

“GREEK-ALBANIAN COOPERATION IN THE ENERGY SECTOR”

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“The Greek Natural Gas Market and International Interconnections”

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Introduction



- Greece took a decision to introduce natural gas in its energy system in 1986 aiming at the following strategic objectives:
 - *To reduce dependence of Greek economy on oil*
 - *To improve country's environmental conditions, especially in the big cities*
 - *To enhance competitiveness of the Greek economy through modernization of its industrial and service sectors' processes and energy equipments*

Introduction

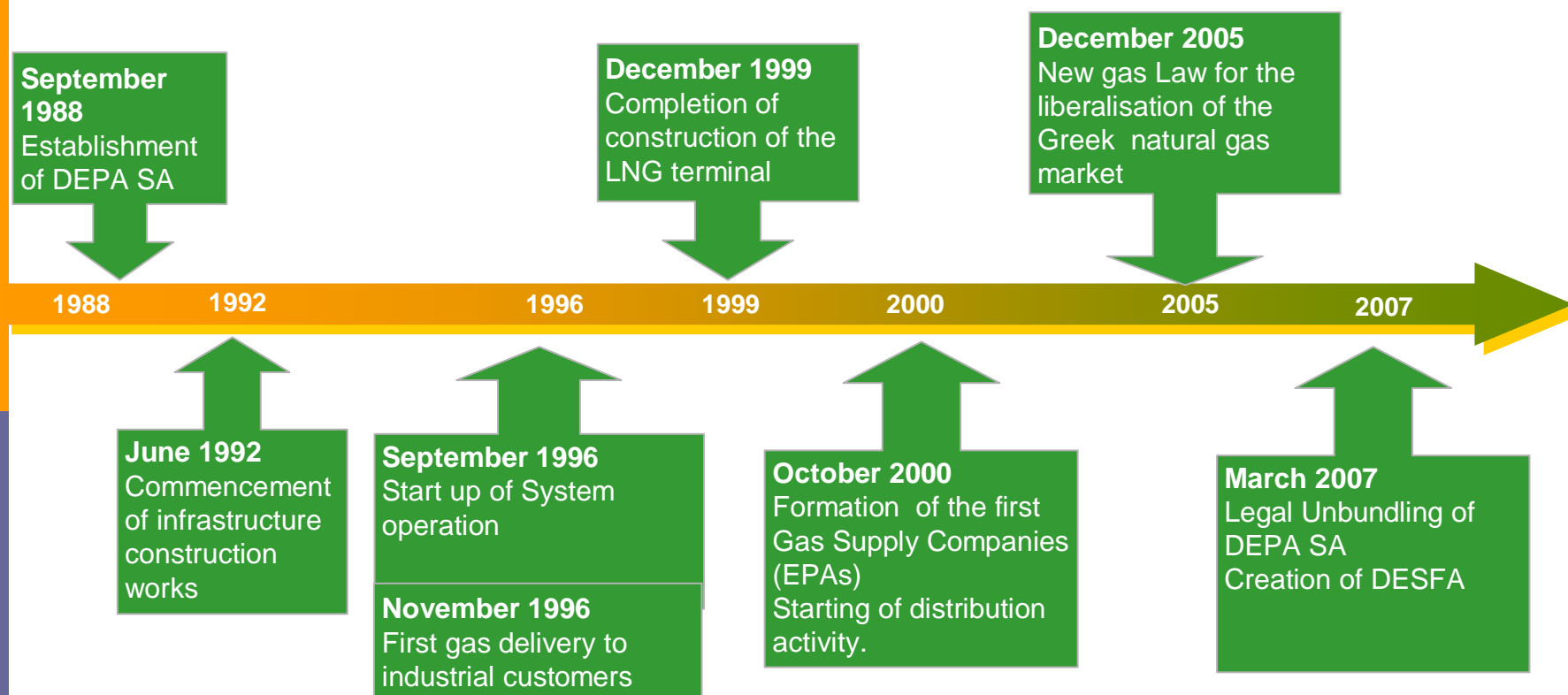


- In the next two years:
 - ✓ two gas supply contracts were concluded with:
 - a) Algeria, for up to 0,7 bcm of LNG per year (1987)
 - b) Russia, for up to 3 bcm of pipe-gas per year (1988)and
 - ✓ a 100% state-owned company under the name Public Gas Corporation of Greece (DEPA) SA was established and granted responsibility to develop the gas infrastructure and introduce the new fuel into the Greek market (1988)



Introduction

(Key milestones in the Greek gas history)



