

Transforming a gas island to a gas hub

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ΔΗΜΟΣΙΑ
ΕΠΙΧΕΙΡΗΣΗ
ΑΕΡΙΟΥ Α.Ε.





Agenda

1. Greece a remote area from the centre of the game
2. Infrastructure is enabler
3. Opening cross border capacity
4. Developing short-term internal market
5. Building long term internal market

Greece remote from the game heat

Key European hubs and exchanges



■ Exchange

▲ Hub

Source: IHS Energy

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Country	Name	Zones	Type	Exchange	Creation	Maturity*
UK	NBP	1	Virtual	ICE	1996	++++
Netherlands	TTF	1	Virtual	APX Endex	2003	++++
Belgium	ZEE	1	Physical (ZEE)	APX Endex	2000	+++
	ZTP		Virtual (ZTP)		Oct 2012	+
Germany	GASPOOL	2	Virtual	EEX	2009	++
	NCG					
Austria	CEGH	1	Virtual	CEGH Gas Exchange	2005	+
France	PEG North	3	Virtual	Powernext	2004	+
	Trading Region South					
Italy	PSV	1	Virtual	PSV Gas Exchange	2003	+
Czech Rep.	OTE	1	Virtual	PXE From end-2013	Jan 2010	-
Denmark	GPN	1	Virtual	NPG	2008	-
Hungary	MGP	1	Virtual	CEEGEX	Jan 2013	-
Lithuania	Lithuania Virtual Trading Point	1	Virtual	GET Baltic	2012/13	-
Poland	Poland Virtual Trading Point	1	Virtual	POLPX	Dec 2012	-
Romania	N/A	N/A	N/A	OPCOM RCE	2014	-
Spain	CDG (or MS-ATR)	1	Virtual	X	2003	-
	MIBGAS (with Portugal)	1	Virtual	x	2015/16	-

*IHS maturity assessment

Source IHS

Infrastructure is enabler: Greece – A Gateway to Europe



--- IGI Poseidon } IGI
--- IGI Onshore }

--- East Med
--- IGB

--- TAP
--- SEP

--- Other Interconnectors
--- LNG Terminal

Greece – A Gateway to Europe

Key projects will enhance national and regional energy security and may catalyse a gas trading hub in Greece

Unlike purely geopolitically driven pipeline plans, those proposed here are realistically based on business merit

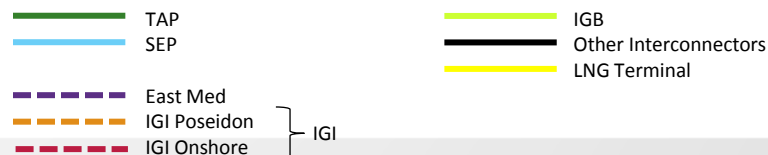
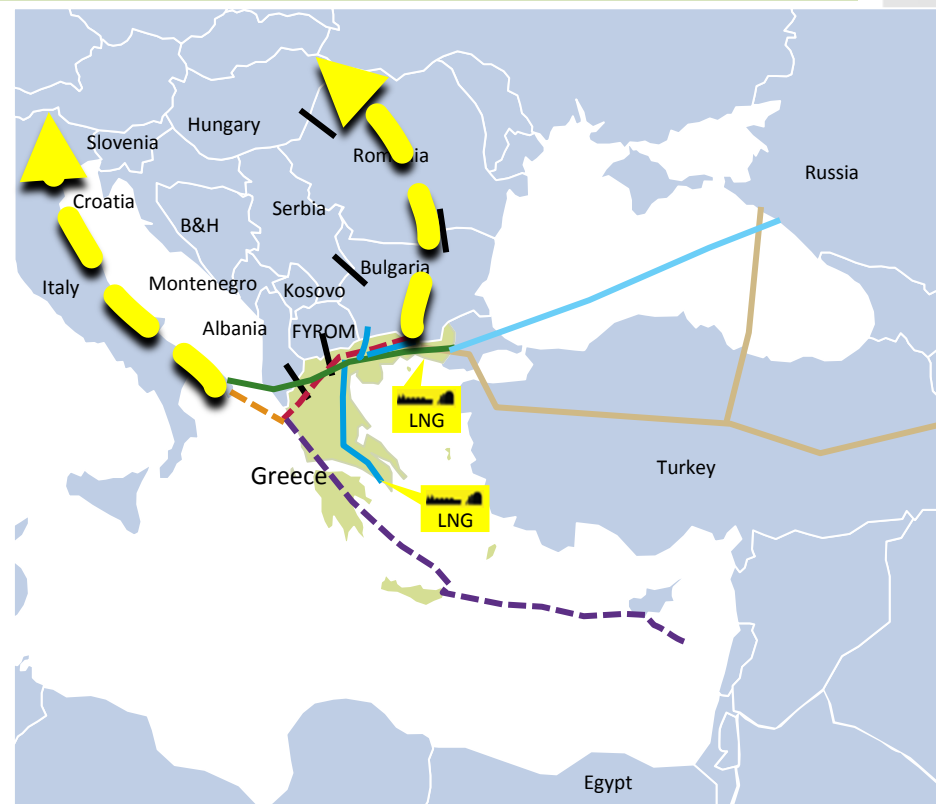
DEPA contribution:

