Prospects for the Establishment of Regional Gas Trading Hubs

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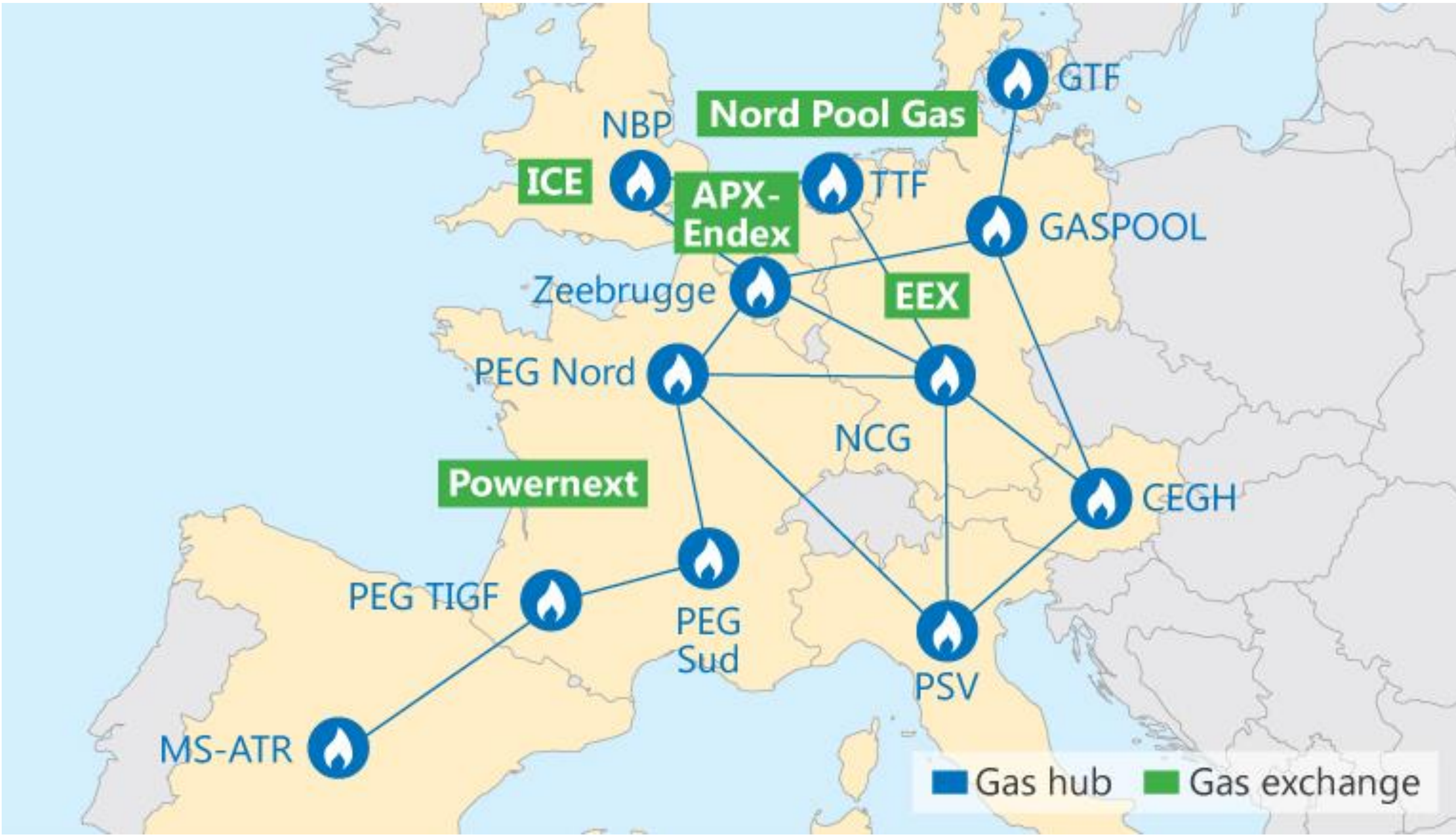
INSTITUTE OF ENERGY
FOR SOUTH EAST EUROPE

European Gas Hubs and Exchanges



Source: Interfax Global Energy

Hub Pricing is Expanding in Europe

GOG: gas-on-gas competition
OPE: oil price escalation

Figure 6.3 Europe Price Formation 2018

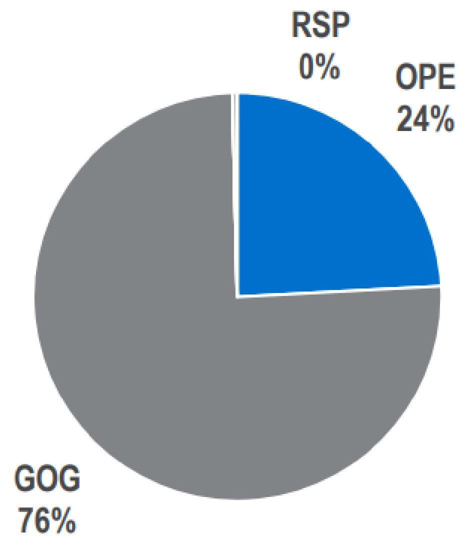
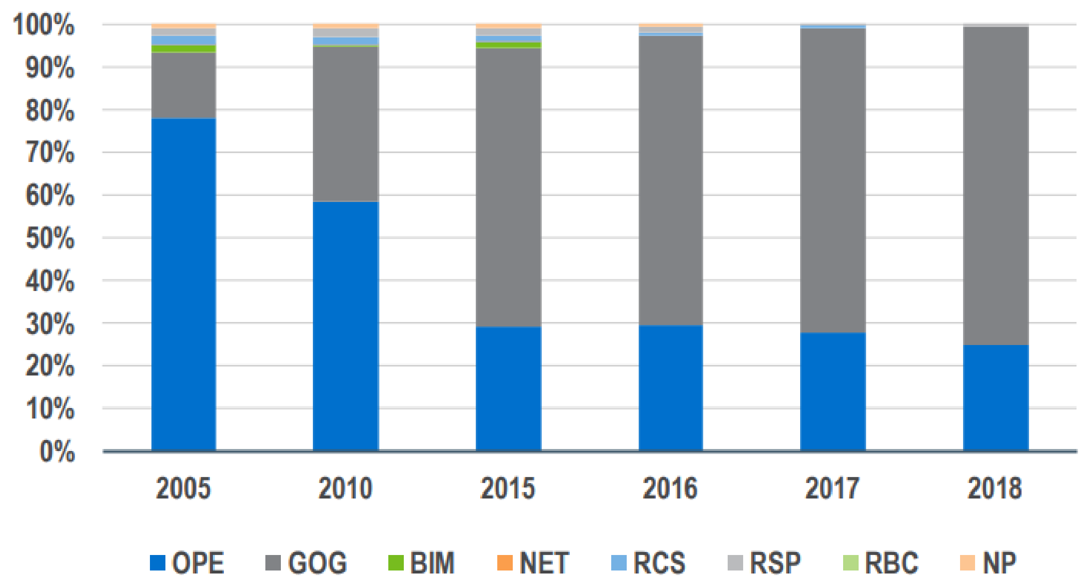