Current structure of the gas industry in Greece

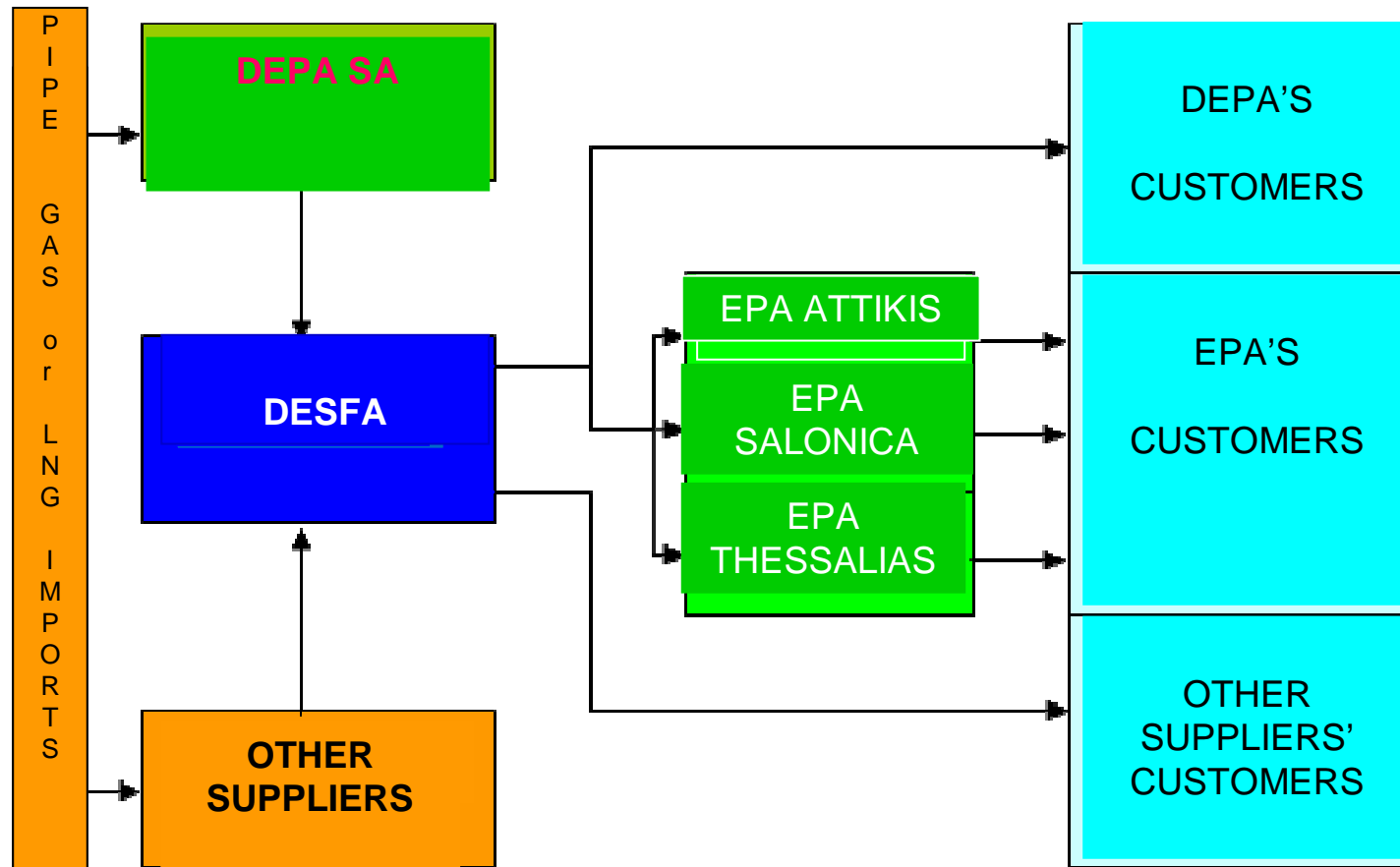
(legislative framework)



- The new gas Law 3428/2005 for the liberalization of Greek gas market provides:
 - a) DEPA's legal unbundling, through the creation of DESFA a 100% subsidiary of DEPA, acting as the Greek Transmission & LNG System Owner and Operator (March 2007)
 - b) Market Opening (eligibility of customers)
 - Power & CHP producers: 1/7/2005
 - Large industrial customers & EPAs: 15/11/2008
 - Non EPAs residential customers: 15/11/2009
 - c) Third party access for the National Transmission System (including LNG terminal)
 - Regulated transportation & LNG tariffs

