Turkish Natural Gas Market & Potential New Suppliers

Argus Turkish Power and Gas Trading 2013
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Orhan Duran
Chairman of the Board

About PETFORM

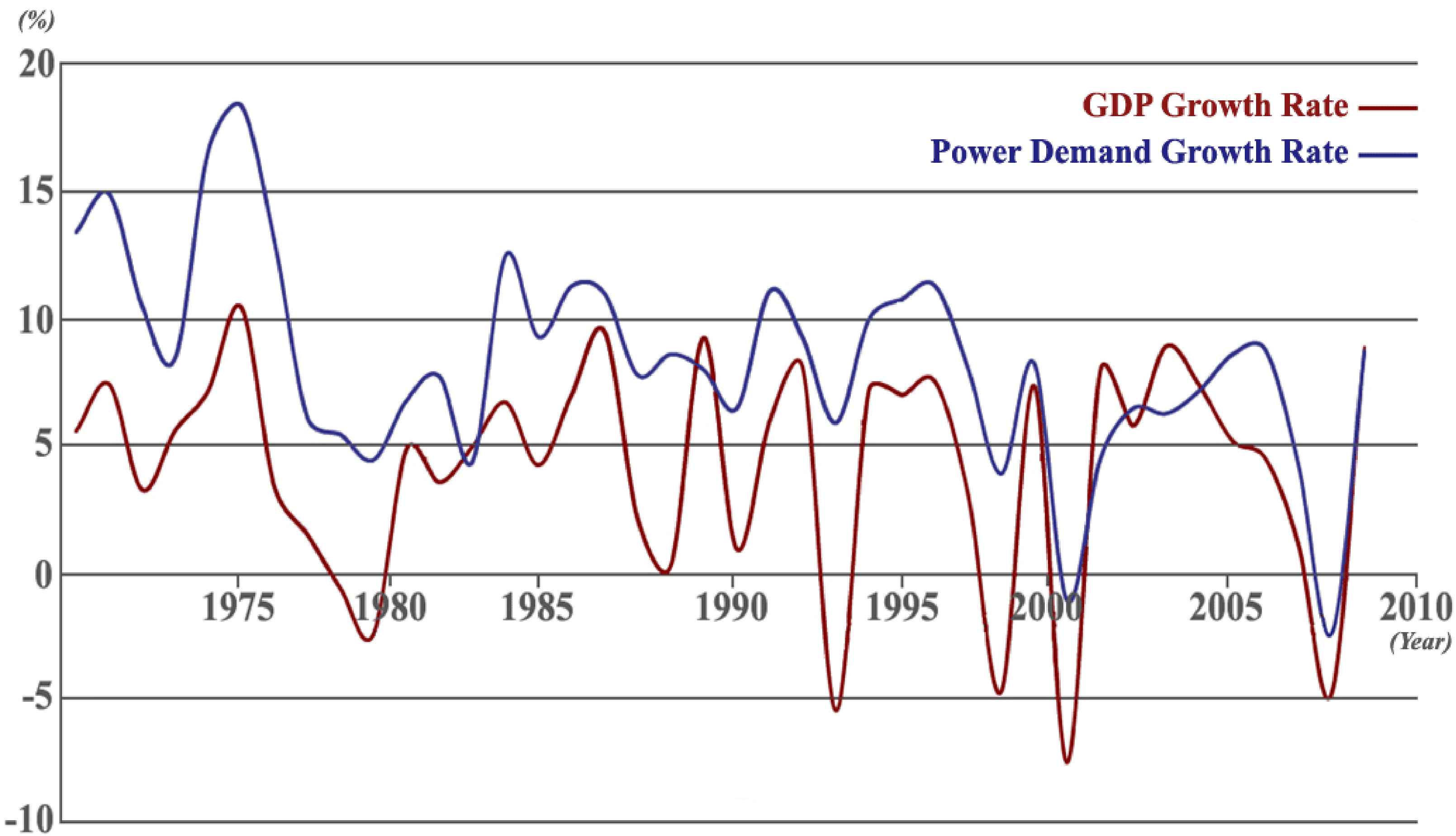
Established in 2000, PETFORM has played a crucial role in the transfer of private sector views to the public authorities regarding to Turkish energy legislation amendments. Member companies mainly have activities in 2 sectors:

- Exploration & Production Sector
- Natural Gas Market

Member Companies

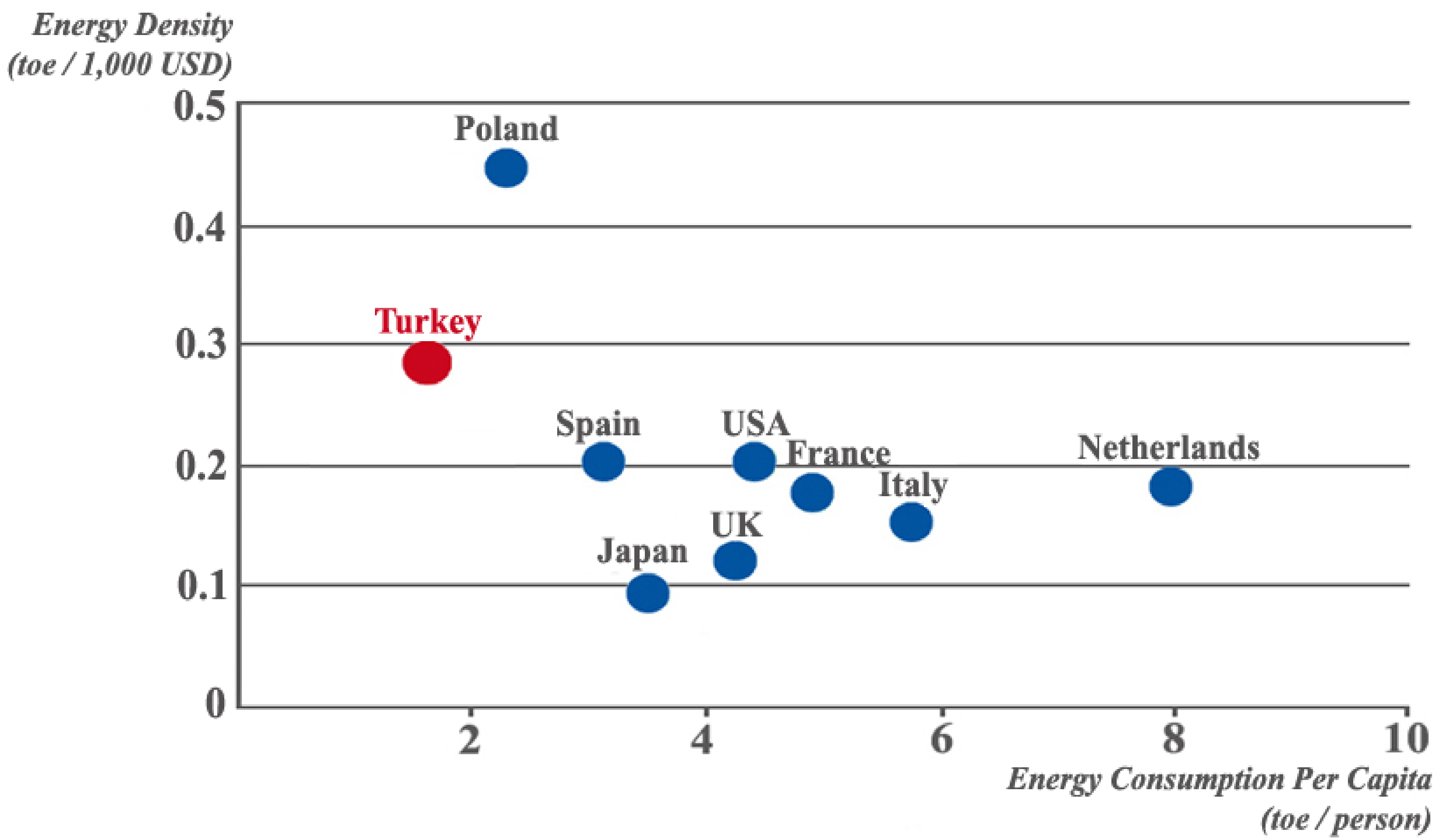
- AKENERJİ
- AKFEL
- AKSA
- ALADDIN MIDDLE EAST
- ANATOLIA ENERGY
- ANGORAGAZ
- ATTİLA DOĞAN İNŞAAT
- AVRASYA GAZ
- AYGAZ
- BATI HATTI GAZ
- BM HOLDİNG
- BOSPHORUSGAZ
- BP
- ÇALIK ENERJİ
- DEMİRÖREN EGL
- DOĞAL ENERJİ
- DOĞAN ENERJİ
- EDISON
- EGEGAZ
- ENEL
- ENERCO ENERJİ
- ENERJİSA
- ENI
- ERDGAZ
- 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