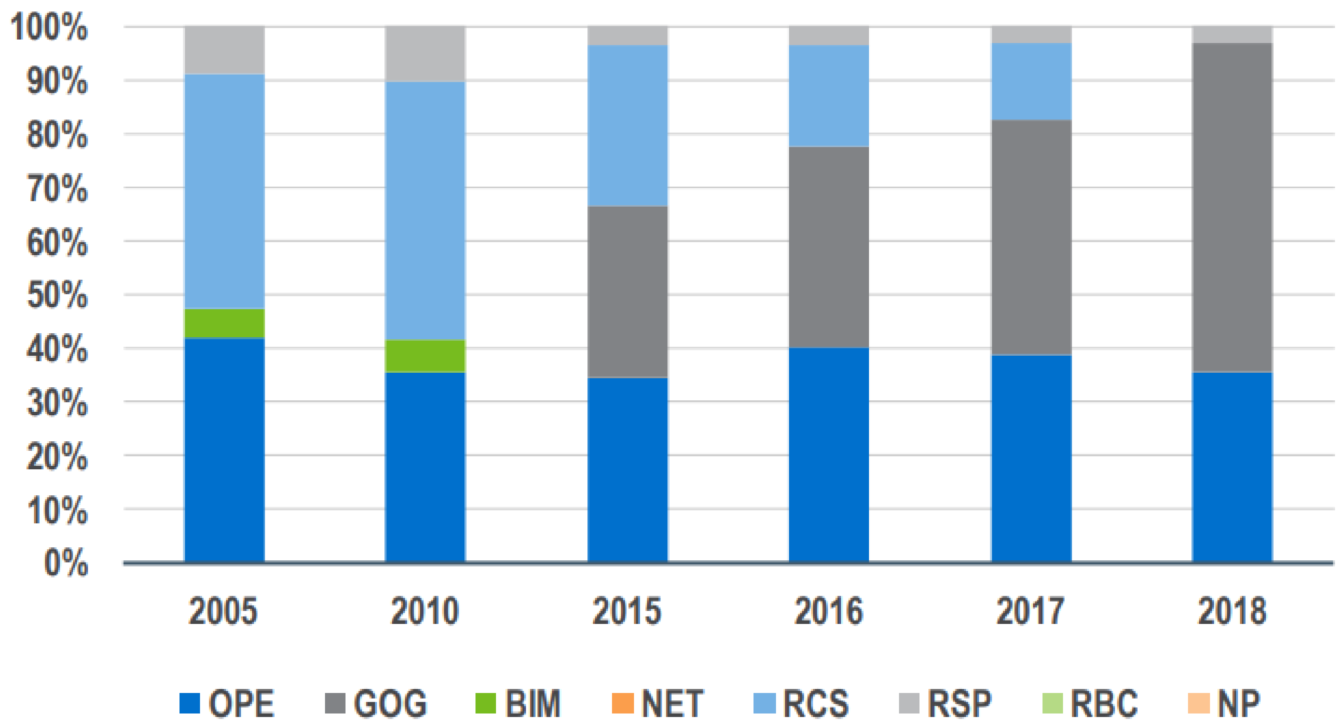
Figure 1.2 Europe Price Formation 2005 to 2018



Source: IGU Wholesale Gas Price Survey 2019

Hub Pricing is also Expanding in SE Europe

Figure 6.8 Southeast Europe Price Formation 2005 to 2018

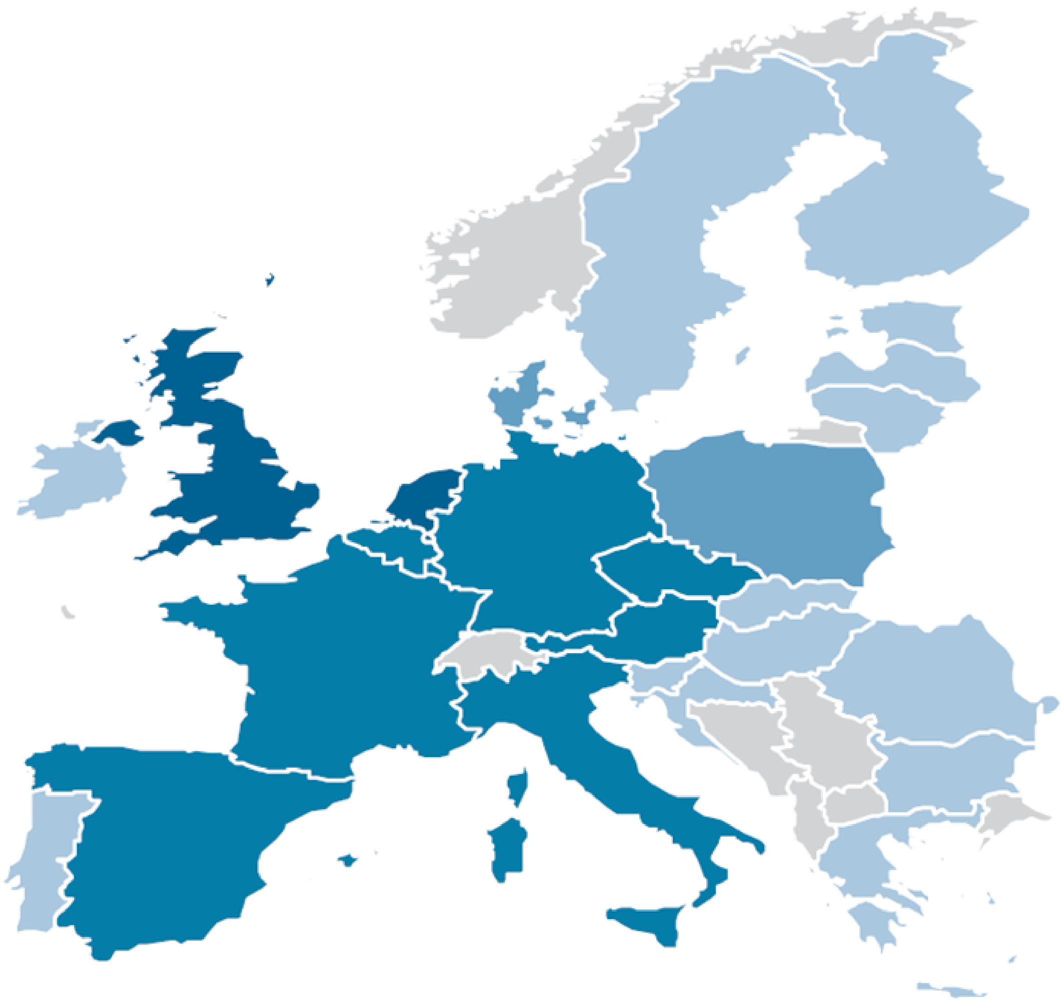


GOG: gas-on-gas competition
OPE: oil price escalation

Southeast Europe, as defined by IGU, includes Bosnia, Bulgaria, Croatia, North Macedonia, Romania, Serbia and Slovenia