■ Southern Gas Corridor / TAP

- SGC underpins regional Market development and integration
- DEPA is a significant stakeholder of the Southern Corridor as a buyer of SD2 gas and as a sponsor of IGB
- The timely realization of TAP will enhance the connection of SEE with mature Central European markets
- Start of construction on 17 May 2016

■ IGI Poseidon

- A mature project, ready to take FID as soon as gas resources are secured
- May transport natural gas from from Iran, East Mediterranean, Middle East and/or Caspian areas (Kurdistan, Iran, Turkmenistan) or alternatively from Russia to Italy and Europe
- It is included in the 2nd PCI list



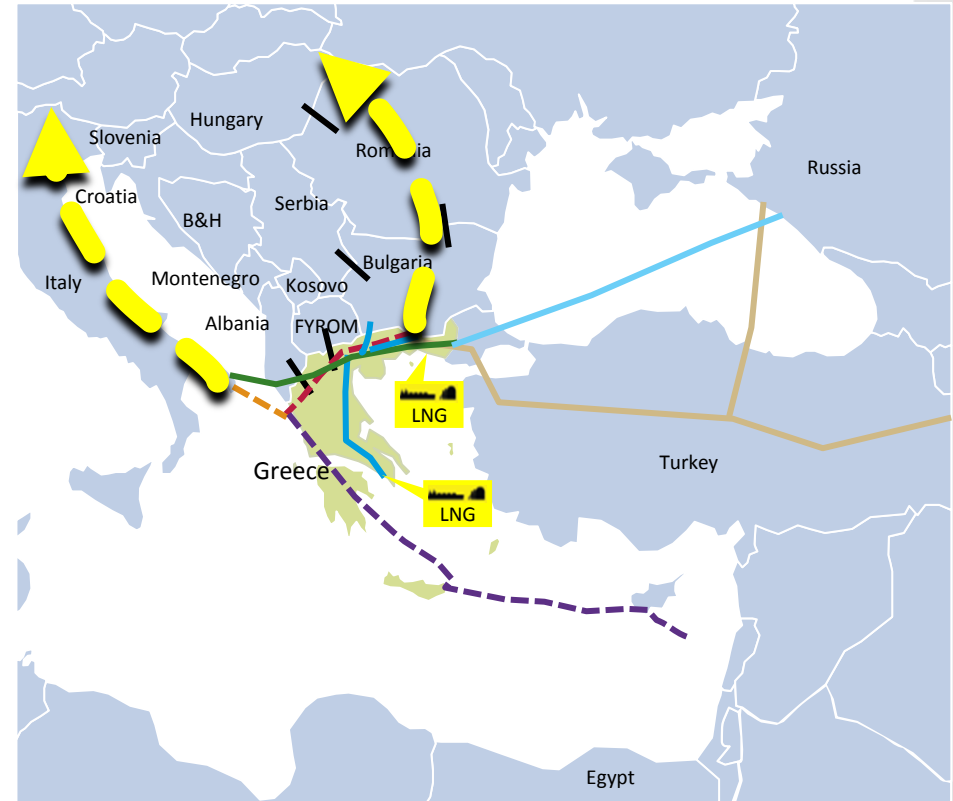
Greece – A Gateway to Europe

■ IGB

- Will connect Bulgaria with LNG and gas from the Caspian and the Middle East through existing and new pipelines (i.e. TAP) and the Greek existing (Revythoussa) and planned (Alexandroupolis) LNG terminals
