

# IEM: Natural Gas Market

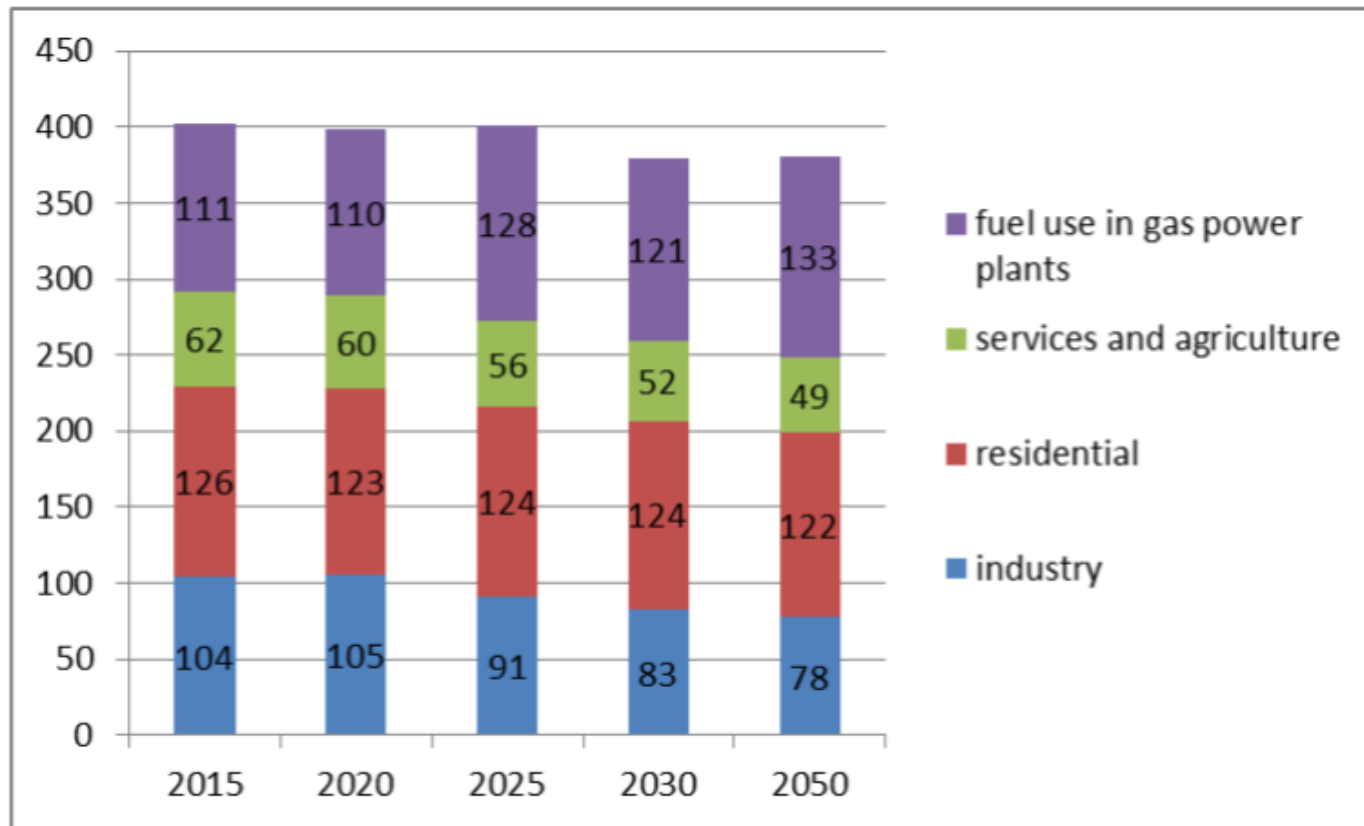
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# Key trends

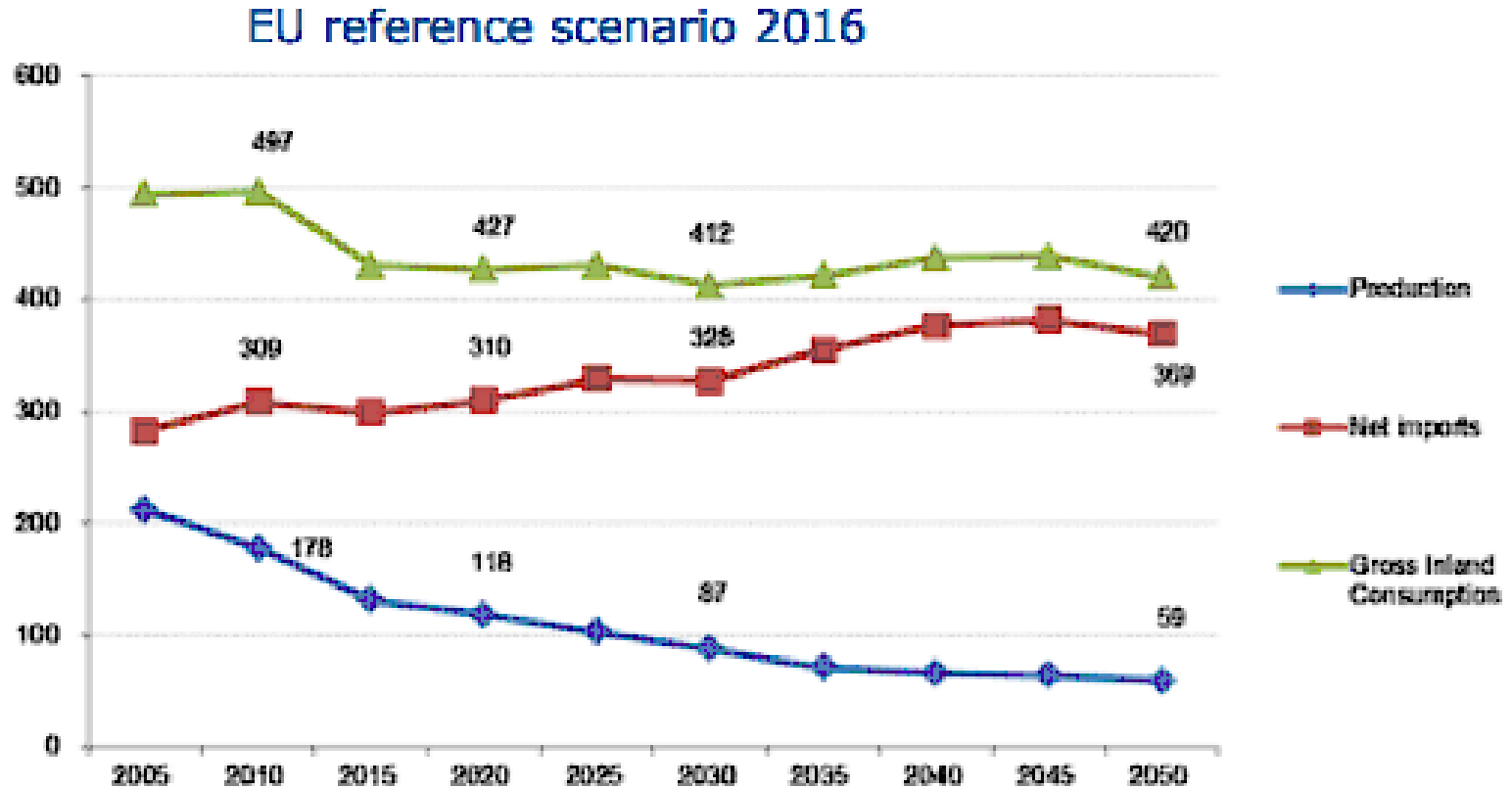
- Peak demand in 2010.
- Between 2008-2013 large investments in gas-fired power plants, LNG terminals, storages and pipelines.
- Market opening and liberalisation, increased hub trading and short-term flexibility, lowering the link between oil and gas prices.
- Geopolitics included. Easier to store in comparison with electricity.

