

# The New Regional Parameters of SE Europe's Energy Landscape

**7<sup>th</sup> SEED**

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INSTITUTE OF ENERGY  
FOR SOUTH EAST EUROPE



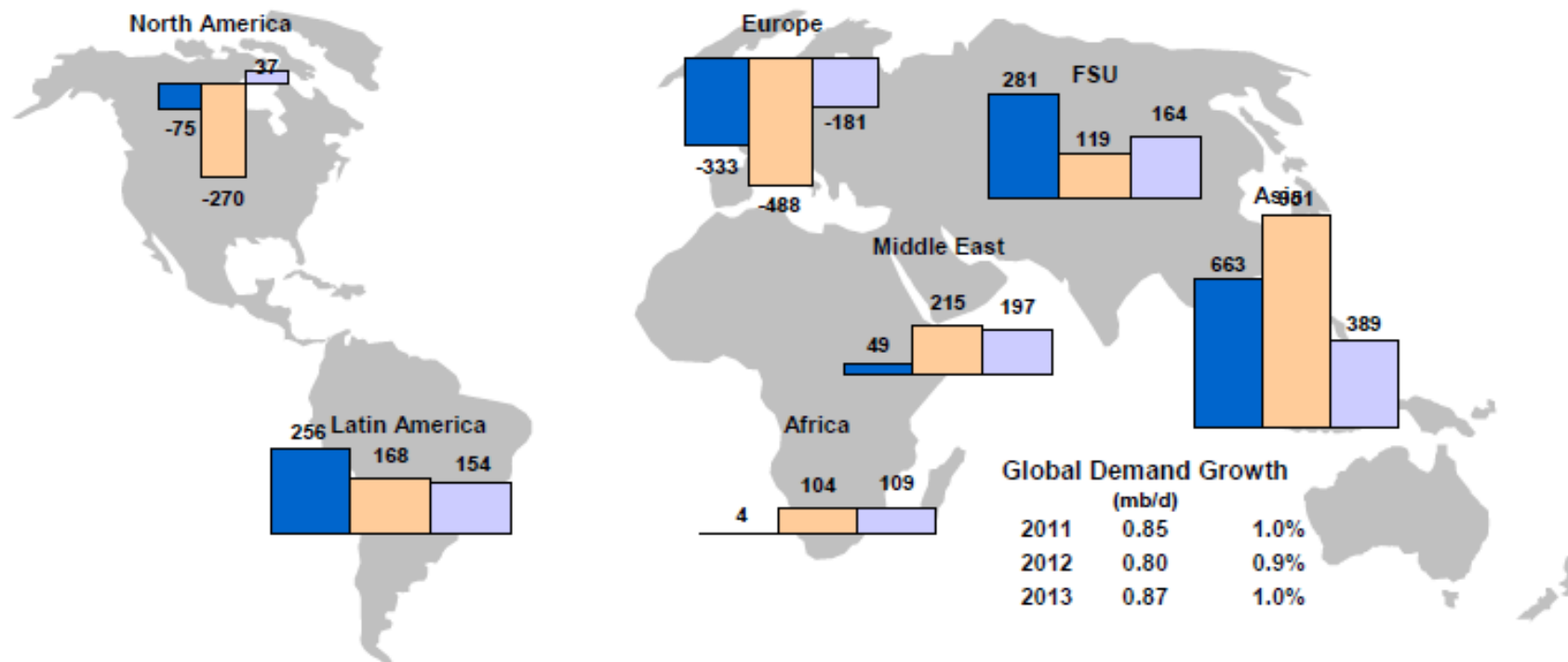
# Vital Signs of the Global Energy Scene

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- ❑ Global oil demand continues to grow but at a diminishing rate (i.e. 0.9% or 780kb/d)
- ❑ Global economic growth will move at slower pace, 2.2% in 2013 and 3.0% in 2014
- ❑ Eurozone recession is deepening at  $-0.5\%$  in 2012 and predicted to move at the same level in 2013 (compared to  $1.5\%$  in 2011)
- ❑ However, average international oil prices have moved above \$100 per barrel during 2013 and for the whole of 2011 and 2012
- ❑ The Syrian civil war and Middle East turmoil will continue to impact international oil prices by maintaining high geopolitical risk conditions
- ❑ High Chinese demand for oil and gas is to be sustained as the new leadership will be pursuing an aggressive urbanization policy
- ❑ The US shale boom is having a strong impact on European gas demand through the export of cheap American coal
- ❑ Global thermal coal prices have been steadily declining over last 12 months

## Global Oil Demand Growth 2011/2012/2013

thousand barrels per day



Source: IEA

# Vital Signs of the Global Energy Scene

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- ❑ Low US gas prices are affecting prices worldwide including Europe
- ❑ European gas demand already softened by recession declined 8% in 2011 and by further 2.0% last year
- ❑ LNG trade continued to expand in 2012 as sea transportation of gas is price competitive in many geographical areas and offers greater destination flexibility
- ❑ Collapse of CO<sub>2</sub> prices in Europe (below €4.0 per ton) is creating problems for viability of ETS and coal replacement and the pursuance of environmental policies
- ❑ RES growth in Europe is being curbed following reduced Feed in Tariffs by several countries. Scale down of investments already visible
- ❑ Europe - China solar PV trade war is expected to impact negatively global PV applications
- ❑ There is a marked return of nuclear power in USA and several other countries with tens of projects under development and construction. The Fukushima factor appears to have been overcome