- It is included in the 2nd PCI list and CESEC list and it is an integral part of the Vertical Corridor contributing to the security of supply of regions of poor diversification
- FID taken on 10 December 2015
- Binding phase of the ongoing Market Test to confirm capacity bookings expressed in the Eol phase - to start by June 2016
- Start of construction scheduled for 1S 2017

■ LNG Terminal in Northern Greece (Alexandroupolis)

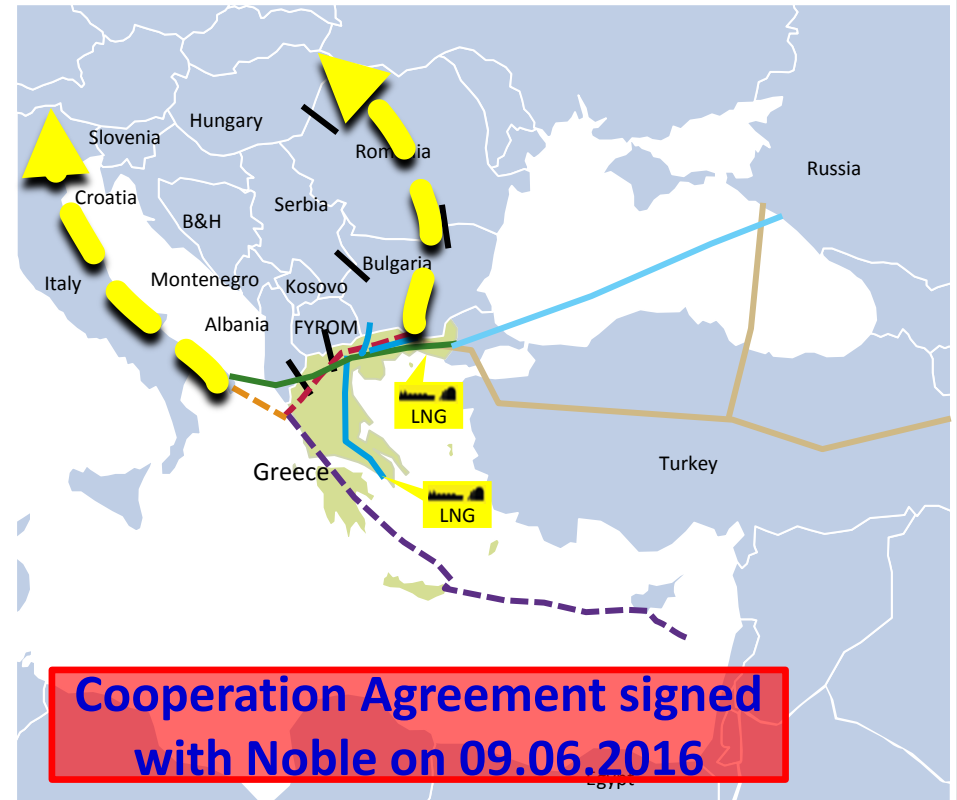
- Will ease global LNG supplies into the SEE region through its proximity to the IGB
- It is included in the 2nd PCI list
- Developed together with international partners/investors
- FID to be taken in 2017
- Initial meeting among potential shareholders (Gastrade, DEPA, BEH, Cheniere) on project company structure and steps ahead took place on 16 May 2016.