GDP vs. Power Demand Growth (1970 – 2010)



Source: Energy Market Regulatory Authority

Energy Density vs. Energy Consumption Per Capita



Source: Turkey Energy Efficiency Report (2010)

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% ↓

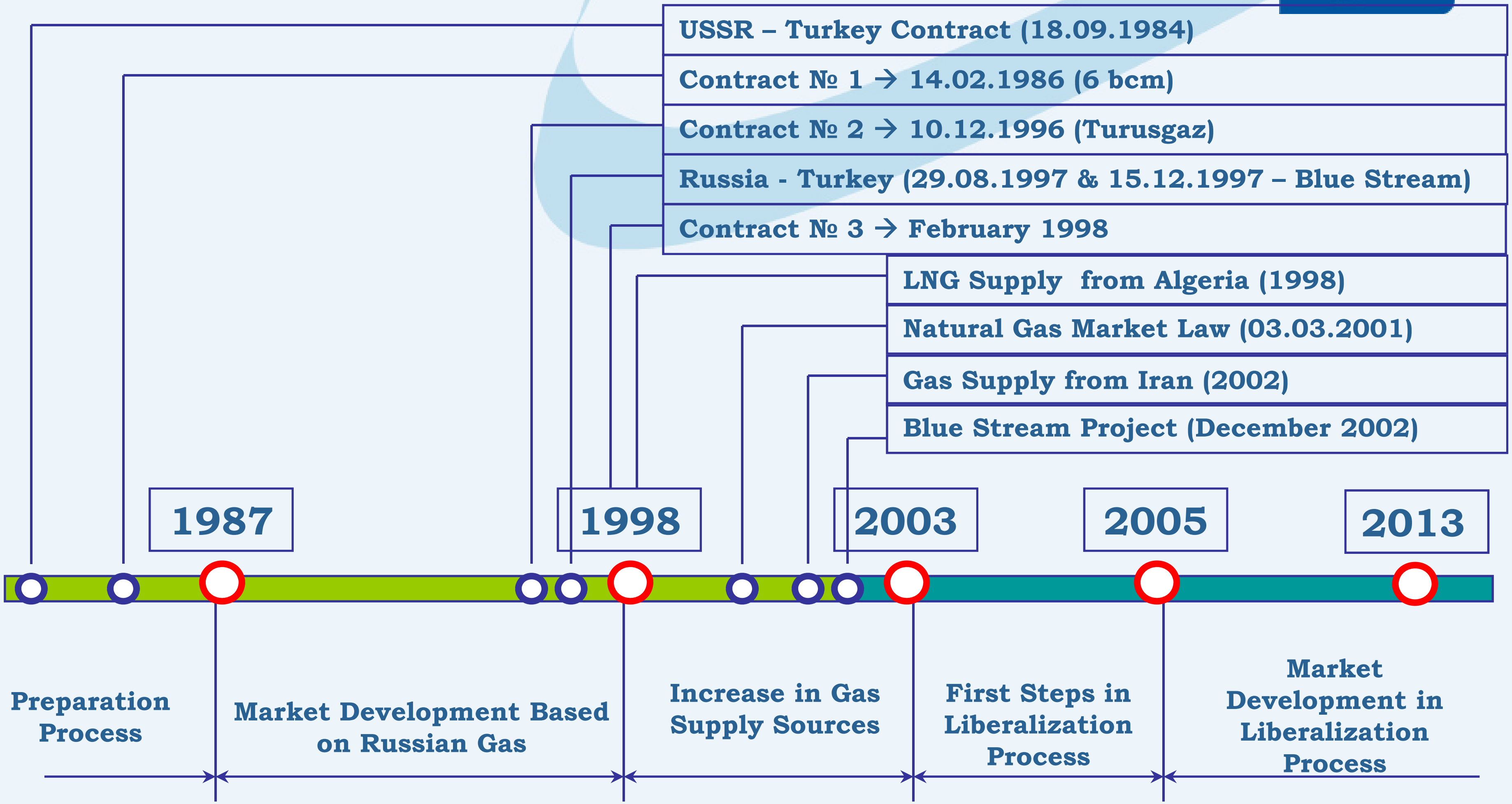
Source: MENR

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

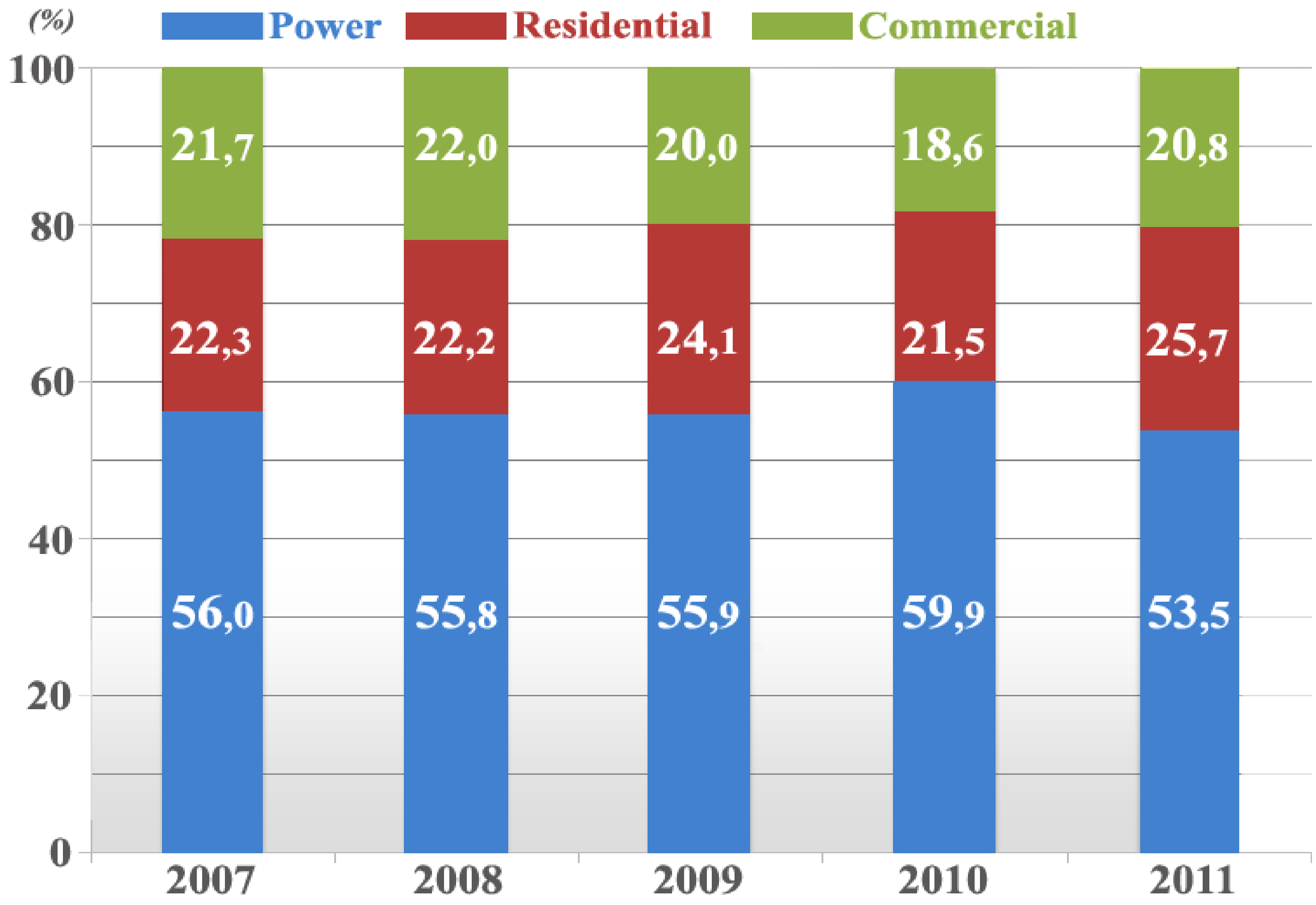
Source: Energy Market Regulatory Authority