Source: IGU Wholesale Gas Price Survey 2019

Where Does SE Europe Stand Today?



Established hubs
- Broad liquidity
- Sizeable forward markets which contribute to supply hedging
- Price reference for other EU hubs and for long-term contracts indexation

Advanced hubs
- High liquidity
- More reliant comparatively on spot products
- Progress on supply hedging role but relatively lower liquidity levels of longer-term products

Emerging hubs
- Improving liquidity from a lower base taking advantage of enhanced interconnectivity and regulatory interventions
- High reliance on long-term contracts and bilateral deals

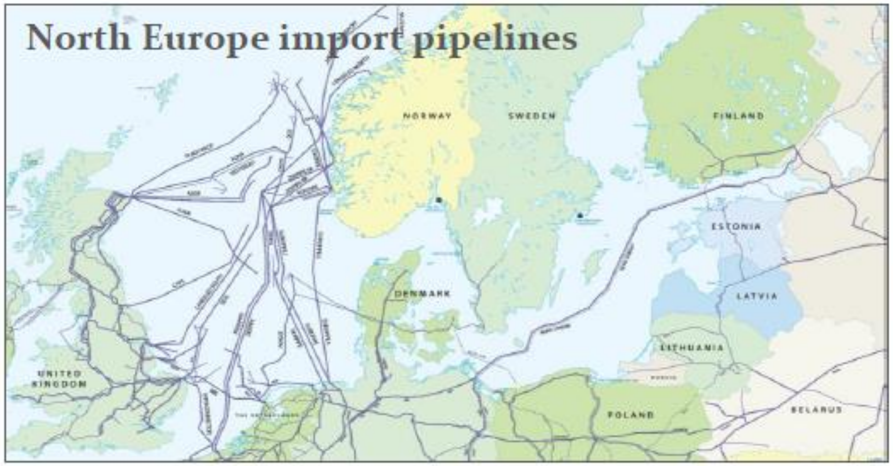
Iliquid-incipient hubs
- Embryonic liquidity at a low level and mainly focused on spot
- Core reliance on long-term contracts and bilateral deals
- Diverse group with some jurisdictions having
  - organised markets in early stage
  - to develop entry-exit systems

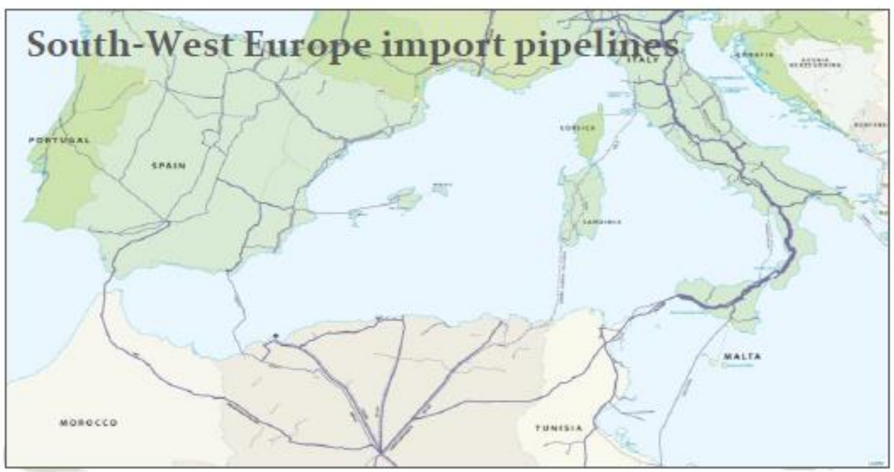
Source: ACER Market Monitoring Report 2018

What is a Successful Gas Trading Hub?

Source: CEGH

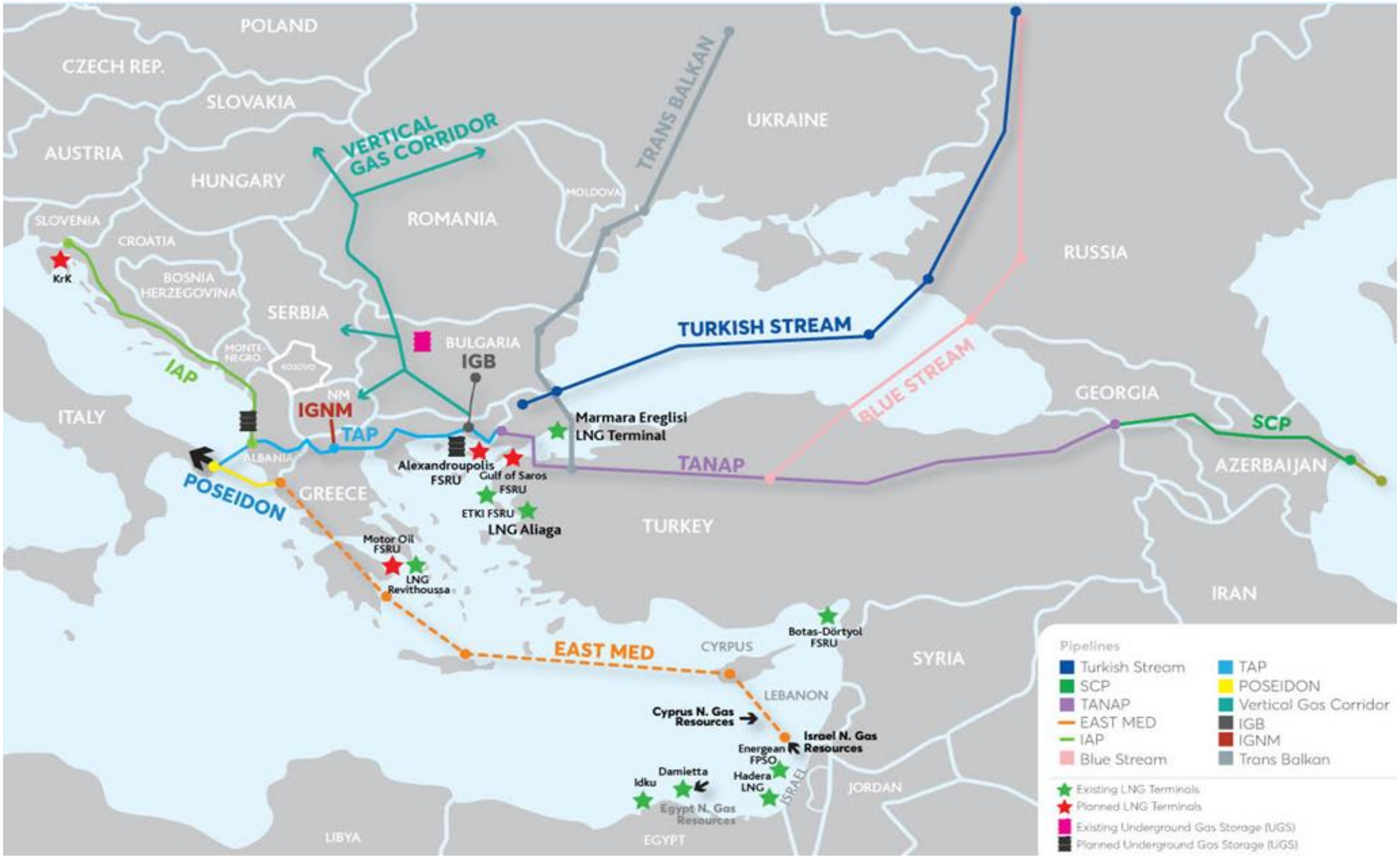
European Gas Network: SEE EU Needs Additional Import Routes