# Key trends

## Evolution of gas demand by sector

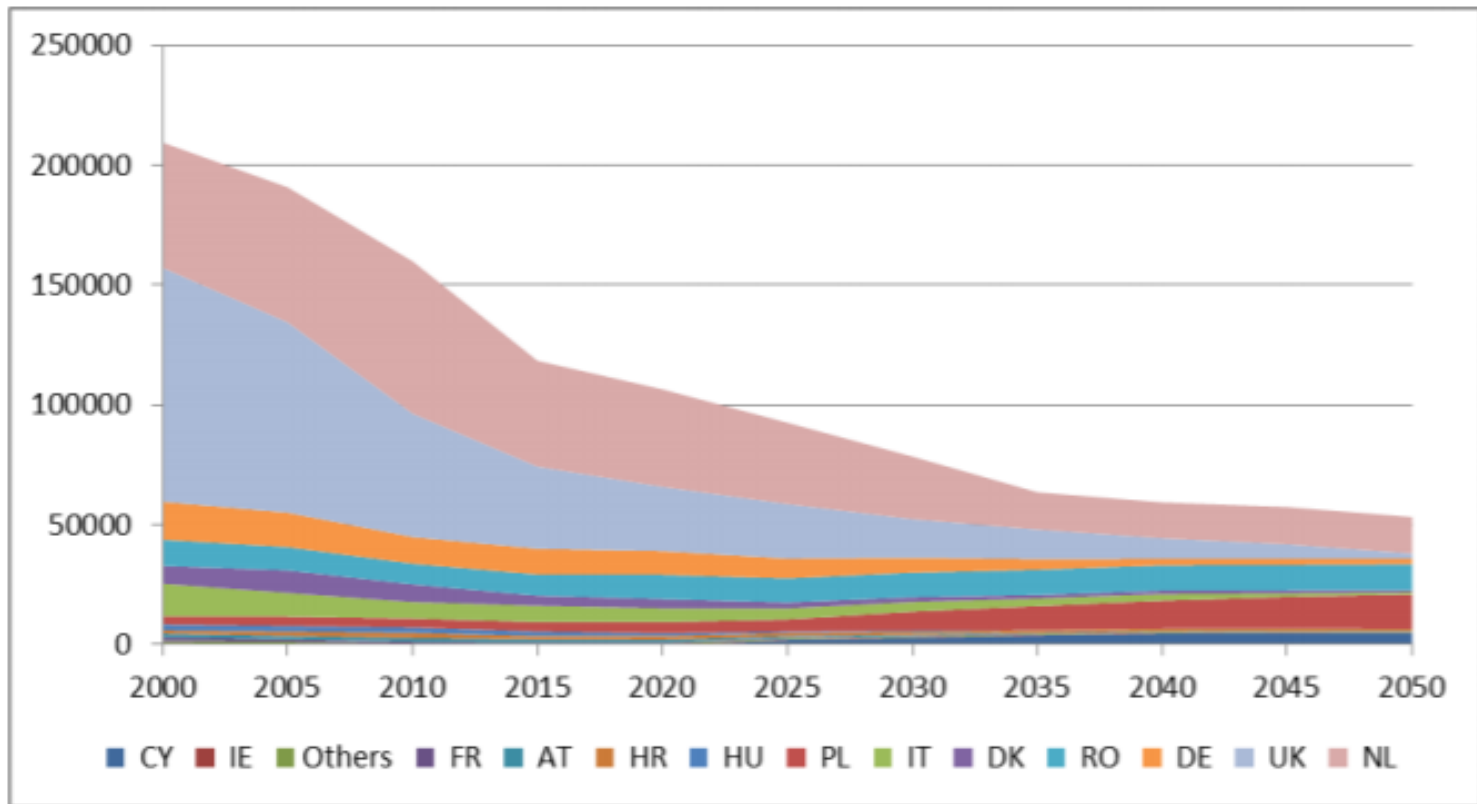


# Key trends

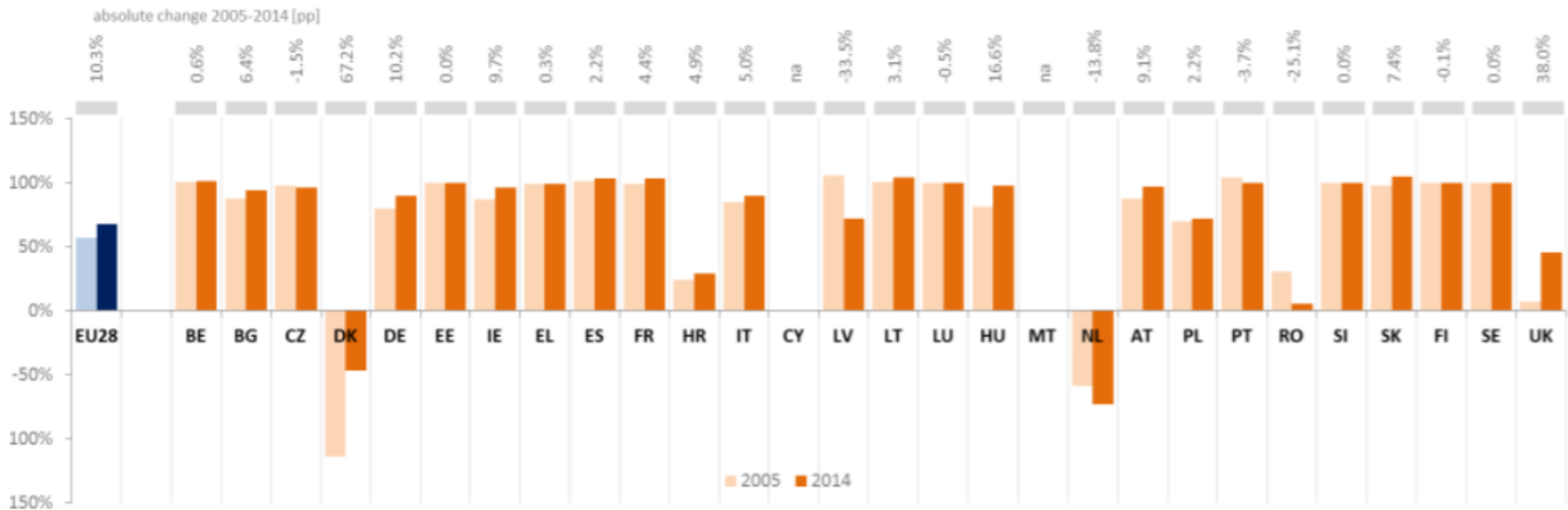


# Key trends

## Gas production (Mtoe), per MS

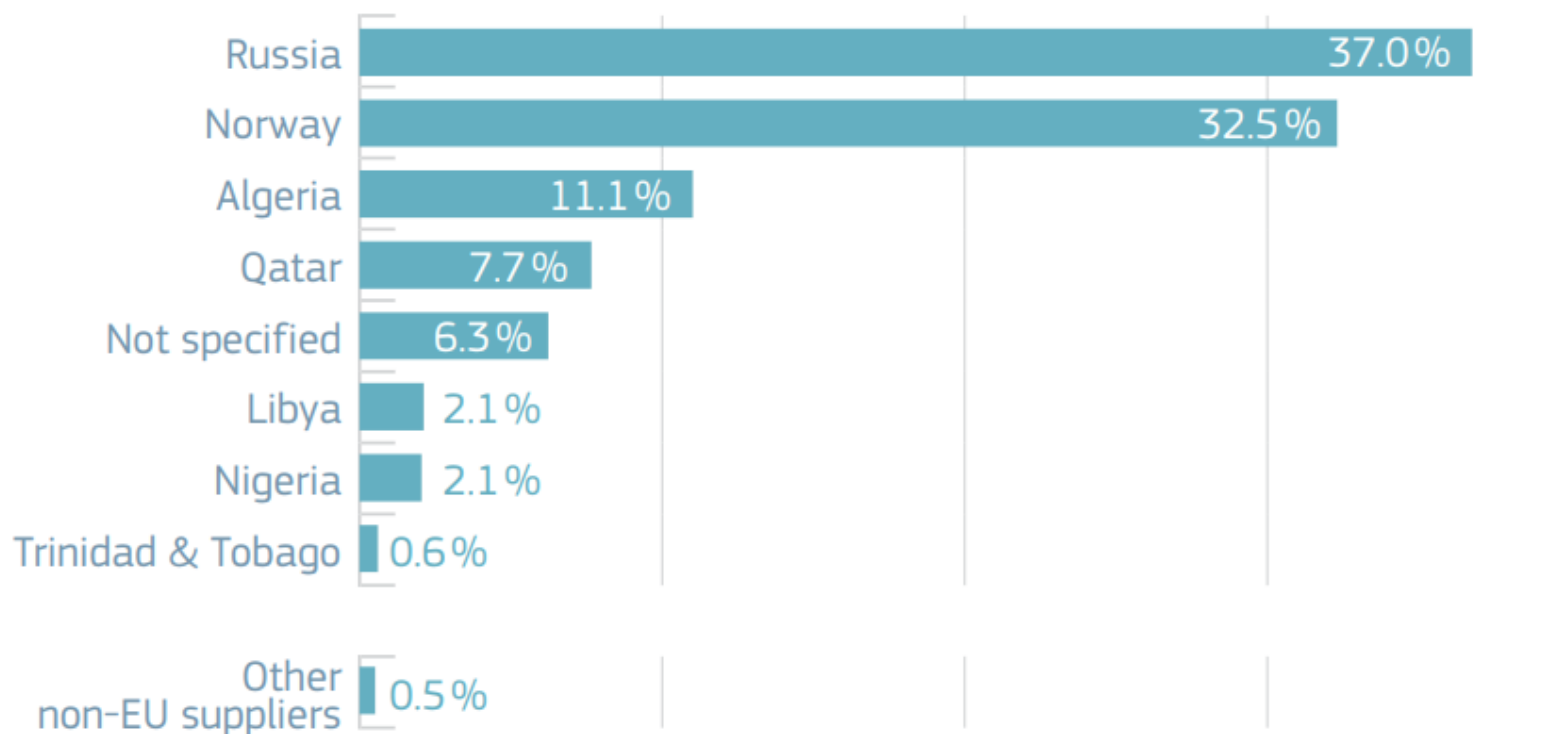


### SoS1 - A1: net import dependency - Natural Gas



# EU 28 imports of natural gas (2015)

Total non-EU = 12624717 TJ-GCV





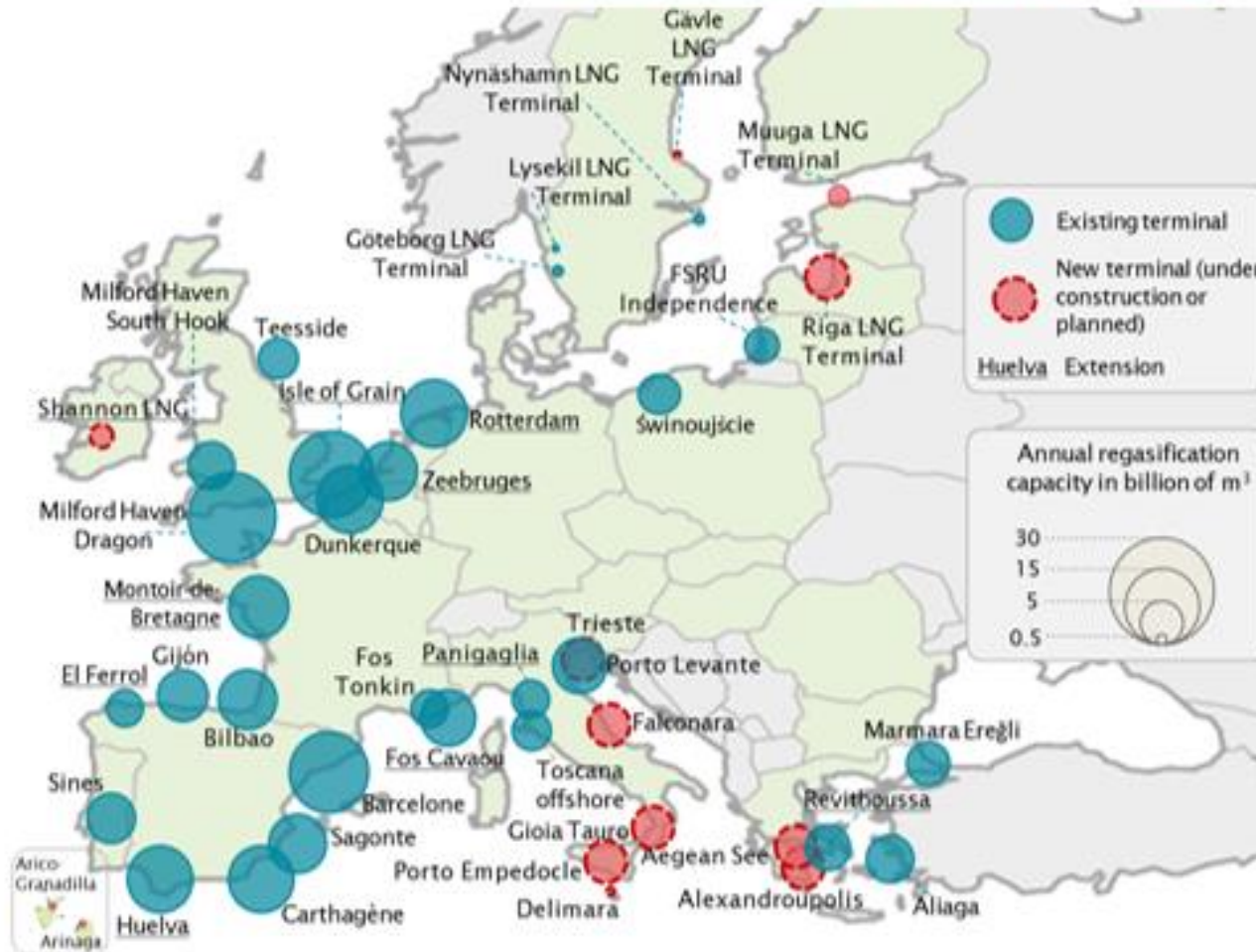


# LNG

- 22 LNG terminals. Klaipėdos in Lithuania, Swinoujscie in Poland and Dunkerque in France opened only recently.
- Utilisation of 23,5%.
- Higher prices in Asia and Latin America (Brazil and Argentina).
- LNG terminals used for re-export to reduce the costs and losses.

# Infrastructures

## Existing and planned LNG terminals in Europe



Source : GIICNL (2017), CLE (2016)

# Regulation

- The same structure as in the electricity sector.
- Based on the third internal market package, an effort to increase market effectiveness, liquidity and cross-border trade.
- Strengthening of the independency and powers of NRAs and their EU co-operation (ACER).
- Active role of TSOs and their EU wide co-operation.
- Common rules for the gas market – Framework Guidelines, Network codes.
- Move from P2P to EE systems.

