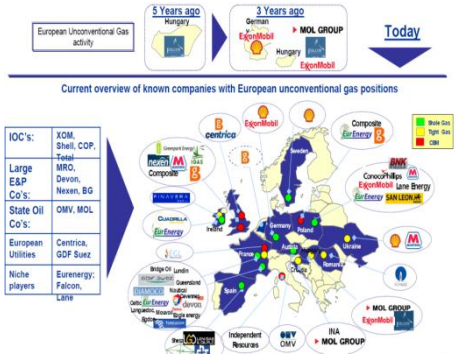


Does Russia have the power to make unconventional uneconomical ?

Instytut Studiów Energetycznych

Andrzej Sikora

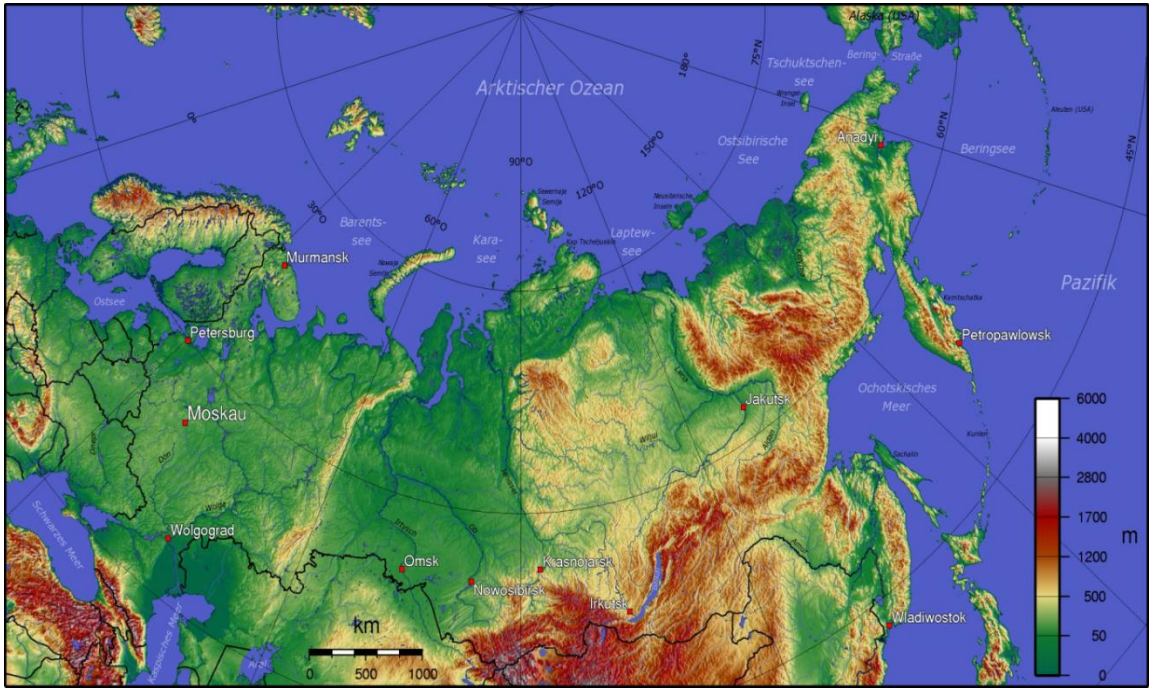
Vienna, February 15th, 2011

Disclaimer

The information on which this presentation is based derives from our own experience, knowledge, data and research. The opinions expressed and interpretations offered are those of Energy Studies Institute and have been reached following careful consideration. However, the Oil&Gas business is characterized by much uncertainty and all of our comments and conclusions should be taken in that light. Accordingly, we do not accept any liability for any reliance which our clients may place on them.

The plan of the lecture

- ✓ **EU-RUSSIA ENERGY DIALOG based on mismatched forecasts…**
- ✓ **Do we observe new Russian Energy Policy ?**
- ✓ **Why EU-27 is not still ready for common European Gas Strategy ?**
- ✓ **How long Gazprom will be the dominant natural gas supplier to the majority number of European countries ?**



Source: www.russiamap.org

- ✓ **Europe's need for Russian gas-political pricing.**
- ✓ **Will unconventional gas break the trend and Poland is ready to lead the European quest for gas independence?**

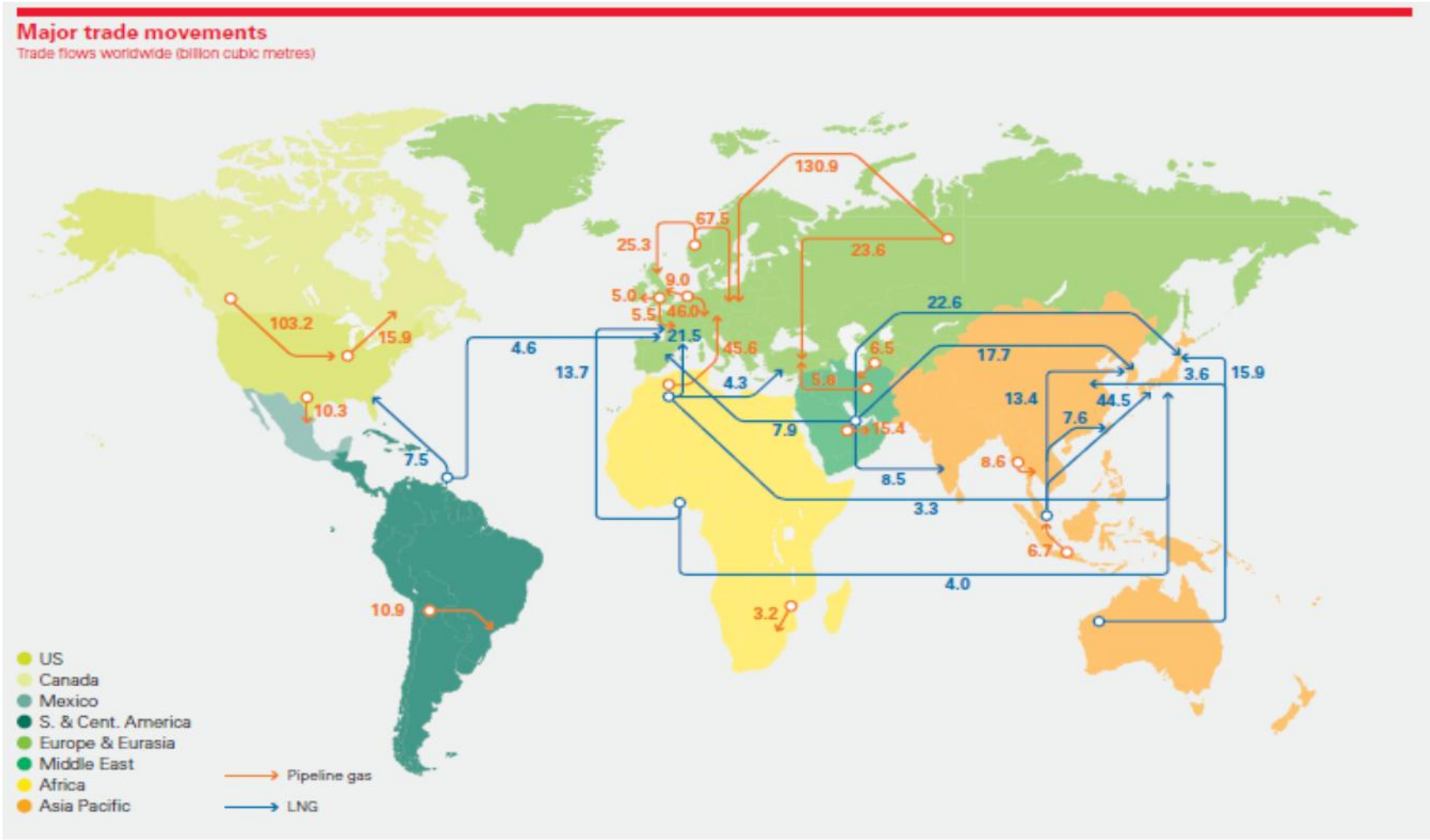
Who dares duplicate the American unconventional gas revolution ?

POLAND?

CHINA?

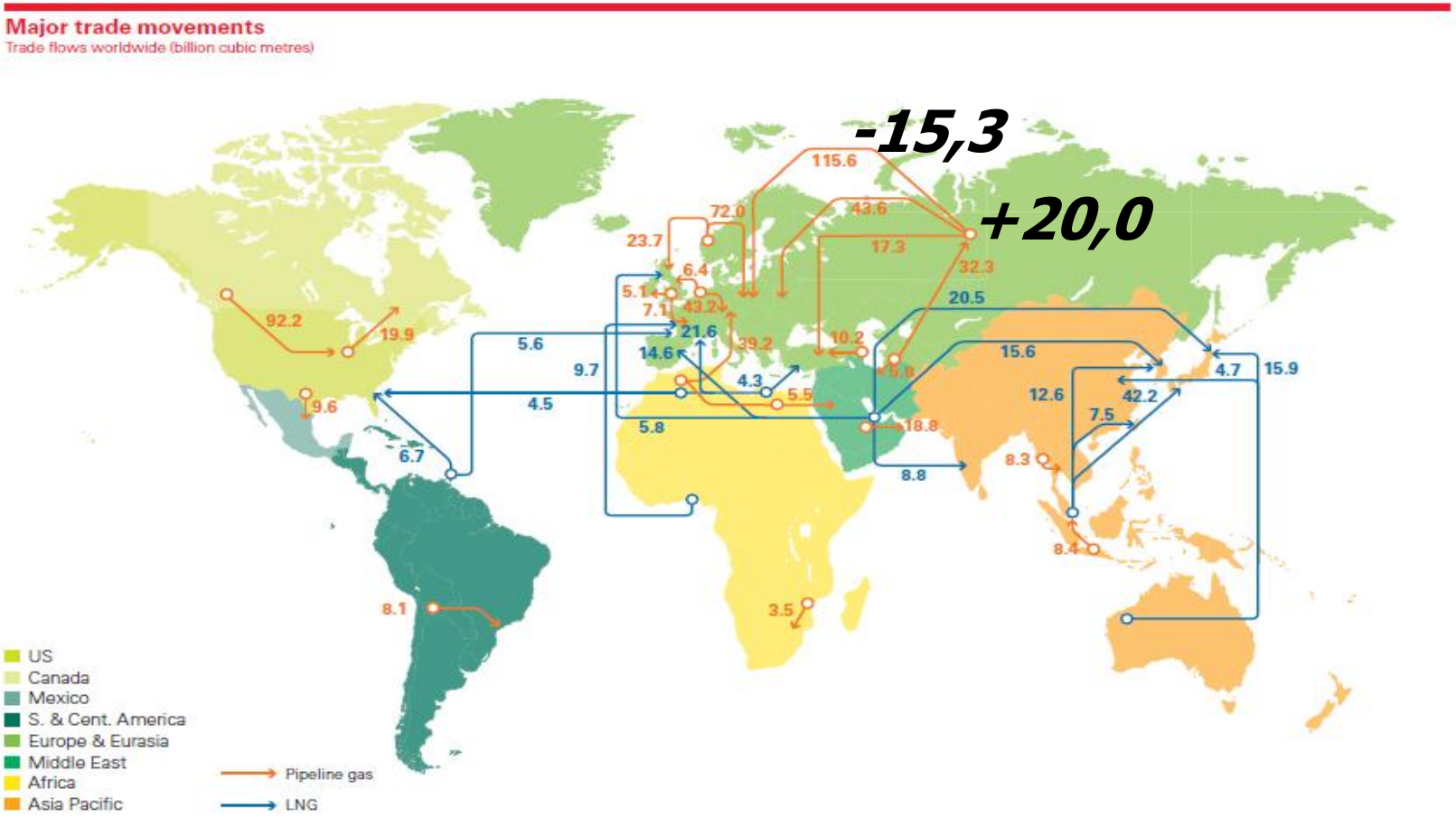
Major trade movements

trade flows worldwide (bcm)



Major trade movements

trade flows worldwide (bcm)