## Brent Crude Oil Prices

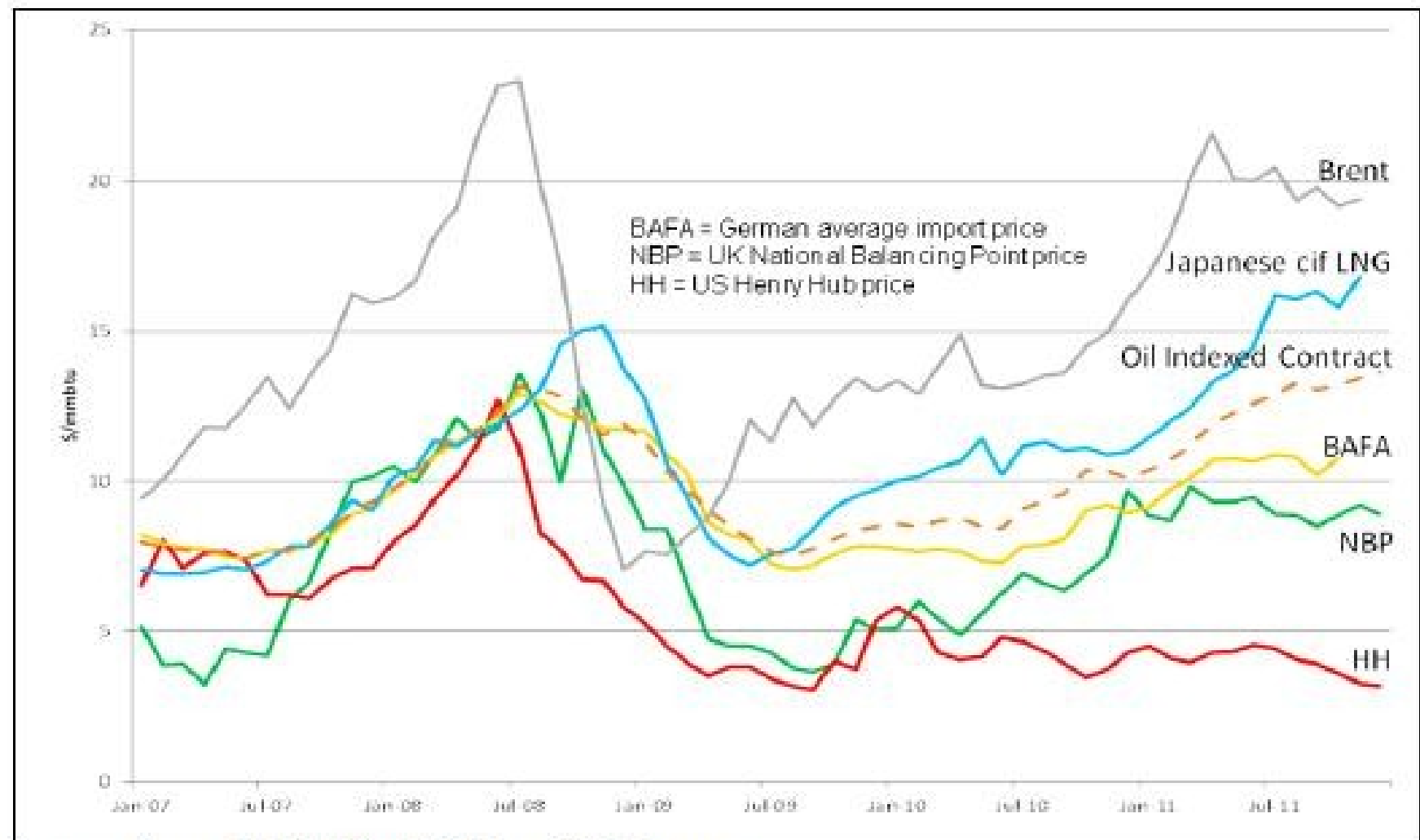


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# Brent Crude Oil Spot Prices (2010 – 2011 – 2012)

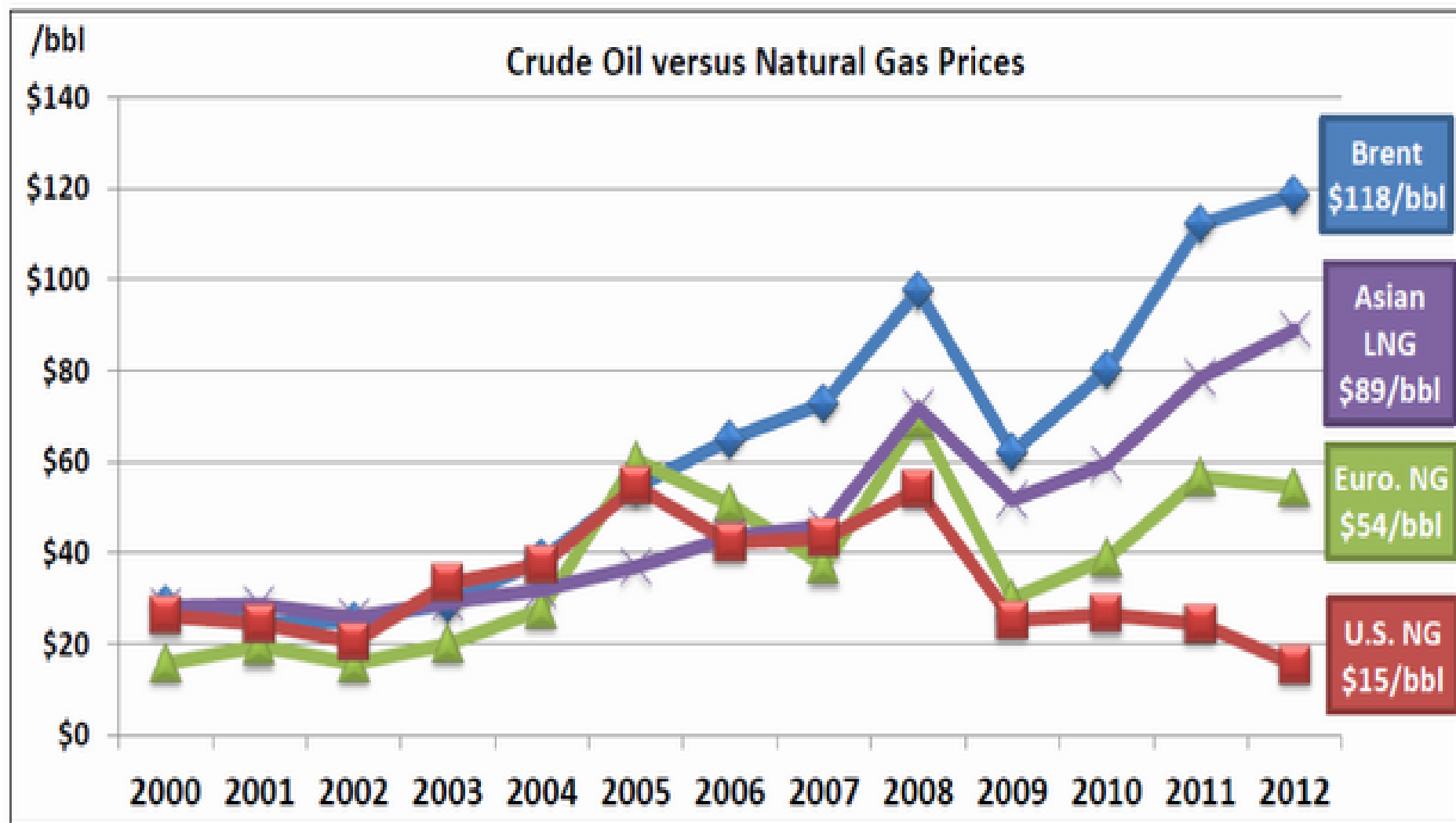


# Global gas and Brent prices: January 2007-December 2011



Sources: Argus, BAFA, EIA, ICIS Heren, H.V. Rogers

# Global gas and Brent prices (2000 – 2012)



Source: Argus, 2012 = YTD through March 20, 2012; natural gas price converted to barrels using factor of 6.05x