# Organization of wholesale market

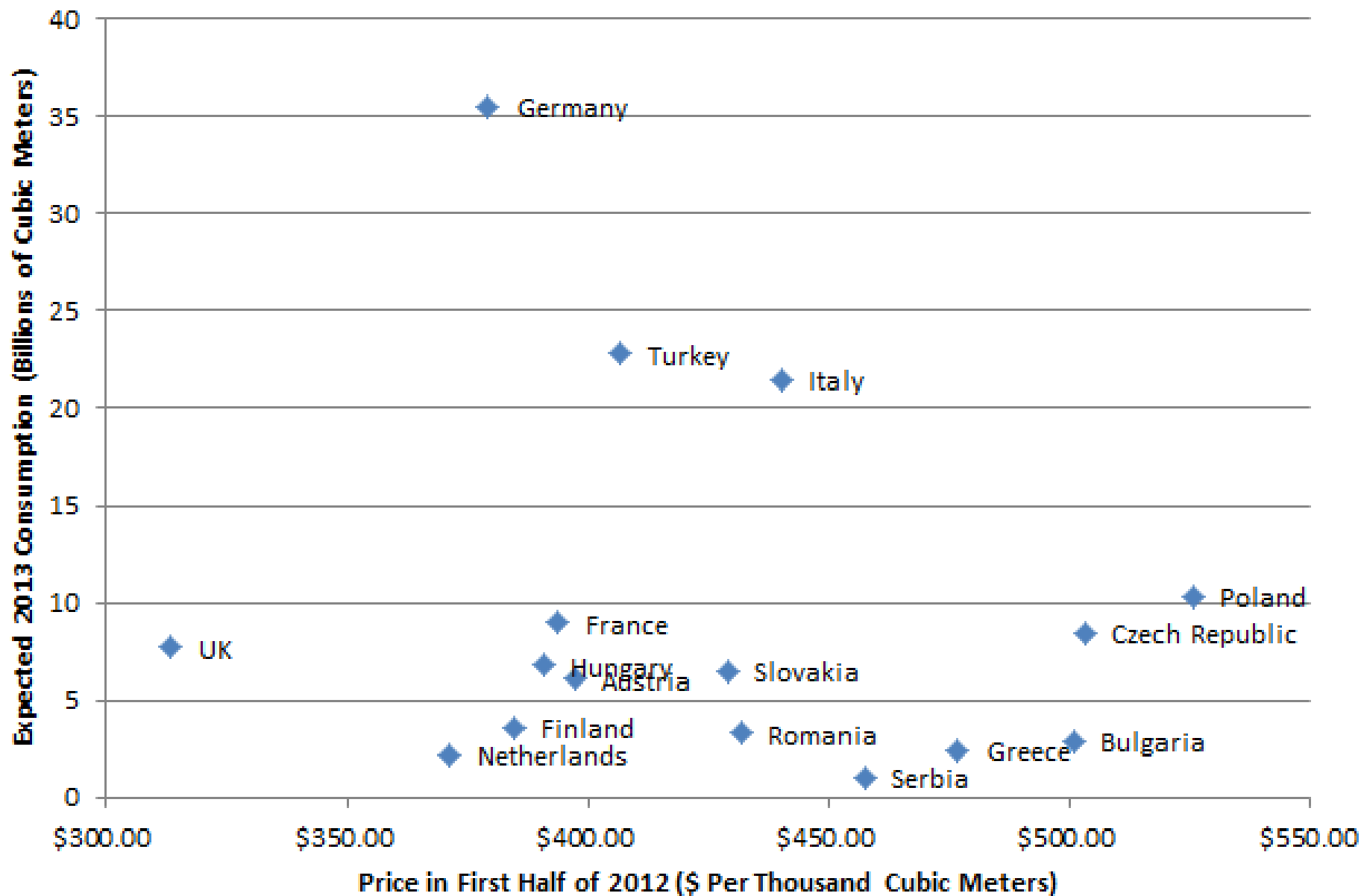
- Shift from TOP LTCs to hub trading.

# Traditional gas market model

- LTC + ToP.
- Pricing formula linked to gas replacement values (oil indexation).
- Net back replacement value gas pricing.
- Territorial restrictions.
- In the EU physical fragmentation of the market.

# Traditional gas market model

- Competition is limited.
- Suppliers have significant market power.
- Price arbitrage (convergence) is limited, resulting in different prices over the EU.



# IEM

- Competition (TPA, unbundling).
- Common regulatory framework with independent regulatory bodies.
- LTCs and destination clauses etc. under pressure (foreclosure potential), shift to hub-trading.
- Interconnectors.



# LTCs

- Anti-competitive foreclosure effects → questioned by the EU's antitrust policy.
- Gas Natural, Distrigaz, E.ON Ruhrgas, Repson, Synergen, etc.
- Not forbidden per se, but volumes locked-in under the contract, duration, cumulative effect and efficiencies are evaluated.

# Territorial restrictions/market sharing

- In 2004 EC confirmed that they restrict competition (GDF-ENI and GDF-ENEL contract from 1997).