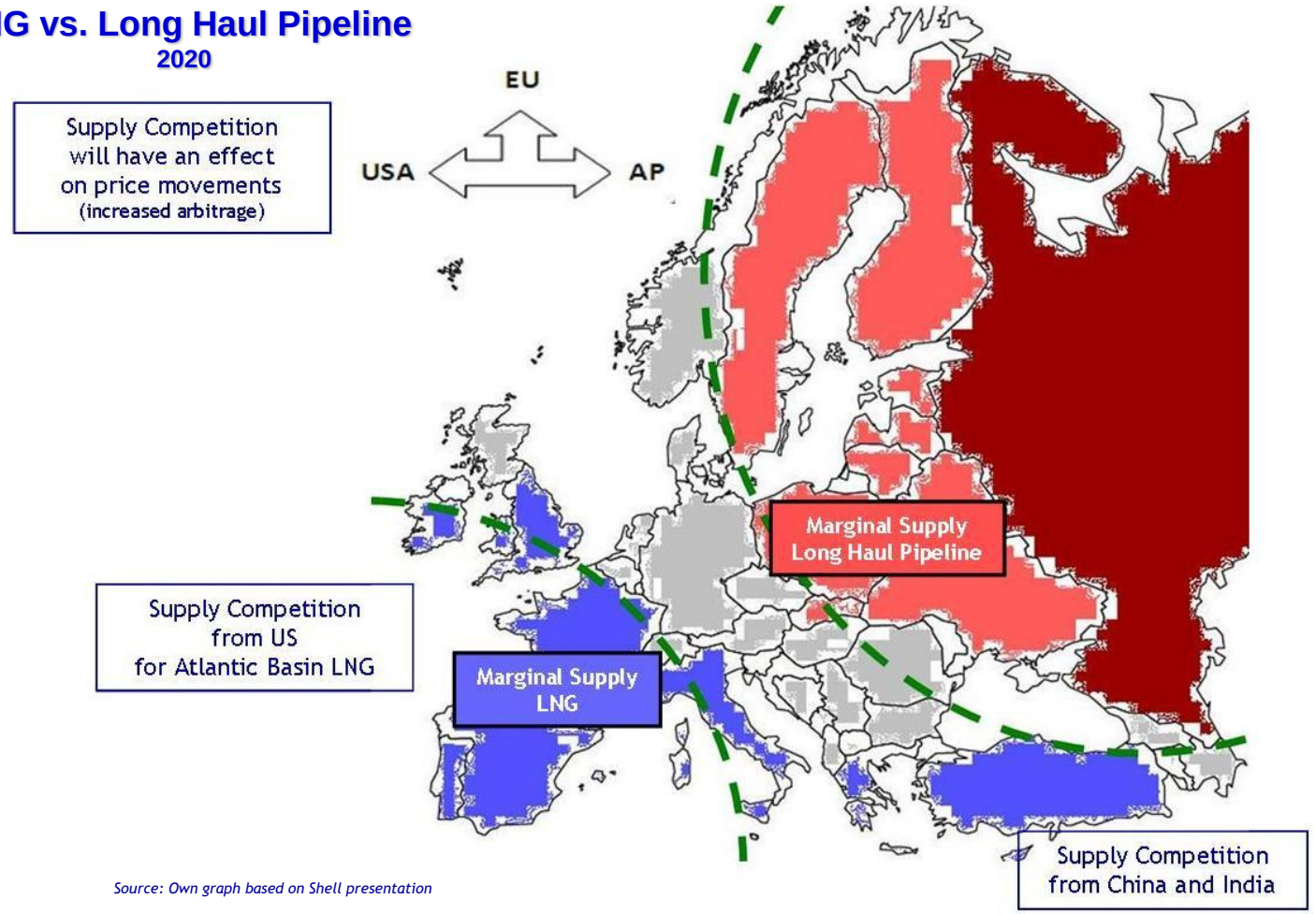


Source: BP Statistical Review of World Energy, June 2009/2010.

Price arbitrage LNG vs. Pipelines

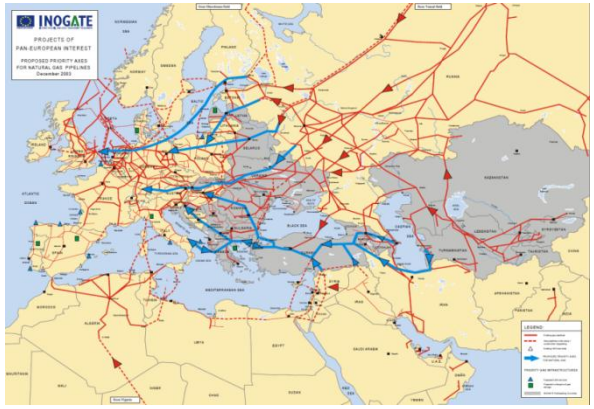
(supply competition has an effect on price movements)

