

NEW SUPPLY PROJECTS – KEY PROJECTS FOR DEVELOPMENT OF NATURAL GAS MARKET IN THE REGION

**6th South East Europe Energy Dialogue
Thessaloniki, 30-31 May 2012**

plinacro



**GAS TRANSMISSION SYSTEM OPERATOR
PLINACRO Ltd**

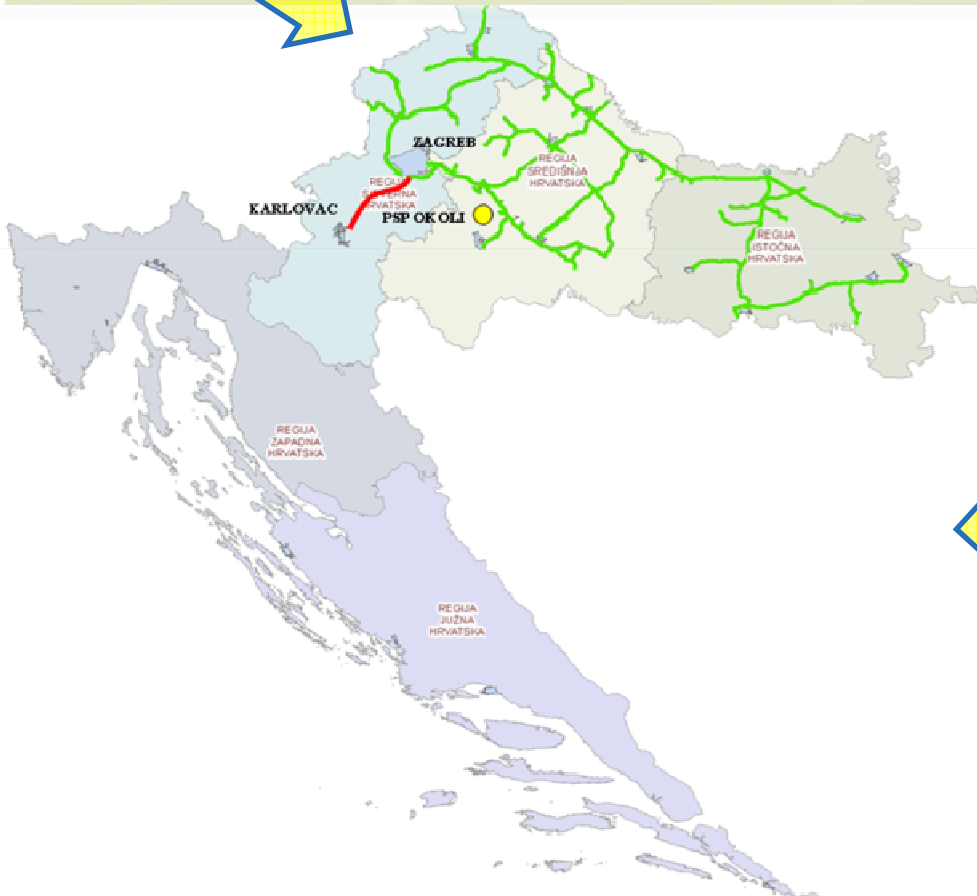
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**GAS STORAGE SYSTEM OPERATOR
PSP Ltd**

DEVELOPMENT OF THE GAS TRANSMISSION SYSTEM IN THE REPUBLIC OF CROATIA

2002.

1.5 bcm



2012.

1.5 bcm

6.5 bcm

1.5 bcm



Technical data - 2002

1,641 km of high-pressure pipelines
 137 MRSs
 Transmission - 2.95 bcm of gas
 max. capacity 560.000 m³/h

Technical data - 2007

2,085 km of high-pressure pipelines
 9 entry points
 151 exit points
 DC - new SCADA, CS system
 Transmission - 3.1 bcm of gas

Technical data - the end of 2011

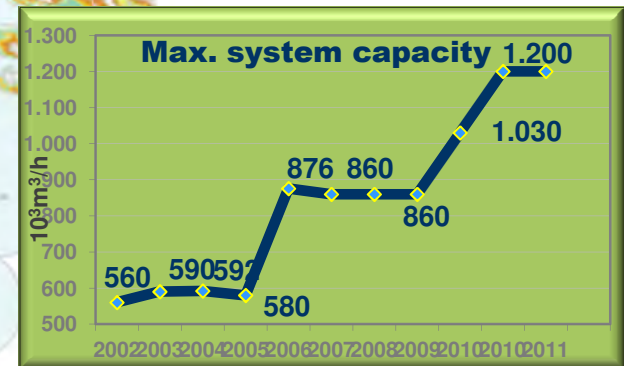
2,643 km of high-pressure pipelines
 10 entry points
 167 exit points
 2 interconnections
 Transmission – 3.4 bcm of gas

