

7th South East Europe Energy Dialogue

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The Greek gas market and the regional perspectives



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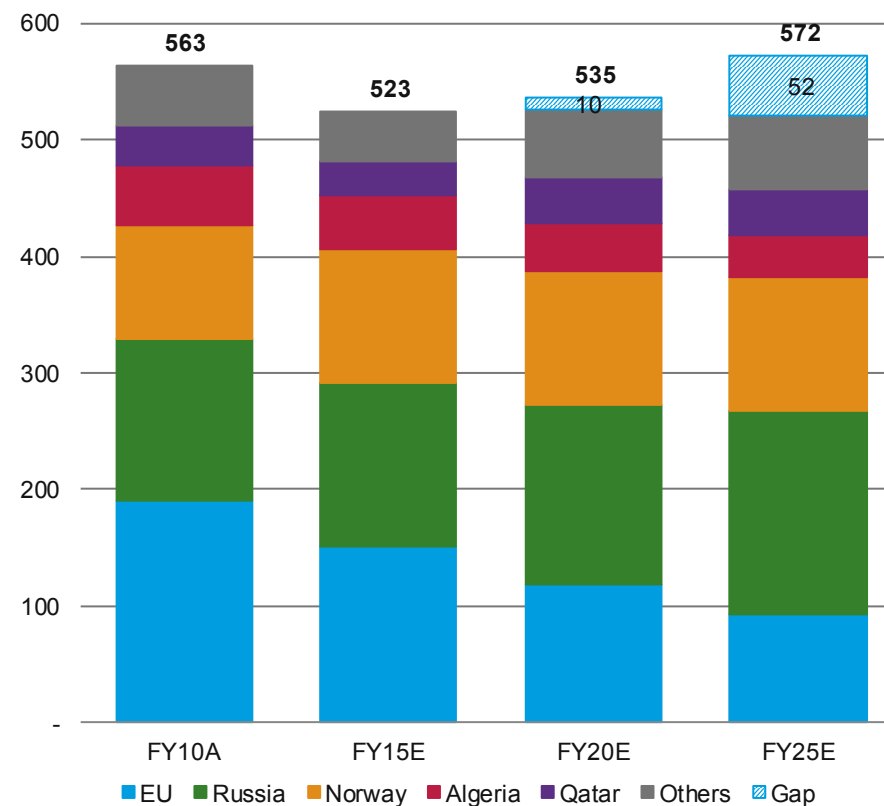


Growing European gas market

Overview of the European gas supply and demand

- **Europe is expected to face a growing supply demand gap post-2015**
 - Europe needs to replace c. 50 bcm from declining production by 2025
 - An important part of the supply gap stems from the demand growth in the SEE region, the closest market to the Southern Gas Corridor
- **Decline in European production unlikely to be offset by existing import agreements although some of the gap could be bridged by increasing supply from Russia, Norway and Qatar (LNG)**
- **Other potential sources to bridge the gap could be US LNG and East Med**

Europe gas supply and demand balance (bcm)