Source: DEPA

The Expanded Southern Gas Corridor



NB.: The TANAP has been completed, while TAP, Turkish Stream and IGB are under construction. The IAP, the IGI Poseidon in connection with East Med pipeline and the Vertical Corridor and the IGF are still in the study phase. Blue Stream and Trans Balkan are existing pipelines.

Source: IENE

Major Gas Pipeline Projects Under Construction in SE Europe

Project	Shareholders	Length	Cost	Capacity
TAP	BP (20%), SOCAR (20%), Snam S.p.A (20%), Fluxys (19%), Enagás (16%) and Axpo (5%)	878 km	€4.5 billion	10.0-20.0 bcm/y
IGB	BEH (50%), IGI Poseidon (50%)	182 km	€220 million	3.0-5.0 bcm/y
Turkish Stream	Gazprom, BOTAS	1,100 km	€11.4 billion	31.5 bcm/y*
Bulgaria-Romania-Hungary-Austria (BRUA)	Bulgartransgaz, Transgaz, FGSZ, Eustream, GCA	500 km	€500 million	6 bcm/y

This amount corresponds to the first two strings of the pipeline with an additional 31.5 bcm foreseen when strings 3 and 4 will be constructed and become operational.

Source: IENE and involved energy companies

Overview of Underground Gas Storage Facilities in SE Europe (2018)

	Number of UGS Facilities	Working gas capacity (bcm)	Max. withdrawal rate (mcm/d)
In Operation			
Bulgaria	1	0.6	4
Croatia	1	0.6	7
Romania	8	3.1	32
Serbia	1	0.5	5
Turkey	2	3.4	45
Total	**13**	**8.2**	**93**
Under Construction			
Serbia	1	0.3	5
Turkey	3	6.5	110
Total	**4**	**6.8**	**115**
Planned			
Bulgaria	1	0.5	4.6
Croatia	1	-	2.4
Greece	1	0.4	4.0
Romania	4	1.2	9.3
Turkey	3	5.5	57.6
Total	**10**	**7.6**	**77.9**
Potential			
Albania	2	1.3	6.5
Bosnia and Herzegovina	1	0.1	1.9
Turkey	1	1.0	16.1
Total	**4**	**2.4**	**24.5**

Source: CEDIGAZ

LNG Terminals in SE Europe

Source: IENE

Poseidon Med II LNG Bunkering Project

Source: DEPA

Anticipated Gas Volumes Through Greece (2021-2030)

- Through **TAP** ⟹ **10.0 bcm (2021)** (i.e. 1.0 bcm to Greece, 1.0 bcm to Bulgaria and 8.0 bcm to Italy), while **20.0 bcm (2030)** (i.e. 2.5 bcm to Greece, 1.5 bcm to Bulgaria and 16.0 to Italy)
- Through **IGB** ⟹ **1.0 bcm (2021)** and **4.0 bcm (2030)**
- Through **IGNM** ⟹ **1.0 bcm (2023)** and **1.5 bcm (2030)**
- Through the **Revithousa LNG Terminal** ⟹ **1.5 bcm (2020)** growing to **3.0 bcm (2030)**
- Through **Alexandroupolis FSRU** ⟹ **1.0 bcm (2022)** growing to **4.0 bcm (2030)**
- Through **East Med** ⟹ **0.0 bcm (2020)** with the prospect of **10.0 bcm (2030)**