- 2009 EC fined GDF Suez and E.ON for the 1975-2005 behavior, EUR553 million each (partitioning the markets regarding MEGAL pipeline).
- Intervention to the Gazprom-ENI, Gazprom-OMV, Gazprom-E.ON or Gazprom-PGNiG agreements.
- Territorial restrictions no longer acceptable on the EU market.

# Oil indexation

- Oil products are no longer substitutes for natural gas in Europe, Gazprom still defends this pricing mechanism.
- Questioned by EC in antitrust proceeding against Gazprom (Sept 2011).

# Hub definition

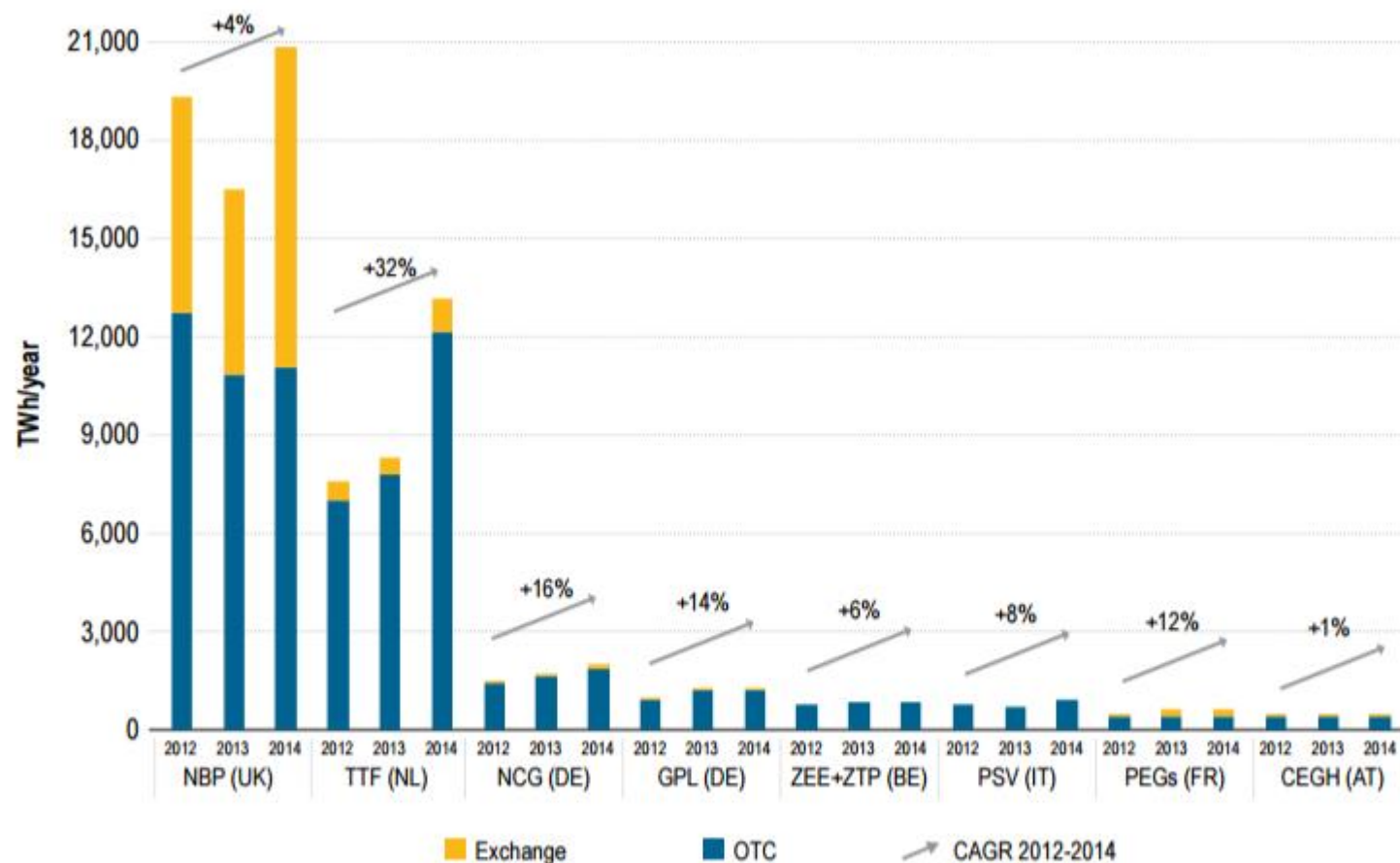
- A point (physical or virtual) at which title to gas can be transferred between buyers and sellers.
- In a physical hub, the contractual place where the gas is exchanged corresponds to a specific and well identified geographical point on the transmission system (Zeebrugge Beach)
- In a virtual hub, the contractual place where the gas is exchanged is being defined as a group of entry and exit points belonging to a whole transmission system or balancing zone (GASPOOL, NBP).
- Both types should allow OTC transaction (preferably through brokers) and Exchange trading.