Source PFC Energy

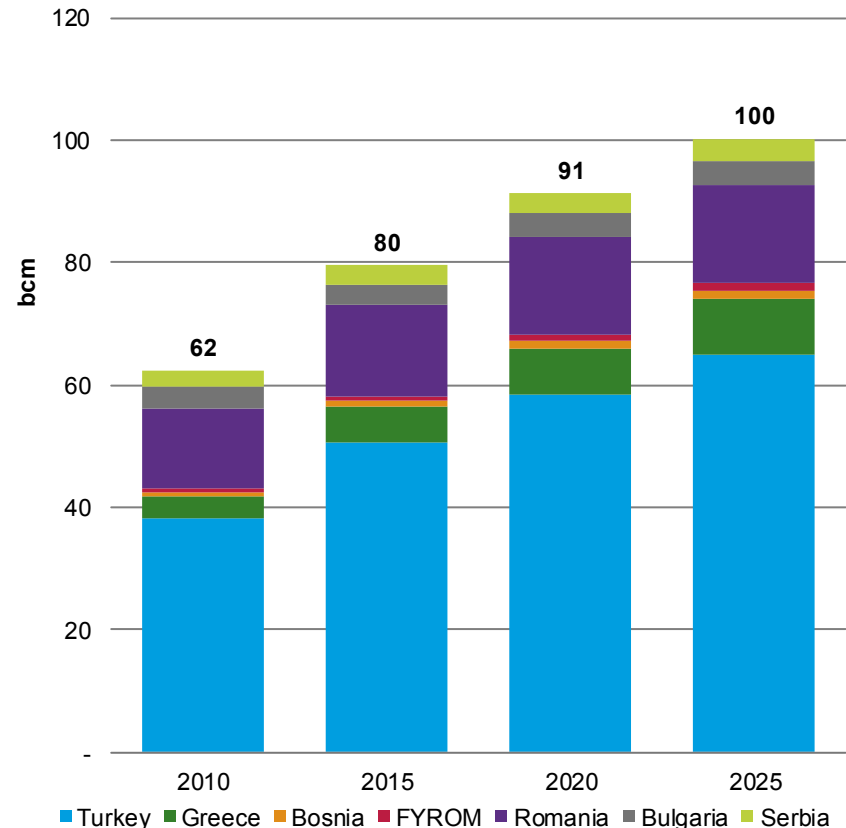
Growing supply demand imbalance in Europe expected

South East Europe & Turkey gas market

Developments in the region

- **Gas demand in South East Europe will grow by 2.5% p.a. from 62.5 bcma in 2010 to 100 bcma by 2025**
 - Greece, Bulgaria, Romania and Turkey remain the biggest markets in the region in 2025
 - Few options exist for meeting this growth, with a supply-demand gap of 20 bcma to be met by different sources
- **South East Europe market is**
 - the closest market to new sources, including LNG through Greece;
 - a growing market with competitive prices;
 - in urgent need to diversify its supply sources and increase its energy security
- **Shah Deniz to supply Europe with more than the initial 10 bcma as the Middle East continues to be impacted by economic / political issues**
- **East Mediterranean (Tamar, Leviathan and Block 12) estimated to export more than 16 bcma**

South East Europe & Turkey: Gas demand by country



Source PFC Energy

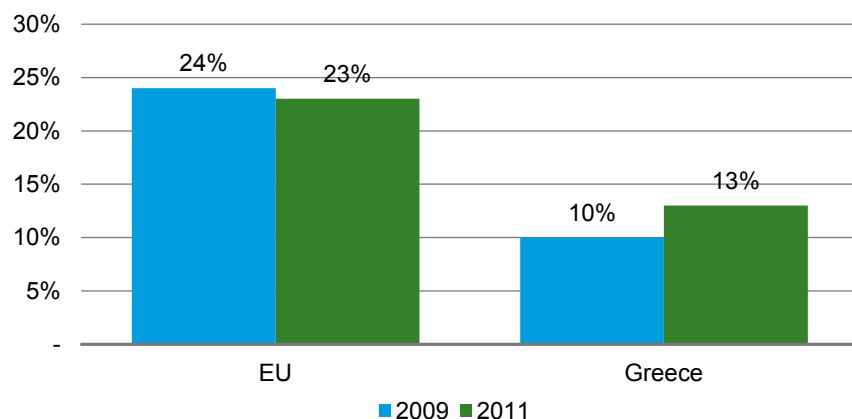
SEE is in urgent need of new suppliers to enhance its energy security

Young gas market with significant potential for growth

Overview of the Greek gas supply and demand

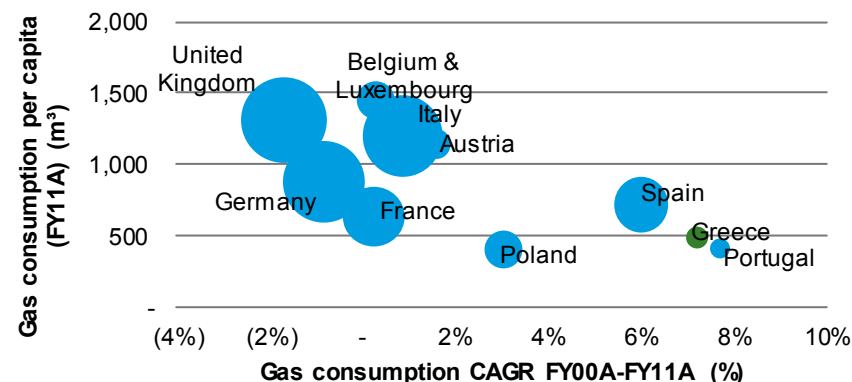
- Natural gas increasingly important component of Greece's energy policy
- Natural gas penetration increases but its market remains immature compared to the rest of the EU
- Solid and fossil fuels expected to reduce their share in favour of natural gas and renewables in line with the EU energy strategy