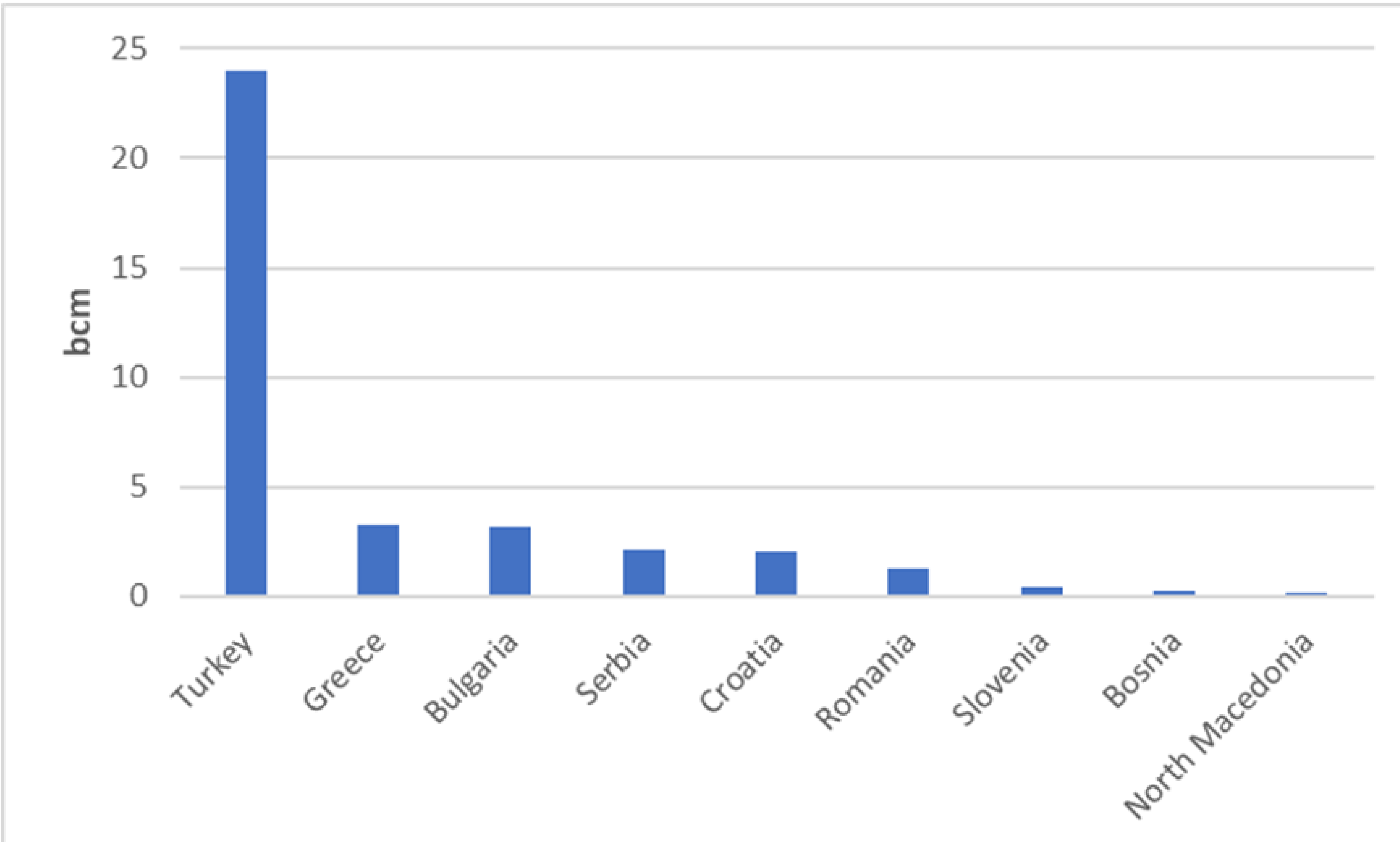
- Based on the above, it is estimated that in the first phase (2021), **12.0-13.0 bcm** of additional gas volumes will be directed through Greece to various destinations, corresponding to 2.6% of European gas demand (excluding Turkey), while in 2030 these quantities may have reached **30.0 bcm**, which will correspond to approx. 6.4% of European gas demand.

Gas Production and Consumption (bcm) in SE Europe (2008, 2018 and 2025)

Country	2008		2018		2025	
	Gas production (bcm/y)	Gas consumption (bcm/y)	Gas production (bcm/y)	Gas consumption (bcm/y)	Gas production (bcm/y)	Gas consumption (bcm/y)
Albania	0.02	0.02	0.1	0.09	0.01	0.22
Bosnia and Herzegovina	0.0	0.31	0.0	0.24	0.0	0.45
Bulgaria	0.31	3.5	0.01	3.04	0.21	4.3
Croatia	2.03	3.1	1.28	2.84	1.52	3.3
Cyprus	0.0	0.0	0.0	0.0	0.0	0.0
North Macedonia	0.0	0.05	0.0	0.18	0.0	0.6
Greece	0.0	4.25	0.1	4.87	0.0	6.0
Kosovo	0.0	0.0	0.0	0.0	0.0	0.0
Montenegro	0.0	0.0	0.0	0.0	0.0	0.0
Romania	11.2	16.9	10.26	11.97	10.02	14.1
Serbia	0.25	1.92	0.45	2.93	0.51	2.8
Slovenia	0.0	0.51	0.0	0.8	0.0	1.07
Turkey	1.03	36.9	0.51	49.64	0.73	56.0
Total	**14.84**	**67.46**	**12.71**	**76.60**	**13.00**	**88.84**