# Hub indicators

- Liquidity – increases when number of customers, volumes traded, number of trades and price transparency all increases.
- Churn factor – ration between the traded volumes and the physical throughput (re-trading ratio). Number of times gas volumes change hand within the hub.
- Level of concentration – the Herfindahl – Hirschmann Index – higher numbers = fewer market participants.
- Depth – significant volumes can be traded without resulting in excessive price moves.



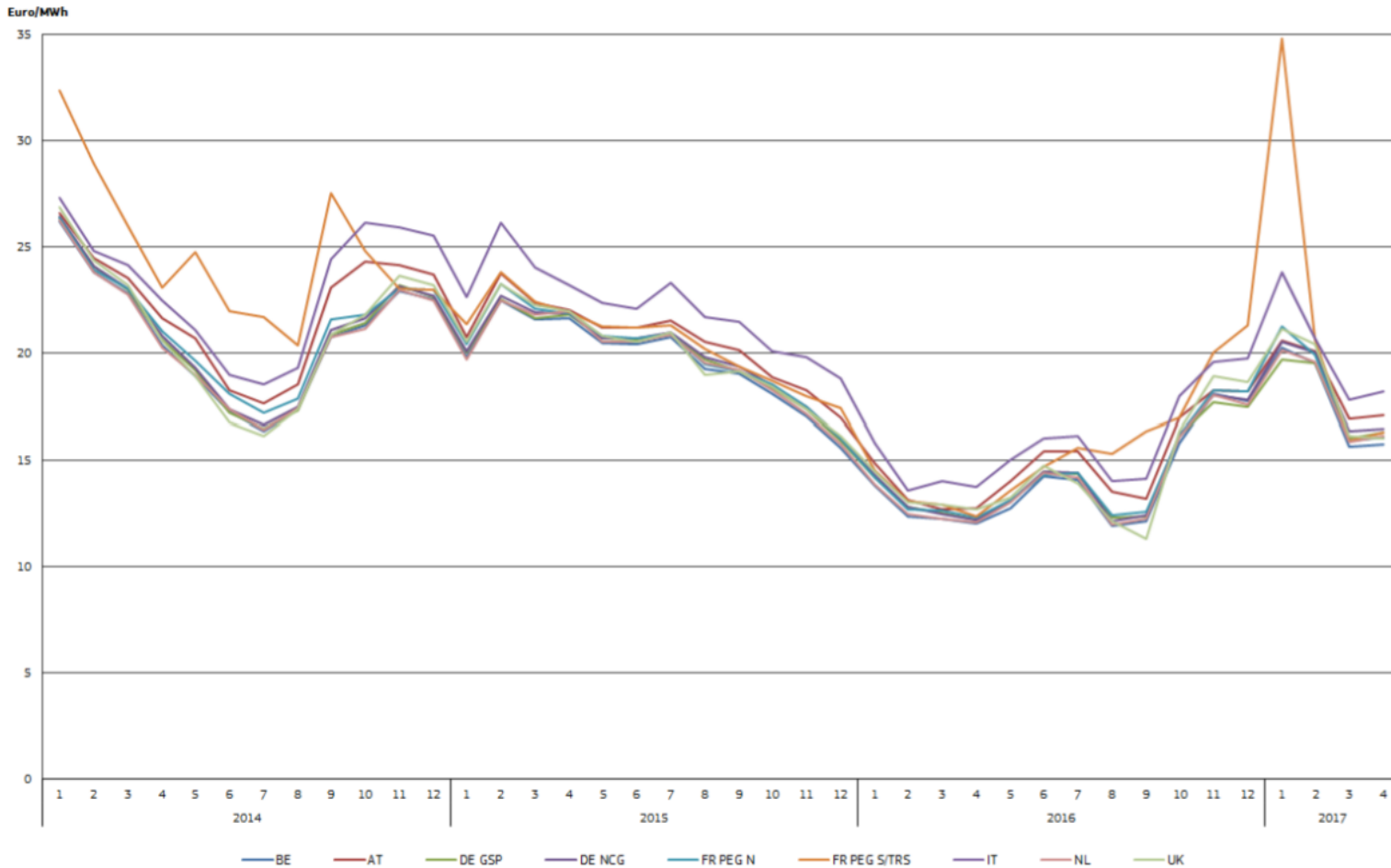
# Traded volumes at main EU hubs and compound annualised growth rate (CAGR), TWh/year and %



Source: GTS (NL), Huberator (BE), Gaspool (DE), NCG (DE), GRTgaz (FR), CEGH (AT), Snam (IT), Trayport (GB).