Gas Imports by Source Country (2009 – 2010 – 2011)

(bcm)	2009	2010	2011	Share in Total (2011)
Russia	19.473	17.576	25.406	57.9%
Iran	5.252	7.765	8.190	18.7%
Azerbaijan	4.960	4.521	3.806	8.6%
Algeria (LNG)	4.487	3.906	4.156	9.5%
Nigeria (LNG)	0.903	1.189	1.248	2.8%
Spot LNG	0.781	3.079	1.069	2.5%
Total	35.856	38.036	43.874	

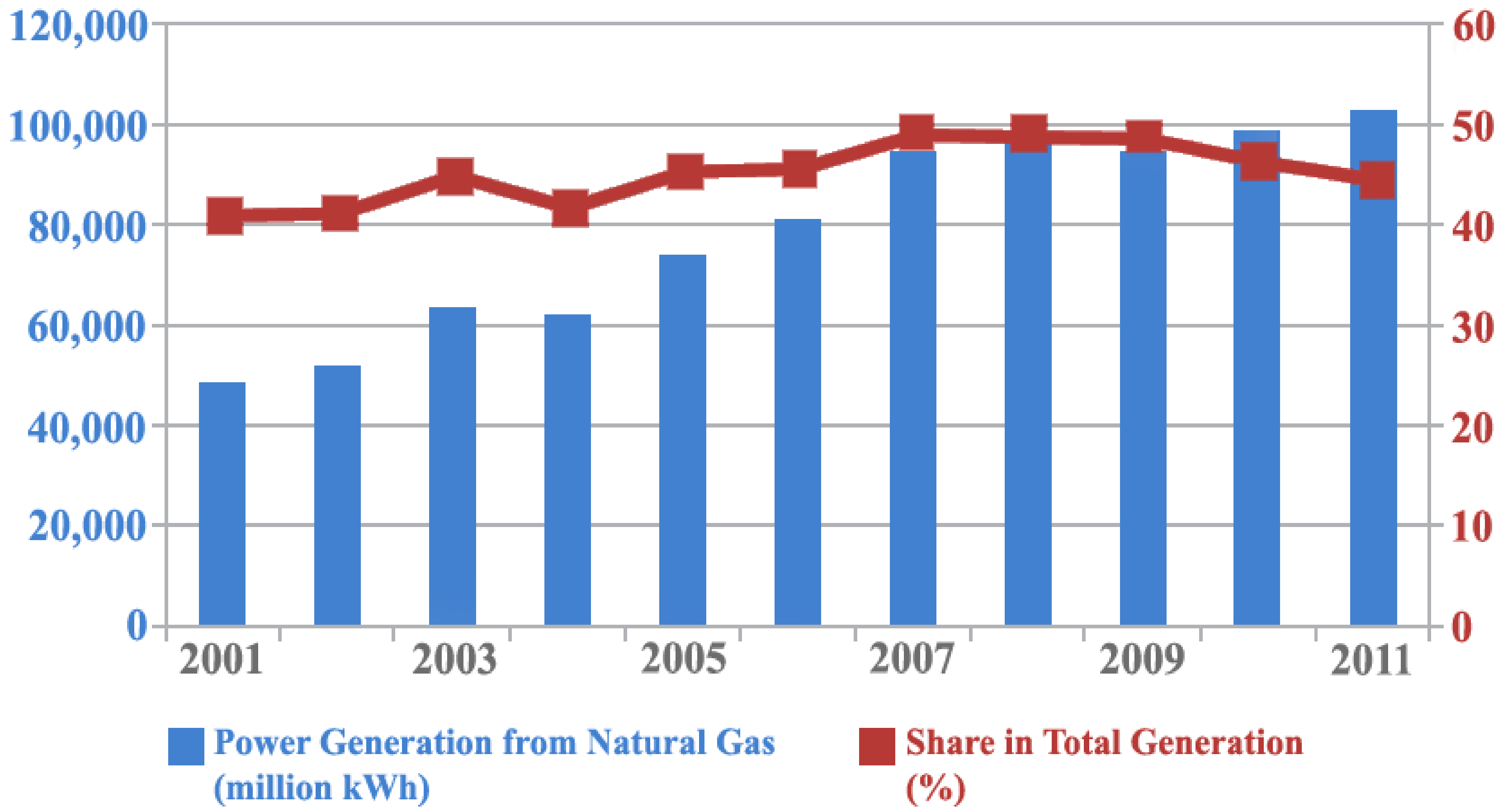
Source: Energy Market Regulatory Authority

Sectoral Breakdown of Gas Consumption (2007 – 2011)



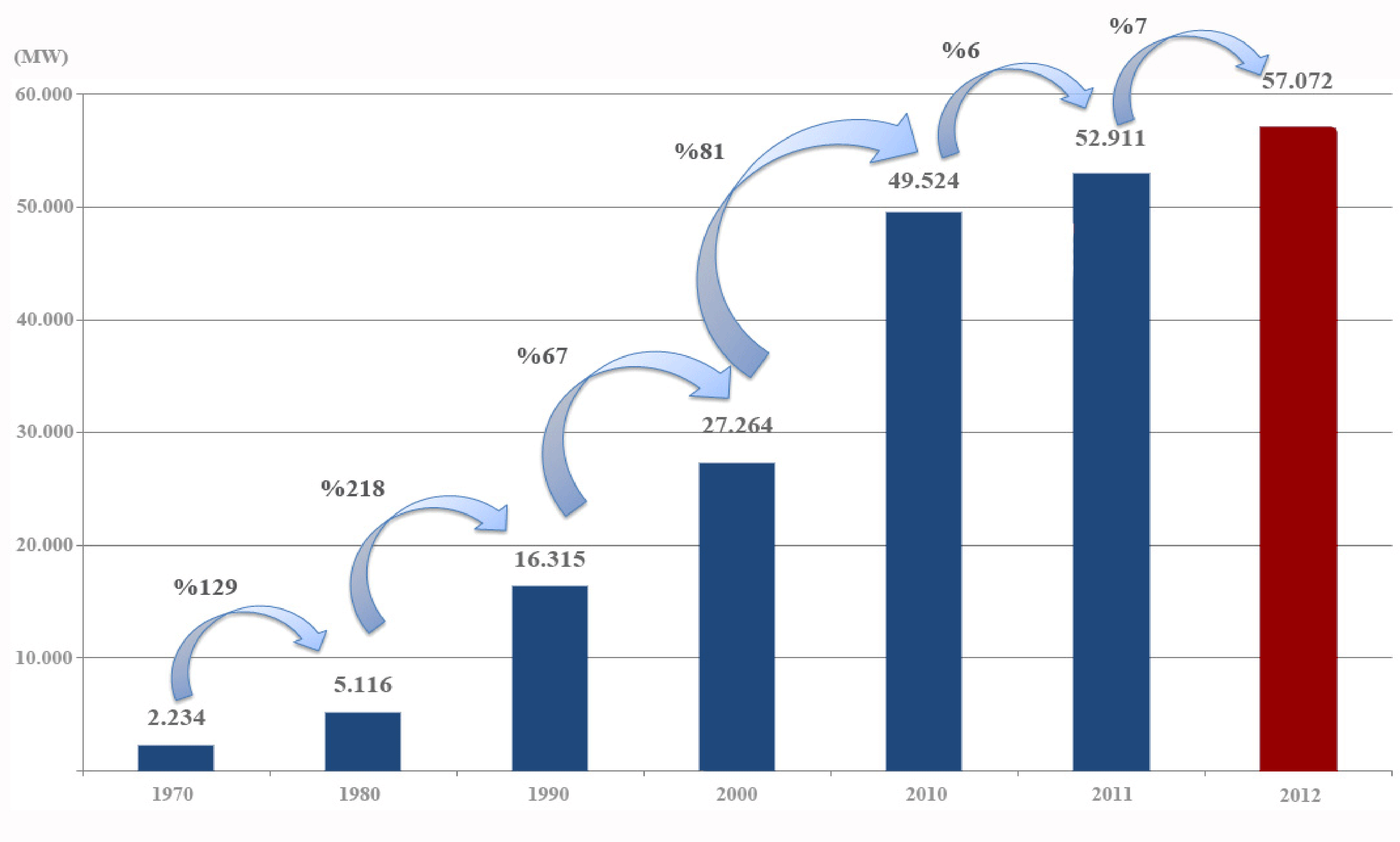
Source: Ministry of Energy and Natural Resources