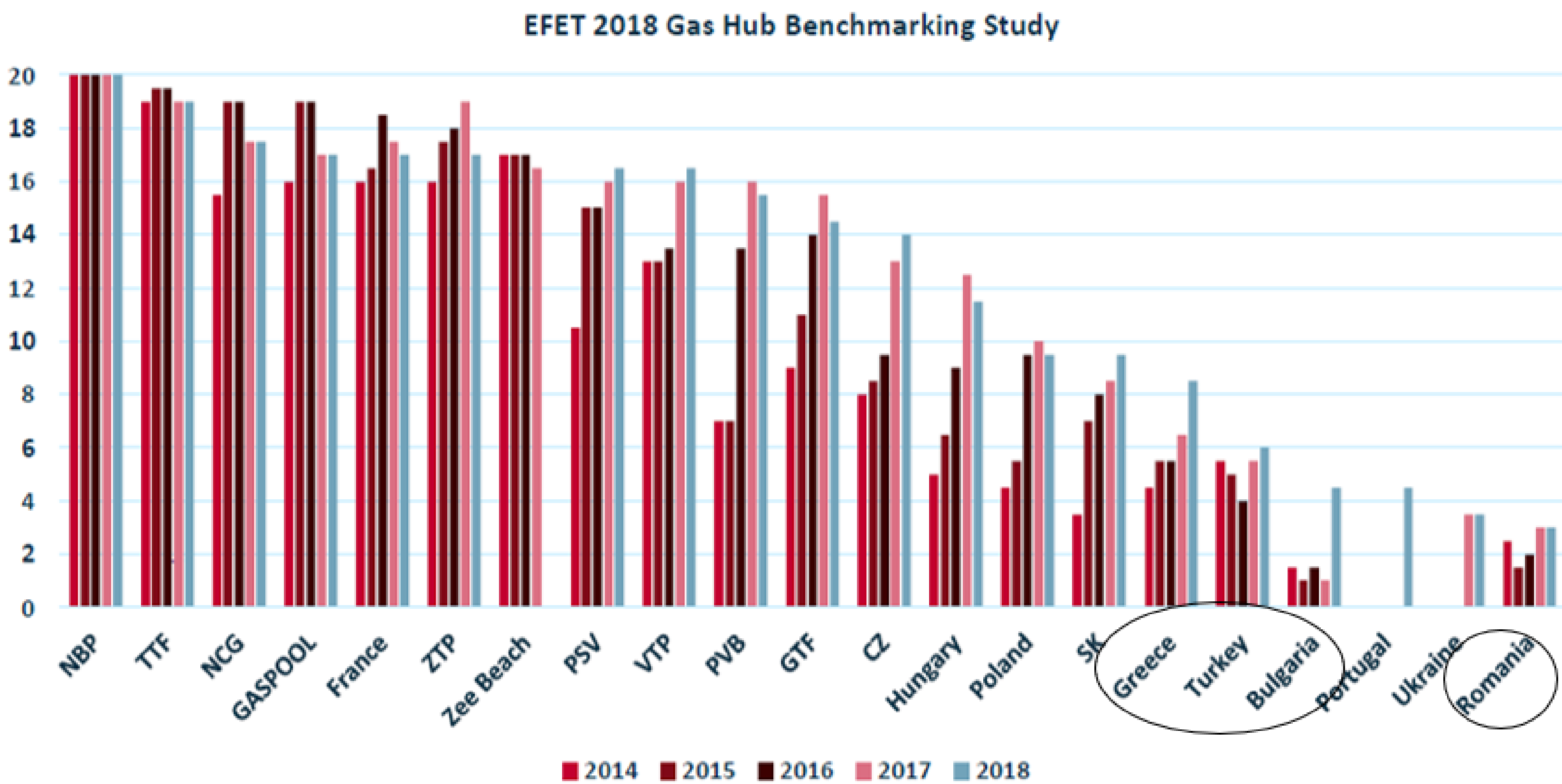
Sources: European Commission, IENE

Russia's Gas Supplies to Selected SEE Countries (bcm), 2018



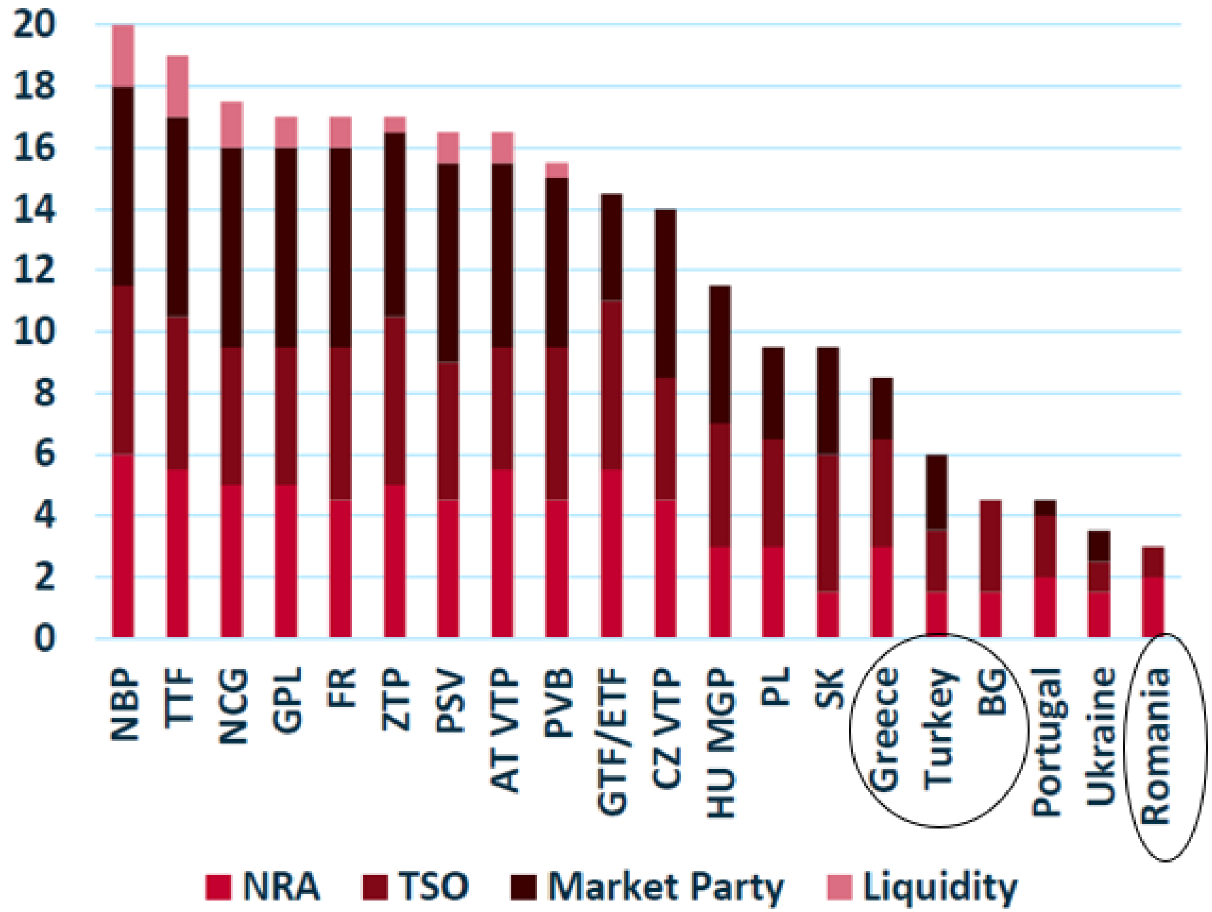
Source: Gazprom Export

Annual Scorecard 2018 Update



Source: EFET

Total Hub Scores 2018



Source: EFET

European Gas Trading Hubs in 2018

NBP
National Balancing Point; Great Britain; 1996

ZEE/ZTP
Zeebrugge Hub / Zeebrugge Trading Point; Belgium; 2000/2012

TTF
Title Transfer Facility; Netherlands; 2003

PSV
Punto di Scambio Virtuale; Italy; 2003

PEG (N,S,T) / TRS / TRF
Points d'Echange de Gaz (Nord, Ouest, Est, Sud, TIGF) ; France: 2004
PEG Nord (merger of PEGs N,O,E); France: 2009
Trading Region South (covering PEG Sud and TIGF); France: 2015
Trading Region France (covering PEG Nord, Sud and TIGF); France: 2018

AOC / PVB
Almacenamiento Operativo Comercial / Punto Virtual de Balance; Spain; 2004/2015

