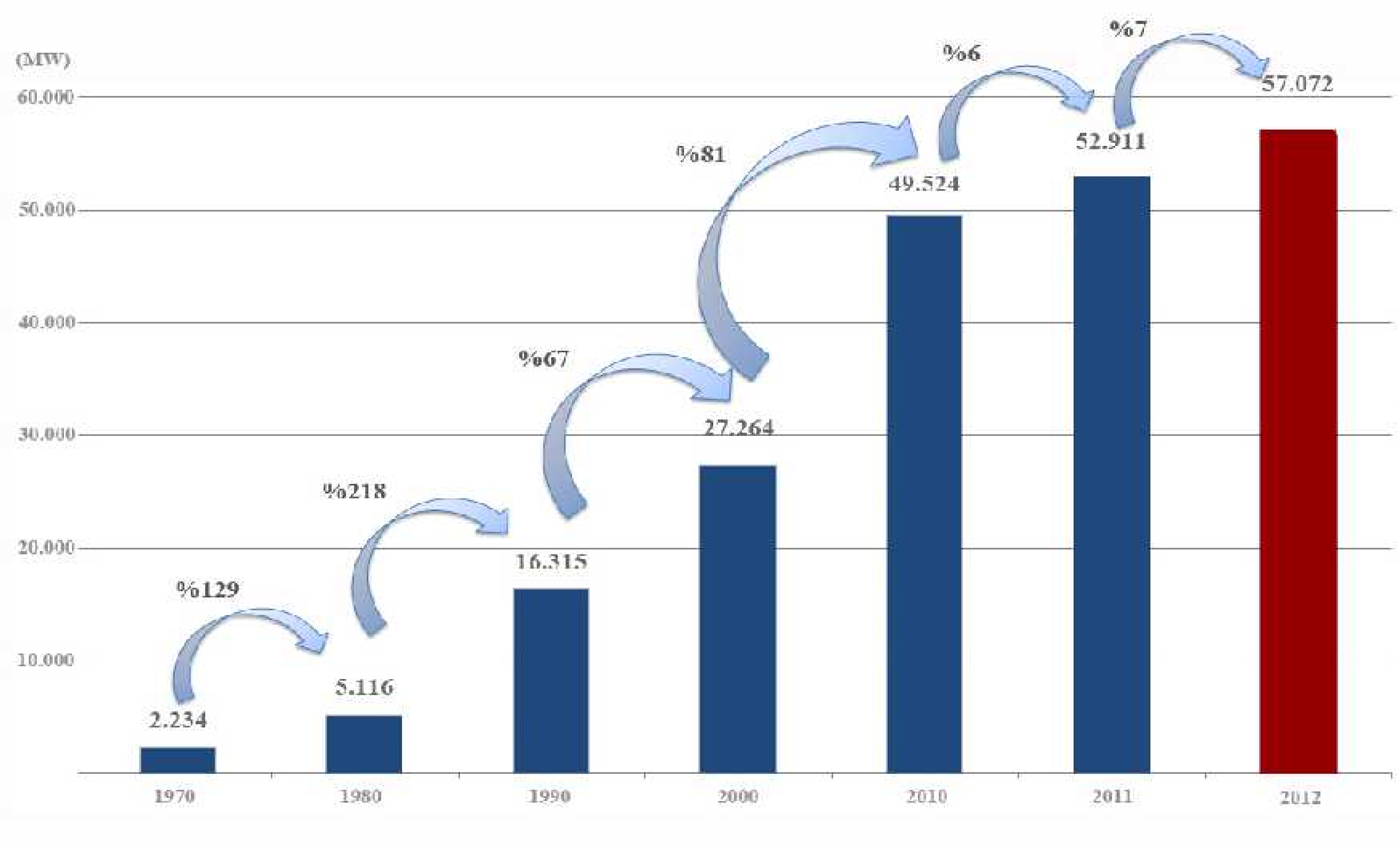
Source: Ministry of Energy and Natural Resources

Natural Gas in Power Generation (2001 – 2011)