Natural Gas in Power Generation (2001 – 2011)



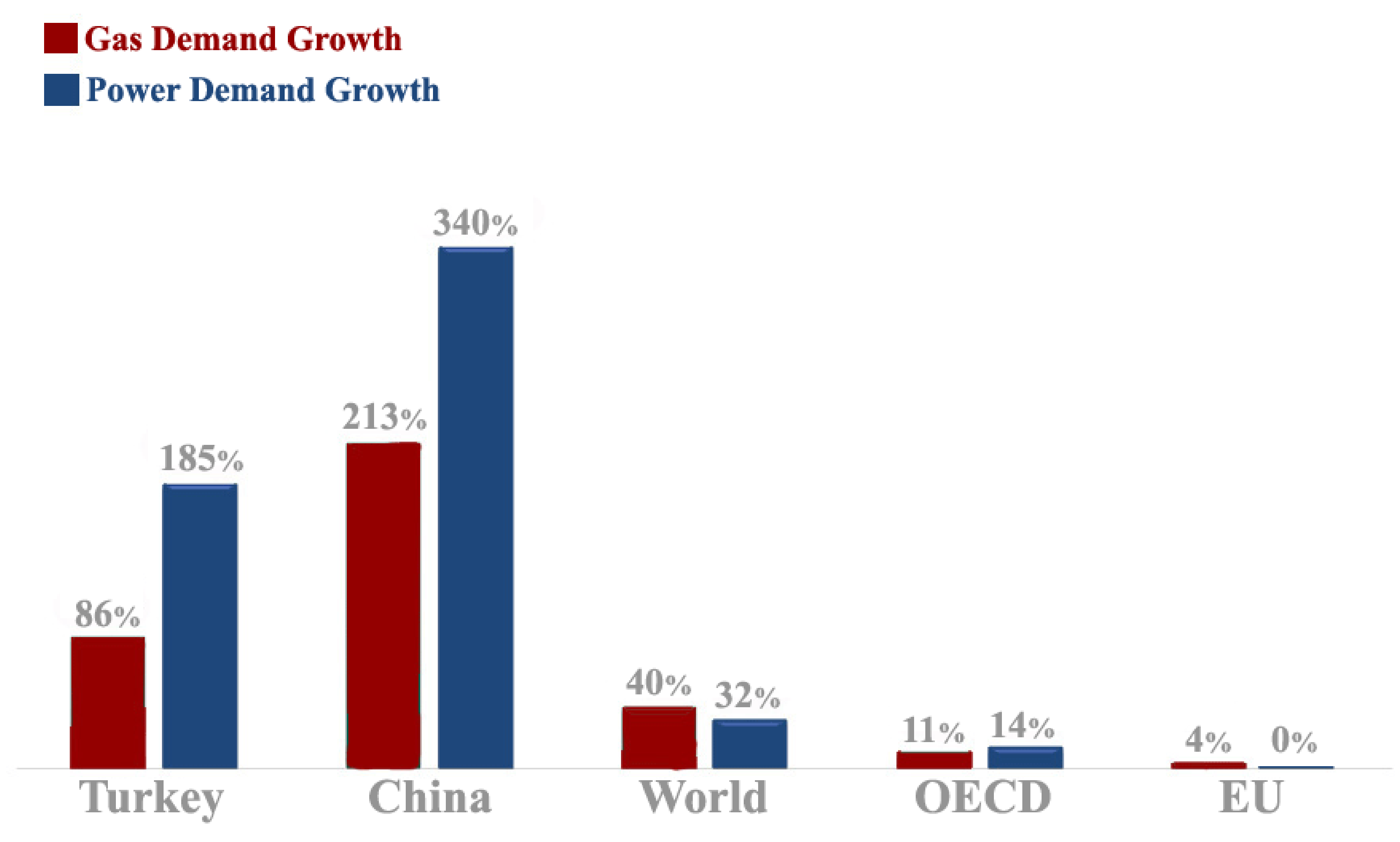
Source: Energy Market Regulatory Authority

Installed Capacity (1970 – 2012)



Source: TEİAŞ

Gas & Power Demand Growth (2001 – 2011)



Source: Energy Market Regulatory Authority

Natural Gas Demand vs Supply (2005 – 2025)