Technical data - 2014

2,775 km of high-pressure pipelines
 10 entry points
 172 exit points
 2 interconnections
 Transmission – 4,5 bcm of gas
 max. capacity 1.200.000 m³/h



UGS Okoli
 Working Gas Volume: 558 mil m
 Max. withdrawal rate: 8 .000 m /h
 Injection rate: 160.000 m /h
 Development of new UGS capacity







**BIG DIFFERENCES IN
DEVELOPMENT OF
NATURAL GAS
SECTOR/NATURAL GAS
MARKET AMONG THE
COUNTRIES IN SOUTHEAST
EUROPE**

A map of Europe and Asia with various countries highlighted in different colors (yellow, blue, green, orange) to represent different development levels of natural gas sectors. The text is overlaid on the map.

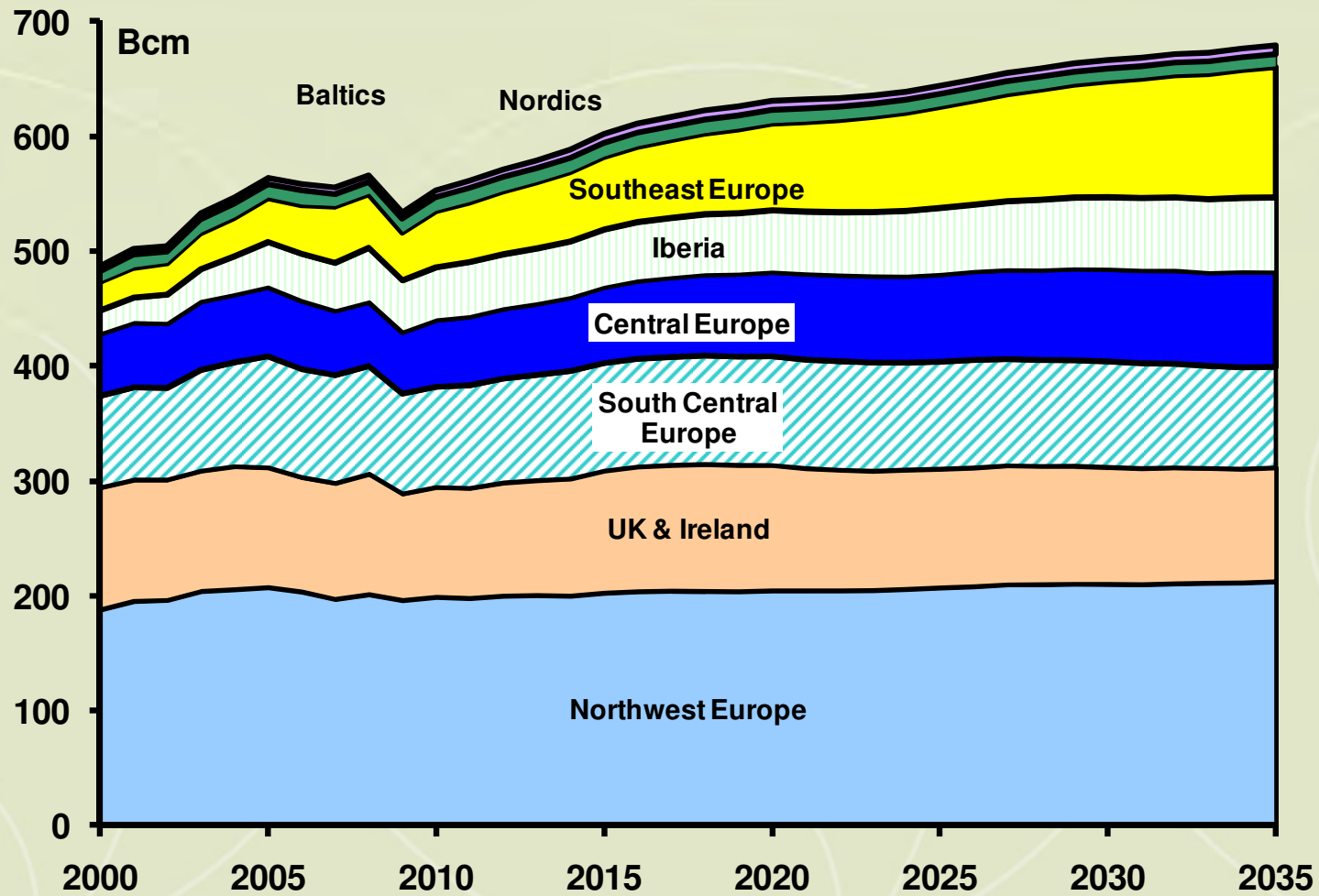
DIFFERENT DEVELOPMENT LEVEL OF NATURAL GAS SECTORS/MARKETS IN SEE COUNTRIES IS A RESULT OF:

- ◆ **POLITICAL DIFFERENCES**
- ◆ **DIFFERENT LEVELS OF ECONOMIC DEVELOPMENT**
- ◆ **NON-EXISTANCE OF OWN NATURAL GAS RESOURCES**
- ◆ **UNAVAILABILITY OF FOREIGN NATURAL GAS RESOURCES CAUSED BY THEIR DISTANCE OR A DISTANCE OF SUPPLY GAS PIPELINES**
- ◆ **AVAILABILITY OF OTHER OWN OR IMPORTED ENERGY RESOURCES**

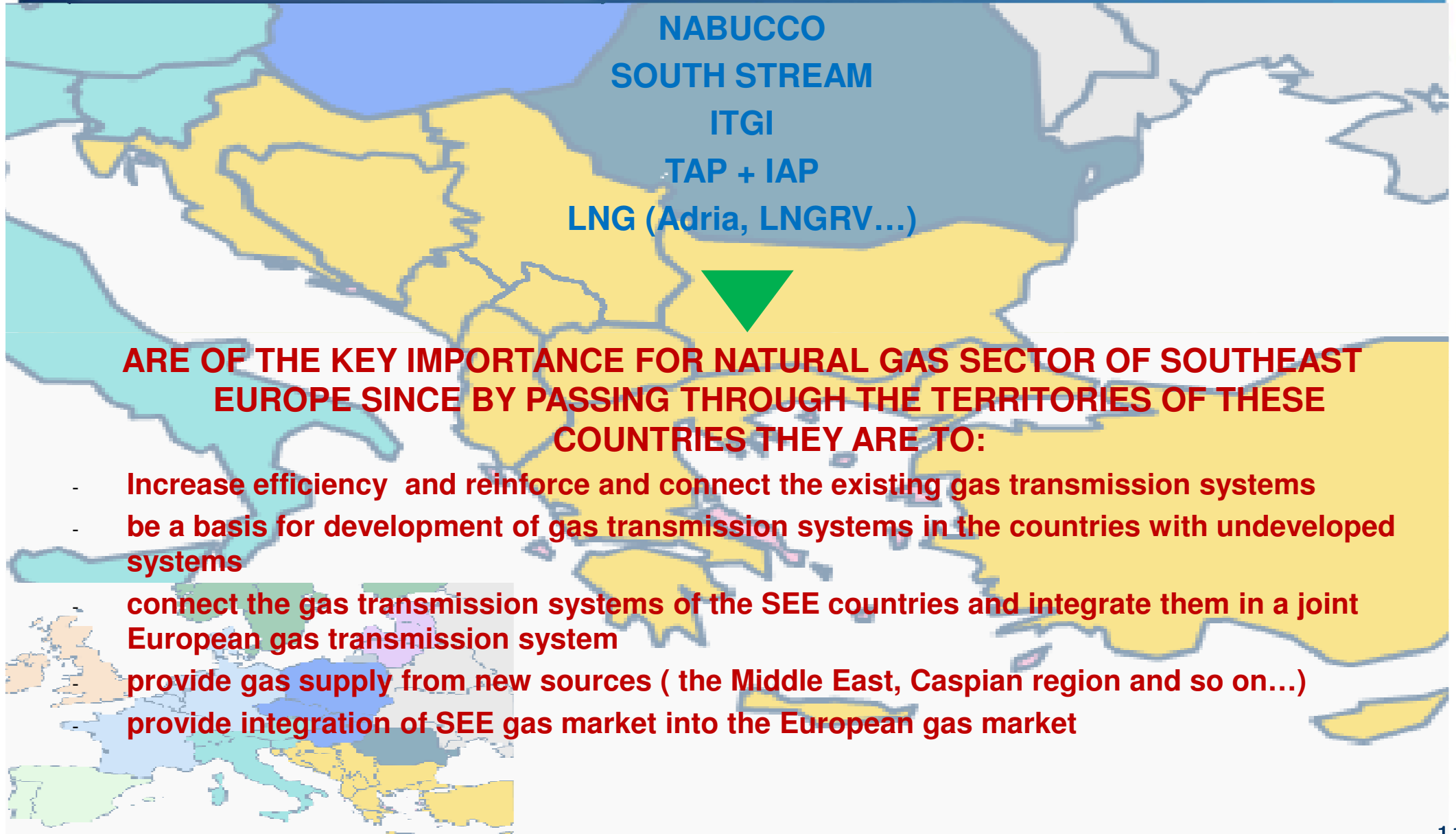
DEVELOPMENT OF NATURAL GAS SECTOR/MARKET