Gas share in primary energy consumption



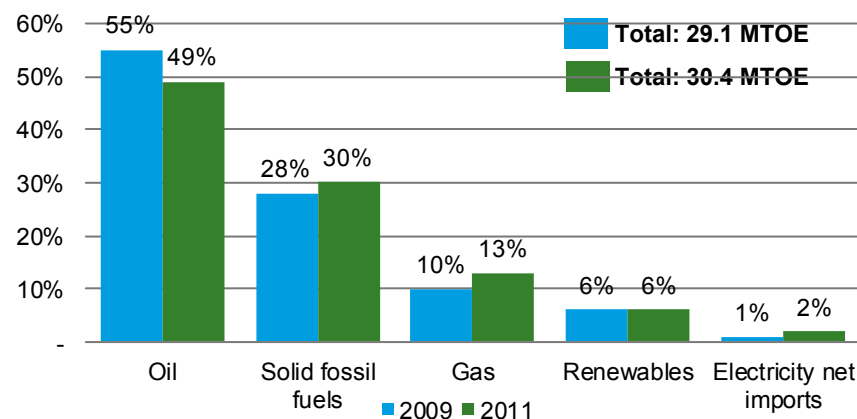
Source Eurogas Statistical Report

Greece in the European gas market



Source BP Statistical Review of World Energy

Primary Energy demand



Source Eurogas Statistical Report

Greek gas market structure

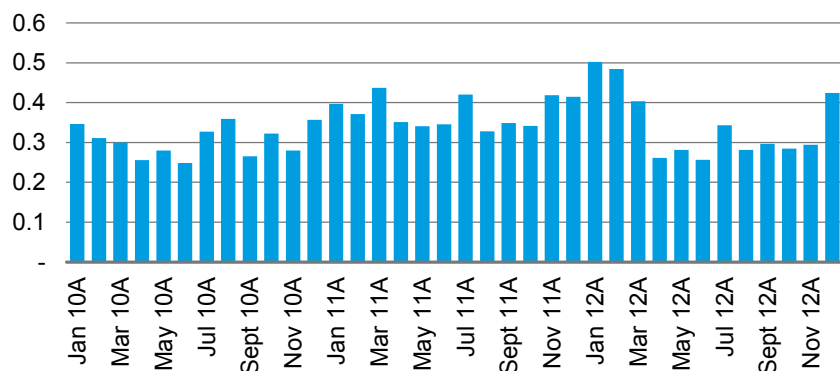
Current trends in gas market

- Demand reached its peak in 2011 (4.5 bcm)
- Market resilient to the economic crises
- Power generation accounts for two-thirds of demand
- Large industry demand relatively stable (c. 15% of demand)
- Distribution market is immature but growing (15-20% of demand)
- Limited seasonal fluctuation, with winter and summer peaks