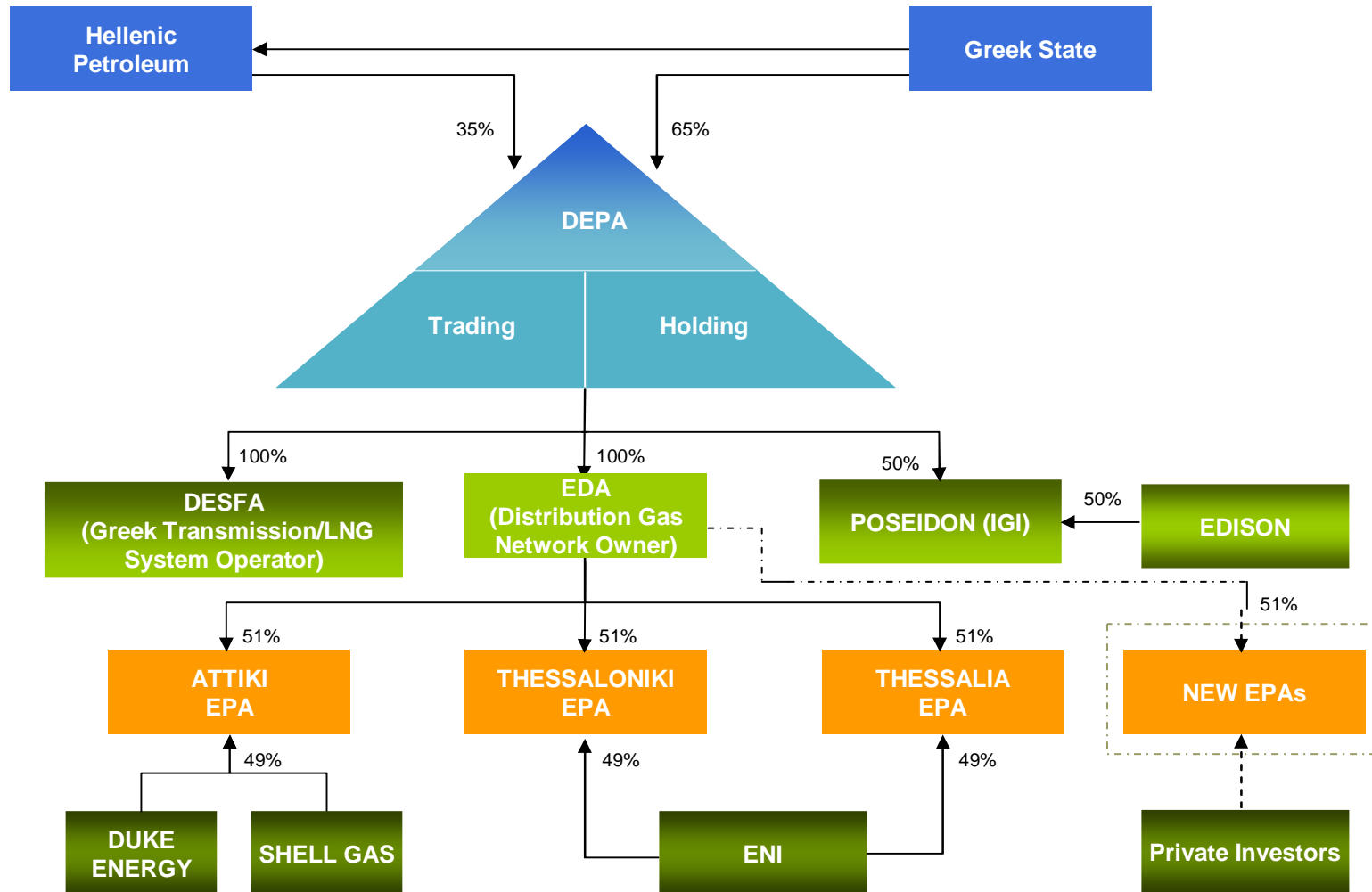
Current structure of the gas industry in Greece

(contractual relationships)



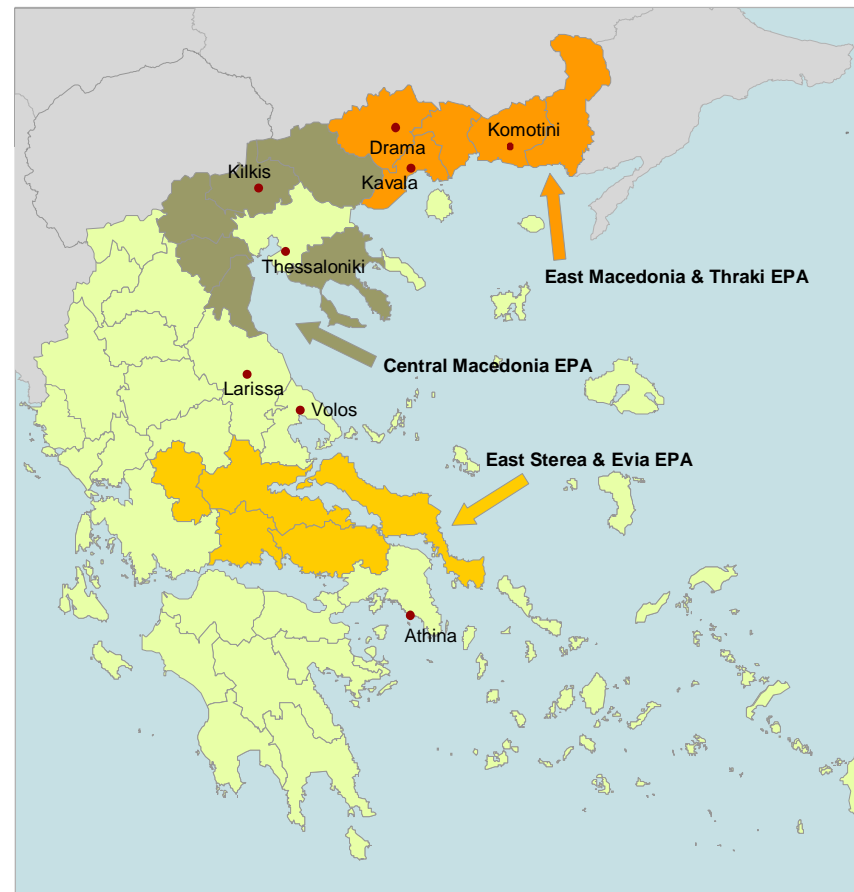
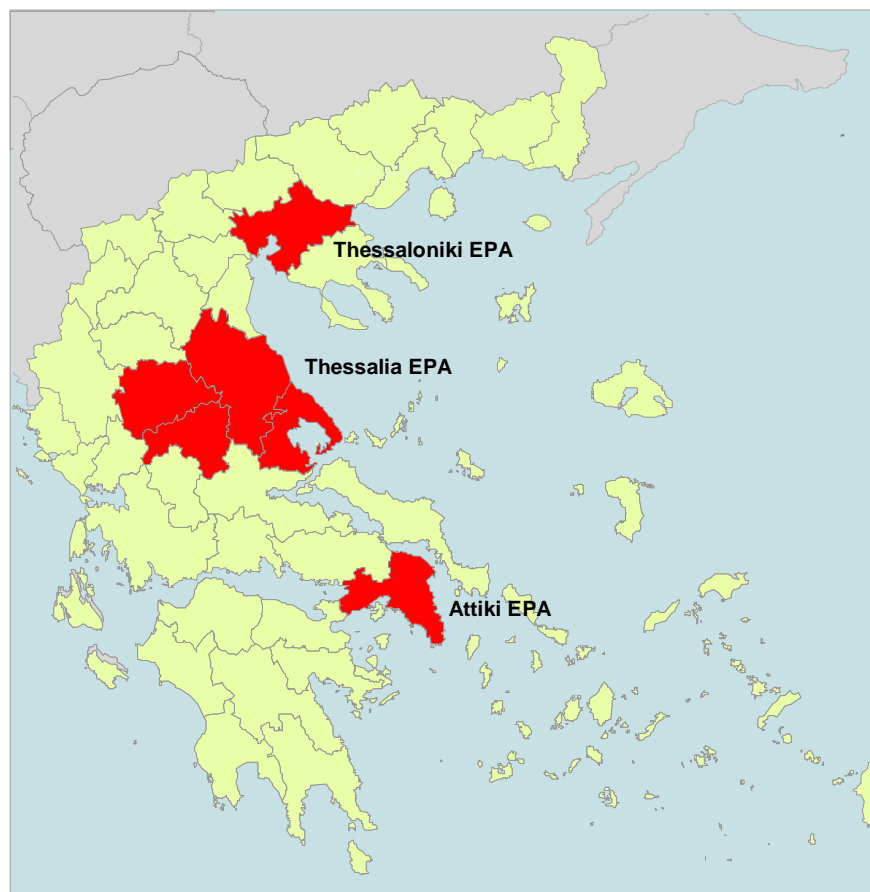
Current structure of the gas industry in Greece