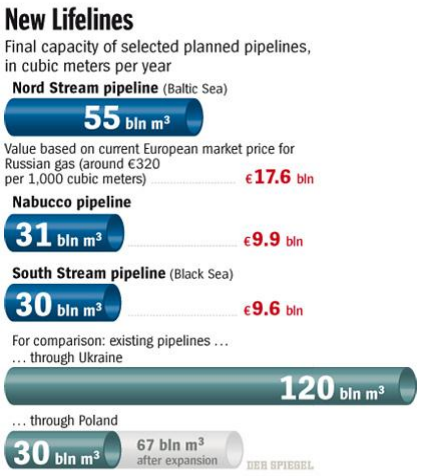
LNG vs. Long Haul Pipeline
2020

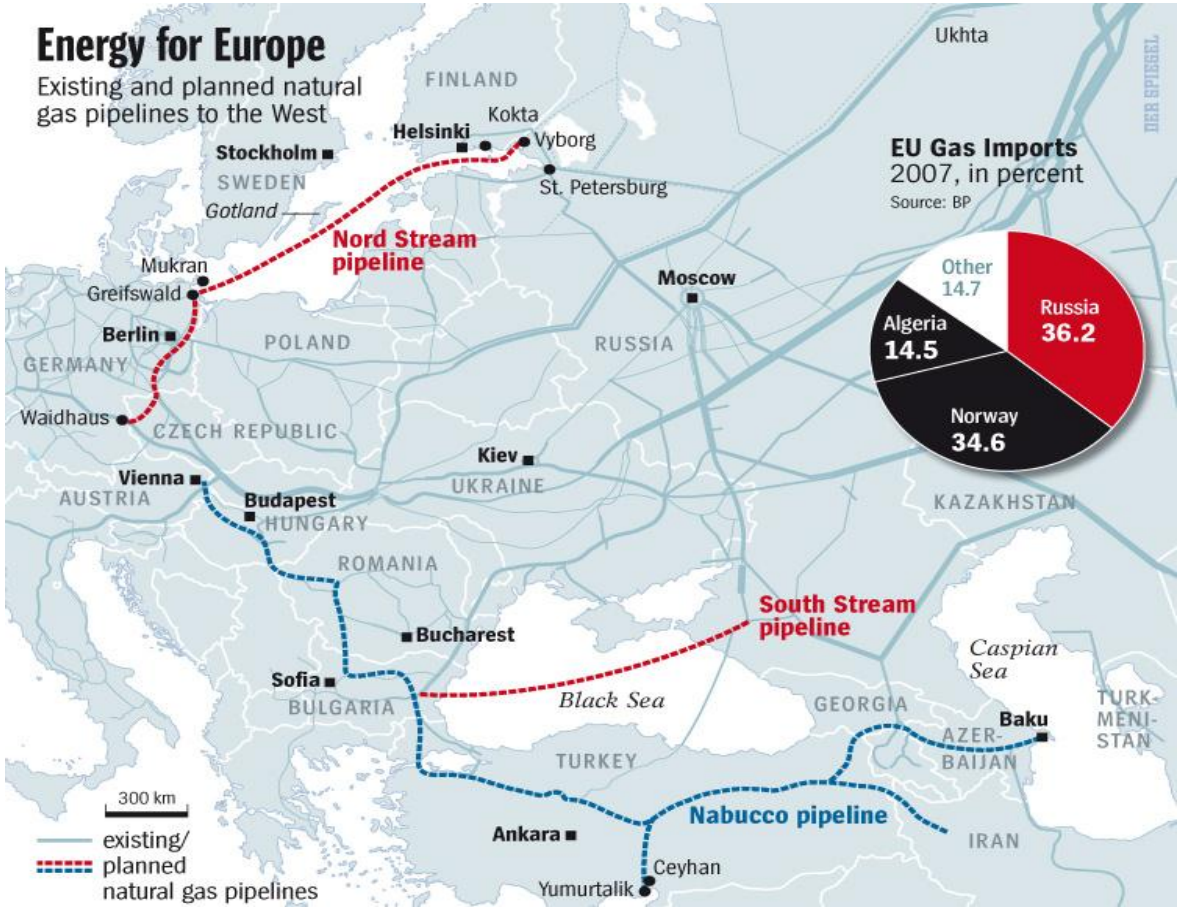


Source: Own graph based on Shell presentation

Decisions on starting new transport routes construction



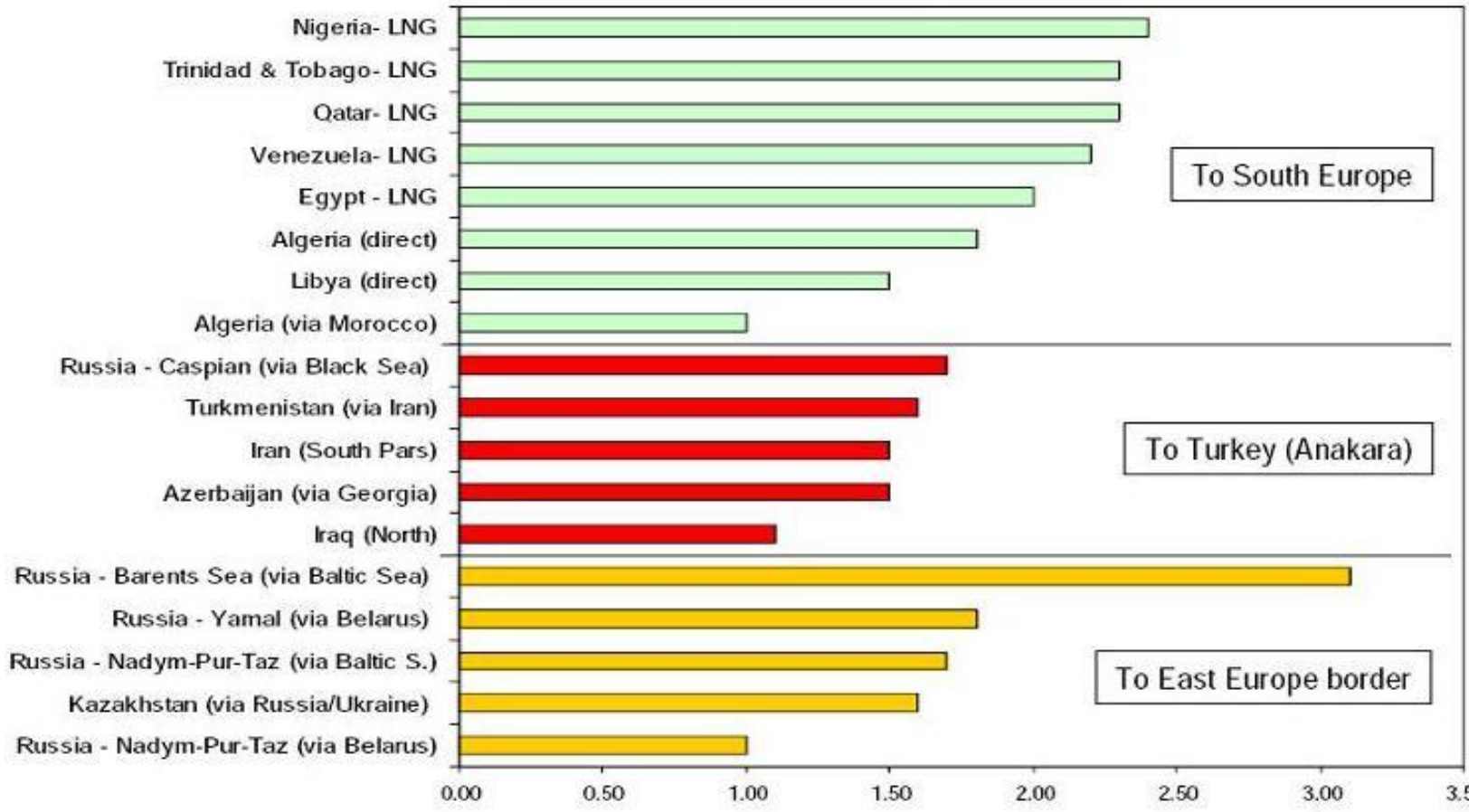




Source: Der Spiegel, 2009

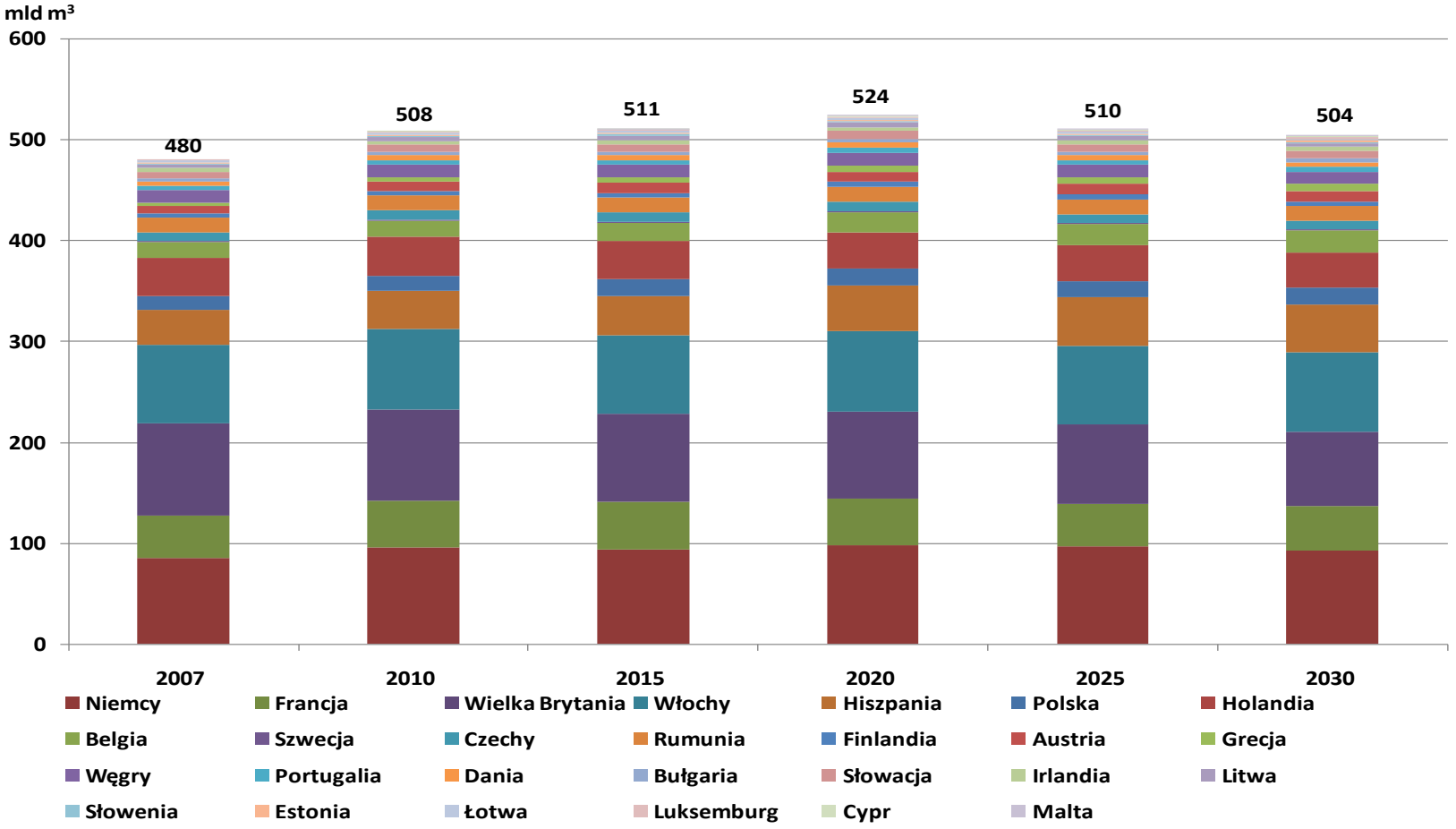
Forecast of transportation costs for natural gas to Europe 2010-15

[USD/MBTU]



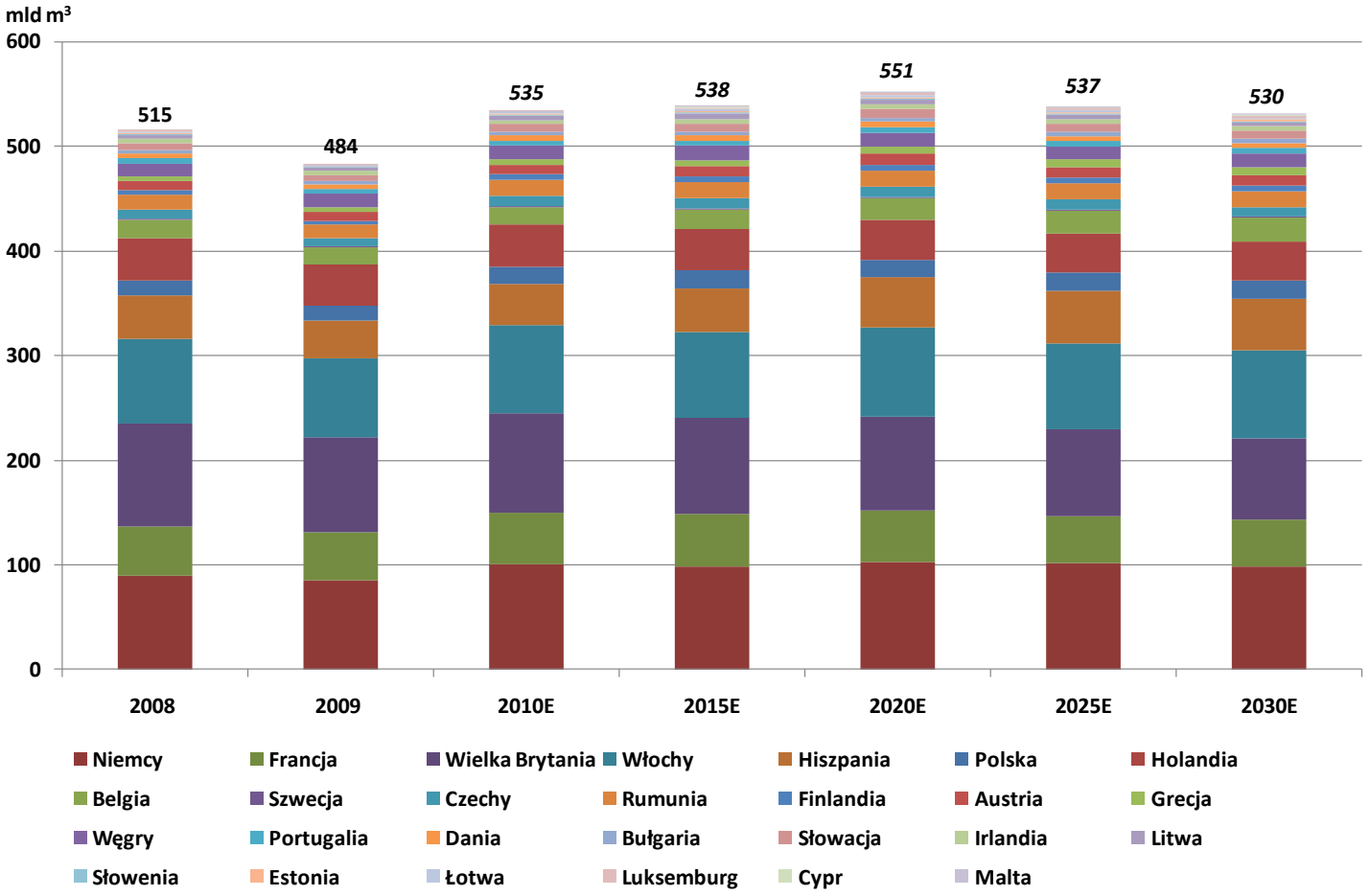
Source: EFMA GAS Group, www.efma.com

Natural gas demand forecast for the UE (2007)



Source: Model PRIMES Baseline (2007) 2009, Eurostat & CERA.

Natural gas demand forecast for the UE (2009)



Source: Model PRIMES Baseline 2009, Eurostat & CERA.

Consumption forecasts – mismatched ?

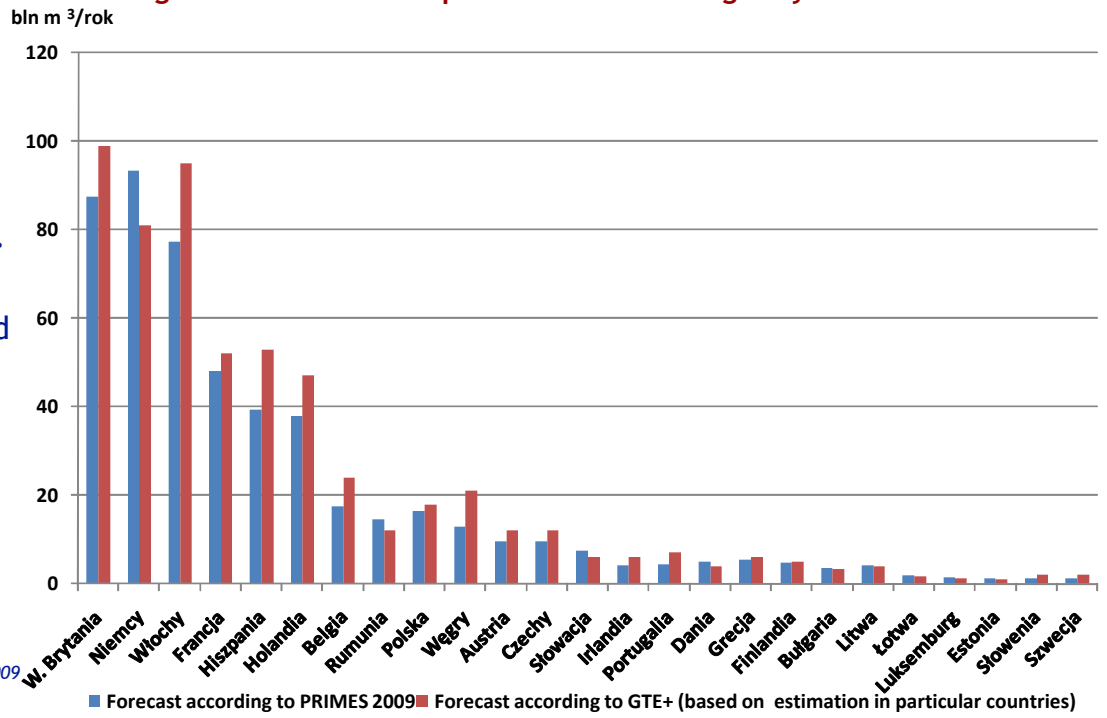
- ✓ **Main sources of the forecasts:**
  - New version of the PRIMES model (Baseline 2009) **dated Aug.5th, 2009,**
  - Consumption forecasts and own production from *„Infrastructure Europe GTE+ Demand Scenarios vs. Capacity Report"* June 2009, have been prepared by the member countries based on their own internal's documents and forecasts (energy policies, emergency and contingency actions, infrastructure development plans etc.).

- ✓ In our opinion the forecast adopted to the new PRIMES model could be too low. For example in 2015 total consumption of the natural gas for the EU-27 is predicted to the level of 535 bln m^3, when we have already consumed in 2008 ca. 515 bln m^3. The Member States own estimations show that consumption in **2015 will be 575 bln m^3.**

- ✓ Having on mind security of the supply we need to use and adopt higher level of the forecast.

- ✓ Higher estimation and higher parameters are more secure in the prognosis.

Prognosis of the consumption of the natural gas by the EU-27 in 2015



Source: Own calculation based on data from PRIMES MODEL (Baseline 2009), Aug 5th, 2009 and GTE+ Demand Scenarios vs. Capacity Report, July 31st, 2009.