Greece – A Gateway to Europe

■ EastMed

- European market constitutes a lucrative monetization option for the Eastern Mediterranean gas since it is a premium market with potential supply gap
- The latest developments in the region with the discovery of the Zohr gas field triggered reevaluation of monetization options
- **The opening of a new Energy Corridor (EastMed) is fundamental for Europe's energy security providing source, route and supplier diversification**
- Following the feasibility study already executed, EastMed pipeline is a viable export option via Cyprus, Crete mainland Greece and Italy (connecting to IGI Poseidon Pipeline)
- It is included in the 2nd PCI list
- Pre-Front End Engineering Design (Basic Design) studies and surveys underway, total budget 4 M€, co-financed by EU CEF program with 2 M€
- Pre-FEED technical studies are expected to be concluded by 15 June 2016
- IHS-CERA is assessing, in a independent manner, the EastMed Project competitiveness among the other available export options in the region - preliminary results are expected within June

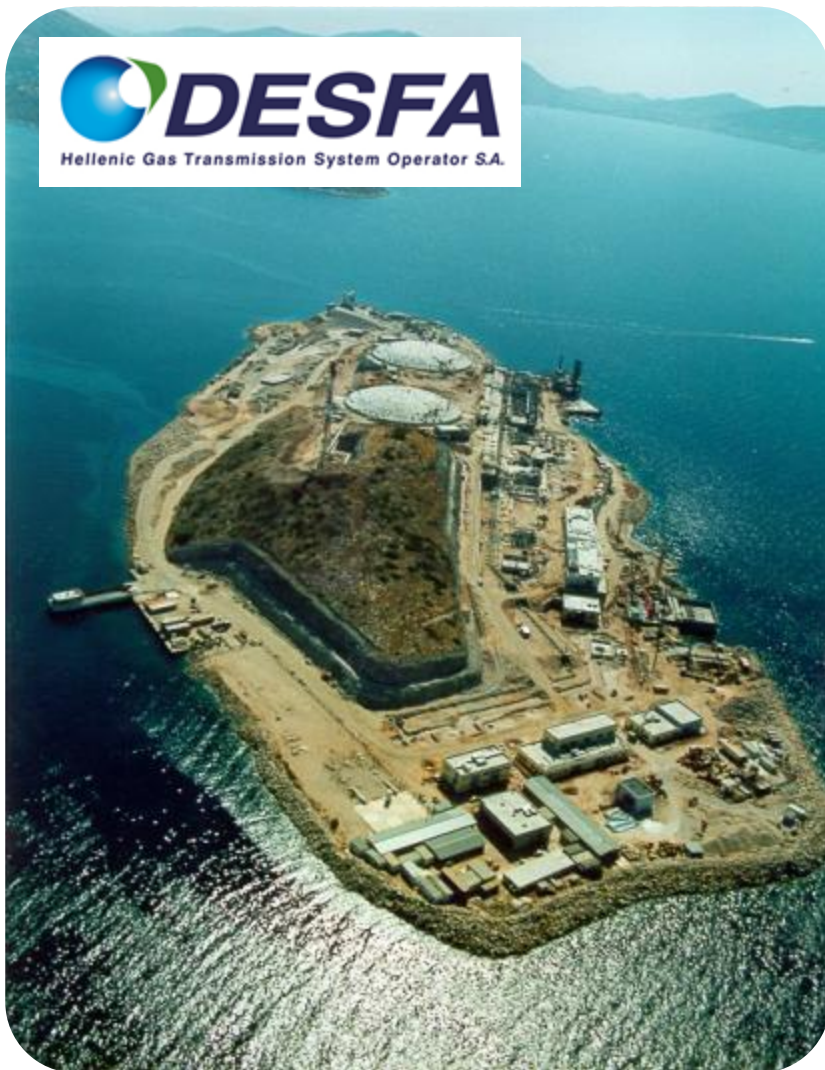


SEP, a new route for gas supplies to Europe

- ✓ A practical option that may benefit from existing work in the IGI onshore & offshore pipeline projects
- ✓ Existing supply contracts into Italy could be easily diverted to SEP and enhance the project viability
- ✓ MoU among Gazprom, Edison and DEPA signed in Rome on 24 February 2016
- ✓ Foresees cooperation in assessing and possibly developing a new supply route for Russian gas to Europe
- ✓ Joint working groups are making progress on the development and implementation of actions
- ✓ Basis is the well advanced IGI pipeline, connecting Greece to Italy
- ✓ The parties involved are strongly committed to the project
- ✓ The development of this new supply route shall be pursued in full accordance with EU legislation