(Structure of DEPA's Group)



Current structure of the gas industry in Greece

(Existing and future EPAs)



The Greek Gas Network



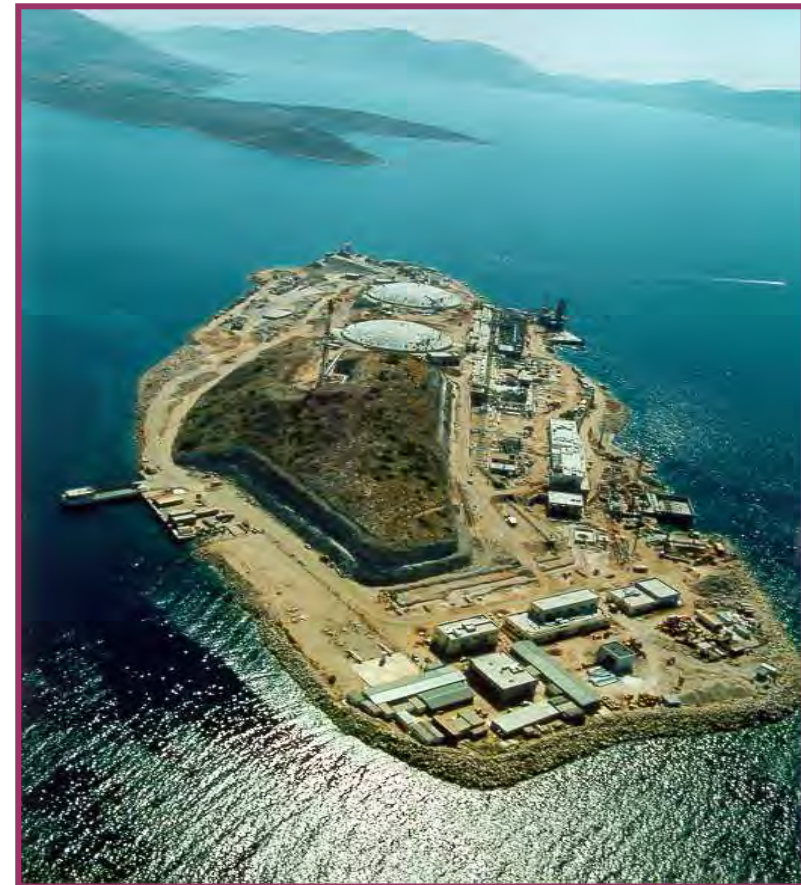
- ❑ Three national gas entry points (Promahonas, Kipoi, Revithousa)
- ❑ High pressure trunk line 512 Km long
- ❑ High pressure branch lines 670 Km long
- ❑ Medium and low pressure networks over 3000 Km long
- ❑ Decades above ground installations for gas metering and pressure control, including two boarder metering stations and four O&M Centers
- ❑ An LNG Terminal at Revithousa Island (2 LNG storage tanks of 65,000 cm each and regas capacity 1,000 cm of LNG/per hour)
- ❑ A modern nationwide telecommunication system, including an integrated SCADA system

The Greek Gas Network



- High pressure network under expansion to new areas (Peloponnese, Evia)
- With upgrade by compressor stations the Greek gas network can sustain a market of ~ 9 bcm / yr
- Two new LNG terminals in Krete and Kavala under consideration
- Various gas transit pipelines projects under consideration