Russia…

Source: East European Gas Analysis

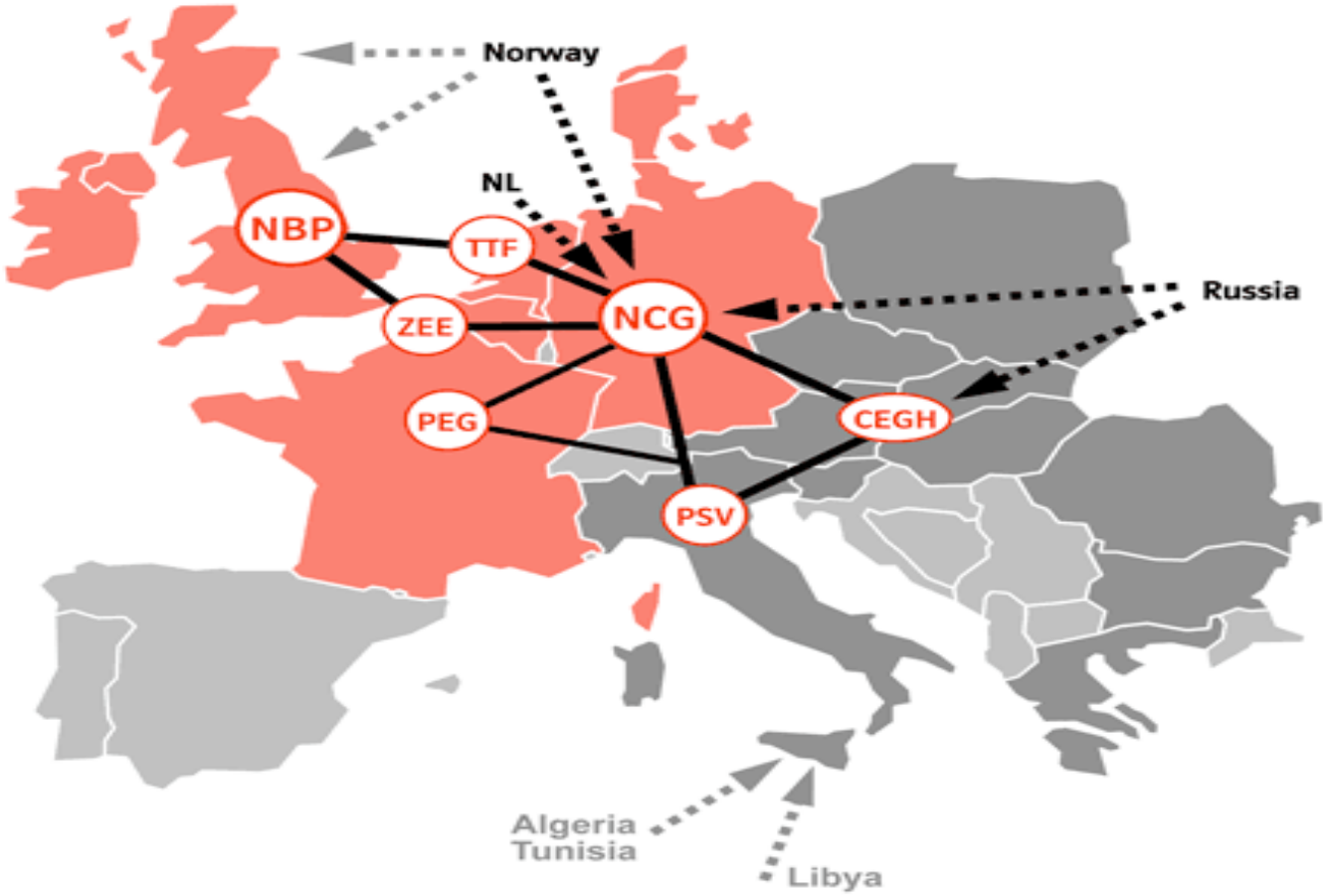
Russia

Russian Oil and Natural Gas at a Glance

Oil	2006
Oil reserves	80 billion barrels
Oil reserves, as percentage of world	7 percent
Saudi Arabian reserves	264 billion barrels
US reserves	30 billion barrels
Oil production	10 million barrels per day
Oil production, as percentage of world	12 percent
US oil production	7 million barrels per day
Oil exports	7 million barrels per day
Oil exporter, rank	2
Oil exports, to US	370,000 barrels per day

Natural Gas	2006
Gas reserves	48 trillion cubic meters
Gas reserves, as percentage of world	26 percent
Iranian reserves	28 trillion cubic meters
US reserves	6 trillion cubic meters
Gas production	612 billion cubic meters
Gas production, as percentage of world	21 percent
US gas production	524 billion cubic meters
Gas exports	263 billion cubic meters
Gas exporter, rank	1
Gas exports, to Europe	151 billion cubic meters

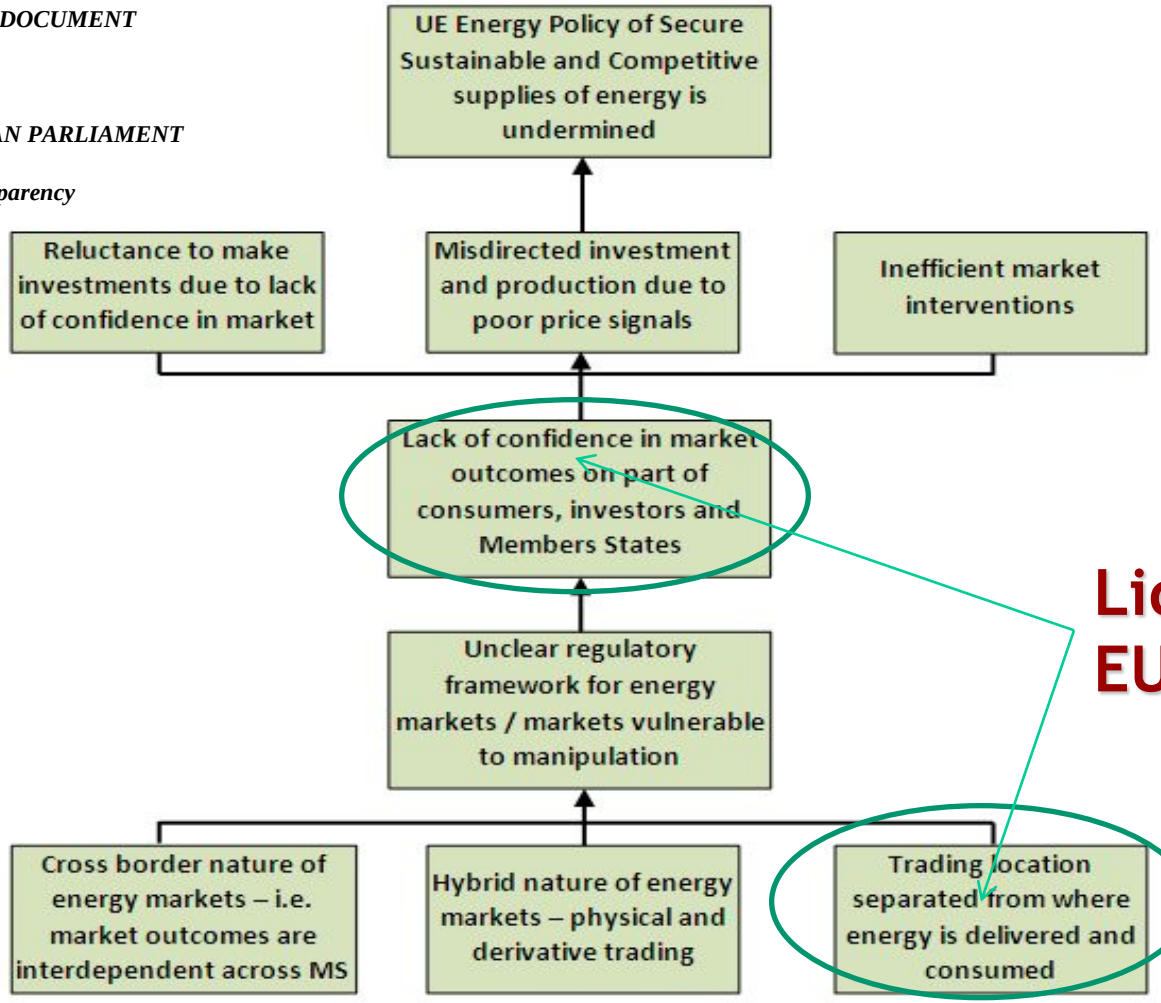
Why EU-27 is not still ready for common European Gas Strategy ?



Source: www.eon-energy-trading.com

Common EUROPEAN gas strategy…

COMMISSION STAFF WORKING DOCUMENT
IMPACT ASSESSMENT
Accompanying document to the
Proposal for a
REGULATION OF THE EUROPEAN PARLIAMENT
AND OF THE COUNCIL
on energy market integrity and transparency



Liquid?
EUROPEAN?

Source: Energy Studies Institute, based on http://ec.europa.eu Brussels, 8.12.2010 SEC(2010) 1510 final

COMMISSION STAFF WORKING DOCUMENT
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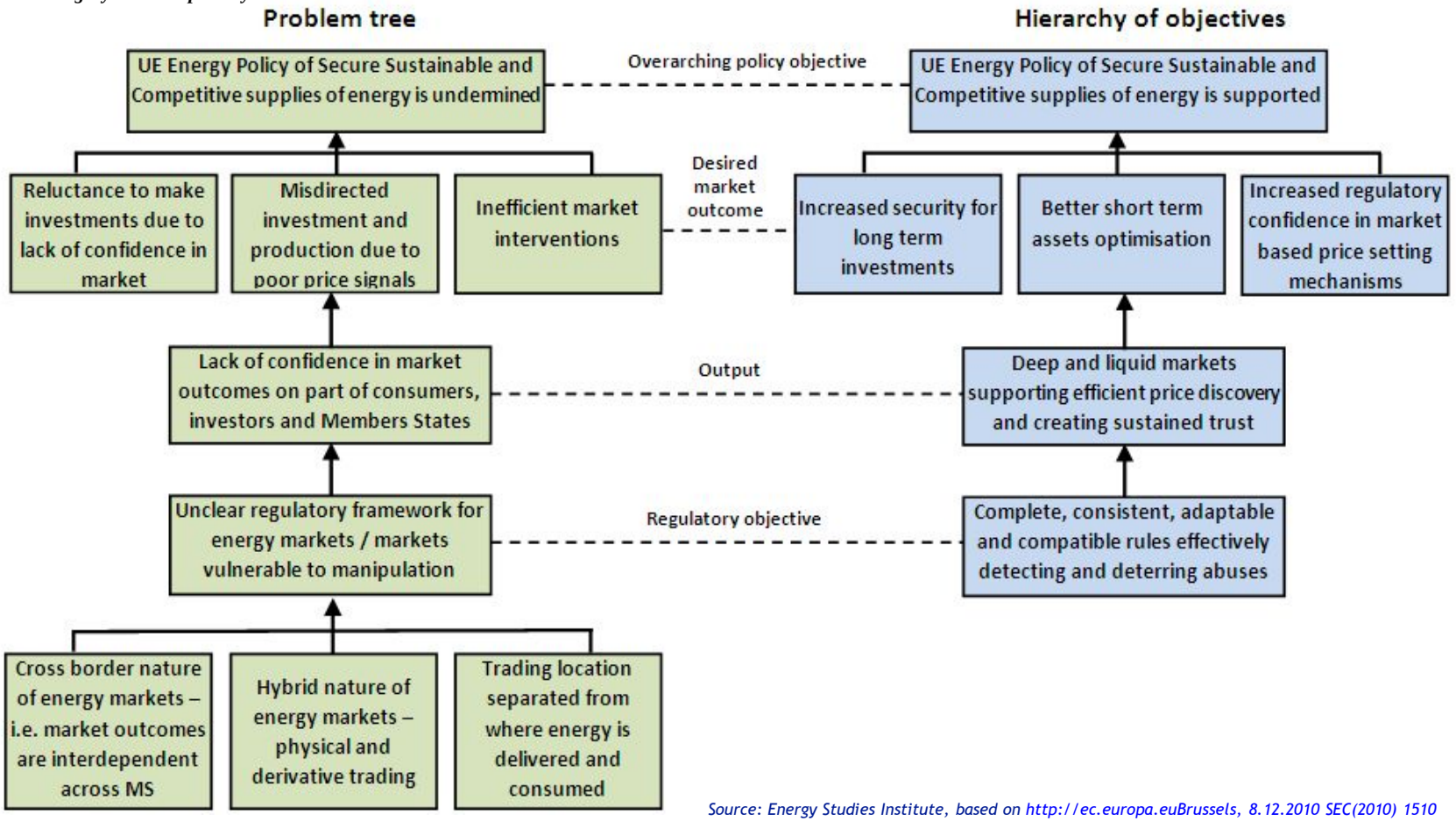
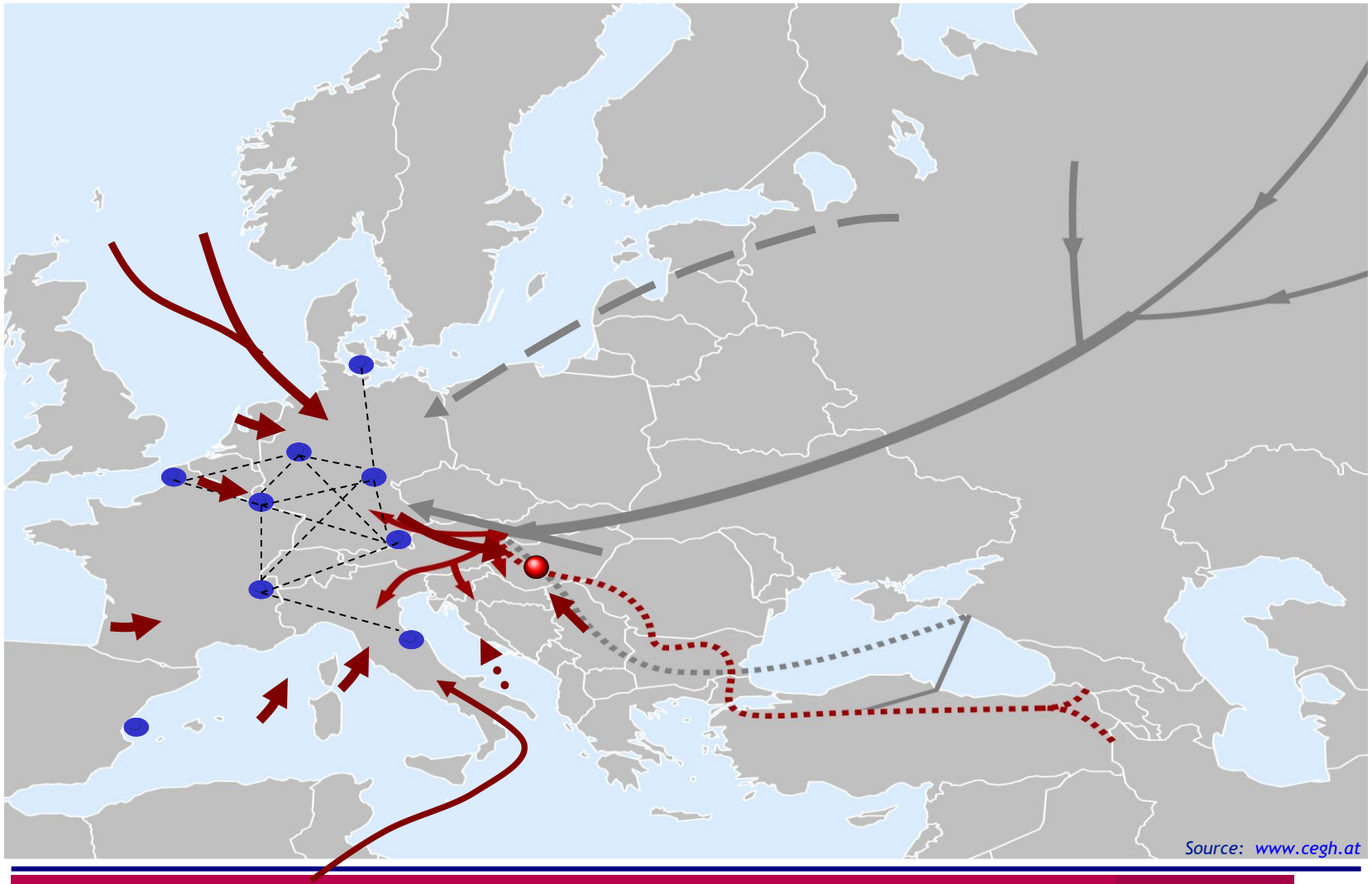
Common EUROPEAN gas strategy…