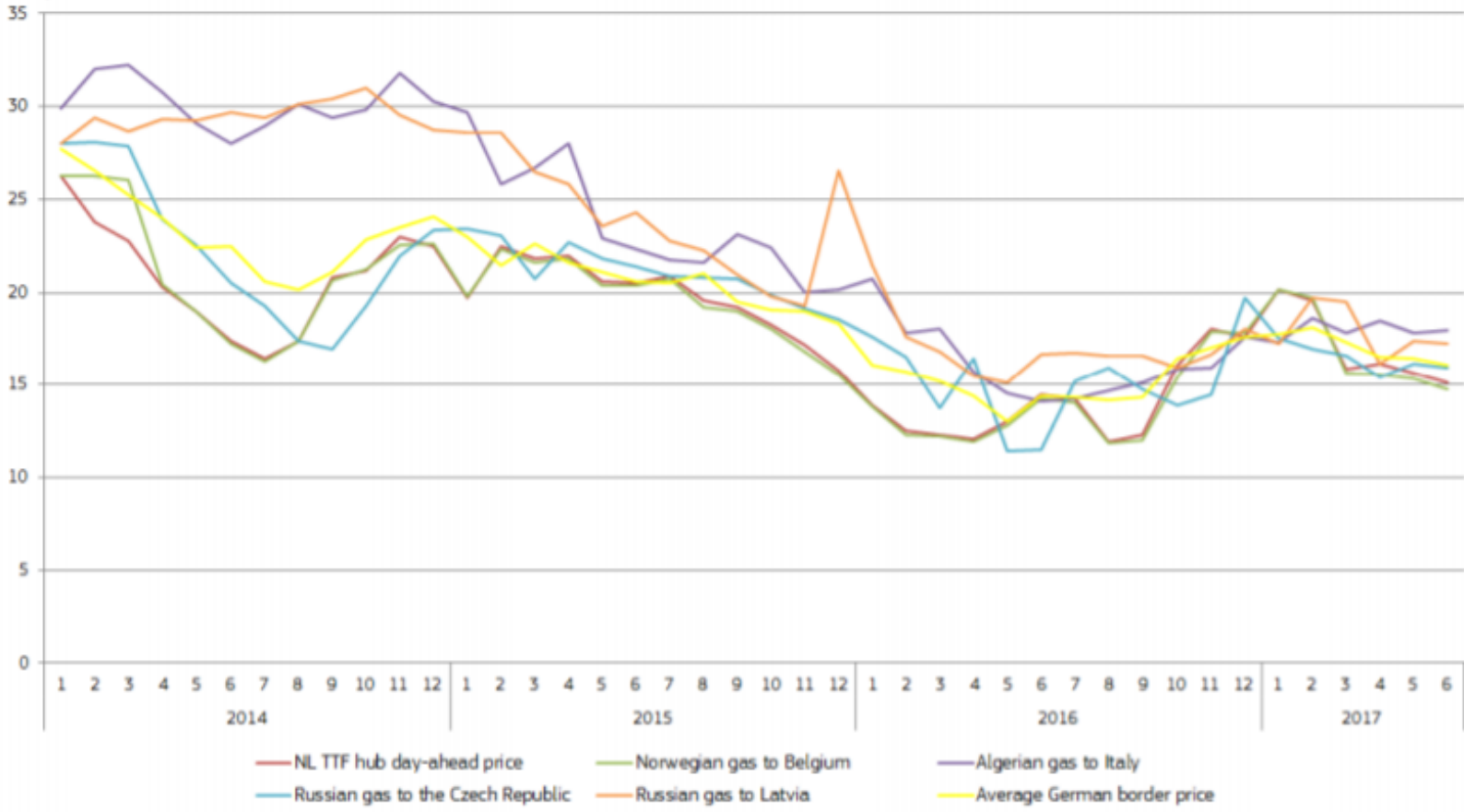
Note: Over-the-counter trade (OTC) refers to volumes traded among parties via brokers, either the parties managing credit risk or trading being cleared by the broker. Exchange execution refers to those volumes supervised and cleared by an organised central market operator.