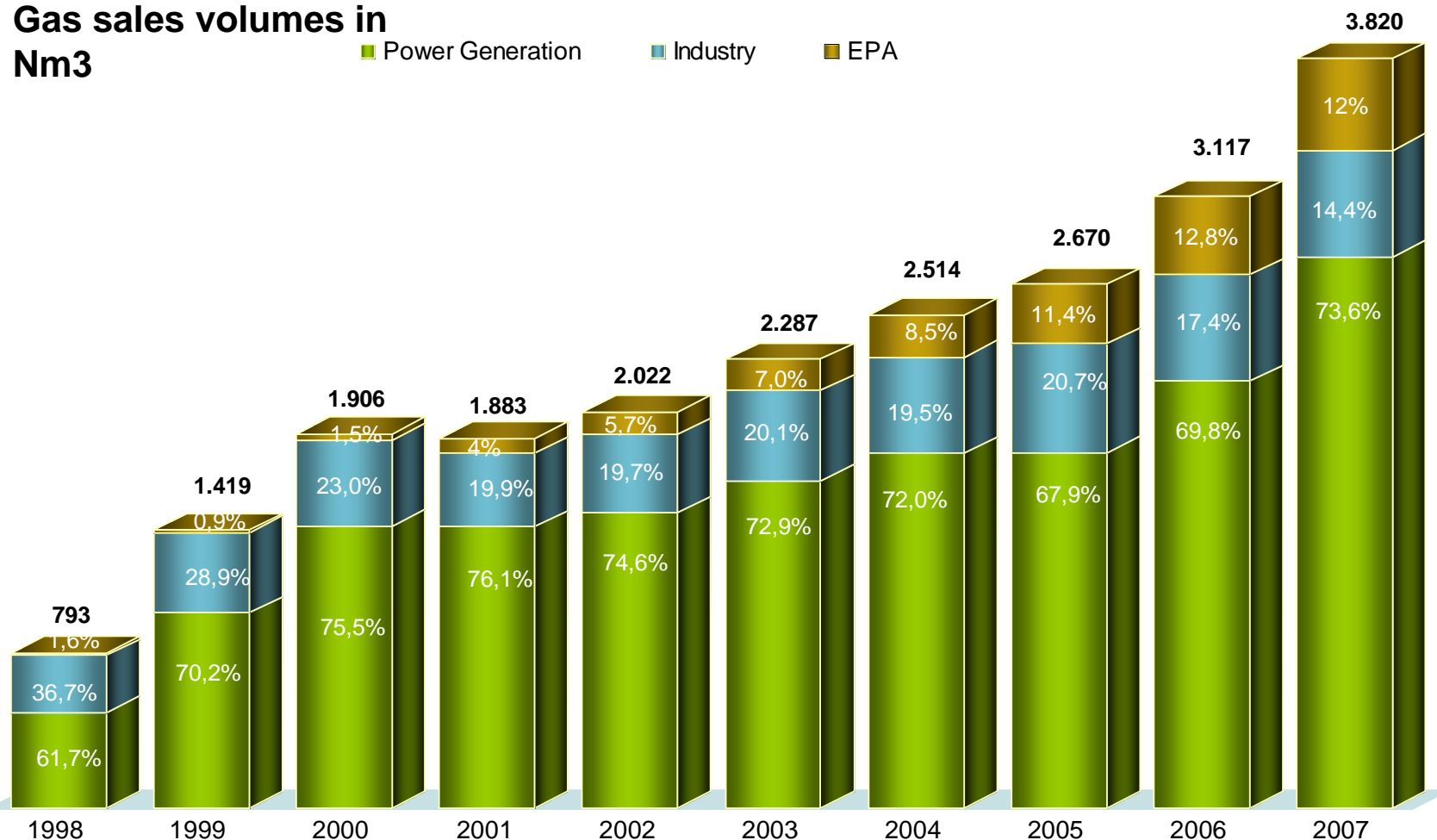
The Greek Gas Network



The Greek natural gas market (Historic operating statistics)

Gas sales volumes in Nm3

■ Power Generation ■ Industry ■ EPA



Gas demand reached 3,8 bcm after ten years of operation

The Greek natural gas market

(2008 statistics)



- **Gas demand** reached 4,0 billion Nm³ last year
- **Gas consumption by sector:**
 - Power generation/co-generation 2864 million Nm³
 - Industrial uses 610 million Nm³
 - Vehicle uses 20 million Nm³
 - EPAs 506 million Nm³
- **Gas procurement by supply source:**
 - Russia (piped-gas) 2652 Nm³ (67,0%)
 - Turkey (piped-gas) 414 Nm³ (10,5%)
 - Algeria (LNG) 584 Nm³ (14,7%)
 - Other (LNG) 308 Nm³ (7,8%)

The Greek natural gas market

(future prospects)