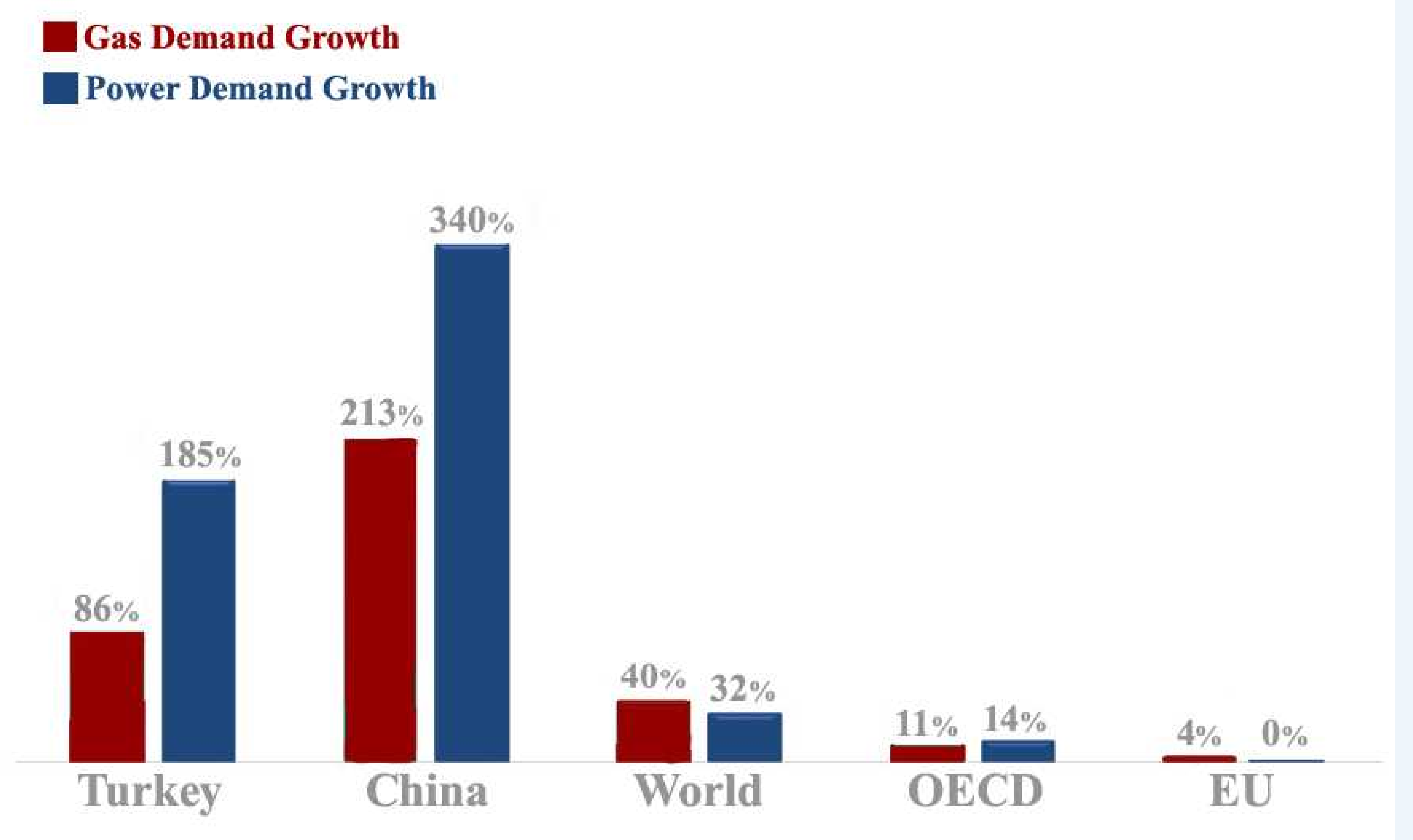
Source: Energy Market Regulatory Authority

Installed Capacity (1970 – 2012)