- In some countries (CROATIA, SERBIA and in ALBANIA in one period) based on OWN PRODUCTION and only in a later phase directed towards IMPORT
- Other countries have been focused exclusively on IMPORT (TURKEY, BULGARIA, GREECE, MACEDONIA, BOSNIA AND HERZEGOVINA)
- Natural gas is at the moment unknown term in energy balance sheets of MONTENEGRO AND KOSOVO and a situation in ALBANIA is almost the same







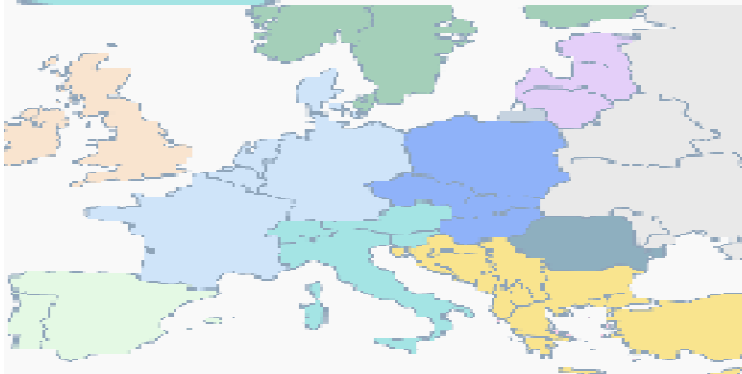
ARE OF THE KEY IMPORTANCE FOR NATURAL GAS SECTOR OF SOUTHEAST EUROPE SINCE BY PASSING THROUGH THE TERRITORIES OF THESE COUNTRIES THEY ARE TO:

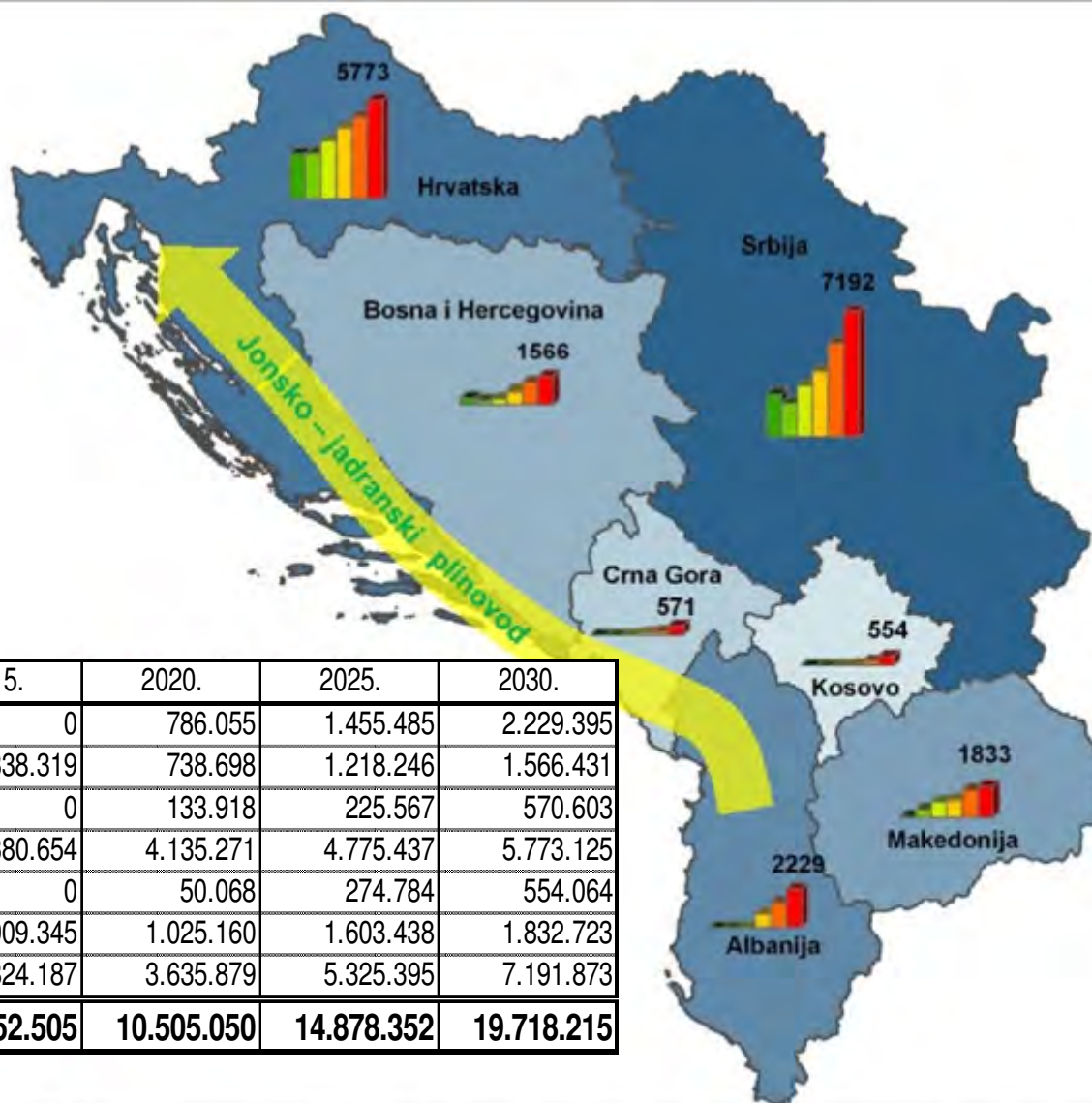
- Increase efficiency and reinforce and connect the existing gas transmission systems
- be a basis for development of gas transmission systems in the countries with undeveloped systems
- connect the gas transmission systems of the SEE countries and integrate them in a joint European gas transmission system
- provide gas supply from new sources (the Middle East, Caspian region and so on...)
- provide integration of SEE gas market into the European gas market