Deduction of Objectives from the Identified Problems



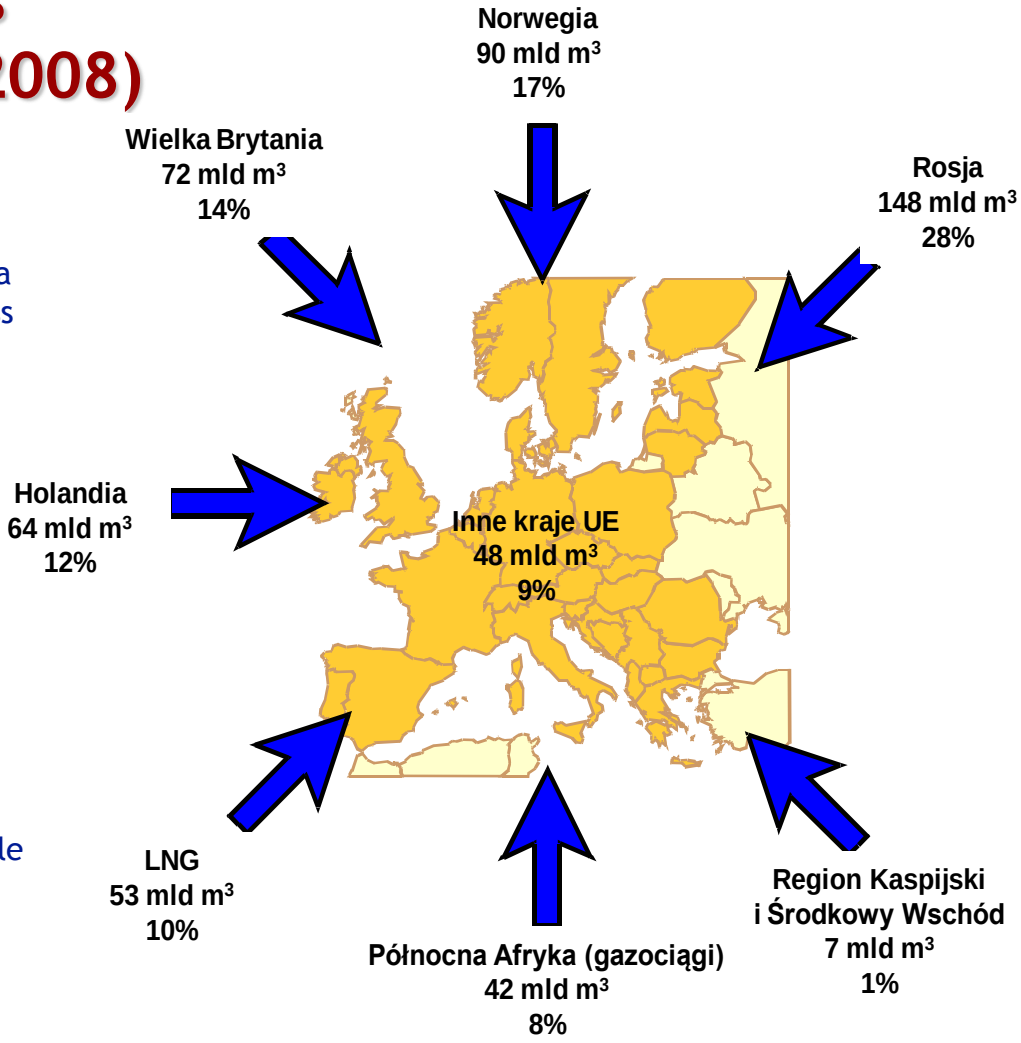
Source: Energy Studies Institute, based on http://ec.europa.euBrussels, 8.12.2010 SEC(2010) 1510

Trading points within Europe's hub landscape



Sources for natural gas deliveries to Europe (2008)

- ✓ In Europe there is a strong obligation on the "new entrants" with Bulgaria and Romania as an EU member to help to correct the weakness in the energy supply system.
- ✓ Several European gas companies (BASF, E.ON Ruhrgas, ENI, GASUNI, GdF) have developed strong business relationships and financial partnerships with Gazprom in both upstream and downstream activities. Other European companies are also heavily engaged in Russia and President Medvedev will now undoubtedly seek to strengthen these bilateral partnerships.
- ✓ Most of EU countries' gas markets are more or less regulated, non-liberalized, hardly available for new participants, so can't be described as a free markets. This situation improves Gazproms' domination and additionally strengthen its negotiation position as a main gas supplier to European Union.

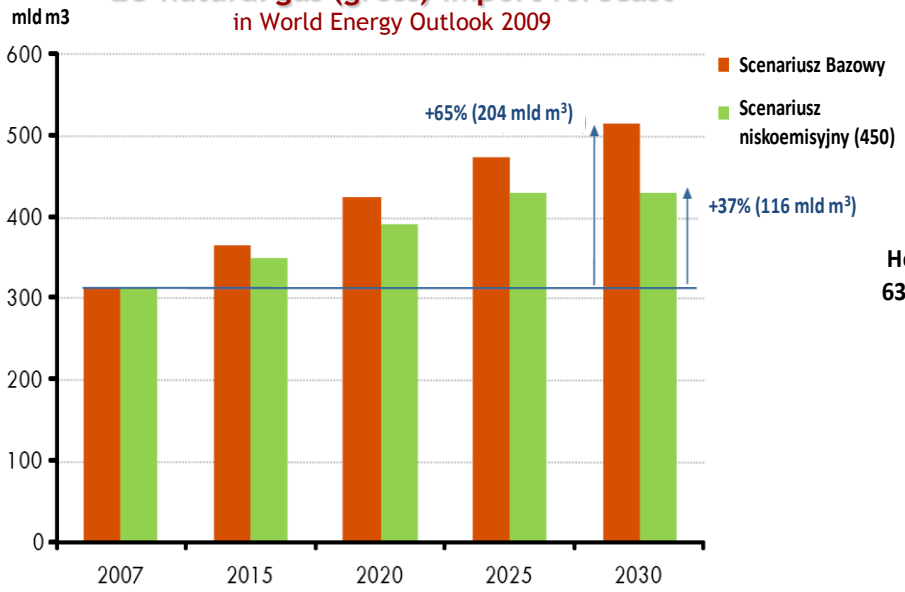


Source: Own calculations based on BP Statistical Review of World Energy 2008

… so we need to come back to rudiments …

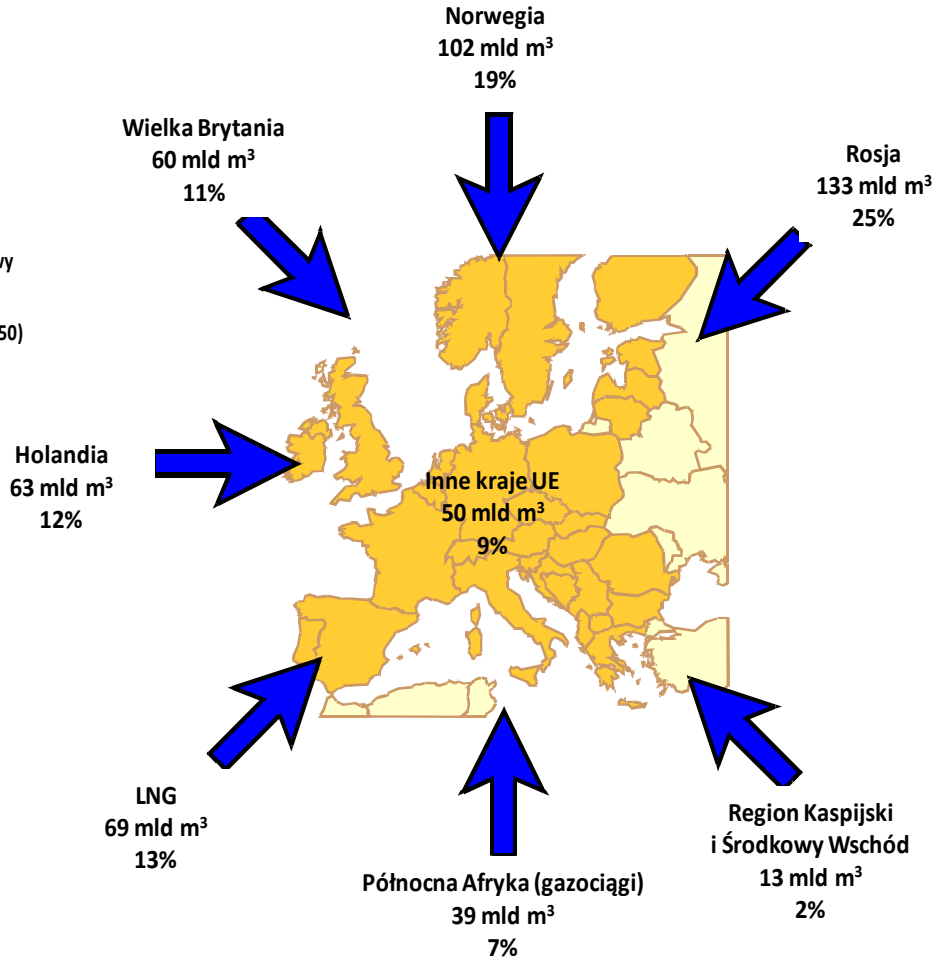
EU natural gas (gross) import forecast

in World Energy Outlook 2009



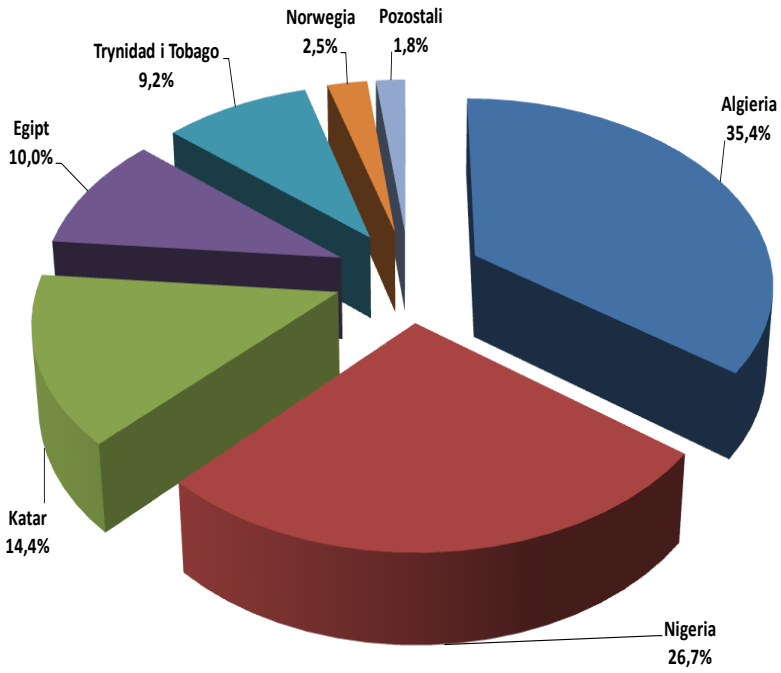
Source: Fatih Birol, World Energy Outlook 2009 presentation for Ministry of Economy of Poland, November 2010.