Demand growth forecast to continue

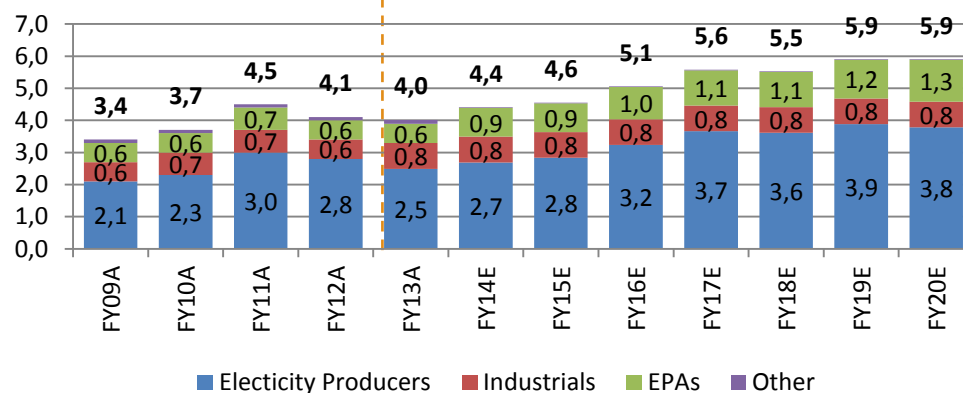
- Demand forecast to reach c. 6 bcm by 2020
- Power sector and distribution market are key growth sectors
- Economic activity and the power generation mix will be key determinants of demand
- Market to benefit from increasing liberalisation and continued roll-out of new gas supply networks

Total market volume seasonality (bcm)



Source DEPA

Total market volume by customer group (bcm)



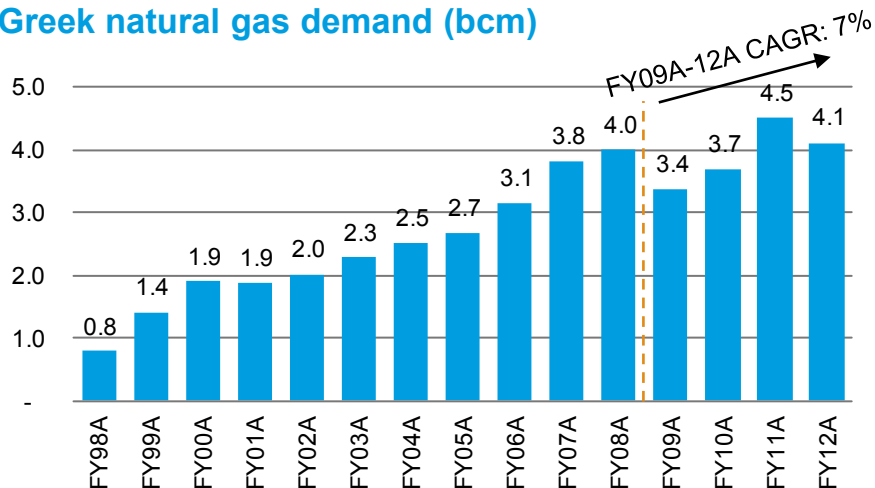
Source DEPA

Resilience of the Greek gas market to the economic crisis

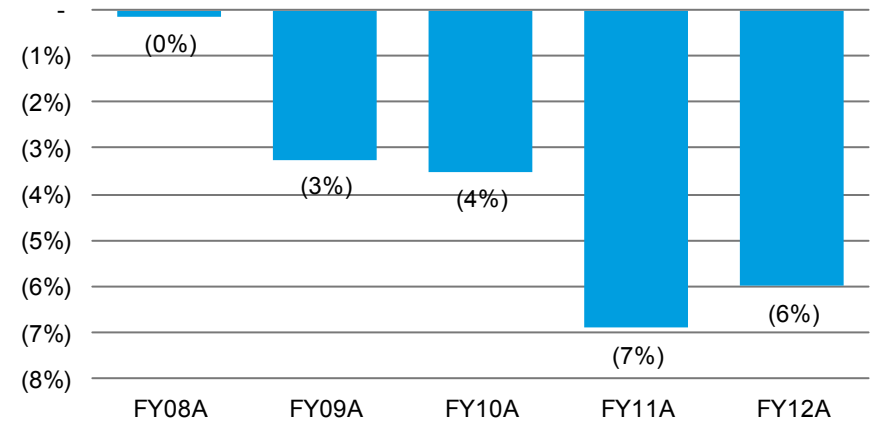
■ The Greek market is experiencing a double substitution effect

- Direct substitution of oil to gas
- Additional substitution of oil to electricity, mainly favouring natural gas which has increased its share in the power generation supply mix from 20% in 2010 to 28% in 2011