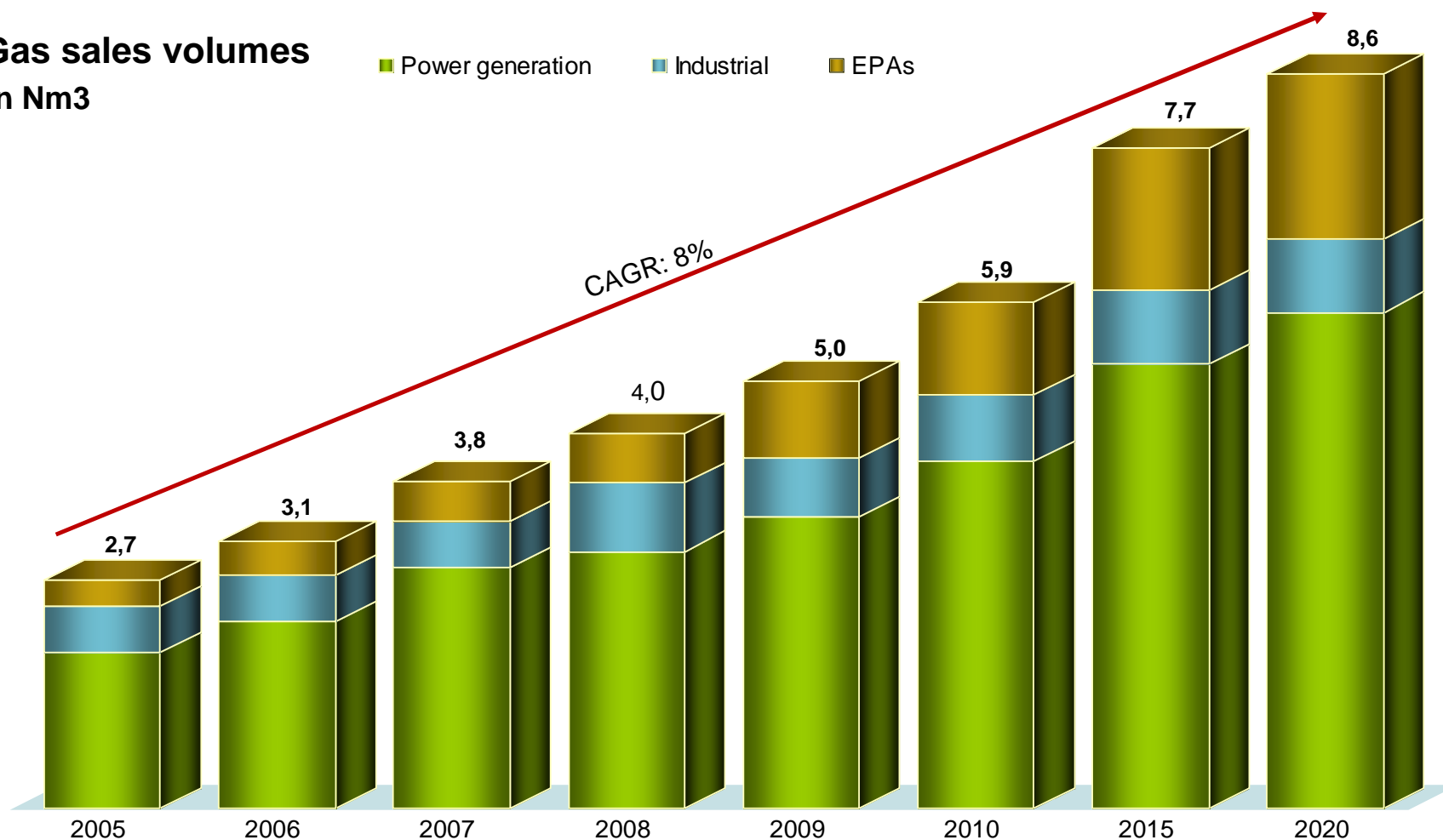
- ❑ Climate change awareness, calls all European countries to take urgently actions towards a lower carbon future
- ❑ Since massive utilization of RES still faces both technological and time constraints, natural gas could be proved an effective vehicle for the achievement of the environmental protection goals, at least in medium term
- ❑ For the same reasons, Greece will need more gas in the years to come to fuel its socio-economic development and to fulfill its environmental protection goals and commitments
- ❑ The main drivers for the Greek gas market will continue to be the power generation sector and the residential and commercial sector

The Greek natural gas market (market forecast)



Gas sales volumes in Nm3

■ Power generation ■ Industrial ■ EPAs



Even with the uncertainties listed before, gas demand in Greece is expected to doubled by 2020