**VICINITY OF NATURAL GAS SOURCES AND ALREADY EXISTING SUPPLY ROUTES
ENHANCED SIGNIFICANTLY DEVELOPMENT OF NATURAL GAS SECTOR IN
TURKEY, GREECE AND BULGARIA**

TURKEY

- **Leader in development of natural gas sector in Southeast Europe**
- **It is becoming a KEY FACTOR of the further development and in a wider European natural gas market**





Country (1000 m3)	2010.	2015.	2020.	2025.	2030.
Albania	0	0	786.055	1.455.485	2.229.395
Bosnia and Herzegovina	242.494	338.319	738.698	1.218.246	1.566.431
Montenegro	0	0	133.918	225.567	570.603
Croatia	3.000.000	3.380.654	4.135.271	4.775.437	5.773.125
Kosovo	0	0	50.068	274.784	554.064
Macedonia	483.677	909.345	1.025.160	1.603.438	1.832.723
Serbia	1.881.141	2.824.187	3.635.879	5.325.395	7.191.873
TOTAL	5.607.312	7.452.505	10.505.050	14.878.352	19.718.215

**SIGNIFICANT POTENTIALS OF NATURAL GAS CONSUMPTION
IN THIS PART OF SOUTHEAST EUROPE**



**SIGNIFICANT SUPPLY-TRANSIT PROJECTS (South Stream, TAP
+ IAP, LNG on the island of Krk)**



**DEVELOPMENT OF NATIONAL GAS SYSTEMS, THEIR MUTAL
CONNECTING AND INTEGRATION IN THE EUROPEAN NATURAL
GAS FLOWS**

Connection of gas transmission system of Lika and Dalmatia with TAP Project (Trans – Adriatic- Pipeline)

MP Split (HR) – Fieri (ALB) DN800 - DN1000 / 75 bar, L= 540 km

Supply with natural gas - Albania, Montenegro, Bosnia and Herzegovina and Croatia

Max capacity: 5 bcm/y

Possibility of transit of natural gas to Central and Western Europe

Possibility of reverse flow

September 2007- Albania, Montenegro and Croatia signed **Ministerial Declaration**.

December 2008 - Bosnia and Herzegovina signed **Ministerial Declaration**.

EGL and Plinacro signed **Memorandum of Understanding**

June 2010 – Interstate Committee established, led by Croatia

February 2011 – Plinacro and TAP signed **Memorandum of Understanding**.