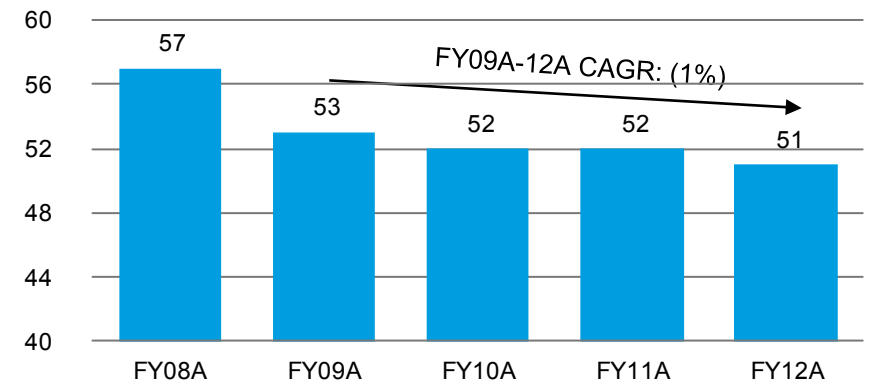
Greek natural gas demand (bcm)



Greek GDP growth (%)



Electricity demand Interconnected system (TWh)

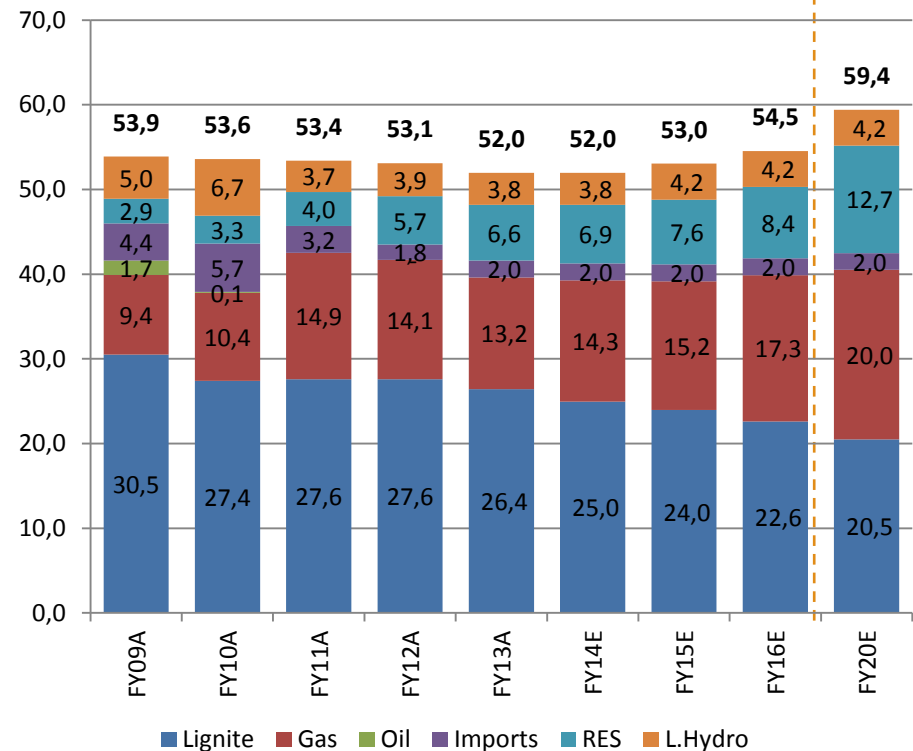


Key drivers of growth in the Greek gas market

Power generation

- **Expected growth of gas fired power generation**
 - Increase in demand following the recession
 - Lower utilisation of lignite power stations
 - Reduction in electricity imports
 - Lower than expected penetration of renewables
- **Greece has 4,750 MW of gas-fired power generation capacity in place (of which 3,200 MW started operation in the last 8 years) and a further 800 MW under construction**
 - Current installed capacity is underutilised, with an average load factor of less than 40% in 2012
 - Potential for a material and rapid increase in gas demand at lower gas prices
- **Regulatory and energy policy decisions such as RES penetration, decommissioning of lignite plants and island connections will continue to determine gas demand for power generation in the coming years**

Power generation mix in the Interconnected system (TWh)