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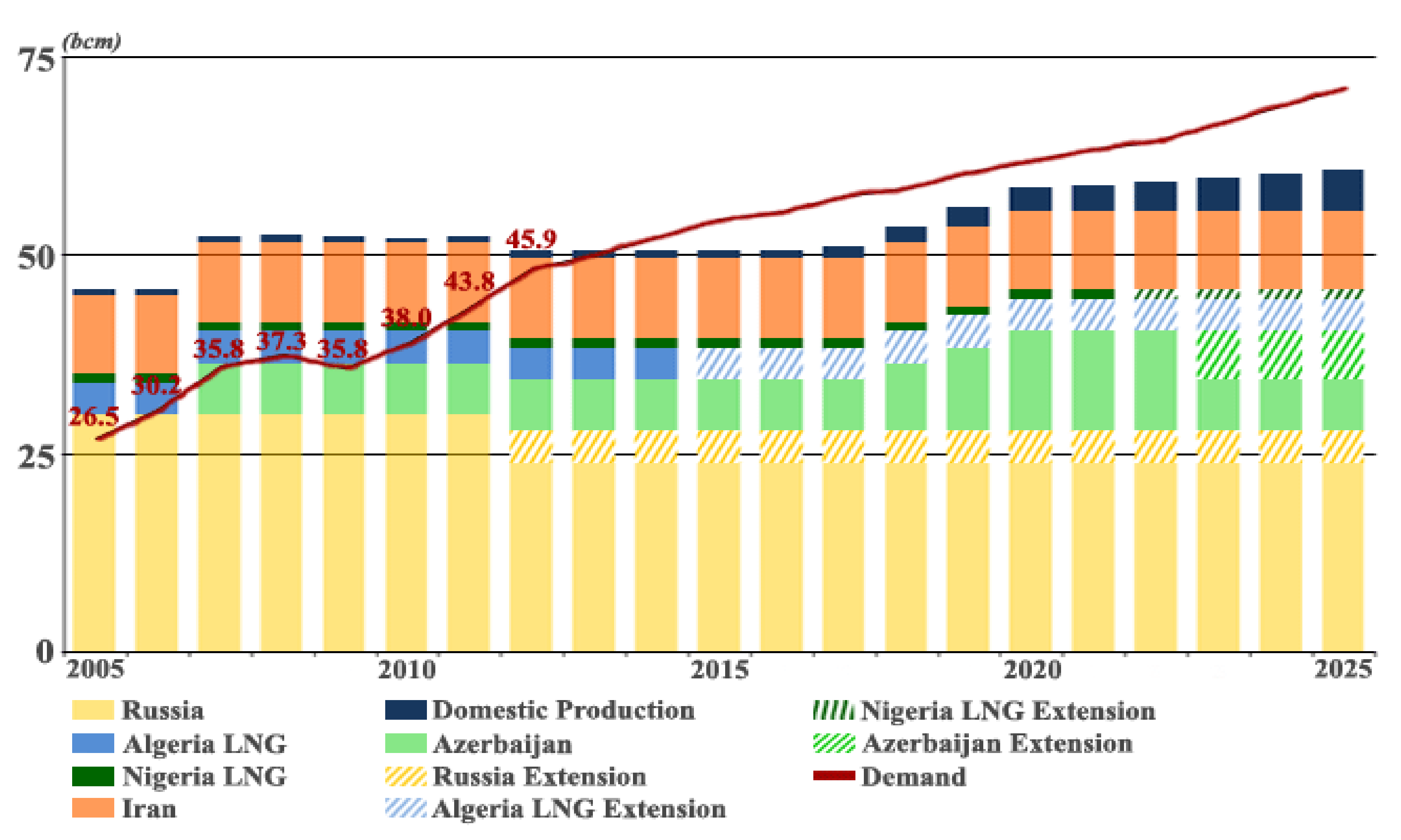
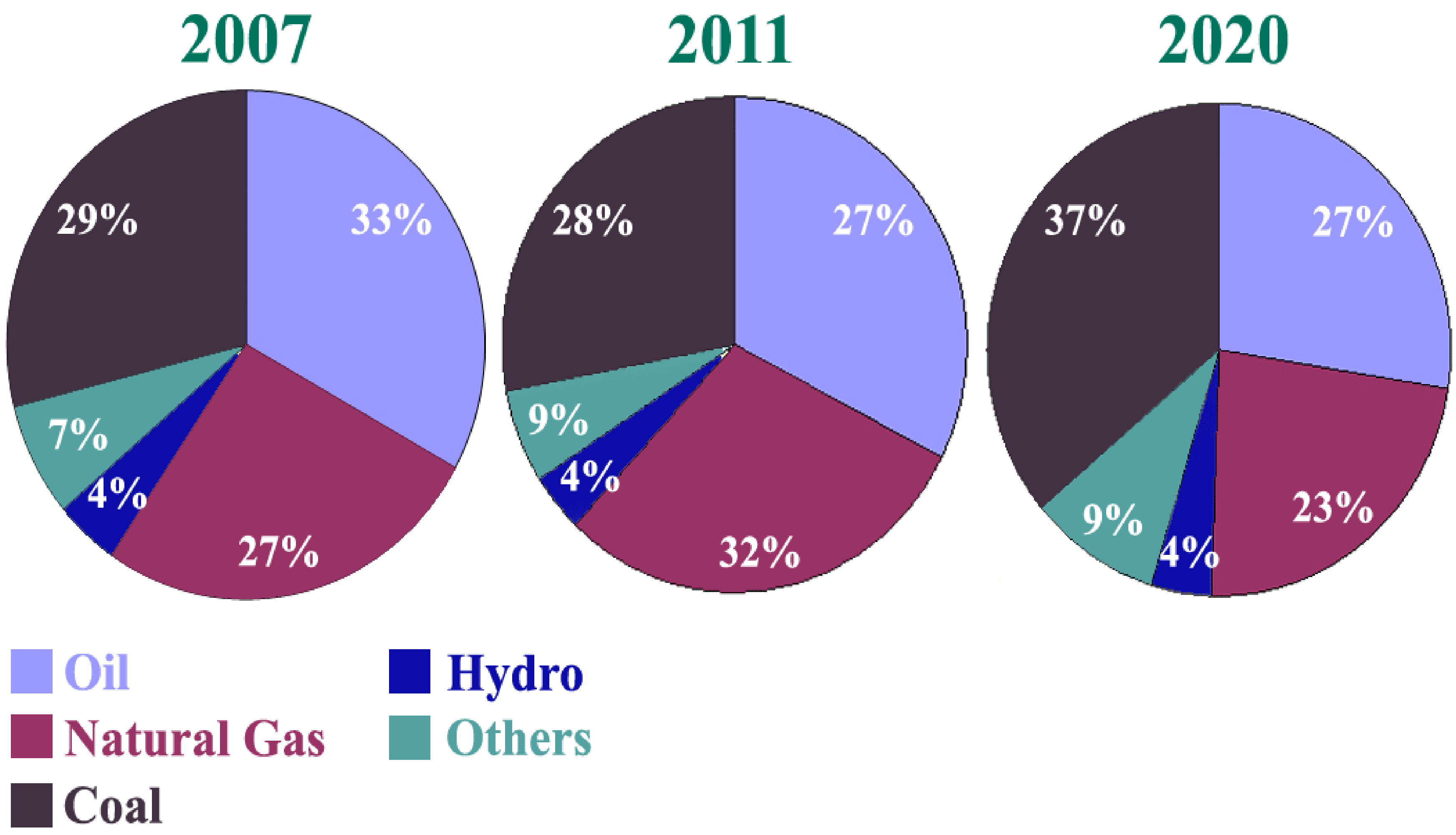


Source: BP

Energy Consumption by Source (2007 – 2011 – 2020)