# Global gas and Brent prices (2013)

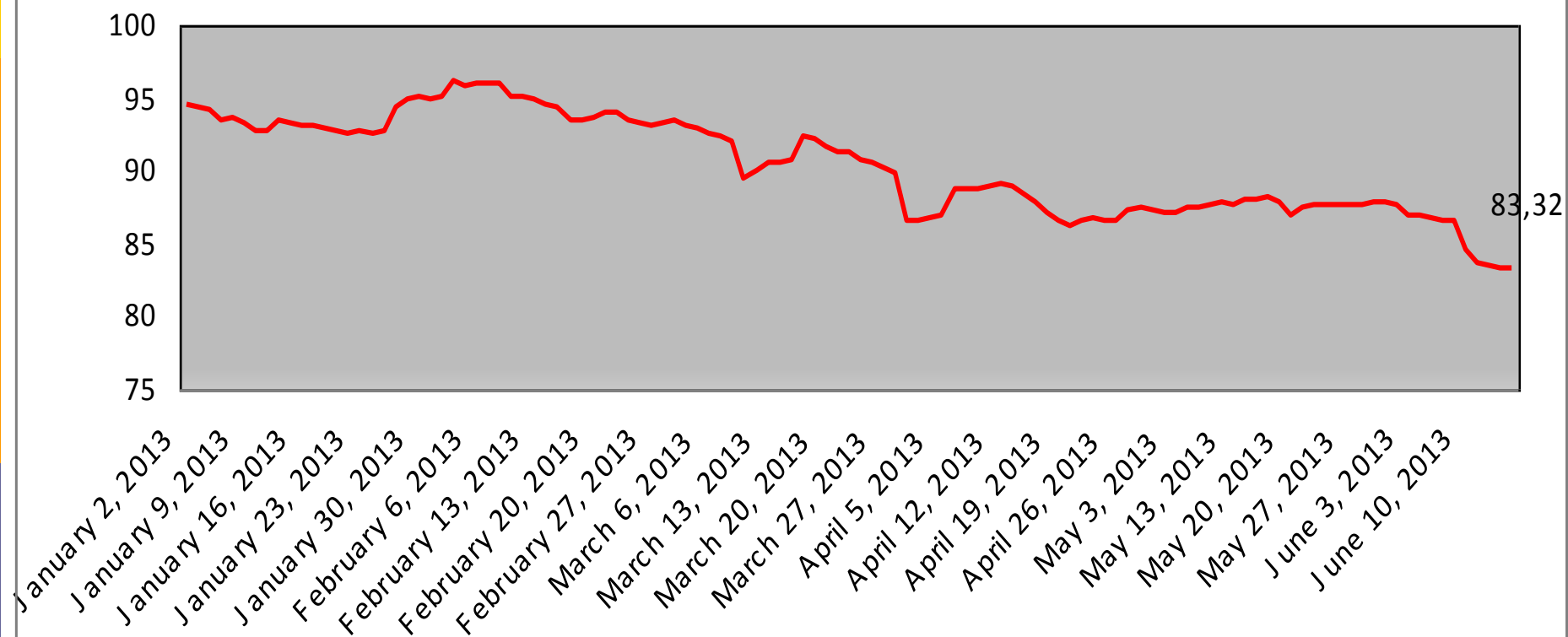


# Average gas prices for 2012 in selected countries based on long-term contracts (\$/mbtu)

Border prices for Russian pipeline gas imports		LNG Imports	
Bulgaria	15,9	France	11,5
Greece	13,5	Greece	13,3
Hungary	11,7	Italy	12,0
Italy	13,2		
Romania	12,4		

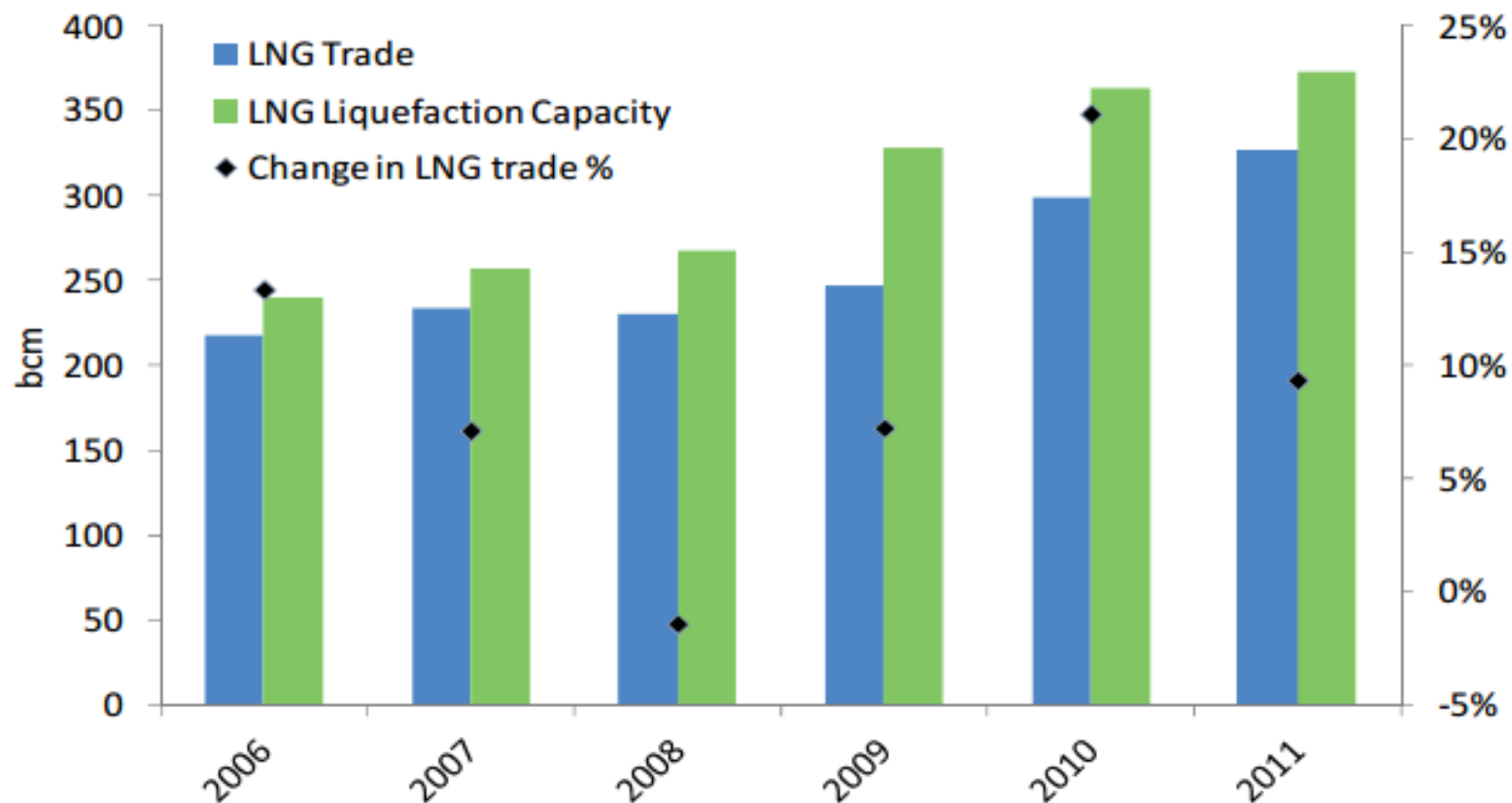
<sup>[1]</sup>Before price revision by Sonatrach