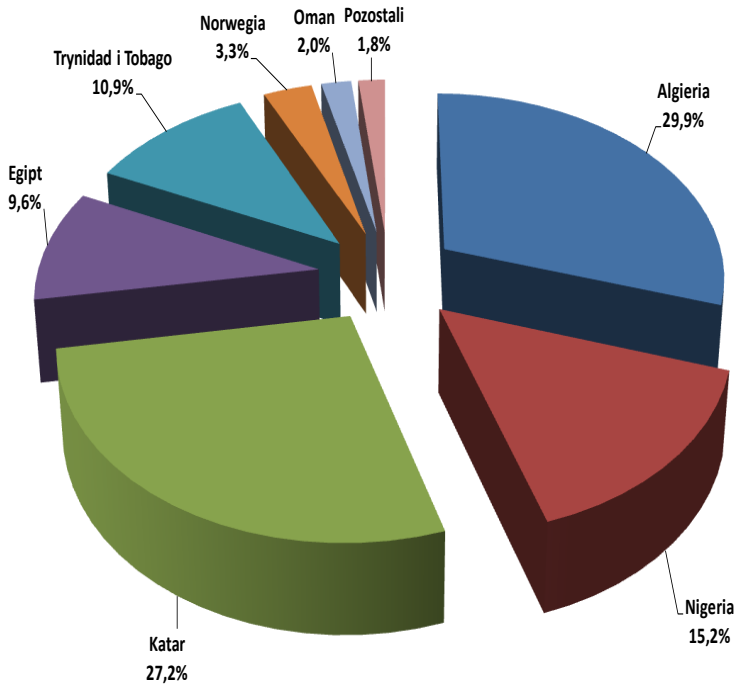
Sources for natural gas deliveries to Europe (2009)



Source: Own calculations based on BP Statistical Review of World Energy 2010

Structure of the LNG deliveries to the UE 2008/2009





Arbitrage occurs and spot LNG is being directed to the best paying market (adjusted for transport costs).

Source: Own calculation based on CERA, Mai 2010 and BP Statistical Review of World Energy, June 2010.

Possible sources of natural gas supply for Europe

(bcm) mld m³	2007	2008	2010	2015	2020	2025	2030
Internal production (low scenario)	186,0	184,6	184,2	**142,5**	**127,9**	**108,1**	**93,3**
Internal production (base scenario)	186,0	184,6	184,2	**142,5**	**127,9**	**108,1**	**93,3**
Import:							
Norway (low scenario)	90,6	92,8	96,8	**102,5**	101,1	97,7	90,6
Norway (base scenario)	90,6	92,8	98,2	**110,7**	110,1	103,2	91,7
Russia (low scenario)	148,0	151,4	163,0	**132,3**	**121,1**	**125,1**	122,7
Russia (base scenario)	148,0	151,4	167,2	**170,8**	**183,8**	**216,0**	231,6
Caspian Region & Middle East (low scenario)	7,4	12,2	7,0	**10,0**	10,0	10,0	13,6
Caspian Region & Middle East (base scenario)	7,4	12,2	7,0	**10,3**	16,4	15,2	19,1
North Africa pipelines (low scenario*)	41,9	45,2	46,8	**55,7**	54,6	54,3	56,6
North Africa pipelines (base scenario*)	41,9	45,2	45,4	**55,5**	58,4	58,4	58,5
LNG (low scenario)	53,3	55,5	79,6	**105,1**	118,0	141,6	137,0
LNG (base scenario)	**53,3**	**55,5**	**73,1**	**110,9**	**142,7**	**173,9**	**175,4**
Total :law scenario	527,2	541,7	577,5	**548,1**	532,8	536,8	513,8
TOTAL base scenario	527,2	541,7	575,2	**600,7**	639,4	674,8	669,6

* For North Africa countries supply: low scenario shown in above was originally as a base scenario because of much higher production and base scenario was originally low scenario (much lower production estimation).
Such assumption was taken to have better comparison and cohesion with forecasts from other directions.

Source: Own estimations based on PRIMES Baseline 2009; CERA forecasts; BP Statistical Review of World Energy (data for 2007, 2008, 2009).

EU-Russia WTO „gas formula" deal

„The representative of the Russian Federation confirms that producers/distributors operating on gas supplies to industrial users would operate to recover their costs (including cost of production, overheads, financial charges, maintenance and upgrade of extraction and distribution infrastructure, investment in the exploration and development costs of new fields) […] and would be able to make a profit, in the ordinary course of business."

(This is a commitment)

Source: Draft Working Party report, WTO ACCESSION OF RUSSIA, Q3 2004

- ✓ **2008 - 63,3 USD/1000m³**
- ✓ **2011 - 126,0 USD/1000 m³**

(no tariffs and transportation costs)

*„Some analysts have questioned whether it is in Moscow's economic interest to join the WTO, since there are **no tariffs** on its biggest export to the EU **- oil and gas**. But the EU policymakers believe the Kremlin has concluded that it needs membership in order to attract the foreign investment necessary to modernize its economy."*

Source: Financial Times
(www.ft.com/cms/s/0/785eb542-f802-11df-8d91-00144feab49a.html)

The 3rd package* in natural gas sector

„The 3rd package of measures adopted by the Commission will ensure that all European citizens can take advantage of the numerous benefits provided by a truly competitive energy market.

Consumer choice, fairer prices, cleaner energy and security of supply are at the centre of the third legislative package, adopted by the Commission on 19 September 2007.

In order to reach those goals, the Commission proposes:

- ✓ *to separate production and supply from transmission networks,*
- ✓ *to facilitate cross-border trade in energy,*
- ✓ *more effective national regulators,*
- ✓ *to promote cross-border collaboration and investment,*
- ✓ *greater market transparency on network operation and supply,*
- ✓ *increased solidarity among the EU countries."*

* DIRECTIVE 2009/73/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC.

Source: http://ec.europa.eu/energy/gas_electricity/third_legislative_package_en.htm

ISSUES for Russia – EU Relations in gas sector

GAZPROM

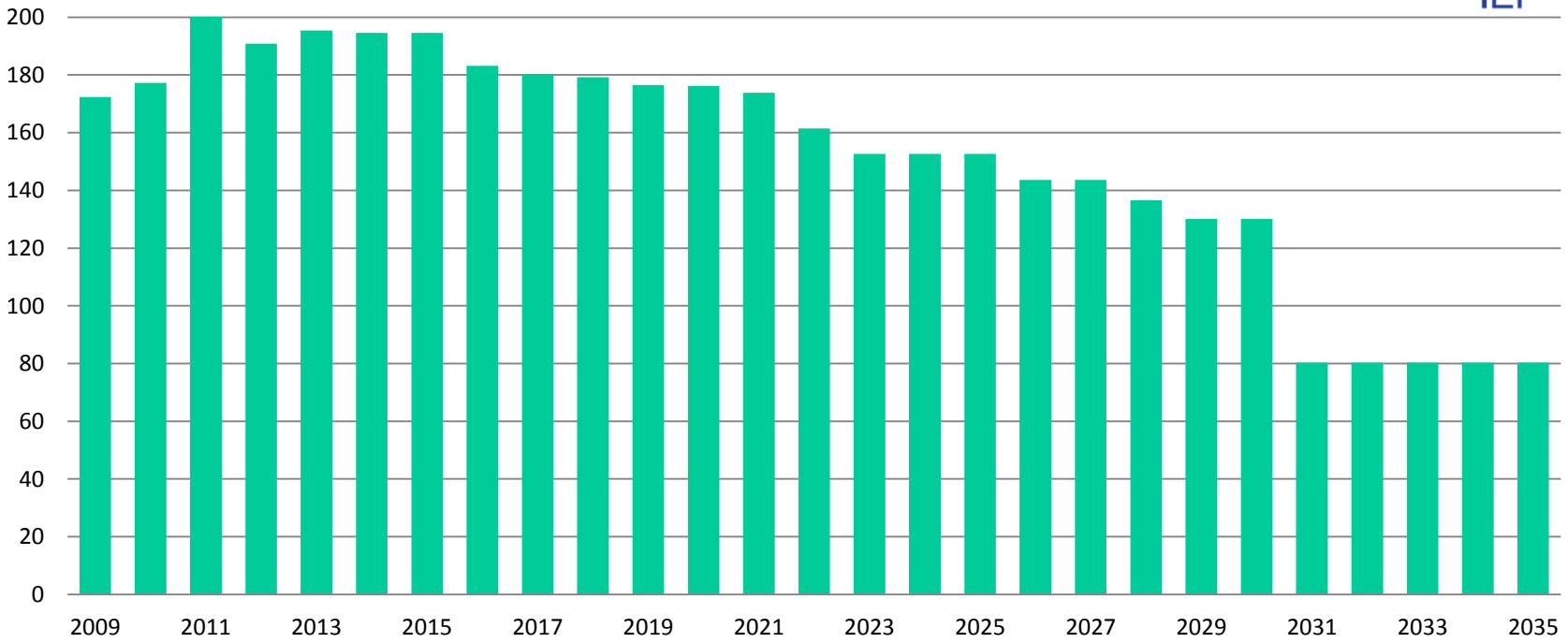
- 3rd Energy (GAS) Directive* & Regulation issues – GAZPROM assets case.
- Gazprom needs real demand for new pipeline projects - stable forecast for future demand.
  Task № 19: Increase the Russian gas export to European market:
  160 bcm in 2008
  120 bcm in 2009
  TARGET ⇨ 200 bcm in 2030
- EU gas market forecast is strongly needed.
- Demand for EU ⇔ secure demand for Russian natural gas.
  Task № 21: Promote the gas pricing system in Europe, including both long-term and spot contracts.
- No external politics please! (transit problems towards Ukraine and/or Belarus).
- Bilateral investments in gas fields, pipelines, energy (NUCLEAR!) and access to end users.
  Task № 22-23: Bilateral investment in gas projects.

* DIRECTIVE 2009/73/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC.

Source: www.gazprom.com; RIA Novosti, www.ft.com

Long-term basis for interdependence

Gazprom: European long-term contracts.



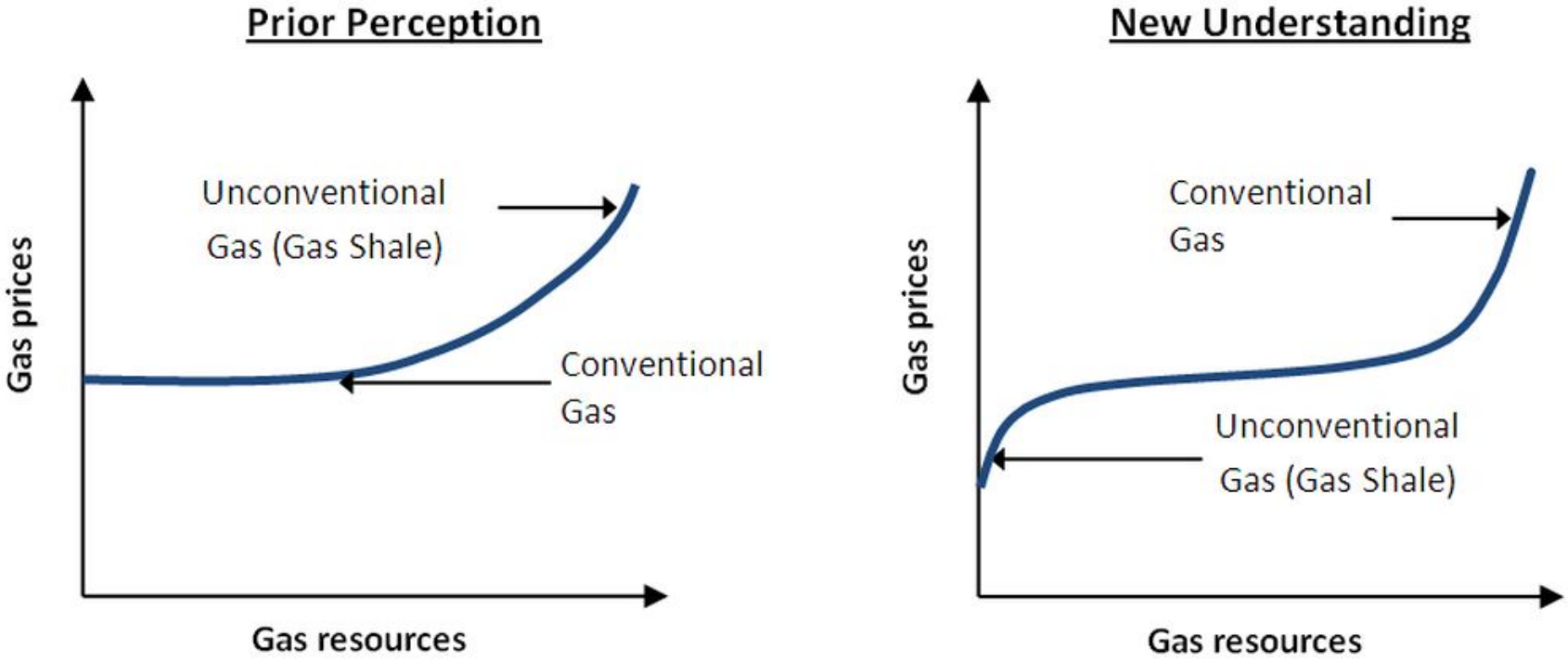
- ✓ **Gazprom has supply** (mainly "Take-or-pay") **contracts till 2037.**
- ✓ **Russia can redirect part of gas flows to the East Asia or create gas-chemistry industry but it needs a lot of time and investments.**

Sources: Gazprom, IEF estimate, M.Belova

Russia ?