Source: Ministry of Energy and Natural Resources

Potential and Possible New Gas Suppliers

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

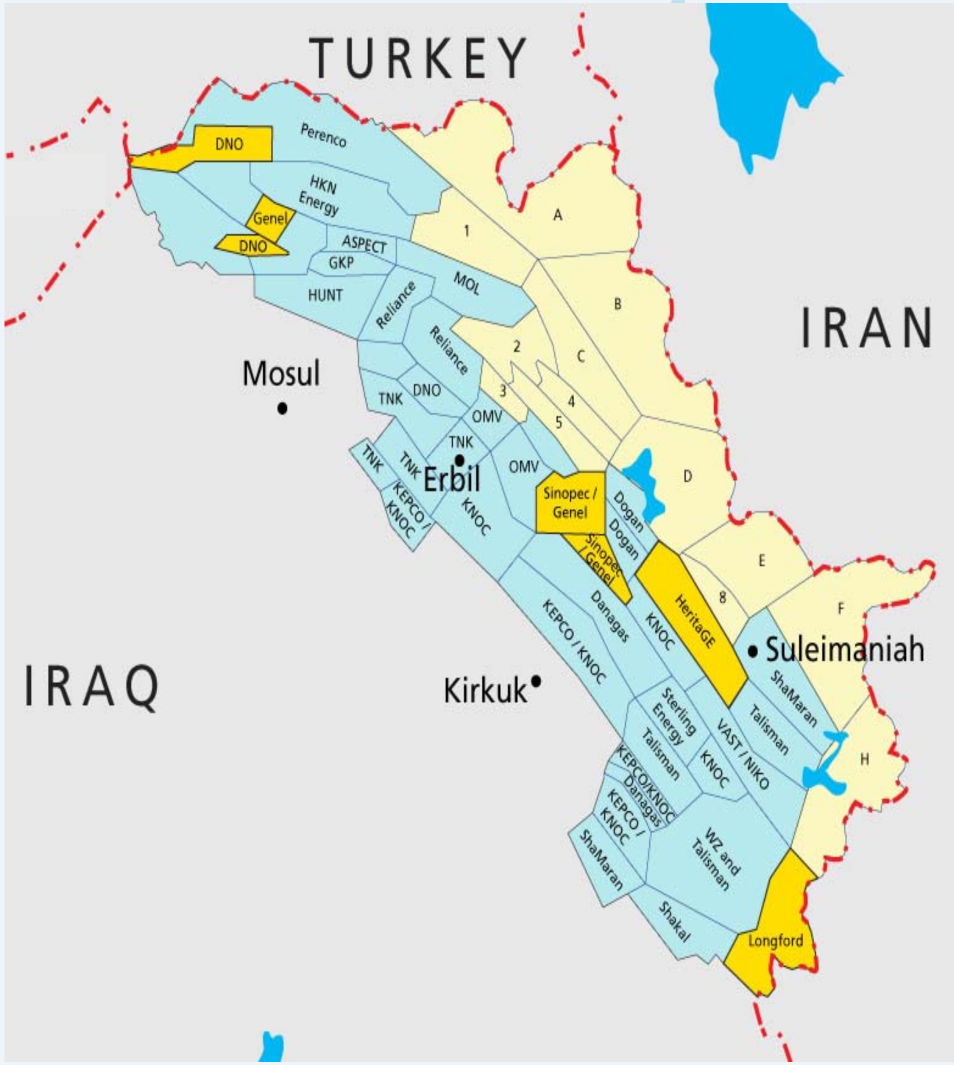
Shah Deniz II & New Fields in Azerbaijan via TANAP