Source DEPA

Note

1. Includes production of photovoltaic in the distribution system linked to the Interconnected system

Gas expected to remain a large proportion of the power generation supply mix

Key drivers of growth in the Greek gas market

Distribution

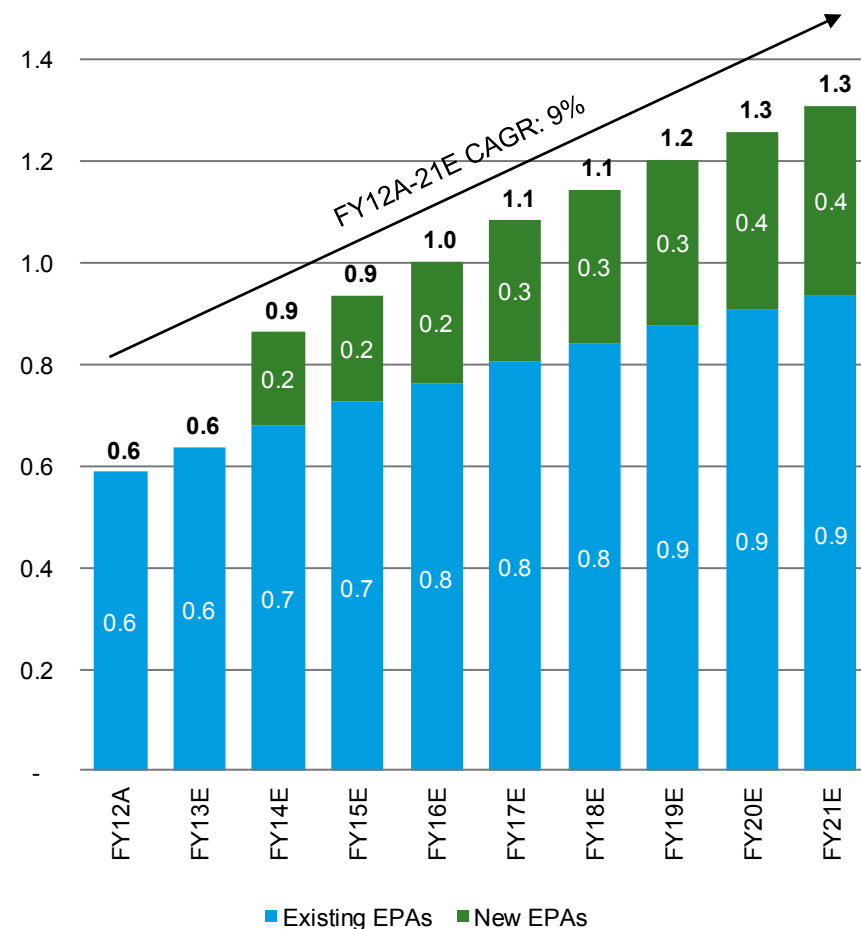
■ High potential for growth

- Demand for domestic use covers only 5% of total demand while the average in the EU-27 is 40%
- Low network expansion
- Recent excise tax increase for heating gasoil promotes gas penetration

■ New EPAs will further increase the use of natural gas in the distribution sector

- Three new EPAs to be established in the areas of Sterea Ellada, Central Macedonia and East Macedonia & Thrace
- The new EPAs will cover cities with a total population of around 650,000
- At market maturity total gas demand in the areas is expected to reach c. 560 mcm
- The total network in the new EPAs will be c. 2,000 km, out of which c. 500 km have been already been constructed by DEPA and will be transferred to the new EPAs

Distribution gas consumption (bcm)