International Interconnections



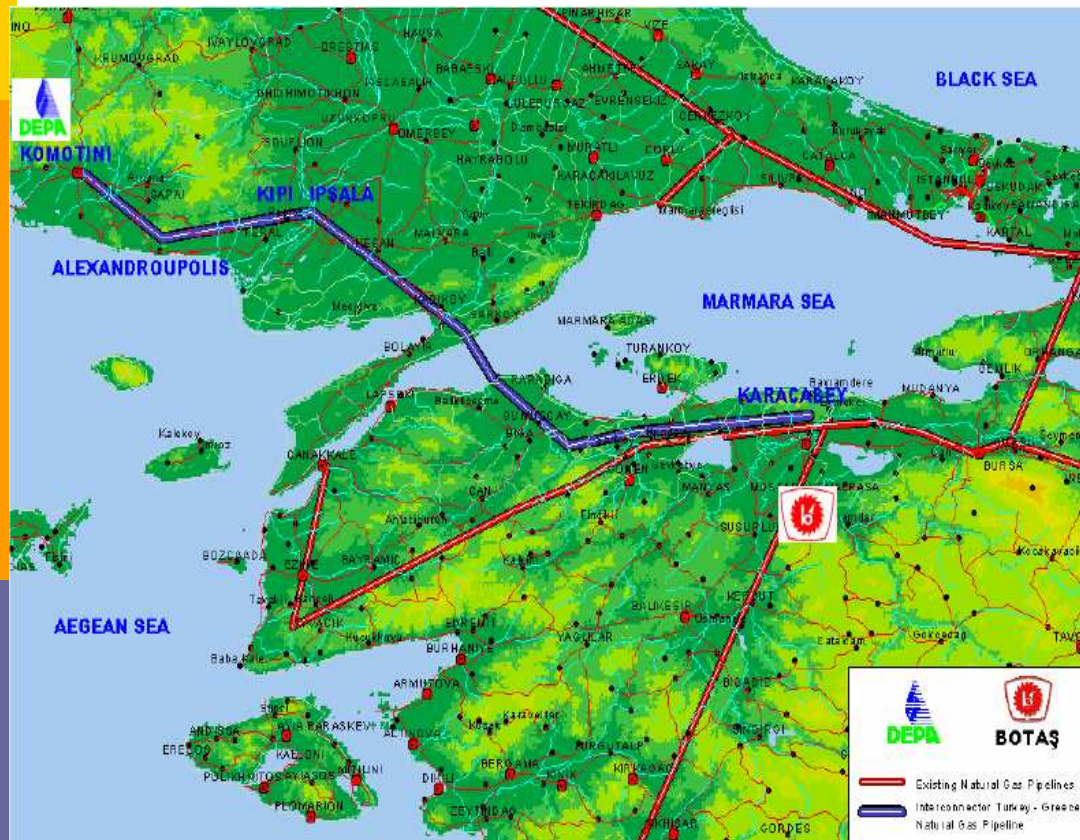
- In late '90s Greece adopted a new, more extrovert long-term strategy in the energy sector aiming at:
 - Diversification of country's gas supply sources and routes and
 - Active participation in the area's ongoing pipeline diplomacy for oil and gas transportation from the broader Caspian region to European and Balkan markets
 - Pioneer role in SE Europe's energy markets and transit activities

International Interconnections



- Few years later this strategy delivered certain and tangible results:
- In 2003 Greece and Turkey agreed to interconnect their gas networks and Greek DEPA and Turkish BOTAS concluded a 0.75 bcm/per year Gas Sale and Purchase Agreement
- The Turkish-Greek Interconnector (ITG) competed and put in operation at the end of 2007
- In the oil sector, Greece, Bulgaria and Russia signed in 2006 the Intergovernmental Agreement for the development of the Burgas–Alexandroupolis oil pipeline

International Interconnections (ITG)



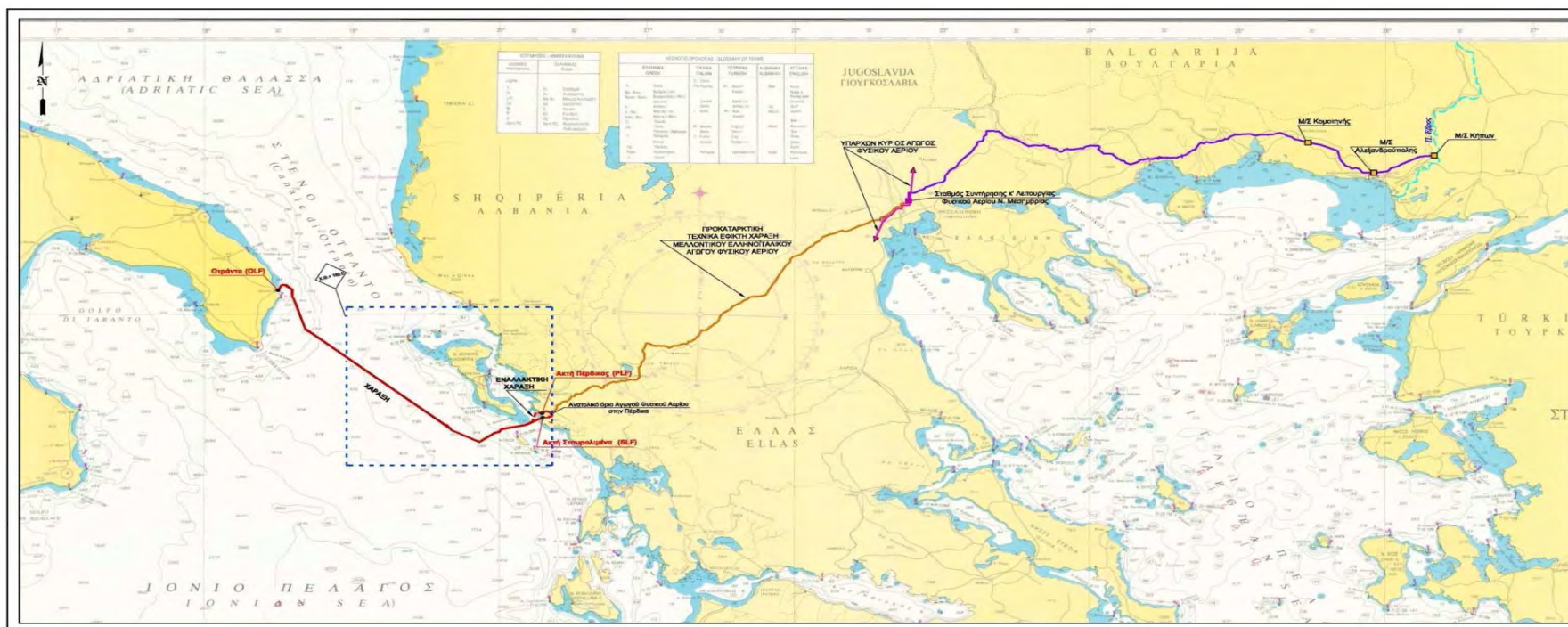
- Realized by BOTAS, DEPA and subsequently DESFA
- Greek part (DEPA / DESFA)**
Komotini – Alexandroupolis
Greek/Turkish border: 86,6 km
- Turkish part (BOTAS)**
Karacabey – Turkish/Greek border: 200km
(17km submarine, max. depth: 70m)
- Diameter:** 36 Inches
- Total capacity:** up to 11,6 bcm/yr
- Inaugurated:** November 18th 2007