April 2011 – TAP/Plinacro/IAP Joint Working Group established

Request for financing from **WBIF** for **comprehensive feasibility study** for the entire IAP led by Croatia i.e. Plinacro; approved 3,5 Mil EUR

ToR for the Feasibility Study- approved by EC, starting drawing up the Study May2012



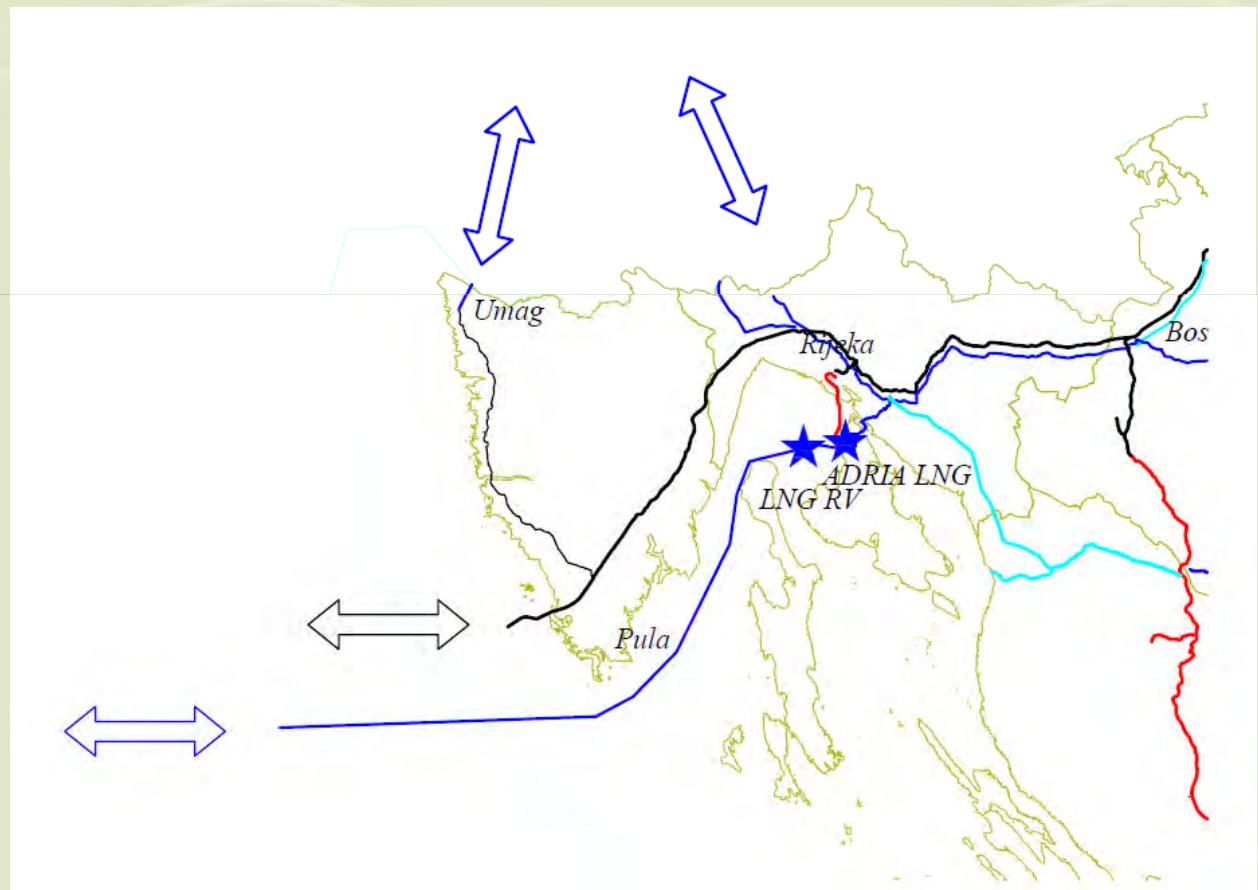
Adria LNG Terminal (10-15 bcm) project has been postponed

- the final investment decision has been postponed and the start of terminal operation has been publicly announced (final investment decision not before 2013, the start of operation not before 2017)
- Considering the present gas market status in the CEE and EU region, this project is too large for the existing market

Our estimates - max 4-6 bcm

LNGRV

- construction of installations for connection of LNG regasification vessel to the gas transmission system
- smaller investment
- shorter construction deadlines
- bridging over the period until a large LNG terminal is put into operation





Drawing up business plan, which comprises:

- together with the selected partner (due to – shortage of financial and professional capacities in Plc)
- Needs to include all future project phases

1st phase: - LNGRV

- Installation for receiving LNGRV
- Capacity: 1-2 bcm/y

2nd phase – FSU- LNG storage – on a vessel

- Onshore Regasification - a part of the future LNG terminal
- Capacity: 2-4 bcm/y

3rd phase: - Construction of LNG terminal

- onshore in compliance with the required capacity
- Capacity: 4-6 bcm/y

Future development of the gas transmission system needs to be harmonized with the phases of LNG development

Request for financing from WBIF feasibility study & Conceptual Design; approved 1 Mil EUR
ToR for the Feasibility Study- approved by EC, starting drawing up the Study - May 2012

Operational since 2013/2014 heating season

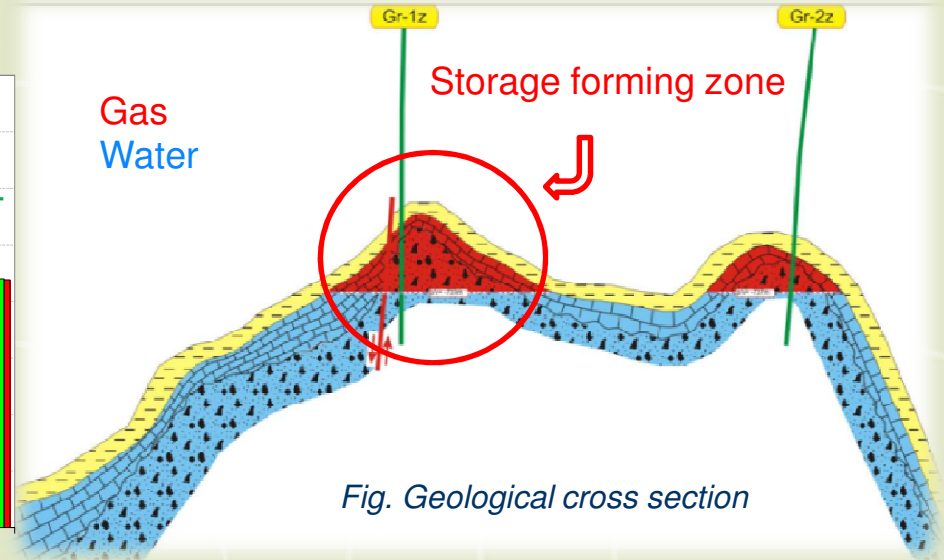
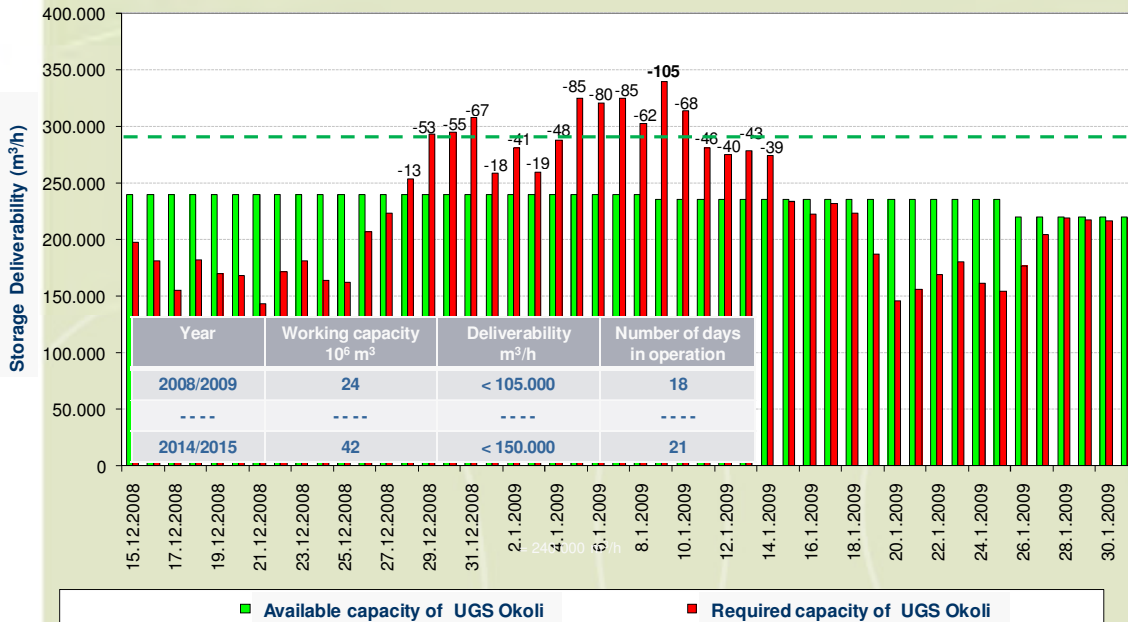