# Wholesale DA gas prices on gas hubs in the EU

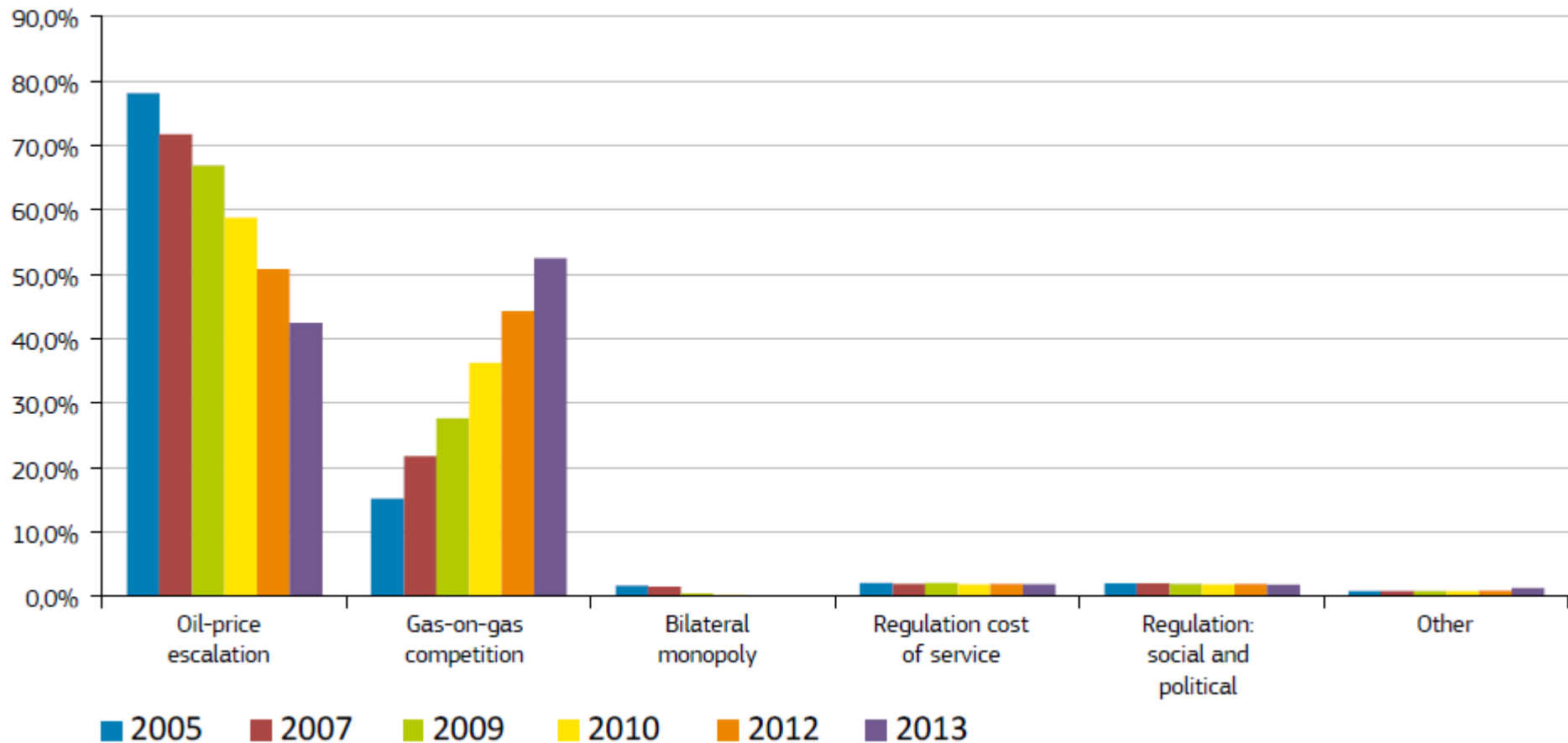




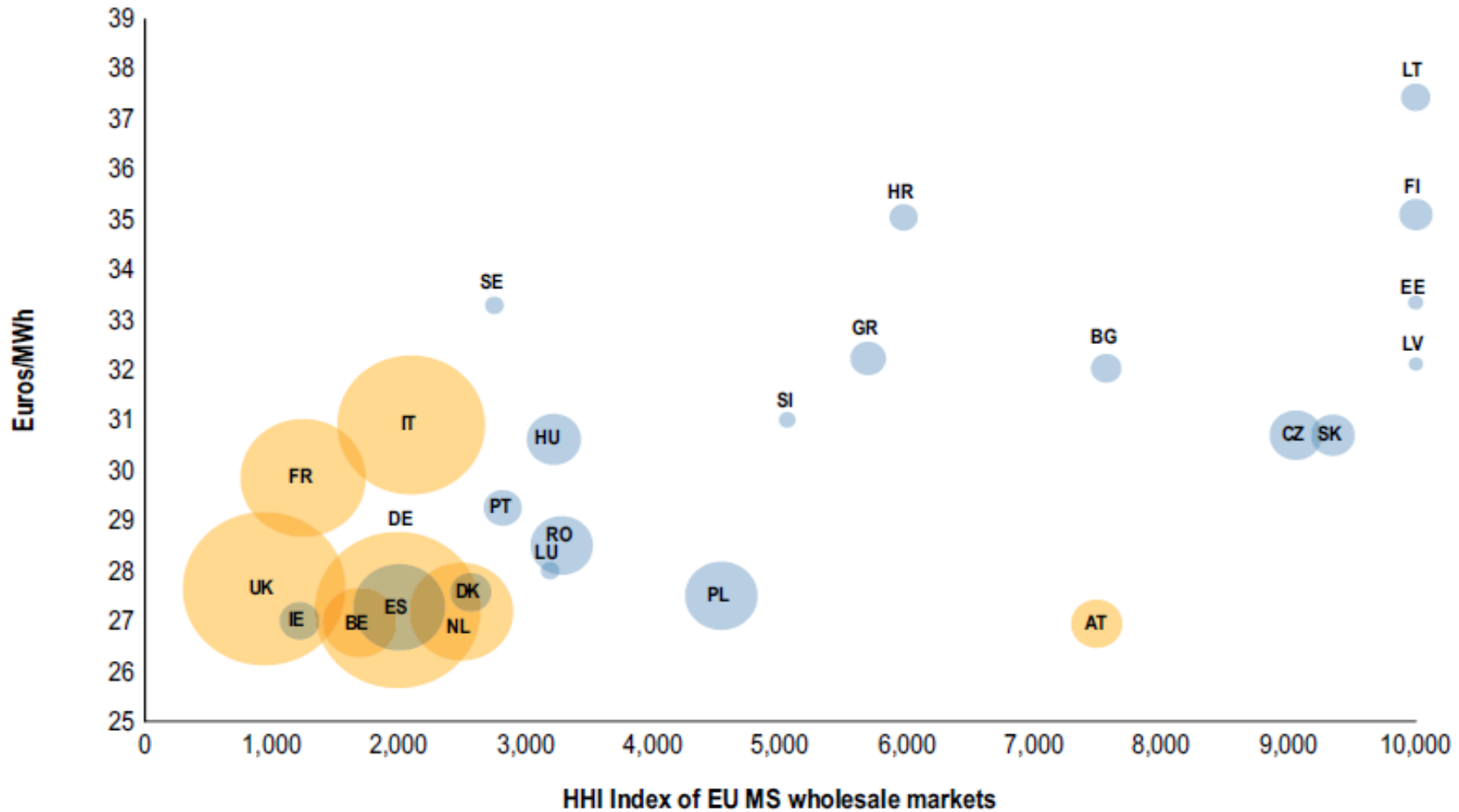
# Comparison of EU wholesale gas price estimations, euro/MWh



## WHOLESALE PRICE FORMATION MECHANISMS IN EUROPE: 2005-2013



# Gas wholesale prices in EU MSs compared with market concentration and gas demand – 2013 (euros/MWh)



# Sources

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- Jirušek et al.(2015): Energy Security in Central and Eastern Europe and the Operations of Russian State-Owned Energy Enterprises
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- Stewart, P.(2016): Are LNG benchmarks still relevant?