## ICE Global Coal Newcastle Index (USD/ton)



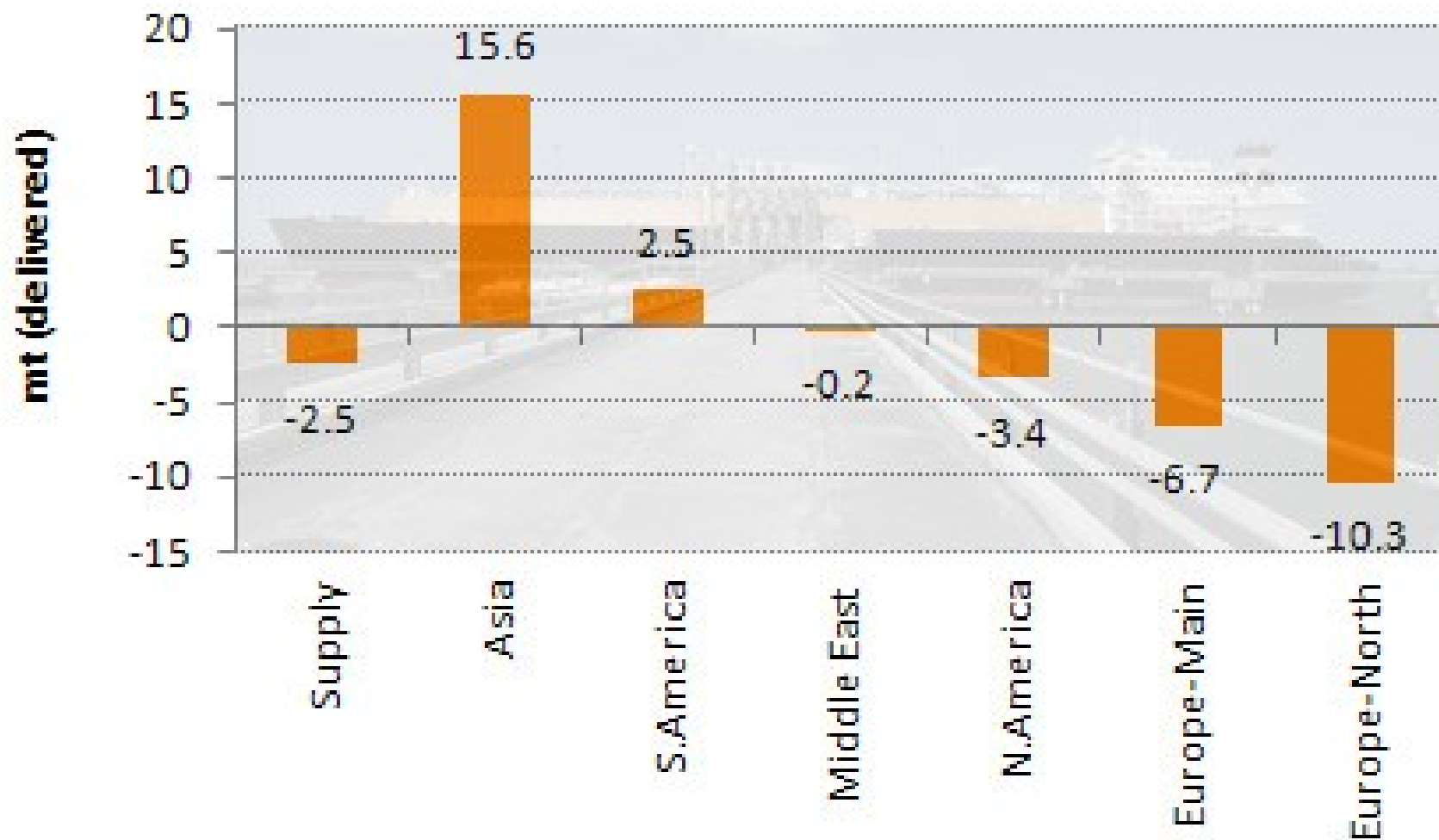


## LNG trade growth, 2006-11



Note: LNG liquefaction capacity at the end of the year.