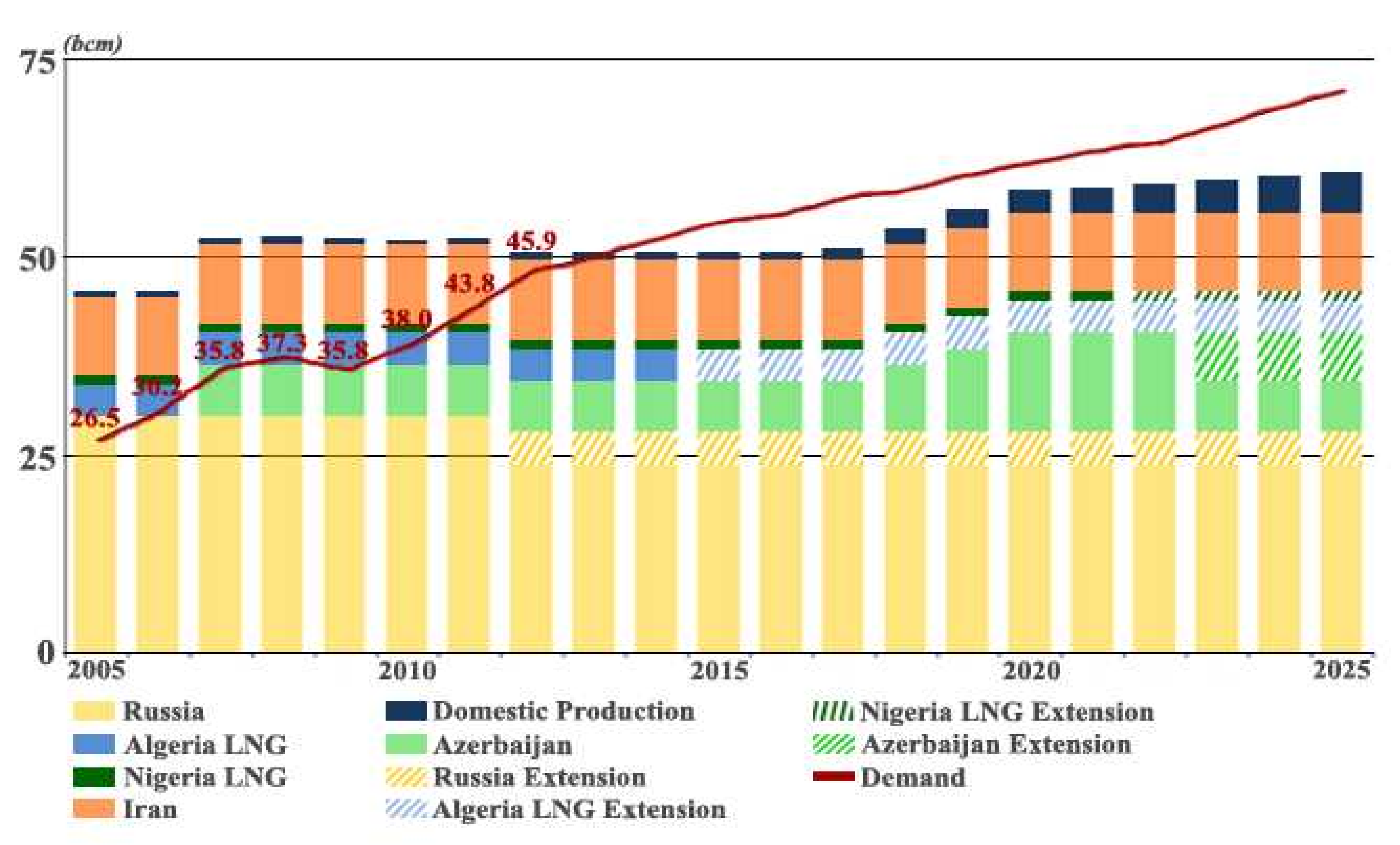
Source: TEİAŞ

Gas & Power Demand Growth (2001 – 2011)



Source: Energy Market Regulatory Authority

Natural Gas Demand vs Supply (2005 – 2025)