Fig. Geological cross section

Parameters	Value
Operating Reservoir Pressure (bar)	77 - 92
Max. Deliverability (m ³ /h)	100.000
Min. Deliverability (m ³ /h)	70.000
Working Gas Volume (10 ⁶ m ³)	25 +
Withdrawal Period (days)	12-15 +

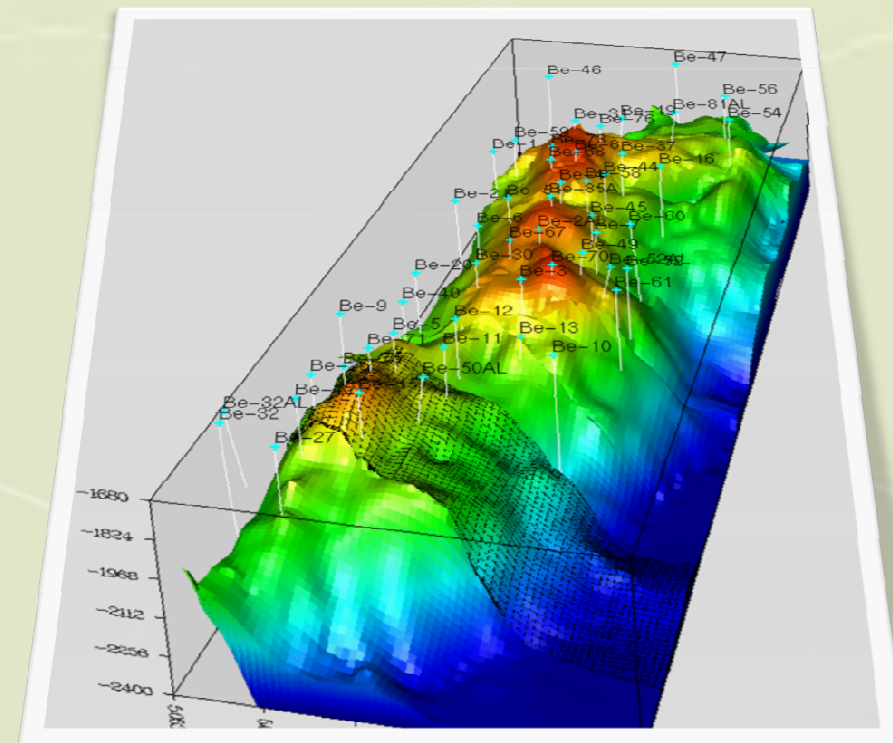
Depth: 800 m
 Permeability: > 100 mD ($k_g \cdot h_{ef} > 3000$ mDm - HDM)
 Res. pressure: 92 bar
 Litology: limestone
 Reservoir fluid: dry gas
 OGIP: 143×10^6 m³

Main properties

Reservoir type	Massive
Reservoir rock	Breccia
Reservoir fluid	Oil
Driving mechanism	Water drive (bottom)
Depth	1 800 m
Init./Actual res. pressure	191 / 169 bar
Flow capacity (k*h)	6 000 mDm
Operat. res. pressure	150 – 191 bar
Max. deliverability	8,2 · 10 ⁶ m ³
Min. deliverability	6,9 · 10 ⁶ m ³
Working volume	510 · 10 ⁶ m ³ (+)
Delivery period	< 75 days
Cushion gas volume	460 · 10 ⁶ m ³
CGV / WV	0,9
Number of wells	8 vertical

Other

Geologically a massive-type reservoir (with closure up to 266 m above initial oil/water contact) enabling forming of a storage with wide range of working volumes; from “small” (50×10⁶ m³) to very large (> 2×10⁹ m³).





THE FACT THAT EACH COUNTRY OF THE SOUTHEAST EUROPE FOCUSES ON SOME PARTICULAR SUPPLY PROJECTS WHICH IT CONSIDERS MOST INTERESTING IS OBVIOUS AND UNDERSTANDABLE



THE BEST EFFECTS OF NATURAL GAS SECTOR AND MARKET DEVELOPMENT CAN BE ACCHIVED THROUGH THE SINERGY OF REGIONAL APPROACH IN PLANNING AND IMPLEMENTATION

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**Thank you for
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