## Global LNG trade: 2012 vs. 2011



# Vital Signs of the SE European Energy Scene

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- ❑ Energy demand is slowing in the Balkans due to recessionary pressures but continue to grow (but at a slower pace) in Turkey
- ❑ South Stream gas pipeline construction commenced
- ❑ TAP – Nabucco West gas pipeline selection imminent
- ❑ Turkey's bold move to develop nuclear electricity will impact regional electricity market
- ❑ Major refinery upgrades and greenfield plants in Serbia, Bulgaria, Romania, Greece and Turkey help maintain competitive prices for consumer
- ❑ Increased activities in oil and gas exploration in almost all countries
- ❑ Lignite plants slowly being replaced by gas fired CCP
- ❑ RES penetration to slow down following collapse of Feeding Tariffs as recession bites in.
- ❑ However it is anticipated that RES will continue to increase its share in the overall energy mix



# South Corridor Gas Pipelines

- ❖ South Stream
- ❖ Trans – Anadolou
- ❖ ITGI – IGB
- ❖ TAP
- ❖ West Nabucco





# South Stream Pipeline

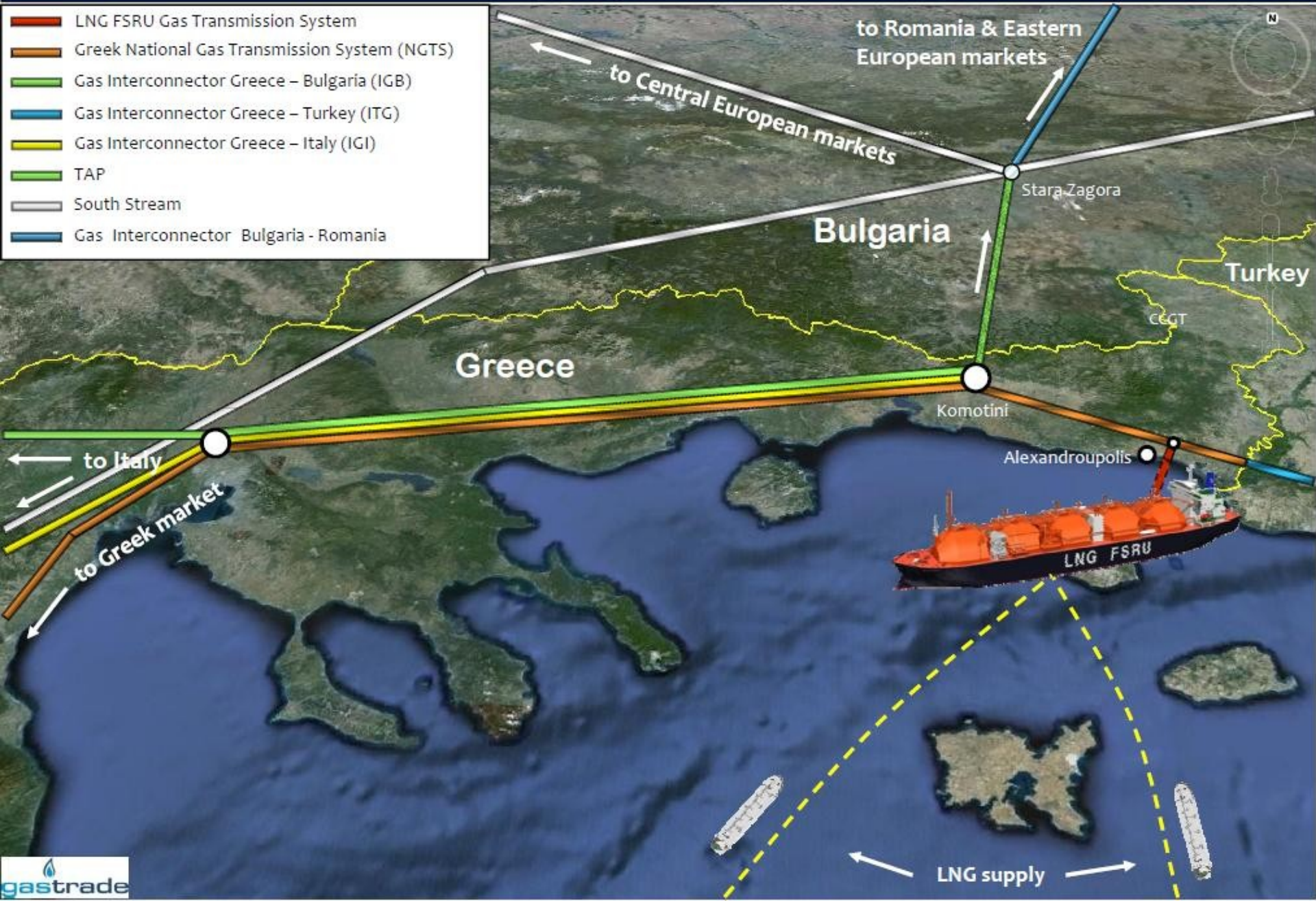


# Nabucco West Vs TAP



# ALEXANDROUPOLIS LNG INGS - A NEW ENERGY GATEWAY TO EUROPE

- LNG FSRU Gas Transmission System
- Greek National Gas Transmission System (NGTS)
- Gas Interconnector Greece – Bulgaria (IGB)
- Gas Interconnector Greece – Turkey (ITG)
- Gas Interconnector Greece – Italy (IGI)
- TAP
- South Stream
- Gas Interconnector Bulgaria - Romania