Potential and Possible New Suppliers

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***

Northern Iraq
Licensed Oil Companies



Total

44 Oil Companies from 21 Countries

Top Investor/Producer

Genel Energy

Major Companies

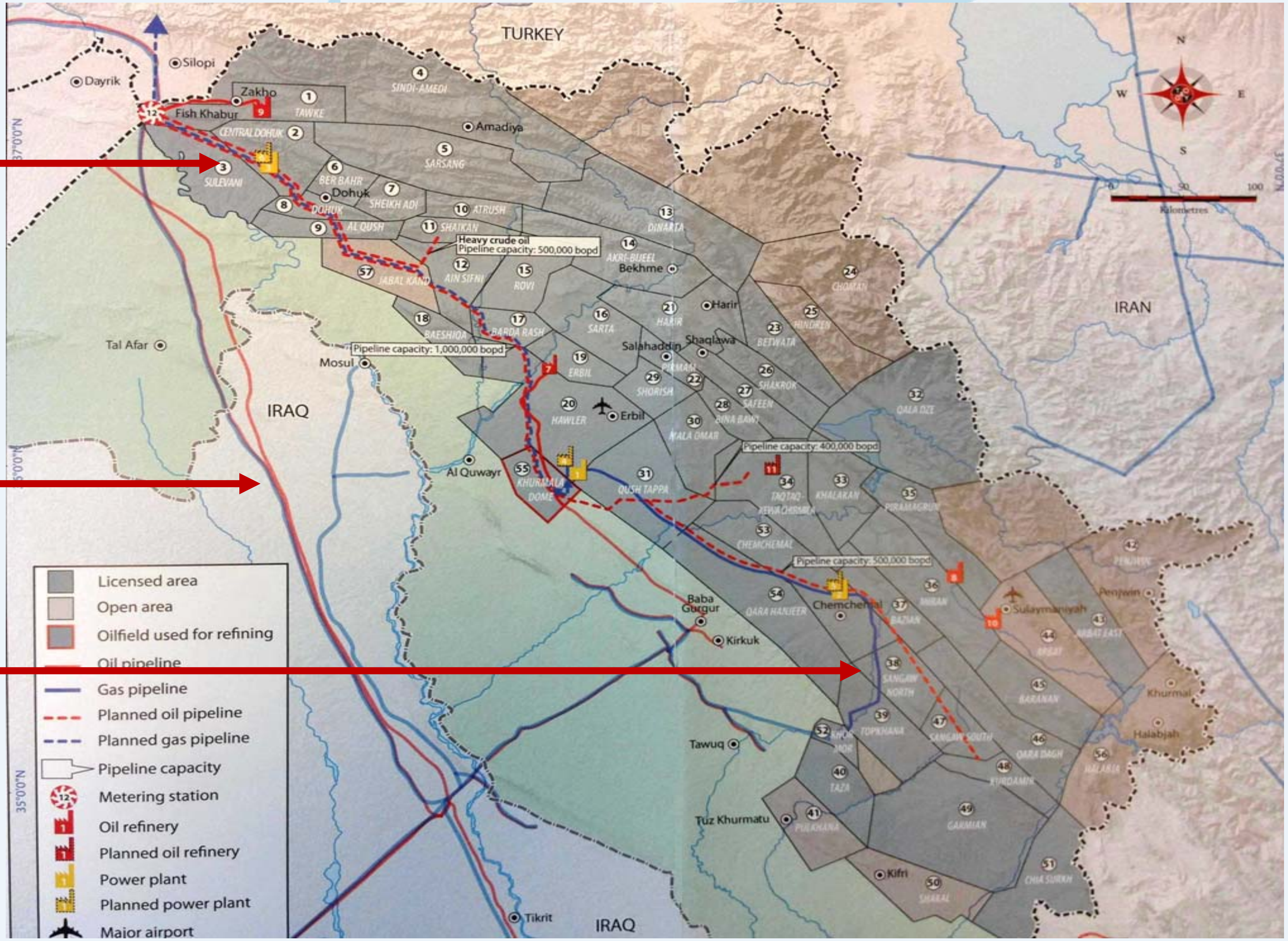
Chevron
ExxonMobil
Gazprom
Total

Northern Iraq
Current & Projected Pipelines

New oil & gas pipelines

Kirkuk – Yumurtalik Oil Pipeline

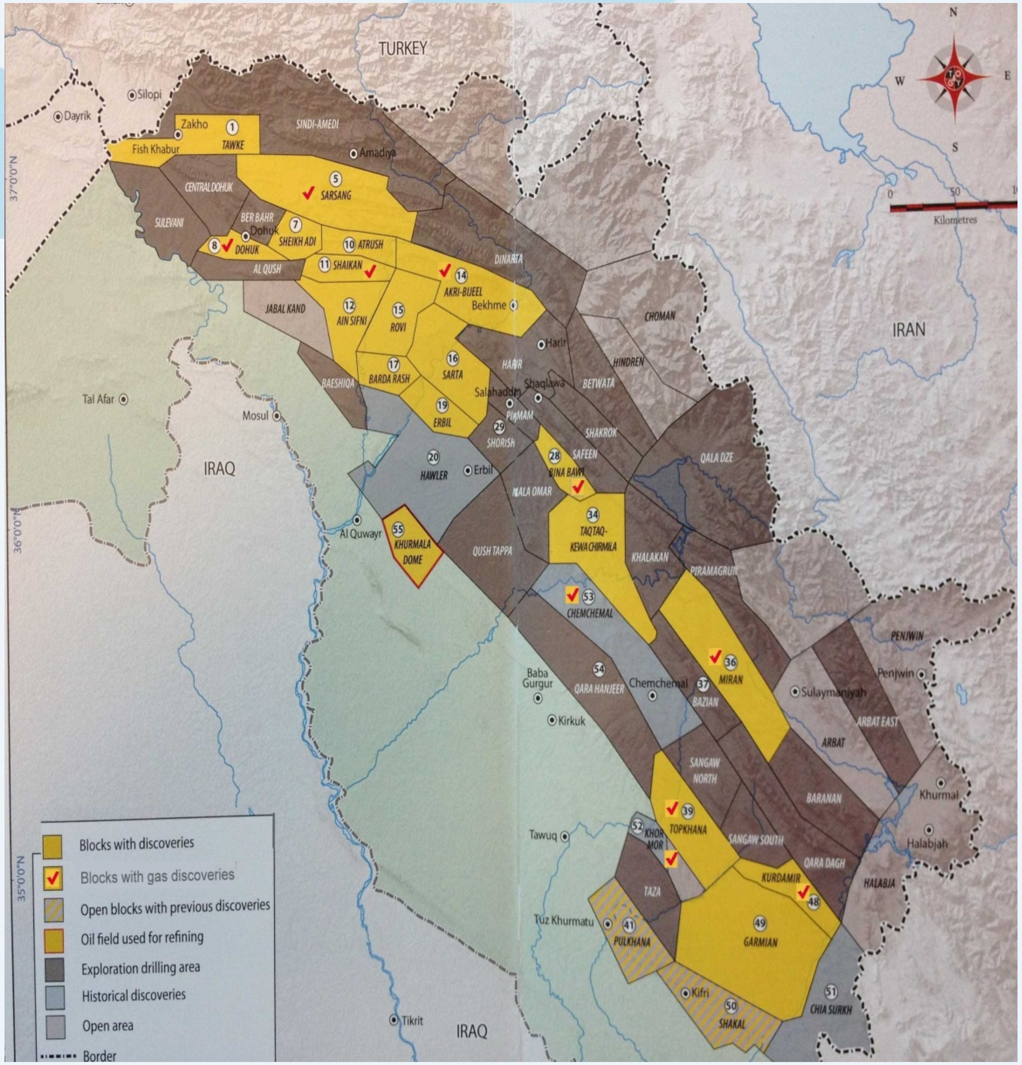
Khor Mor Gas Pipeline



Source: Genel Energy

Northern Iraq Gas Fields Explored

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

Eastern Mediterranean Gas Fields Explored

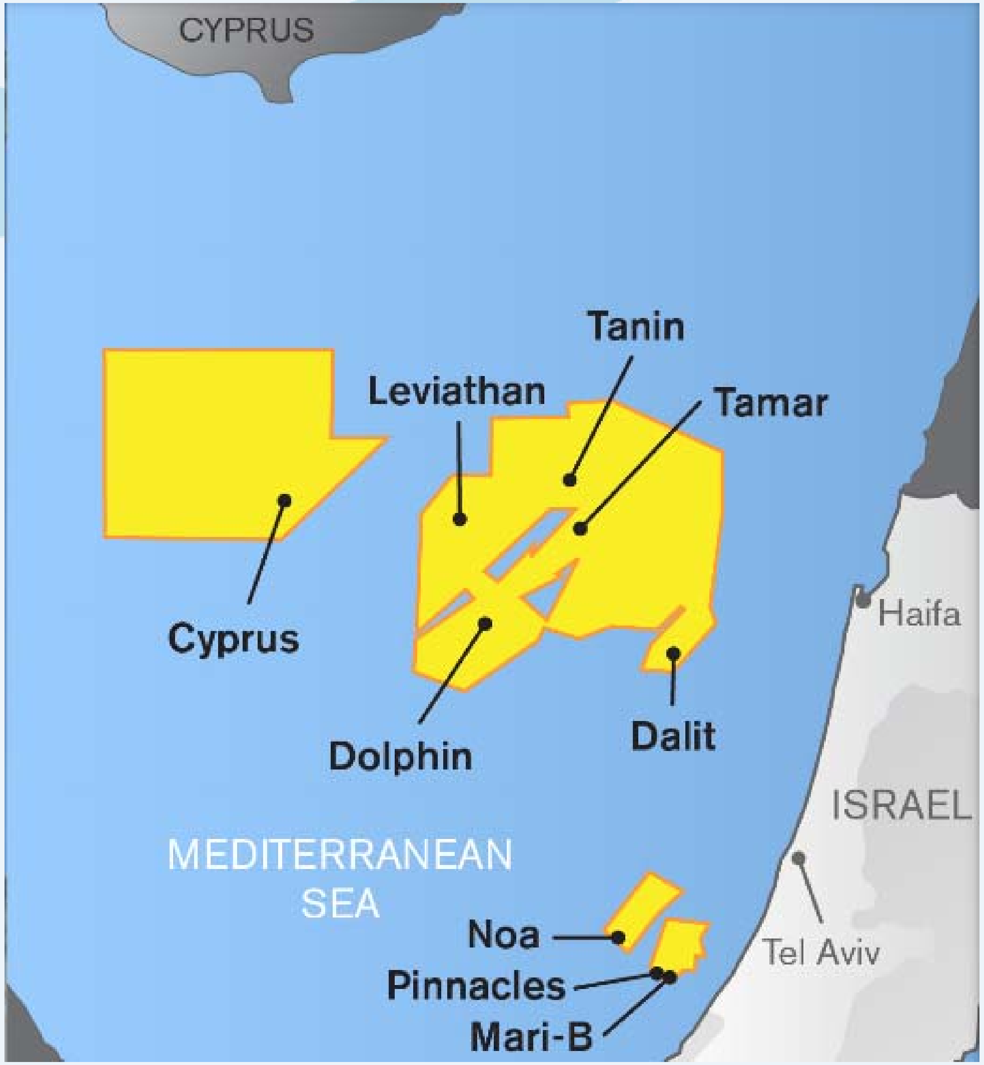
Leviathan	17 tcf
Tamar	8.4 tcf
Cyprus Aphrodite	5-8 tcf
Noa + Mari-B	1.1 tcf
Dalit	0.5 tcf