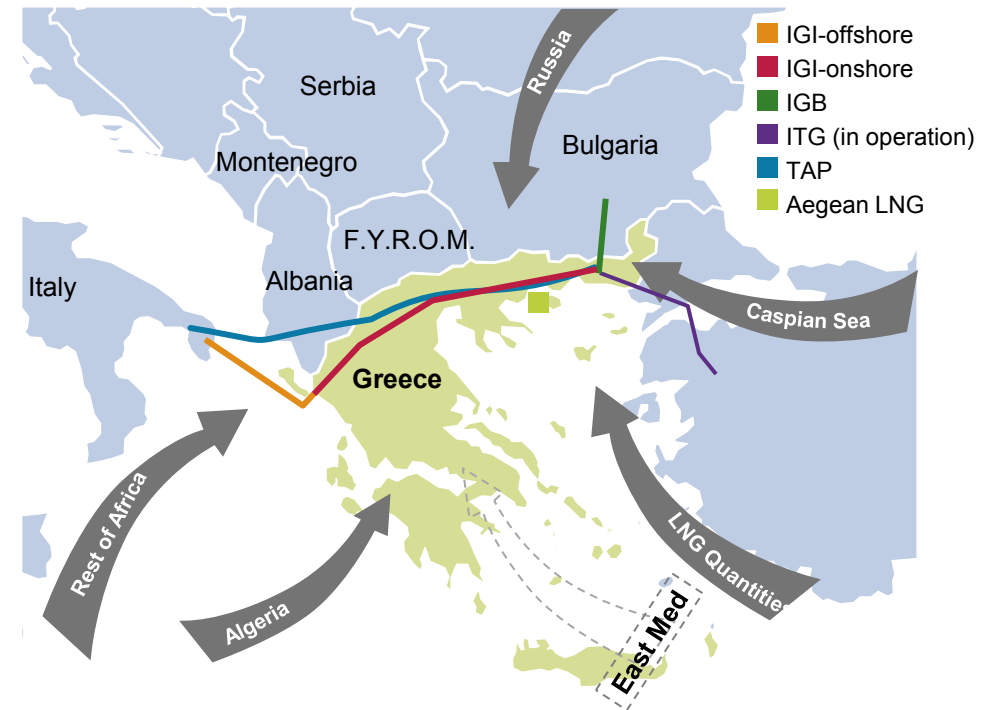


Source DEPA

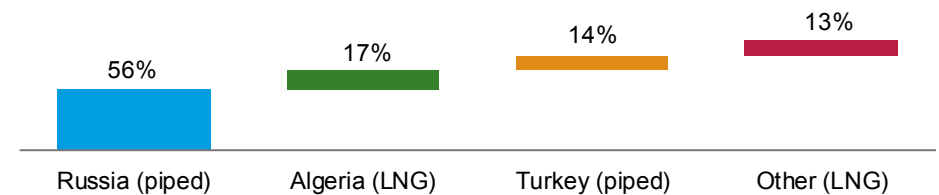
Strategically located gas market

- Potential for Greece to become a major gas supply hub for Southeast Europe and for DEPA to further leverage its supply portfolio
- Russia, Turkey and Algeria are key supply sources, with the respective entry points providing a total daily capacity of 25 mcm
- Numerous planned gas pipeline / LNG projects will serve material export markets and provide further diversification opportunities
 - Interconnector Greece-Bulgaria (IGB) / Aegean LNG
 - Interconnector Turkey-Greece-Italy (ITGI) / Trans Adriatic Pipeline (TAP)
 - East Med to open a new energy corridor

Greece as a transit and trading hub



% import volumes – FY12A



Source DESFA

Gas sources

Developments in the region

Caspian Region	Azerbaijan's development of Phase II of the Shah Deniz field will supply Europe with more than the initial 10 bcma as early as 2019
	Turkmenistan has considerable reserves, however the need of the Trans-Caspian pipeline significantly reduces the chances of exports to Europe by 2025
Middle East	Iran will not be able to export to Europe due to sanctions imposed which also apply to the energy sector
	Iraq is currently affected by domestic political issues and no export potential to Europe is foreseen by 2025
East Med	New supply route from the Levantine basin exclusively to EU countries, initially carrying 8 bcma with potential for 16 bcma
	Seismic studies have been recently completed in Western and Southern Greece by PGS. Seismic data are currently under assessment

South East Europe: summary of gas sources



Key international projects

IGB is a key international project of strategic importance to the region

■ IGB / Aegean LNG System

- IGB and the Aegean LNG act as a gateway to SEE through Greece, creating synergies with smaller interconnectors in the region (e.g. Bulgaria-Romania), allowing access to the evolving SEE energy market