International Interconnections (ITG)



- From a Greek perspective ITG could potentially meet various long terms objectives:
 - *to cover Greece's increasing gas demand through diversified sources*
 - *to increase country's security of gas supply and*
 - *to create competition on the supply side in order to secure greater stability and reduction of gas prices*
 - *To establish Greece as a gas transit country for the Italian or / and Balkan markets*
- The vision to expand ITG to Italy it seems now more realistic and DEPA the Italian Edison (and Turkish BOTAS) work systematically towards the creation of the Turkey-Greece-Italy Interconnector (ITGI)

International Interconnections (IGI)



IGI Off-shore Pipeline

To be developed **by Poseidon Co**, a DEPA-EDISON 50/50 JV

Length: 203 Km

Diameter: 32"

Max capacity: up to 12 bcm/yr

IGI On-shore Pipeline

To be developed **by DESFA S.A.** the Greek TSO, 100% subsidiary of DEPA)

Length: approx. 600 Km

Diameter: 36"-42"

Expected Start up: end of 2012

International Interconnections (TAP)



- The completion of the ITG created favorable conditions for another gas transiting project
- The Trans Adriatic Pipeline (TAP), supported by Swiss-based EGL and StatoilHydro.
- The pipeline will be connected to the Greek Gas Network near Thessaloniki and will cross consecutively Northern Greece, Albania and Adriatic Sea in order to be linked with the Italian gas system in Italy's southern region of Puglia
- TAP will have a total length of 520 Km, out of which 186 Km in Greece, 200 Km in Albania, 115 Km offshore and 20 Km in Italy
- The 48 inches diameter onshore and a 36 inches diameter offshore pipeline, will have a 10 bcm capacity per year, expandable to 20 bcm per year

International Interconnections (TAP)



- According to its sponsors TAP is an independent, non discriminatory and open for third parties gas transit pipeline which could:
 - Tap the vast gas reserves of Caspian, Russia, and Middle East
 - Promote economic stimulus, stability and cohesion in SE Europe
 - Satisfy the growing gas demand in SE European Countries, including West Balkans and Italy
 - Contribute to Europe's gas sources and routes diversification efforts

International Interconnections (TAP)



International Interconnections

(South Stream)



- Furthermore, in 2007 there was another development which may drastically change the regional pipeline game
- Russia announced its intention to develop the so-called South Stream pipeline in cooperation with the Italian major ENI and gained political support from many countries in the area
- The pipeline, with a total capacity of 30 bcm per year, will link Russia with Bulgaria via its undersea segment in the Black Sea and then through its northern and southern branches will reach both to Central and Southeastern Europe's markets
- The recent Russian-Ukrainian gas crisis could perfectly explain the logic behind Gazprom's bypass-and-develop strategy and its plans to develop the North and South Stream pipelines



Increasing concerns and uncertainties related to security of gas supplies



- ❑ Despite the above described developments in the gas pipelines of regional interest, during the last years there have been increasing concerns about gas availability and security of gas supplies in Greece and in the broader area due to:
 - ✓ **Geopolitical tensions and political instability in many gas producing and transiting countries**
 - ✓ **High gas imports dependence from one major supplier (Russia)**
 - ✓ **Delays in the necessary upstream investments in both traditional and alternative gas producing countries**
 - ✓ **Delays in the implementation of the new regional gas supply pipelines and LNG re-gas facilities**
 - ✓ **Lack of clear and effective regulatory regimes in various transiting countries**
 - ✓ **Project financing obstacles, especially under the current conditions in the energy and financial markets**

Concluding remarks



- ❑ SE European countries, including Greece and Albania, will need more gas to fuel their socio-economic development in the years to come
- ❑ Local authorities should urgently take actions towards securing future gas supplies and new gas infrastructure in a way that will balance regional countries' wariness for the continuously increasing dependence on Russian gas and their interests to gain access to alternative gas sources and routes
- ❑ For the time being, gas availability issues and other geopolitical and financial barriers/uncertainties prevent sponsors of regional pipelines and LNG re-gasification facilities to make their final investment decisions

Concluding remarks



- ❑ Further delays in the implementation of the critical gas supply and transit infrastructure will have serious implications for both sufficiency and security of gas supplies in the region
- ❑ Local governments, regulatory authorities and gas companies should enhance their cooperation in order:
 - **to establish a common understanding on current energy challenges and gas supply issues of regional interest**
 - **to improve security of gas supplies through the implementation of the necessary gas supply and transit infrastructure in the region and**
 - **to create favorable conditions and attractive business climate in the regional gas markets (and in the energy markets in general) that will facilitate both investments and gas trade in the near future**

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