GTF / ETF
GasTransfer Facility / Electronic Transfer Facility; Denmark; 2004

CEGH / VTP
Central European Gas Hub / Virtual Trading Point; Austria; 2005/2013

GPL
Gaspool; Germany; 2009

NCG
NetConnect Germany; Germany; 2009

MGP
Magyar Gázkiegyenlítési Ponton; Hungary; 2010

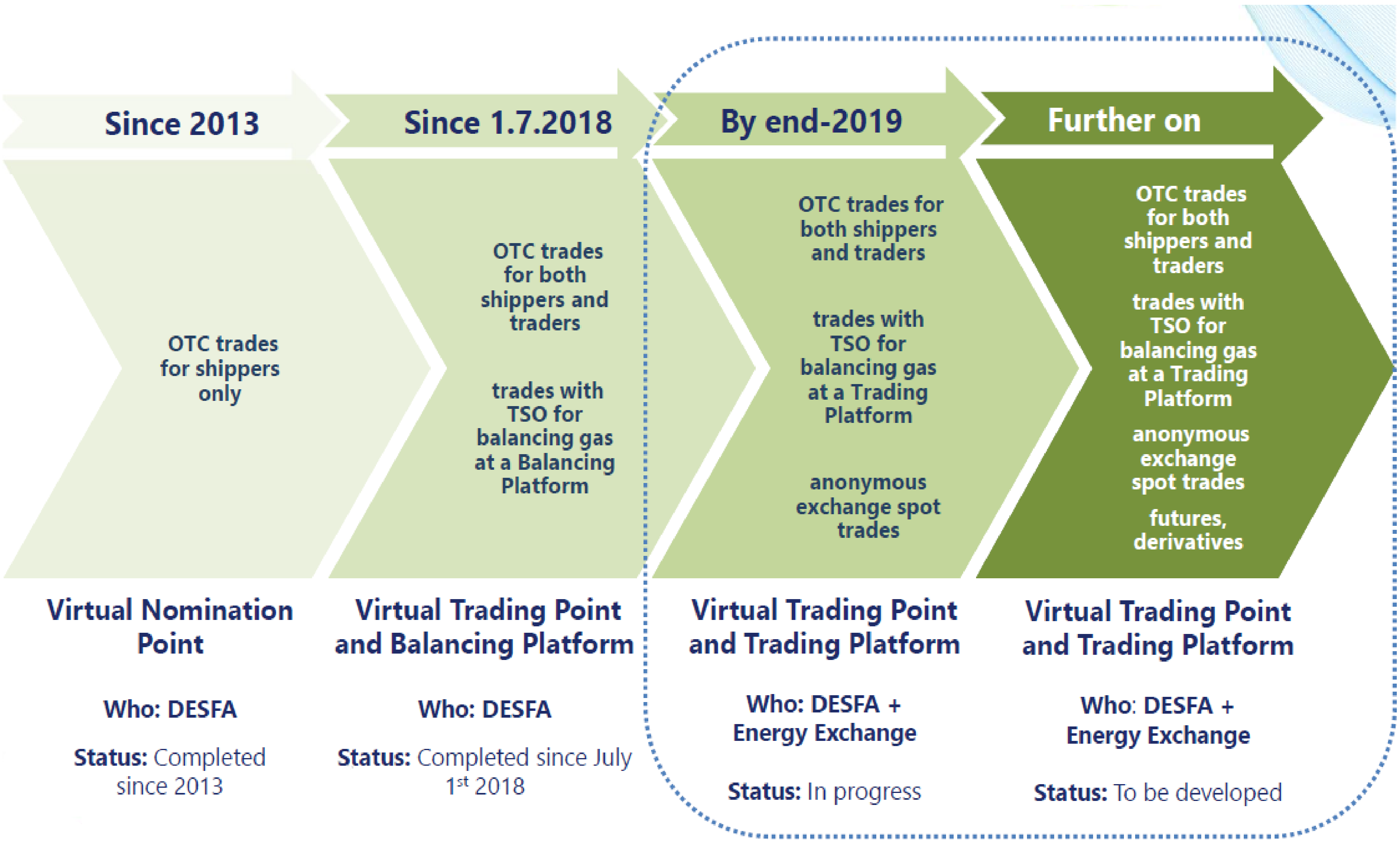
VOB
Virtuální Obchodní Bod; Czech Republic; 2011

VPGS
Virtual Point Gaz-System; Poland; 2014

SK (VOB)
Slovenskom Virtuálnom Obchodnom Bode; SK; 2016

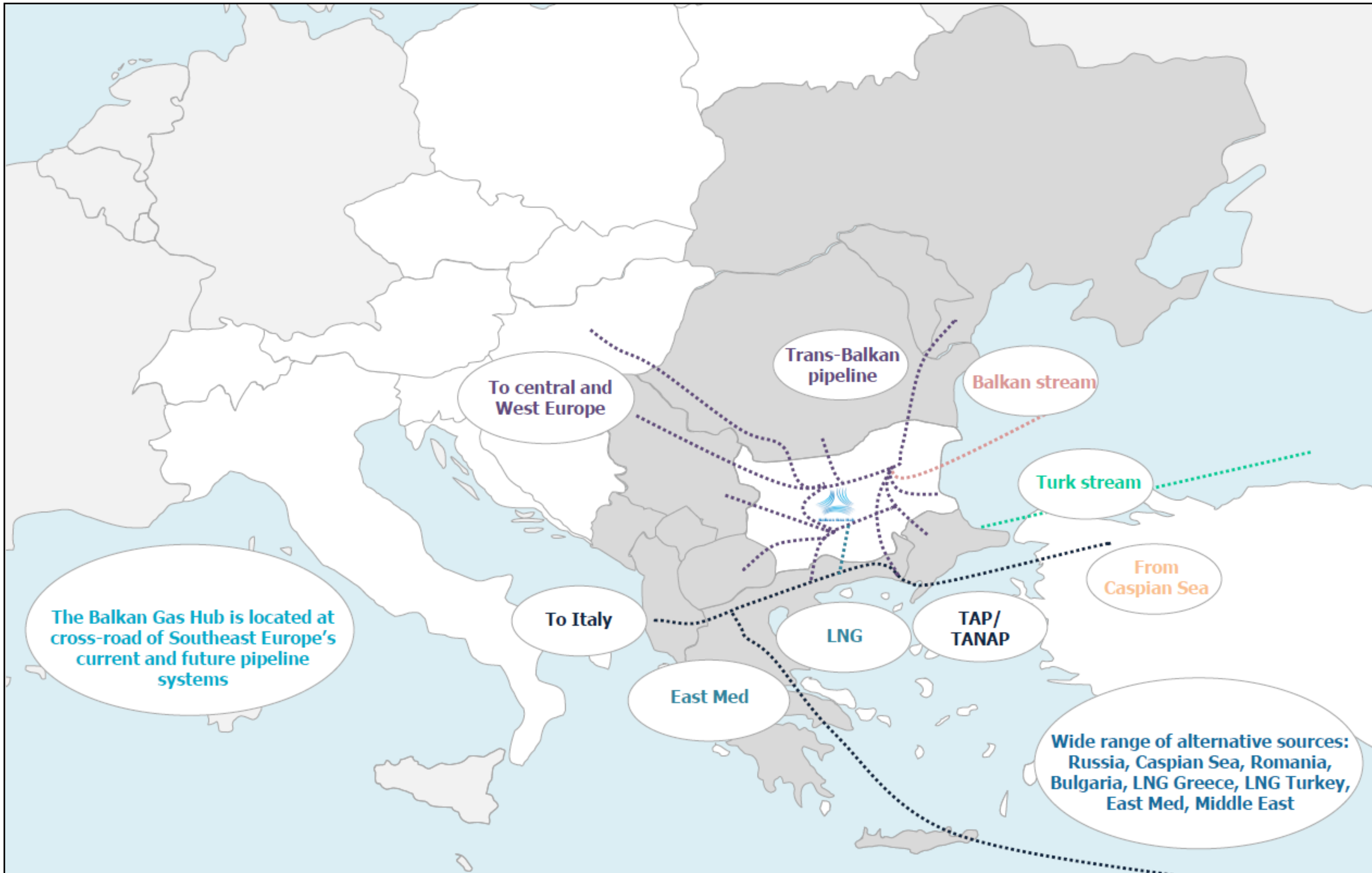
Source: Heather, P. (2019), "A Hub for Europe: The Iberian promise?", OIES, March 2019