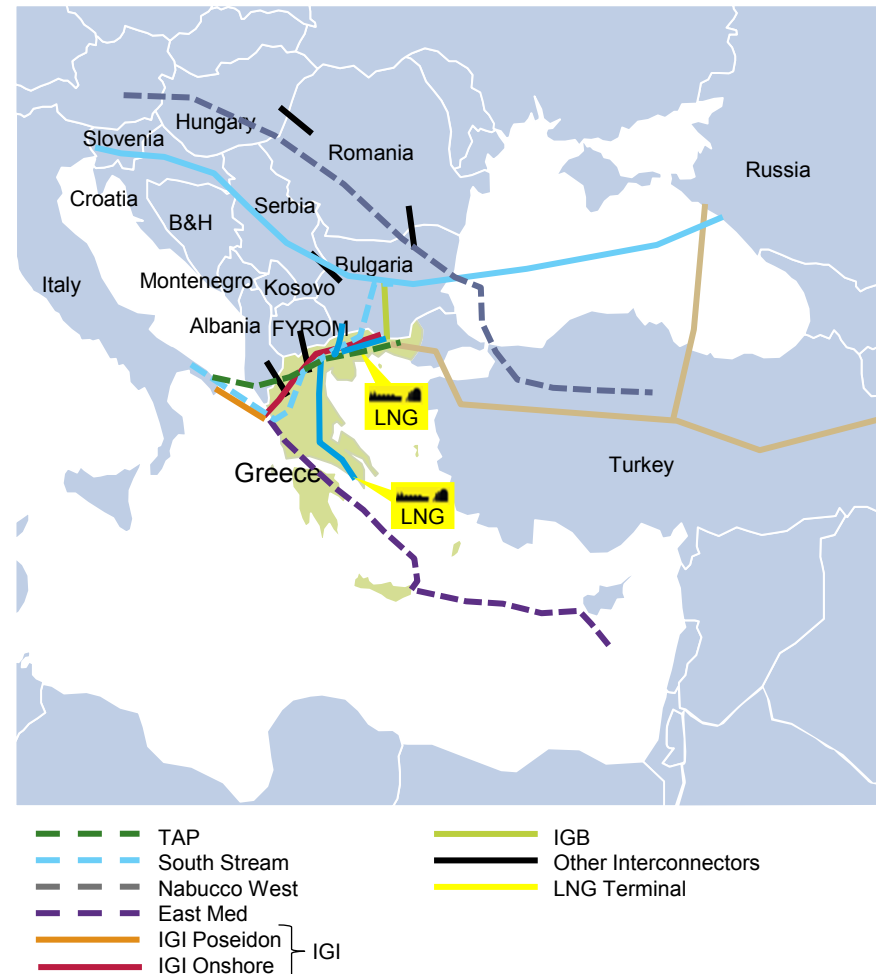
■ IGB update

- Will initially carry 3 bcma to South East Europe as early as 2015 and will be scalable up to 5 bcma
- Technical design and permitting procedure will be concluded in Q4 2013, FID to be taken within 2013 and first gas in 2015
- IGB in cooperation with the 2 NRAs has launched its Market Test –EOI to be submitted by 15 July 2013.

■ Aegean LNG update

- As early as 2015 the Aegean LNG will be able to supply 5 bcma into Greece and from there, in conjunction with IGB and ITG, to SEE and Turkey
- Technical development for FSRU solution progressing beyond completed feasibility and EIA study under tender

Location of key international projects



Key international projects

East Med – a new energy corridor

- **East Med pipeline to export gas to Southeast Europe markets as early as 2019, opening a new energy corridor**
 - East Med will create a new supply route from the Levantine basin exclusively to EU countries, initially carrying 8 bcma
 - Technological advances will enable an increase in the pipeline's capacity in future
- **East Med is expected to be accorded a Project of Common Interest label by the EU allowing for**
 - Streamlined permitting granting procedures and improved regulatory treatment as well as support with regard to financial institutions
- **Studies on East Med**
 - Prefeasibility studies have shown conclusively that East Med is technically feasible and less expensive than LNG option
 - Feasibility studies and Reconnaissance Surveys need to be conducted to decide on the optimum route/landfalls etc.
 - East Med may carry gas to Europe as early as 2019

Location of East Med