## SE Europe Capacity Mix 2009,2020

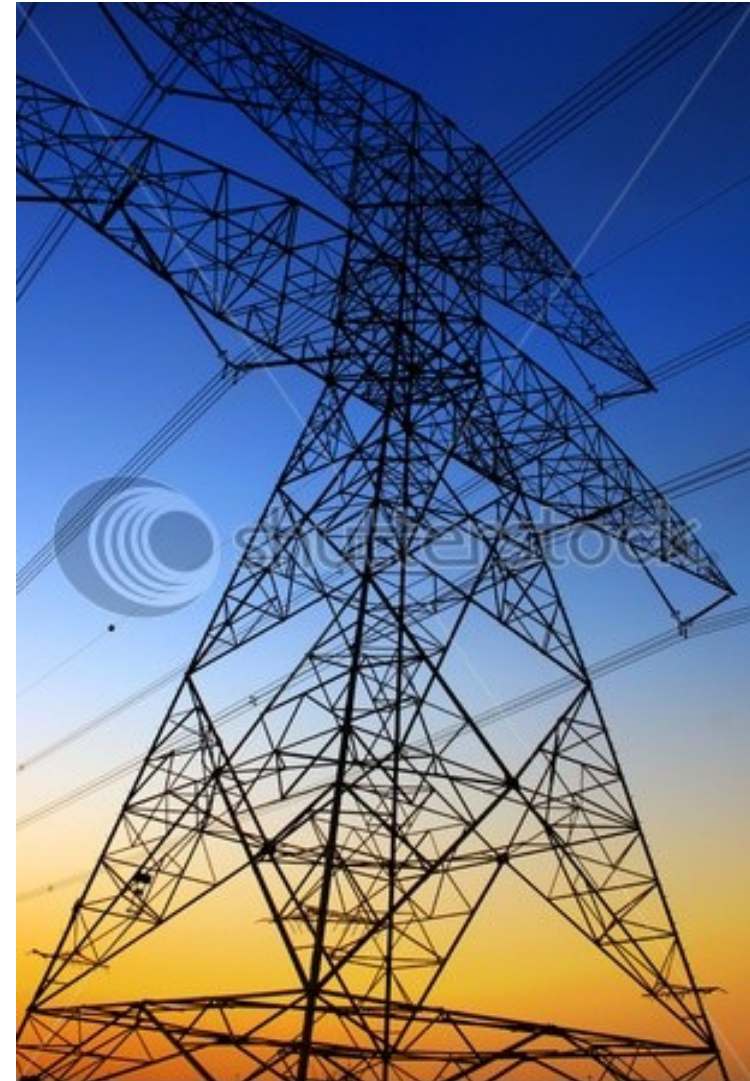
### Installed Capacity in GW

	2009	2020	Additional Capacity (GW)
<b>Oil</b>	5,5	3,3	-2,2
<b>Solid Fuels</b>	39,7	45,8	+6,1
<b>Nuclear</b>	3,5	10,3	+6,8
<b>N. Gas</b>	25,1	32,1	+7,0
<b>Hydro</b>	32,5	37,6	+5,1
<b>RES</b>	4,1	14,5	+11,4
	<b>110,4</b>	<b>143,6</b>	<b>36,4</b>

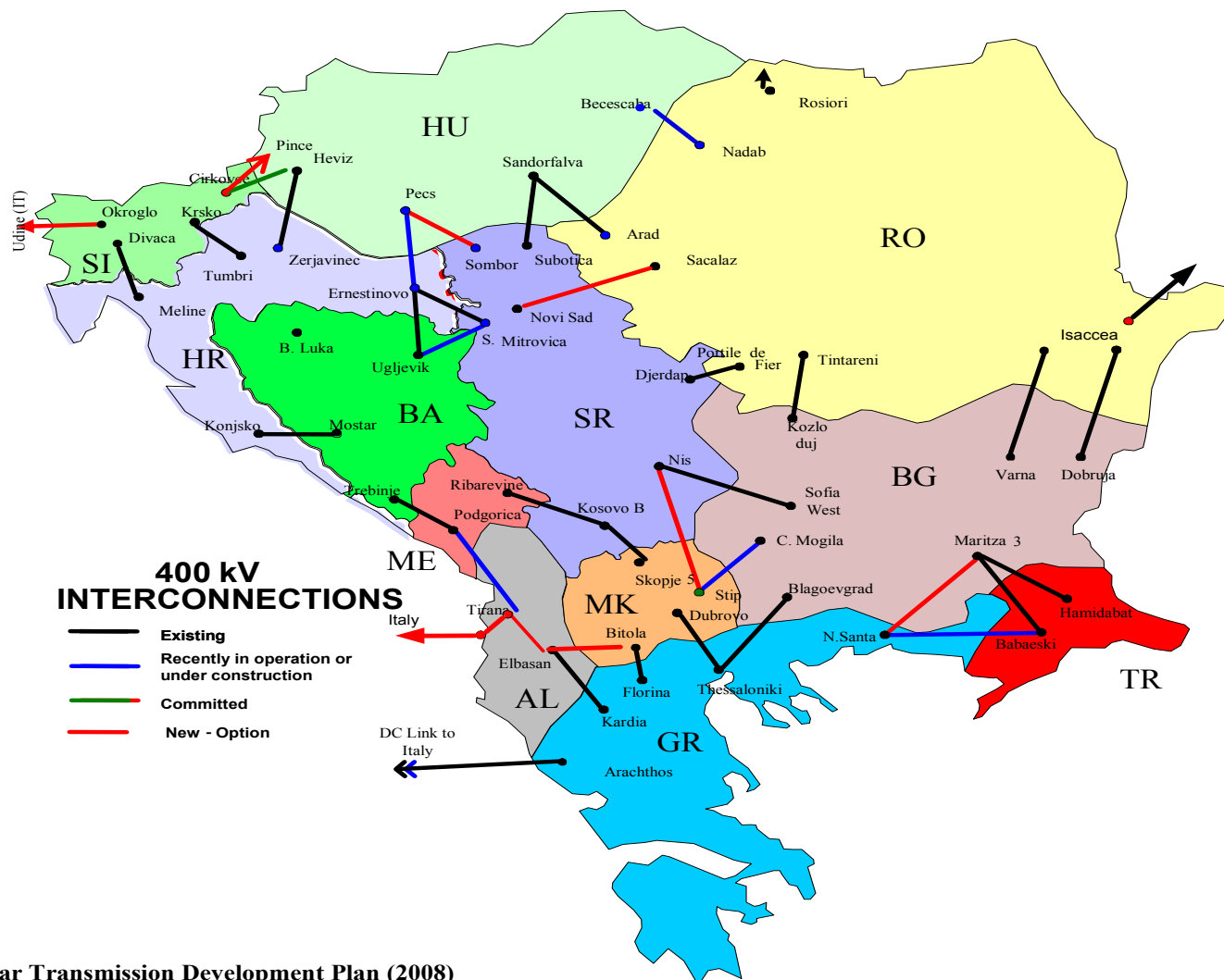


## Substantial new Electricity Infrastructure is Foreseen in SE Europe by 2020 by all 12 Countries of the Region

- ❖ **Anticipated new power generating capacity:**
  - Thermal/ nuclear ~ 27.0 GW
  - Renewables      Low scenario ~ 15.0 GW  
                         High scenario ~ 25.0 GW
  
- ❖ **Anticipated investments in:**
  - Thermal and Nuclear plants, lignite/ coal mine development, electricity grids, HV Transmission lines ~90.0 Billion Euros
  - RES (Solar Thermal, Solar PV, Wind, Biomass, Geothermal, Min Hydro) ~35 – 50 Billion Euros



# Electricity Interconnections



Source:  
UCTE 10 Year Transmission Development Plan (2008)

## Turkey' Nuclear Plans Are Advancing

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- ❑ Sinop station – 5.000 MW by 2023
- ❑ Akkuyu station - 4.800 MW by 2025