Proposed Road Map for the Development of a Natural Gas Hub Based in Greece



Source: DESFA

The Balkan Gas Hub, as Envisaged by Bulgaria

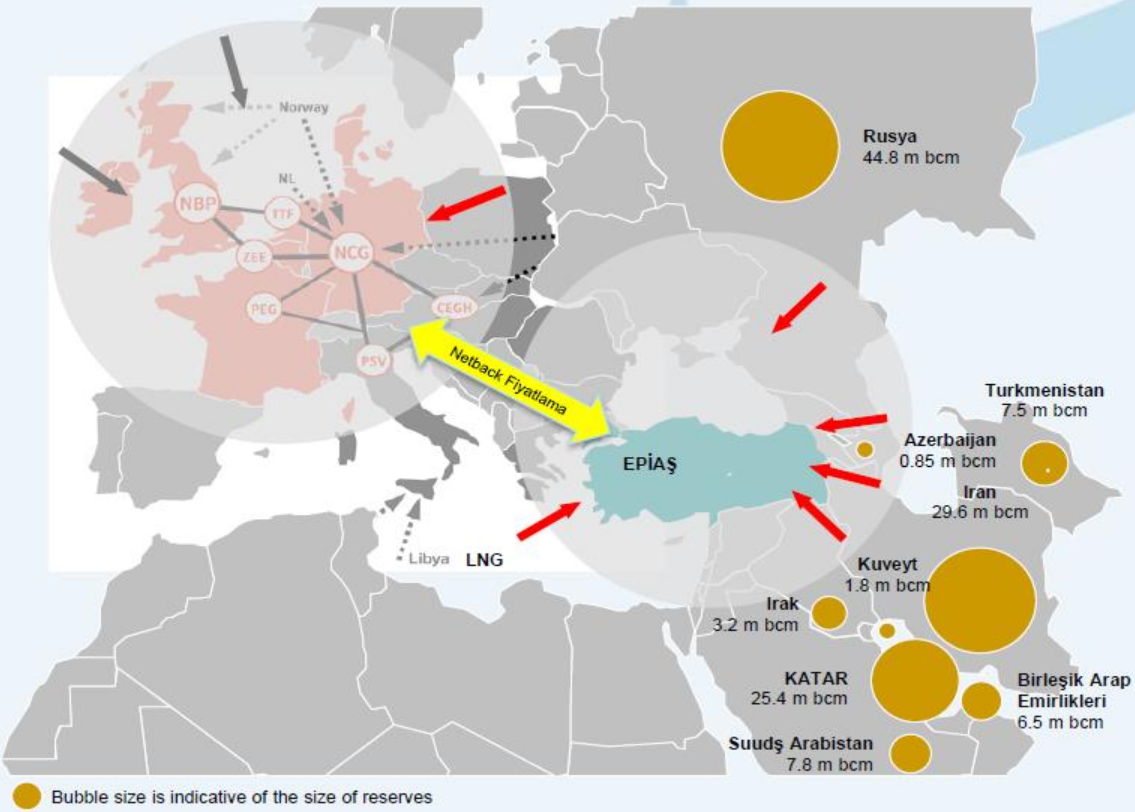


Source: Schneider, M. (2018)

The Gas Hub of Romania

Source: OIES Energy Insight

Integration of Turkey with European Hubs



- 8 major European trading hubs
- Trading on OTC's via brokers
- Trading on Energy Exchanges

After Turkey completes structural reforms, its gas market will be integrated with EU trading hubs and establish a regional gas reference price

Source: PETFORM

The Creation of a Natural Gas Hub Based in Turkey

- After the successful completion of a five-month testing phase, starting on April 1, 2018, the spot gas trading system in Turkey officially went online.
- On July 27, 2018, EPİAŞ began to publish gas transmission data through its online transparency platform. It also started to share transport nomination, virtual trade, capacity, reserve, actualization and stock amounts, on a daily basis.
- **EPİAŞ launched its spot gas trading system on the energy stock exchange in early September 2018.**

Source: EPİAŞ

Emerging Gas Trading Hubs in SE Europe

- Each country in SE Europe is planning to become a regional gas trading hub. Based on the aforementioned EFET Annual Scorecard 2018, **Greece, Turkey, Bulgaria and Romania are set in a course of developing gas trading activity.**

- **Some of the above countries will be able to launch fully-fledged gas trading hubs by 2021-2022.**

- In SE Europe, there are also **other countries** that have already expressed interest for the establishment of a gas trading hub (e.g. Croatia and Slovenia).

- It is not yet clear which of the above countries will come to play **a dominant role** in the region so as to be soon recognized as a regional gas hub. Greece and Turkey appear to be frontrunners at this stage.

New IENE Study on Gas Trading Hubs in SE Europe

- The changing landscape in the SE European gas markets
- Overview of the existing and emerging gas trading hubs in the European and SE European region
- The role of **Central European Gas Hub (CEGH)** as a benchmark and pivot for promoting gas trading in SE Europe

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Thank you for your attention

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