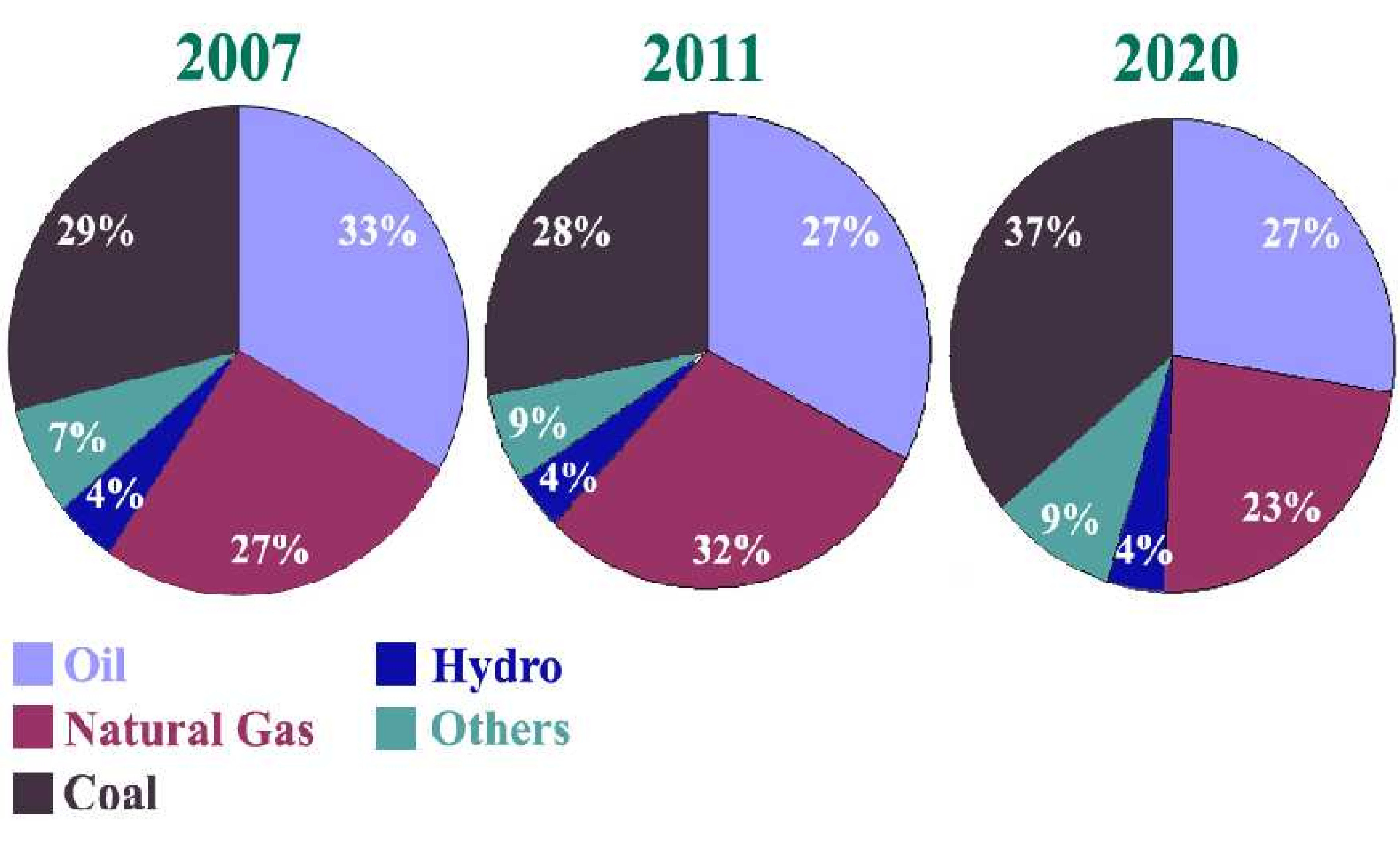


Source: BP

Potential and Possible New Gas Supply Resources

- Shah Deniz II & New Fields in Azerbaijan
- Northern Iraq / Iraq
- Eastern Mediterranean Offshore
- Black Sea Offshore
- Shale Gas?

Energy Consumption by Source (2007 – 2011 – 2020)



Source: Ministry of Energy and Natural Resources

Shah Deniz II & New Fields in Azerbaijan via TANAP

Azeri Gas in Turkey & Europe
TANAP + …?

Northern Iraq / Iraq

Iraq in World Oil Ranking & Reserve Potential

Top Proven Reserve Holders :

1.Saudi Arabia	265.4 billion bbl
2.Iran	151.2 billion bbl
3.Iraq	150.0 billion bbl

Total Potential Reserves :

Iraq	→ 250 bbl oil & 3.2 - 5 tcm gas
N. Iraq (KRI)	→ 40 - 45 bbl oil & 1 - 2 tcm gas

Source: BP & USGS

Opportunities in Iraq (II)

PETFORM

- ✓ Current daily production: 3 mmbd (first time since 1979)
- ✓ Daily production targets: 6 mmbd in 2020 and 8 mmbd in 2030
- ✓ But its possible potential up to 10 – 11 mmbd
- ✓ Investment needed until 2030: 500 billion USD