- **Export Capacity**

10 - 12 bcma in 10 years

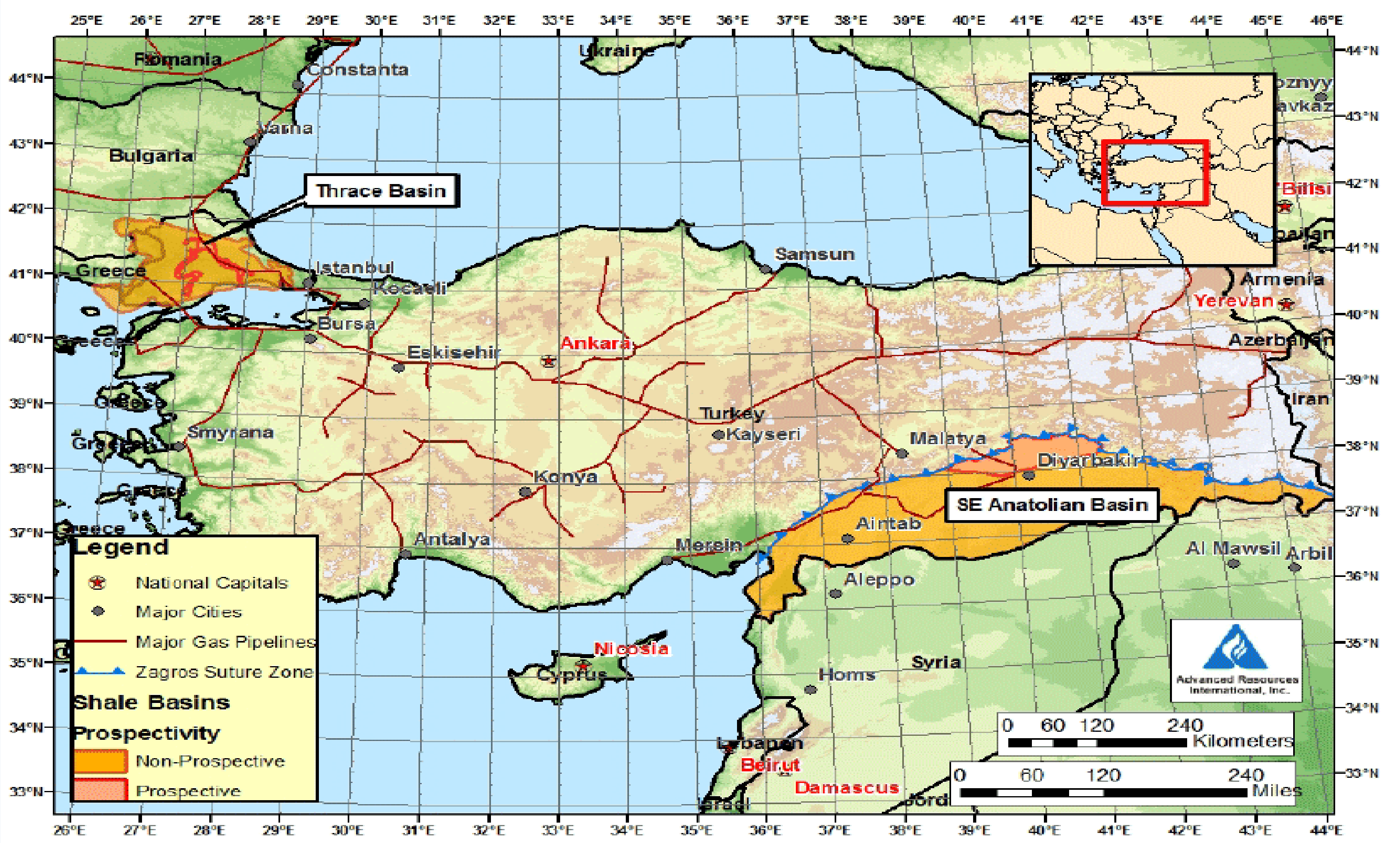
- **Most Feasible Route**

Israel - Turkey Pipeline



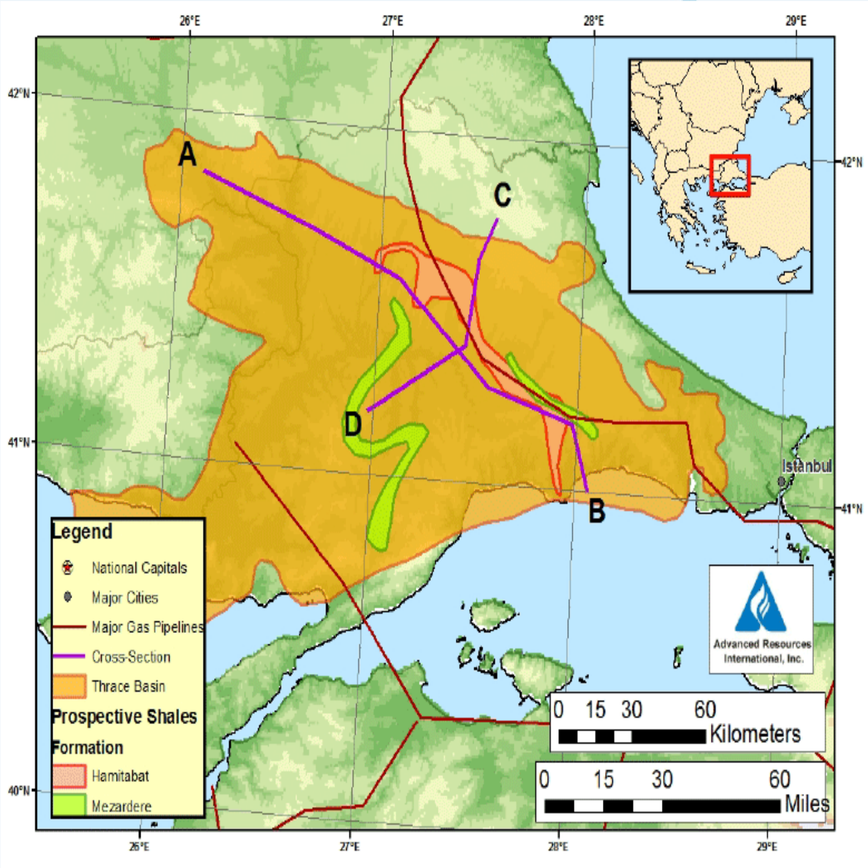
Source: Noble Energy

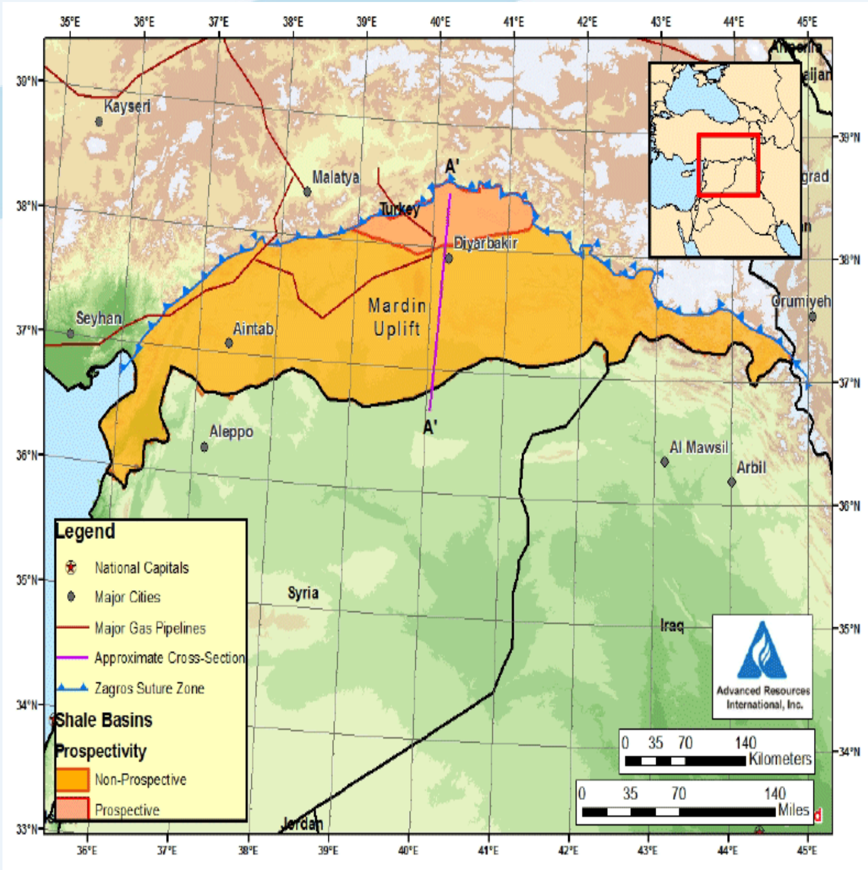
Shale Gas in Turkey
Thrace & SE Anatolia



Source: US Energy Information Administration

Shale Gas in Turkey
Potential Basins





Hamitabat → 4 tcf ?
Mezardere → 2 tcf ?

Dadaş → 9 tcf ?

Source: US Energy Information Administration

Policy Recommendations

Recommendations (I)
Natural Gas Market

1. Removal of subsidies and cross-subsidies
2. Removal of restrictions for private sector's imports
3. Legal unbundling of BOTAŞ
4. Completion of IT (EBB & Scada) and technical infrastructure investments in a timely manner
5. Legal and commercial ground for Gas Hub / Gas Trading

Recommendations (II)
E&P Sector

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

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

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

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

Policy Recommendations (III) 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 plan / projects in order to examine the shale oil/ shale gas potential of Turkey

3. Construction of nuclear energy plants to meet future energy demand of Turkey

4. Implementation of environment-friendly energy strategies

THANK YOU…