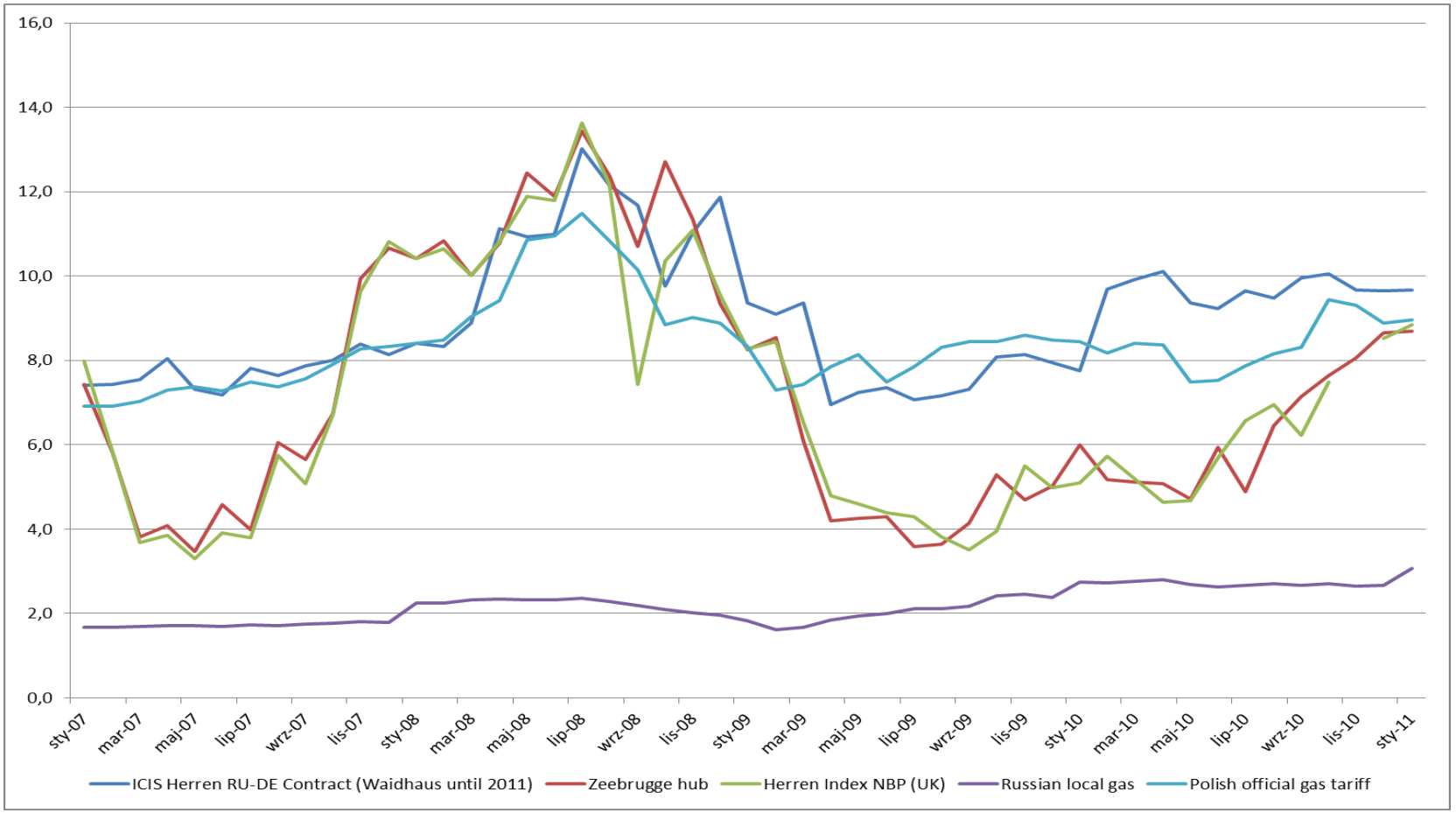
✓Shale gas has moved to the bottom of the US gas supply curve.

✓Until recently, conventional gas was viewed as low-cost, while shale gas was an abundant but high-cost US resource – that perception has now reversed.



Source: Vello A. Kuuskraa, „Gas Shales Drive the Unconventional Gas Revolution", Advanced Resources International, Inc., Washington Energy Policy Conference: The Unconventional Gas Revolution, March 9, 2010, Washington, D.C.

Natural gas prices Poland vs. UE
Russian domestic gas 2011



Source: Fertilizers Europe

Potential barriers for large scale shale gas exploration and production in Poland

- ✓ **Strong population in service areas.**
- ✓ **„Natura 2000" - a strong environmental organizations and changes and heterogeneity of environmental** (noise, lack of water).
- ✓ Protectionism of companies servicing the domestic market (especially drilling).
- ✓ Impediments to the entry of foreign firms drilling (eg, Polish/EU powers for operators of drilling equipment).
- ✓ Difficult and lengthy procedures for procurement of drilling equipment from outside the European Union.
- ✓ Auctions (time/price) to perform drilling.
- ✓ Lack of the market liberalization and uncertainty over gas prices resulting from insufficient liberalization of the domestic gas market (the domestic price of mining ?).
- ✓ Unclear (difficult) provisions concerning the right to geological information and the high price of the geological information.
- ✓ Lack of tax and financial incentives and capital for exploration.
- ✓ Lack of Polish technical thought (the need to purchase technology).
- ✓ Lack of competition in the market for service.
- ✓ Break the generation among Polish drillers, geologists, geophysicists, etc. (lack of the specialists in the country).
- ✓ Polish Energy policy PEP2030 not pushing gas as an energy source.

Potential barriers for large scale shale gas exploration and production in Poland

- ✓ **Strong population in service areas.**
- ✓ **„Natura 2000" - a strong environmental organizations and changes and heterogeneity of environmental** (noise, lack of water).

…and lets imagine that somebody will be „supporting" such voices:

- „Mining also disturbs the groundwater patterns in your area. Water tables may be lowered and runoff is redirected". This can have an impact on the ecosystems in the area – your area !
- As many oil shale deposits are in desert areas, such as the Western US and Israel's Negev desert, water disturbances are of particular concern.
- Extraction of gas from shale has many environmental impacts. Extraction uses large amounts of water, from one to five times as much water as fluid produced. This water can be highly contaminated with organic and inorganic compounds and provides a serious ecological hazard […]."

…and I am not drawing your attention to an economic point of view ☺☺☺

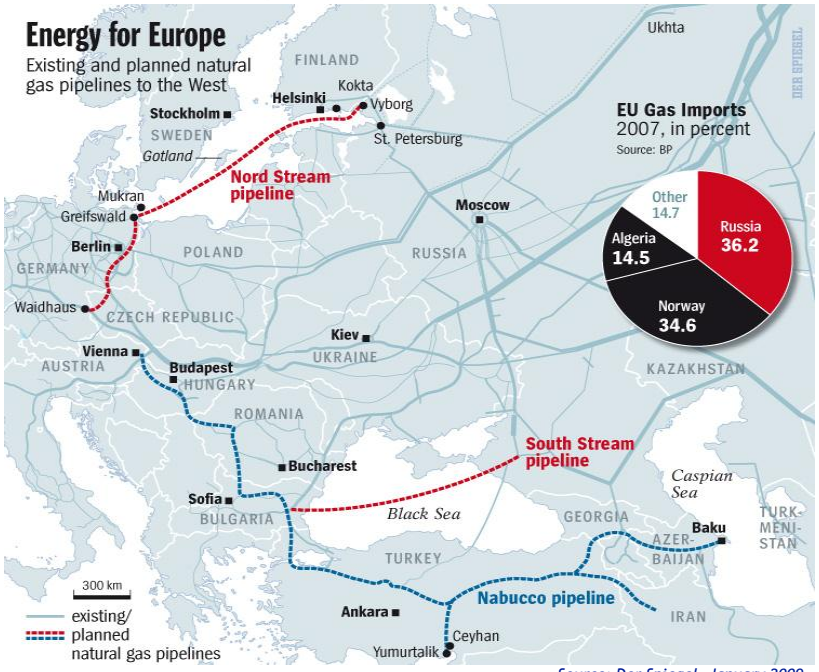
Can Poland duplicate the unconventional gas revolution ?

„With a little help from my friends…"

Strategy at first…

- ✓ Stable and long term energy policy
- ✓ Strategic planning for coal industry
- ✓ Development of the gas market
- ✓ Pro-ecological solutions:
  - CCS what for ?
  - Nuclear - to expensive ?
- ✓ Technology or support for an access to high efficient & flexible technology and services

Existing and planned natural gas pipelines to the West

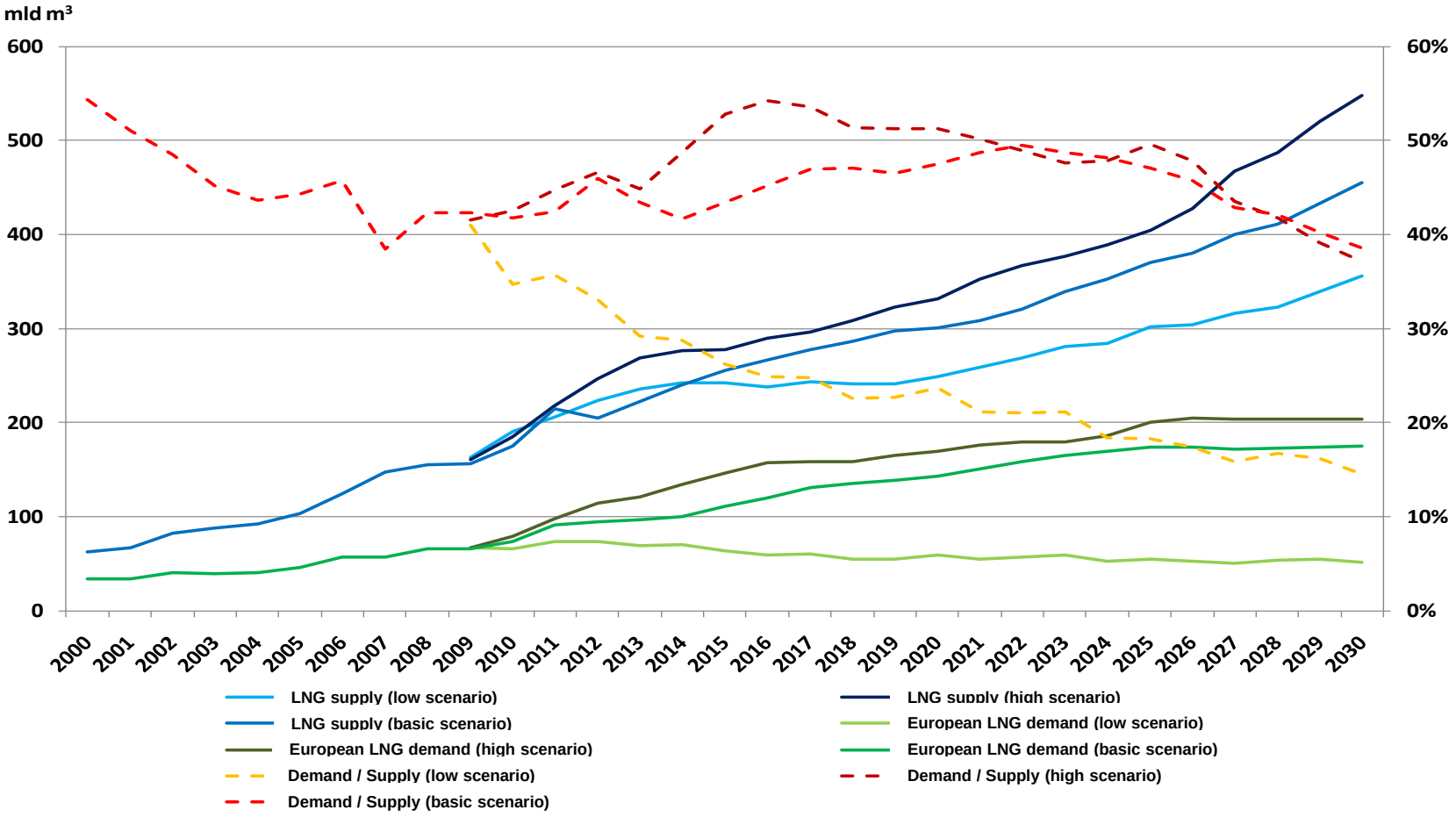


Source: Der Spiegel, January 2009

Questions ?