## Renewable Energy Sources

- ❑ Steep rise in RES installed capacity over last 3 years
- ❑ Solar PV installed capacity in Greece ~ 2.750 MW and Bulgaria ~ 700 MW (May 2013)
- ❑ Wind in Greece, Bulgaria, Romania, Turkey ~ 6.100 MW total installed capacity (May 2013)
- ❑ Small Hydro – Albania, Montenegro, Croatia, Serbia, Romania, Greece, Turkey, Bosnia – Herzegovina ~1850 MW



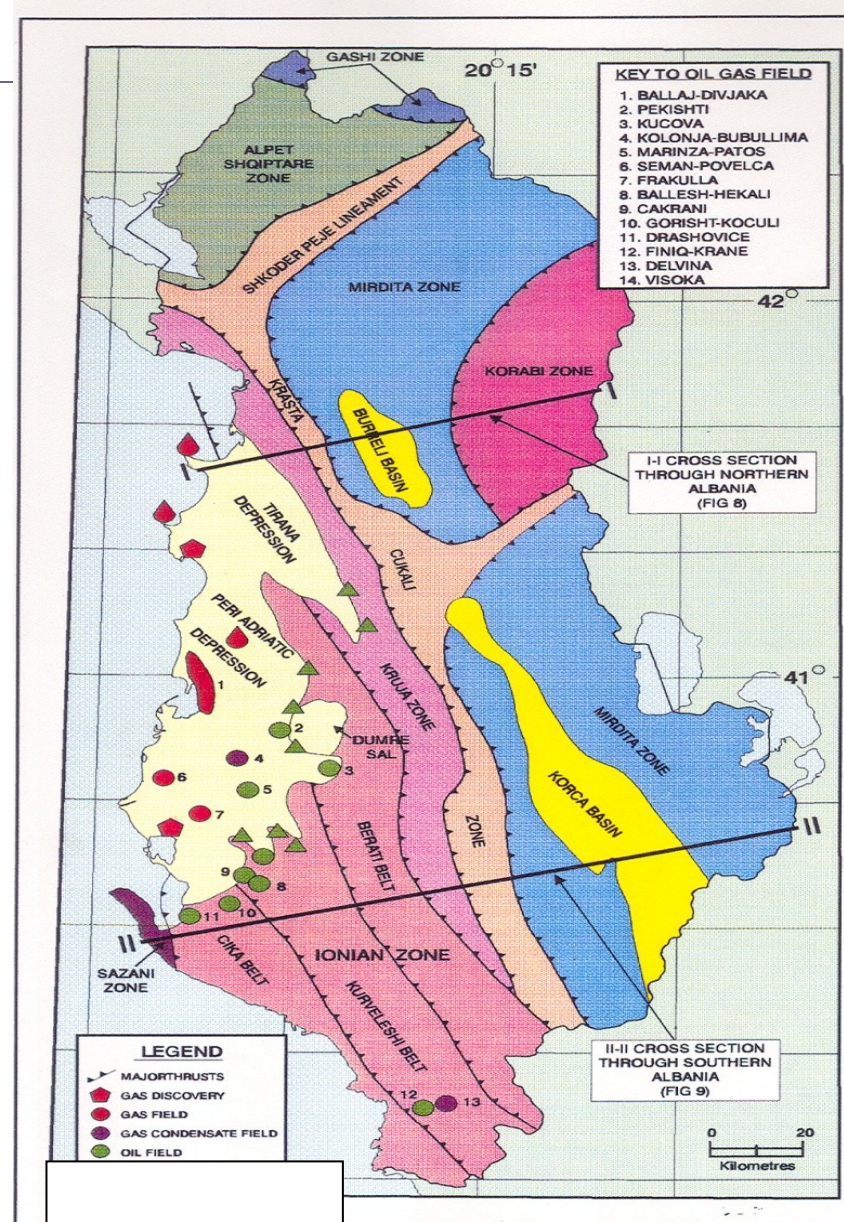


# Upstream Sector – Exploration & Production



# Important Hydrocarbon Developments in Albania

- Investment in oil & gas now averages approx \$ 300 million per year
- Albania currently produces some 35.000 bb/d
- Sharp rise of production over the last 3 years
- More exploration licenses to be announced in 2013/2014



# Cyprus – Israel Natural Gas Deposits

## ■ Major New Natural Gas Discoveries:

- Cyprus, Block 12 ~ 7.0 – 9.0 TCF,  
(gross mean estimated)
- Israel, Tamar deposit ~ 9.0 TCF
- Israel, Dalit deposit ~ 3.0 TCF
- Israel, Leviathan deposit ~ 15.0 TCF
- 2<sup>nd</sup> Cyprus Round successfully completed and 3 new licenses awarded (ENI, Total, Kogas)



## Romania - Black Sea

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- ❑ New major offshore gas finds promise significant production opportunities
- ❑ Ana, Doina and Domino fields are vital for opening up Black Sea exploration in Romania sector
- ❑ Estimates for 600 Bcm offshore natural gas resource base
- ❑ Anticipated capital investment of \$ 30.0 billion over next 15 years

# Ana and Doina Development



Ana and Doina are the next (and currently only) fields to be developed offshore Romania