-

Iraq will be a key player in the next 10-15 years

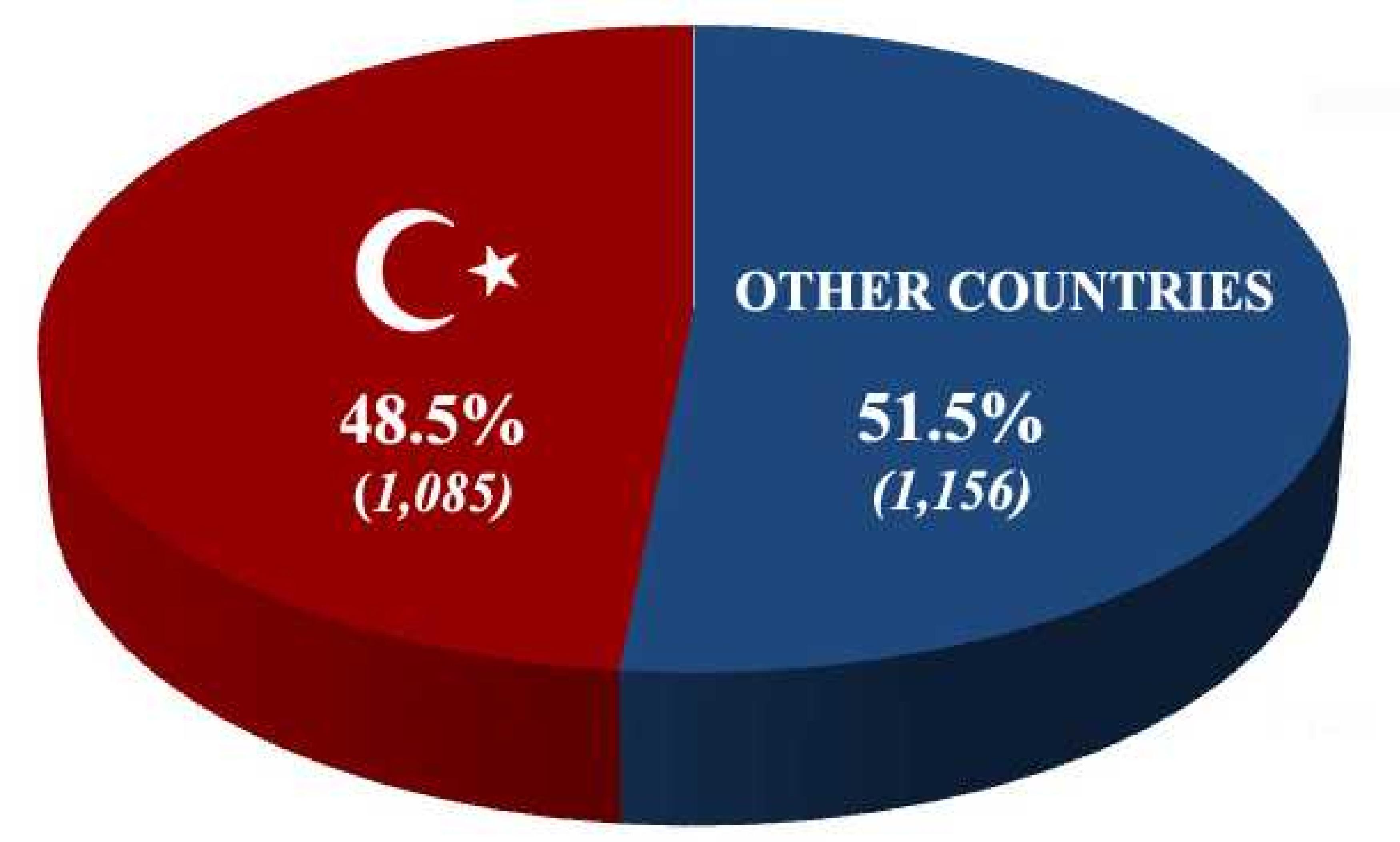
Turkey – Iraq Foreign Trade Volume (1990 – 2012)

Position in Turkey's Import Ranking:

- Currently **2nd**
- Most probably **1st** in a few years

Source: Ministry of Customs and Trade

Breakdown of Investors in Northern Iraq- KRI (2012)