Expansion of Revithoussa LNG Terminal



- **SUPPLY DIVERSIFICATION**
 - Import gate for LNG (spot and LT)
- **S.E.E. BENEFIT:**
 - Supply source for the region
- **PEAK DEMANDS:**
 - Covers peak demand in Greece
- **RELIABILITY:**
 - Enhances National NG Network Reliability.

- **CURRENT**
 - Storage 130,000m³LNG
 - Sendout 13,7mcm/d, 150GWh/d, 5bcmpa
- **EXPANSION**
 - Total storage 225,000m³ LNG
 - Sendout =19,1 mcm/d, 215GWh/d, 7bcma

Opening Cross Border Capacity – a game changer

Interconnection Agreements on the way change the game

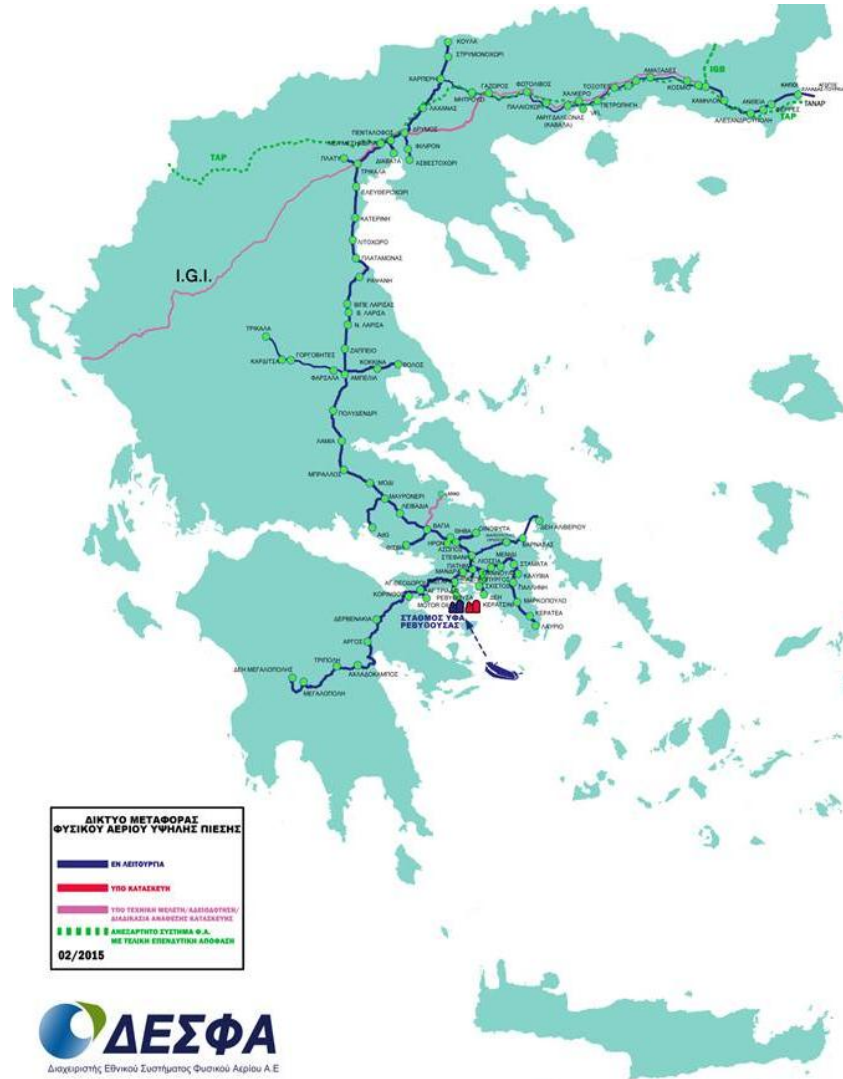
- **Greece - Bulgaria**
 - IA conclusion and initiation of testing phase expected pronto
 - Full IA implementation & initiation of capacity auctions at IP to follow
- **Bulgaria-Romania & Romania-Ukraine**
 - Expedited procedures expected to quickly conclude the relevant deals
 - Then open access will be provided to the Trans-Balkan pipeline in forward and reverse flow
- **Greece - Turkey**
 - Both markets understand significance of opening cross border trade at the IP Kipi
 - Sizeable volumes from/to Turkey may bring early liquidity in the region **before** TAP commencement date