# Oil & Gas Exploration in Greece is Moving Ahead

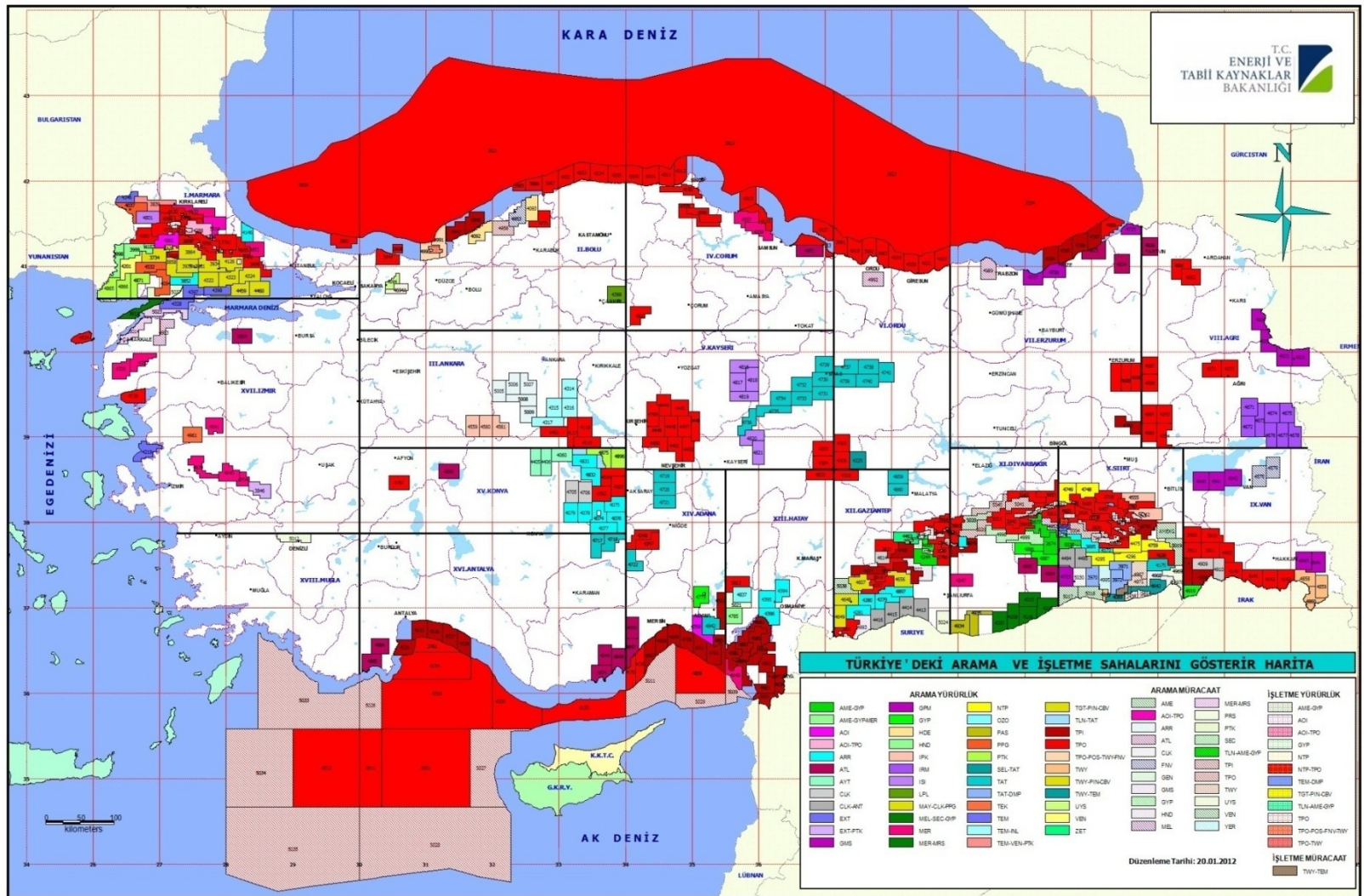
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## **Oil & Gas Upstream**

- Greece currently produces 2.000 bb/d
- However, more than 80% of Greece remains unexplored
- There is a small number of proven oil and gas deposits
- Non exclusive seismic surveys were completed in West Greece and South of Crete (2013)
- Open Door procedure in progress for exploration of 3 deposits in West Greece with exploration licenses to be awarded in 2013.

## MAP SHOWING EXPLORATION AND PRODUCTION LICENCES IN TURKEY



**There Are 43 Companies in Petroleum Industry  
2 of them State Oil Company and its subsidiary**



## Major Oil Refining Projects under Development in SE Europe (2010-2020)

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**While refineries are being shut in North and West Europe new refining capacity, revamping, upgrades and expansion, including addition of new storage capacity, oil terminals and crude/ product pipelines and biofuel plants is taking place in SE Europe**

- Greece, Cyprus, Turkey, Bulgaria and Romania - 19.0 Billion Euros
- Albania, FYROM, Montenegro, Bosnia - Herzegovina, Croatia and Serbia - 4.0 Billion Euros





## “Redefining SE Europe’s Energy Map”

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- A number of significant developments in terms of policy and infrastructure are currently taking place in SE Europe which when completed, by the end of this decade, will have reshaped fully the energy landscape of the region.
- These developments concern both market operation and energy production/ transmission capabilities.
- There appear to be some important policy implications

## Energy Infrastructure (a)

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- The realization of a number of key energy infrastructure projects is of vital importance and will lead to the transformation of the region's energy landscape. These include:
  1. Gas interconnectors (IGI, IGB, Turkey – Bulgaria, Bulgaria – Romania etc)
  2. Extended electricity grid interconnections between all countries of the region
  3. Construction of the Trans – Anadolou gas pipeline
  4. South Corridor Pipelines (South Stream, TAP and/or Nabucco West)
  5. Introduction of nuclear power in Turkey
  6. Large scale exploration of Romanian gas deposits and broader Black Sea hydrocarbon development in the Black Sea.

## Energy Infrastructure (b)

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- 7 Further oil & gas exploration and increase of indigenous oil and gas production by almost all countries of the region
- 8 Addition of significant new and upgraded refining capacity in Greece, Serbia, Turkey and Bulgaria
- 9 Construction of underwater electricity transmission cables (i.e. Israel – Cyprus, Greece, Greece – Italy, Aegean islands – Greek mainland, Turkey – Cyprus)
- 10 Addition of significant new coal/lignite power generation capacity in whole region
- 11 Large scale RES utilization (i.e. PV in Greece, Bulgaria and Romania, Wind in Greece, Romania, Turkey and Hydro in Albania, Montenegro, Croatia etc)
- 12 Large scale energy efficiency programmes to cover public buildings and housing sector will help improve demand side management. Likely to impact energy demand by 2020 (they already do in the case of SWH in Greece & Turkey)

# **Significant Investment and Business Opportunities in SE Europe over the next decade**

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- ✓ Oil and Gas (upstream)
- ✓ Oil (midstream, downstream)
- ✓ Natural Gas (transmission, distribution , storage)
- ✓ Power Generation (Thermal Plants, CCP, Nuclear, Large Hydro)
- ✓ Electricity Transmission and Distribution
- ✓ RES (SWH, Photovoltaic, Wind, Mini-Hydro, Biomass, Geothermal)
- ✓ Energy Efficiency in building sector

## Policy Implications

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- Completion of integrated regional electricity market and increase of cross border trade
- Development of regional gas market where gas price hubs will have a role to play
- Establishment of regional cooperation for oil and gas exploration
- Investment facilitation for both large infrastructure projects and small scale industrial and domestic applications
- Recognition of SE Europe's role of key component of European Energy Policy



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**Thank you for  
your attention**

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