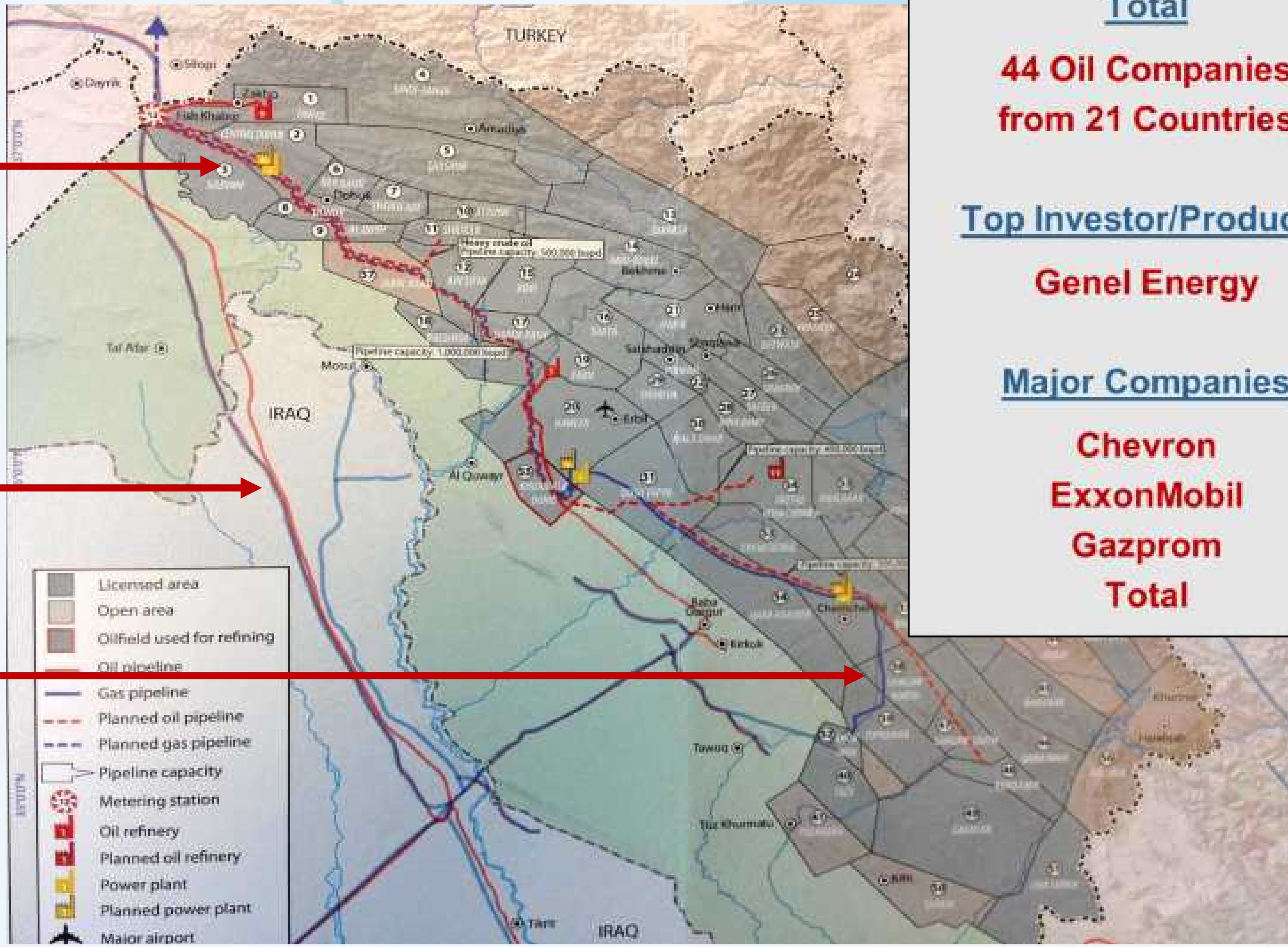
Source: KRG

Current & Projected Pipelines in Northern Iraq

New oil & gas pipelines

Kirkuk – Yumurtalik Oil Pipeline

Khor Mor Gas Pipeline



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Total

44 Oil Companies from 21 Countries

Top Investor/Producer

Genel Energy

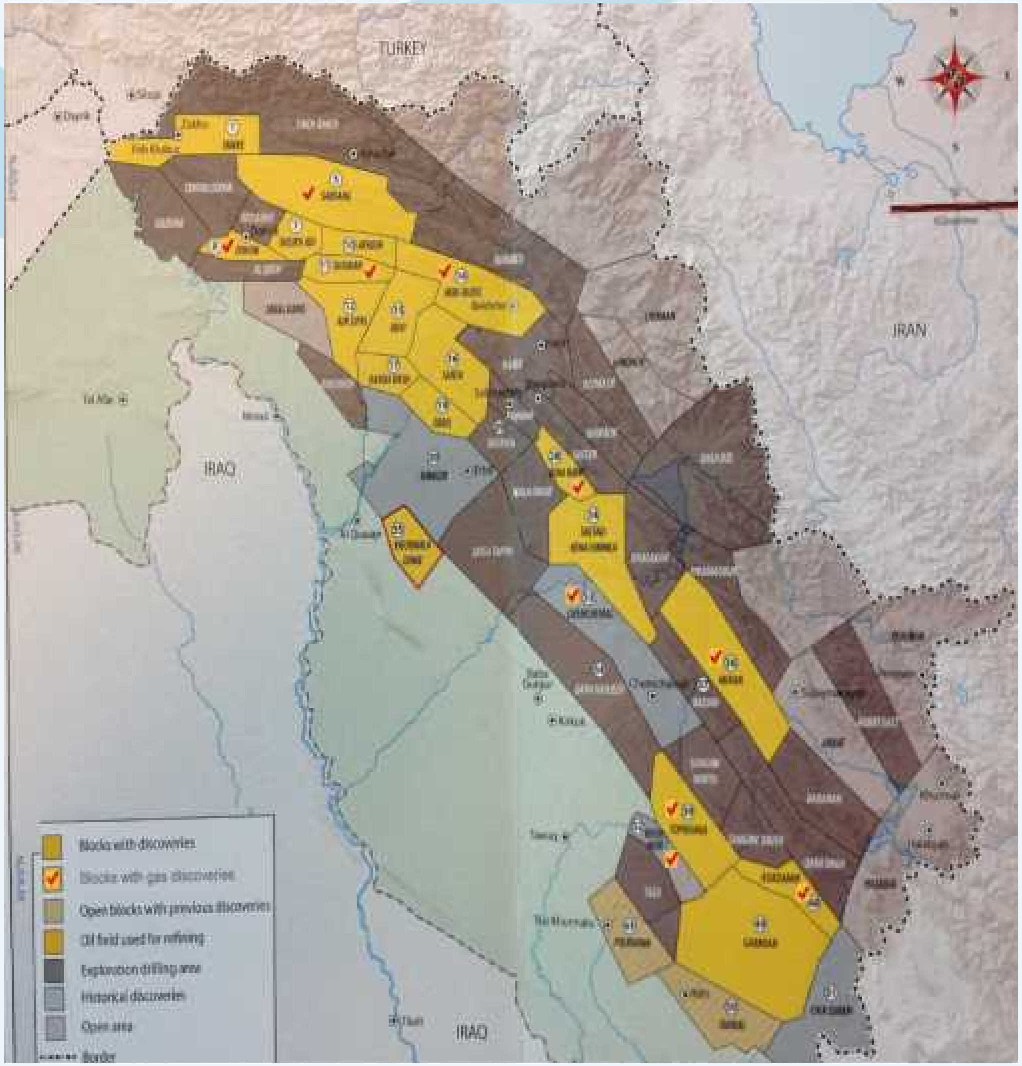
Major Companies

Chevron
ExxonMobil
Gazprom
Total

Source: Genel Energy

Gas Fields Explored in Northern Iraq

Miran	198 bcm
Chemchemal	59 bcm
Khor Mor	51 bcm
Shaikan	43 bcm
Kurdamir	27 bcm
Dohuk	?? bcm
Akrı-Bijeel	?? bcm
Sarsang	?? bcm



➢ Gas Import Potential

15 bcma in 10 years

30 bcma in 20 years

Source: Genel Energy

Comparison of Oil Sharing Systems

Baghdad	Arbil
No Petroleum Law	Petroleum Law & Model PSC
Service Agreement	Production Sharing Agreement
INOC 51% + IOC 49%	KRG 20-25% + IOC 75-80%
Licensing Rounds	Negotiation on Each License
Fee *(3-10 USD per barrel)*	R Factor *(KRG 65-90% + IOC 10-35%)*

- ***Hydrocarbon Law***
- ***Revenue Sharing Law***
- ***Restructuring of Oil Sector***

Why Northern Iraq / Iraq for Turkey?

- ✓ Last and most promising unexplored onshore in the world
- ✓ One of the lowest operational costs
- ✓ Logistics advantage
- ✓ Historical, cultural and religious ties
- ✓ Fast growing political and commercial relations
- ✓ Reliable and economical oil/gas resource
- ✓ Challenging but promising investment climate