Market regulatory convergence

- **Greece - Bulgaria**
 - Countries committed to develop **common balancing rules** which will enhance interoperability of neighbouring systems
- **Harmonisation with Romania, as well, would create significant momentum**



Developing short term internal market



Significant developments undertaken in the direction of regulatory maturity in Greece

■ Current status

- First Network Code since Apr2010, initiated TPA to Transmission Network and LNG Terminal
- Since Feb2013, entry -exit system implemented & a Virtual Nominations Point established
- Interim measures for balancing gas applied
- TSO procures balancing gas through open international tender

■ Network Code Update expected until Oct2016

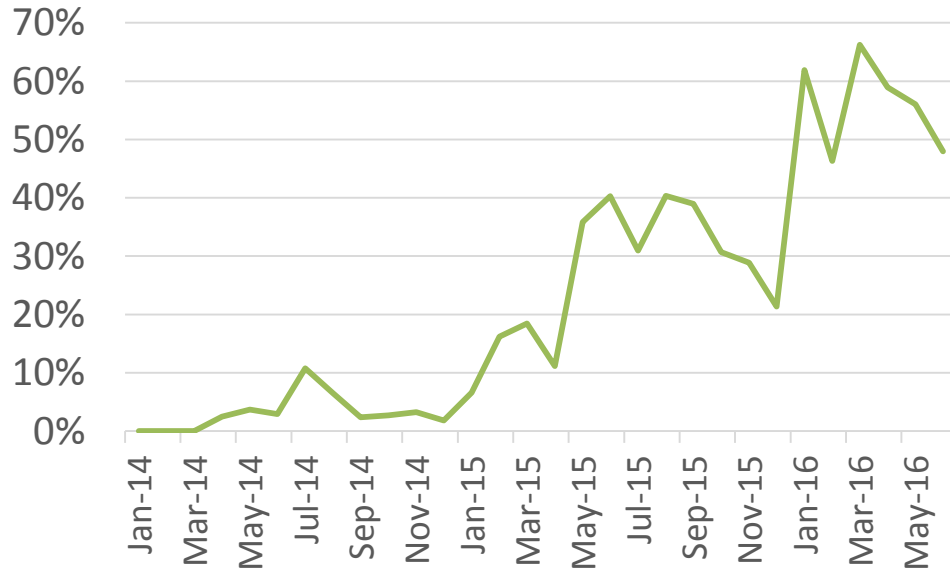
- Adopts provisions to further implement CAM NC, BAL NC, Interoperability NC as per EU regulation
- New capacity products offered at IPs (interruptible, reverse, virtual reverse)
- Capacity auctions to be initiated at IPs
- Intraday nomination cycle introduced together with stricter balancing rules (converging to BAL NC provisions)
- Likely full cycle renomination at IP Kulata/Sidirokastro

■ Balancing platform

- Balancing platform currently under development by DESFA, expected to come online in 2017
- Will transform into a Trading Platform (full implementation of Bal NC), when sufficiently liquidity in market

Competition in the market

VNP trades over Greek Market Consumption



Greek market participants start showing interest in exchanging gas at VNP

- During the last 3 months, **56%** of gas delivered was previously traded at VNP
- Currently only **physical** gas shippers can be active at VNP

■ Gas Release

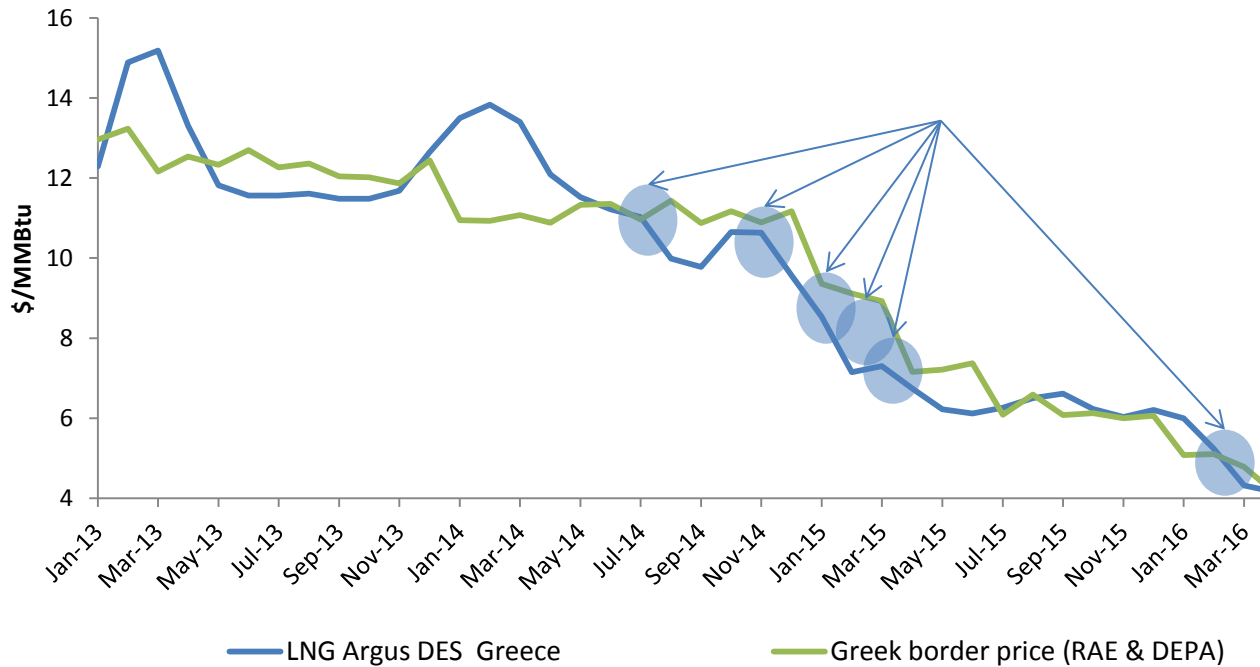
- DEPA has committed to release 10% of its annual sale to auctions since 2013 and does so
- Most of gas released is delivered to VNP where primary buyers carry out further trading
- Auctions have become very popular lately (see graph)

■ VNP balancing point

- In parallel with the development of a balancing platform, balancing gas trade is bound to move from Revithoussa (LNG) to the VNP (gas)

Spot LNG imports demonstrate efficient arbitrage

Greek Spot LNG imports vs. Market Prices



- When the Greek Border Price exceeds LNG prices, SPOT LNG imports are motivated into the Greek market



Building long term internal market

■ VNP transformation

- After Oct2016, DESFA will make preparations to transform VNP to a Virtual Trading Point (VTP)
- VTP will enable **paper trading** activity to take place, allowing involvement of financial institutions

■ Market transparency

- The National Regulatory Energy Authority publishes monthly Greek border prices every quarter
- Independently, DEPA publishes quarterly the auction starting price
- Both figures are valuable benchmarks of actual gas import prices in Greece

■ Development of a futures exchange

- Commodities Exchange in Thessalonica has worked in pilot projects on the development of an Energy Exchange for power and gas, where the option of physical delivery of gas will be at the emerging VTP

When TAP commences operation, Greece will be physically connected to European liquid hubs. Then, the VTP is likely to emerge as a transit hub, where trades will occur between two of the largest markets in the region, Italy and Turkey.

A big thank you!

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