Eastern Mediterranean Offshore

Gas Fields Explored in Eastern Mediterranean

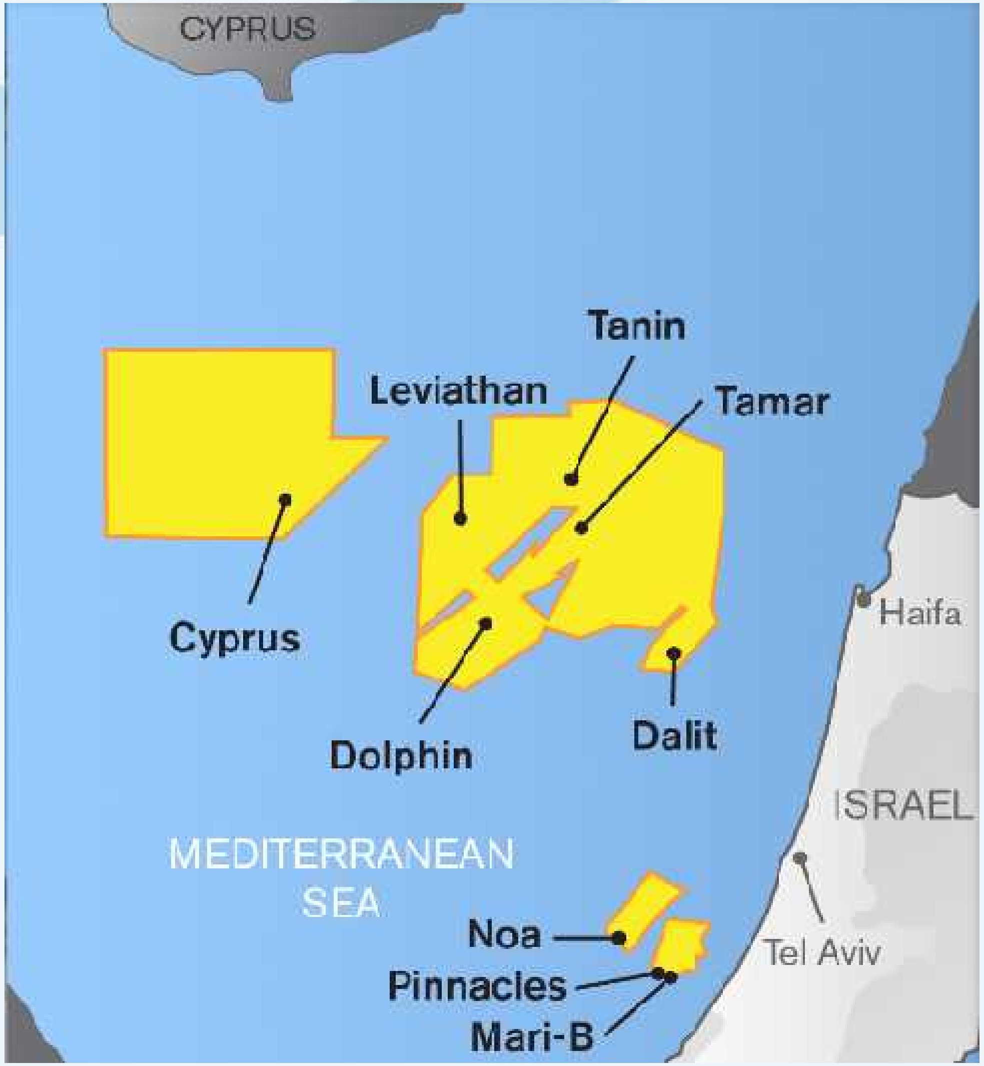
Leviathan	17 tcf
Tamar	8.4 tcf
Cyprus Aphrodite	5-8 tcf
Noa + Mari-B	1.1 tcf
Dalit	0.5 tcf

- ➢ **Export Capacity**

10 - 12 bcma in 10 years

- ➢ **Most Feasible Route**

Israel - Turkey Pipeline



Source: Noble Energy

Recommendations (I)
E&P Sector

1. Examination of Turkey's onshore and offshore hydrocarbon potential, and classification and digitalization of technical data on sedimentary basins

2. Promotion of new drilling investments in new Turkish Petroleum Law

3. Full support to TPAO's offshore exploration projects with major companie

4. Showing political and financial support for Turkish oil companies (national and private) in Iraq and playing constructive role in solving oil sharing and all other political problems between Baghdad and Arbil.

Recommendations (II)
Energy Sector in General

1. Implementation of new policies in order to increase the share of domestic resources in total energy consumption and to promote energy efficiency,
2. Preparation of a comprehensive strategic plans/projects in order to examine possible unconventional resources (shale oil/gas potential) of Turkey,
3. Promotion of alternative resources (wind, solar, geo termal, biomass etc..),
4. Construction of nuclear energy plants to meet future energy demand of Turkey,
5. Implementation of environment-friendly energy strategies

THANK YOU…