Support

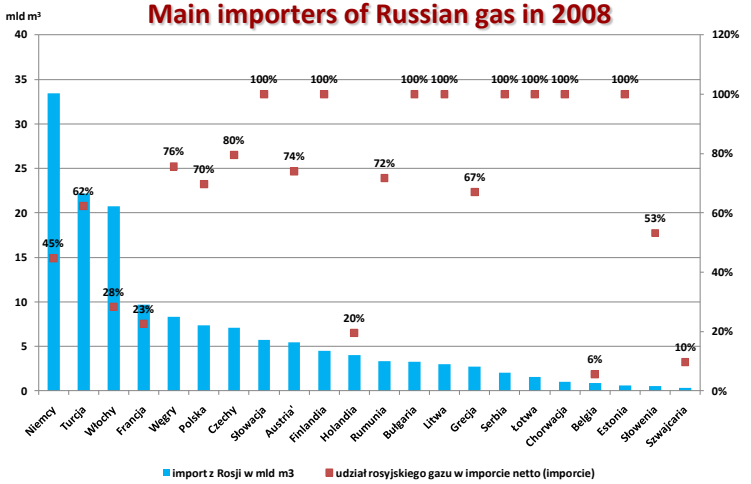
LNG - myth or reality for the European Union ?



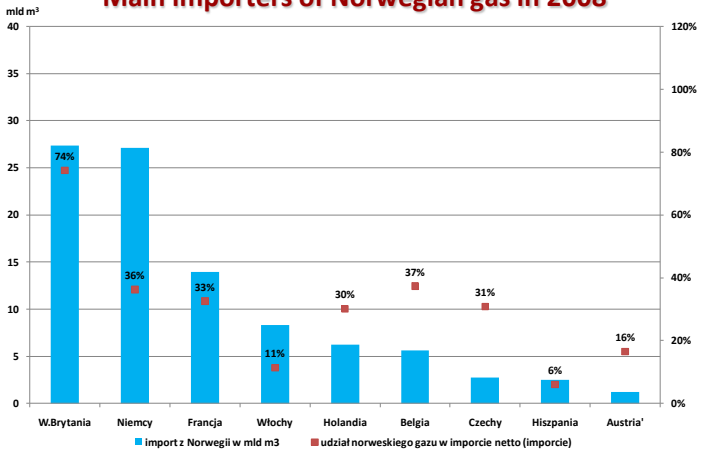
Source: „LNG Supply and demand forecast for European market", CERA

Russia, Norway, Algeria and EU gas consumption

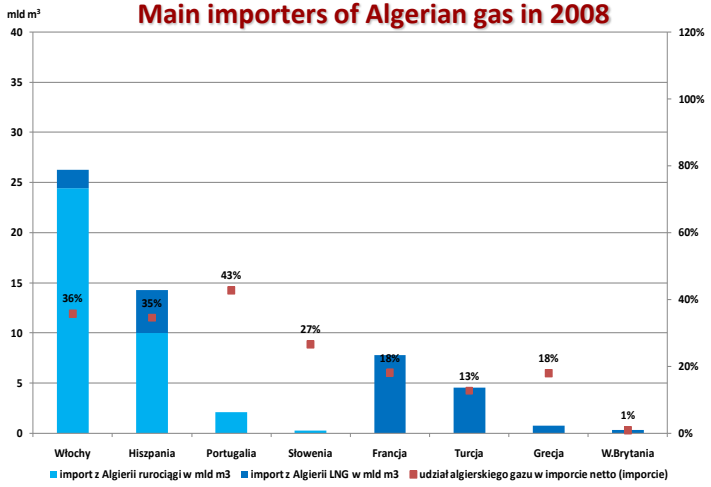
Main importers of Russian gas in 2008



Main importers of Norwegian gas in 2008

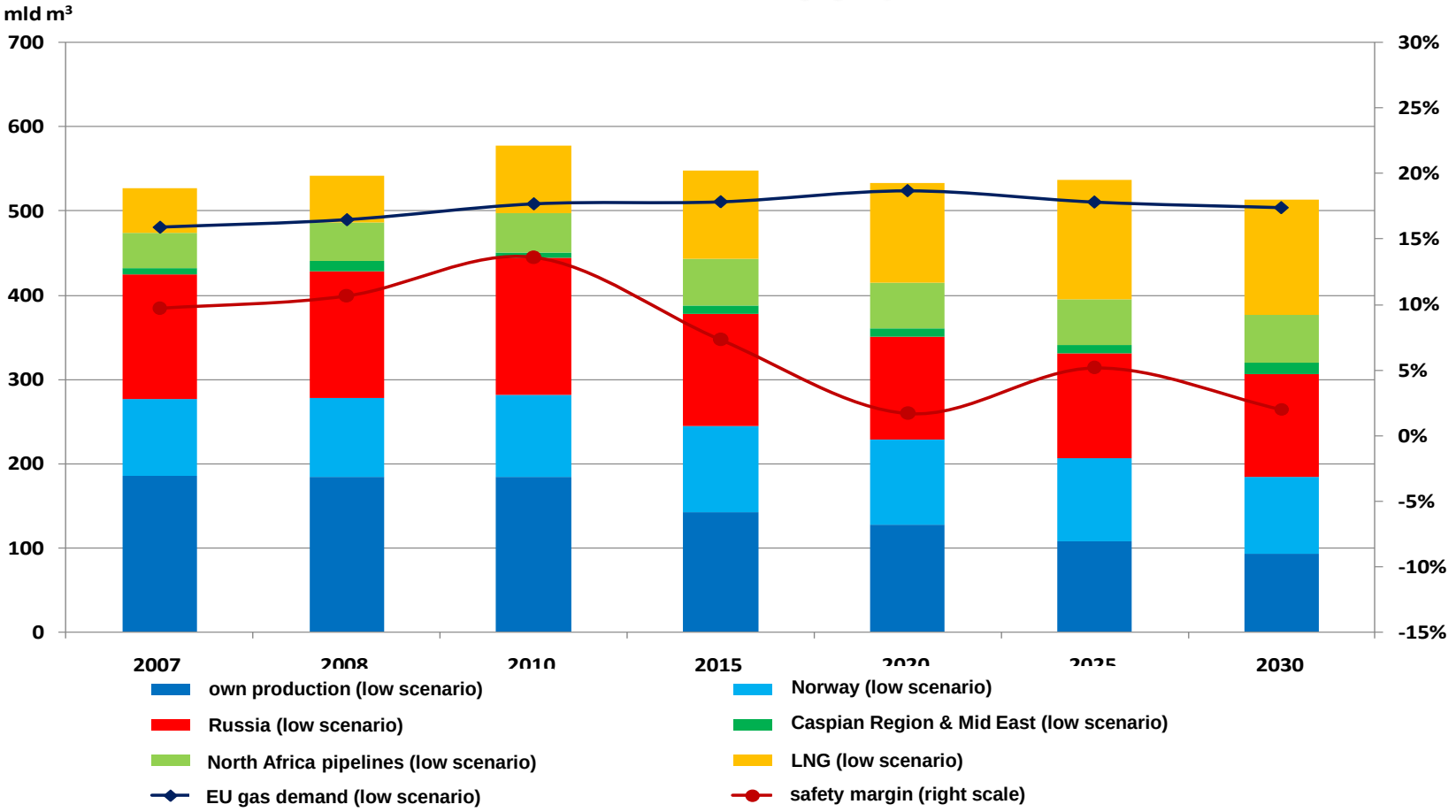


Main importers of Algerian gas in 2008



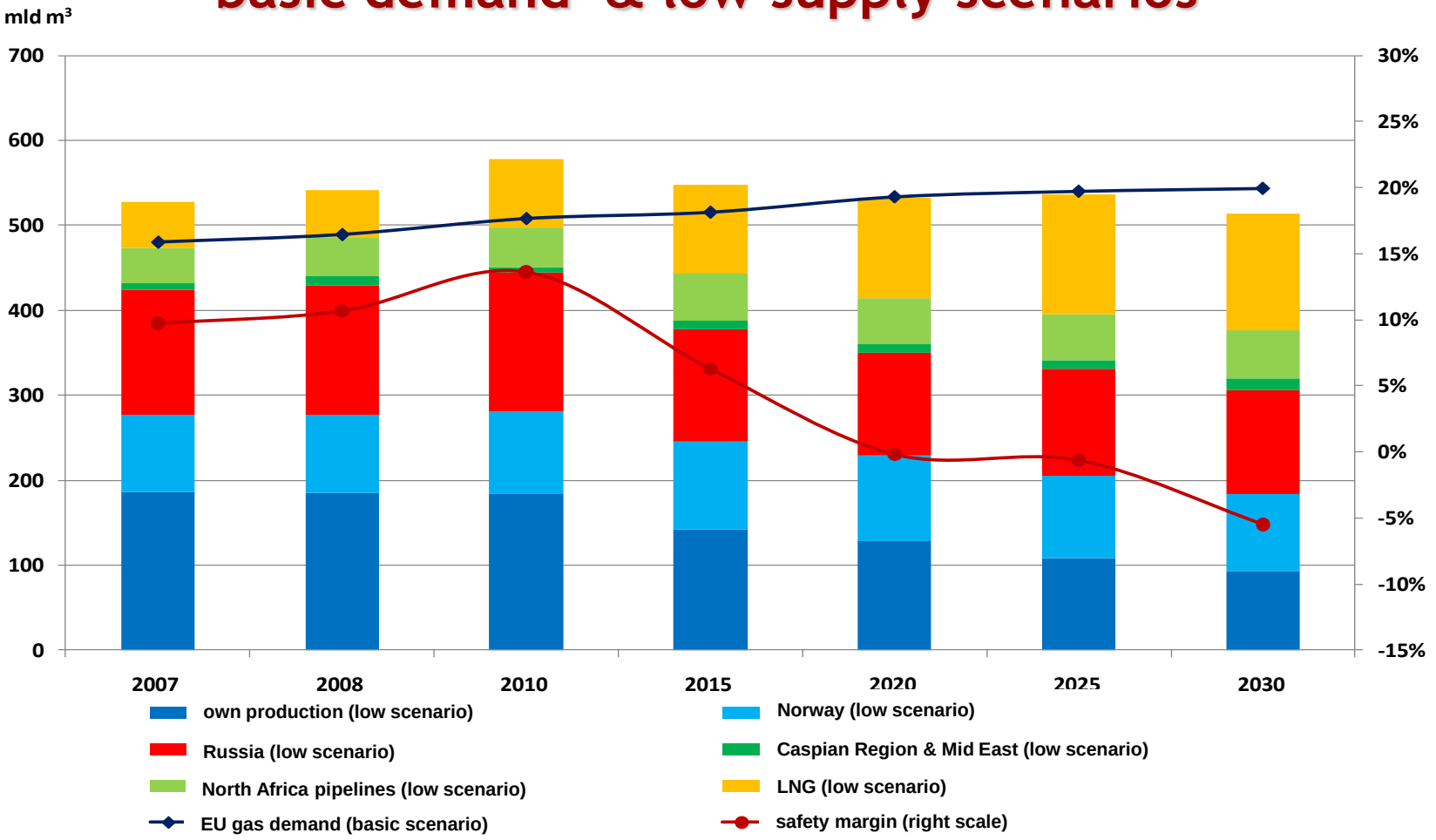
Source: Own calculation based on BP Statistical Review of World Energy, June 2009 and CERA data, May 2010.

EU natural gas balance
low demand & low supply scenarios



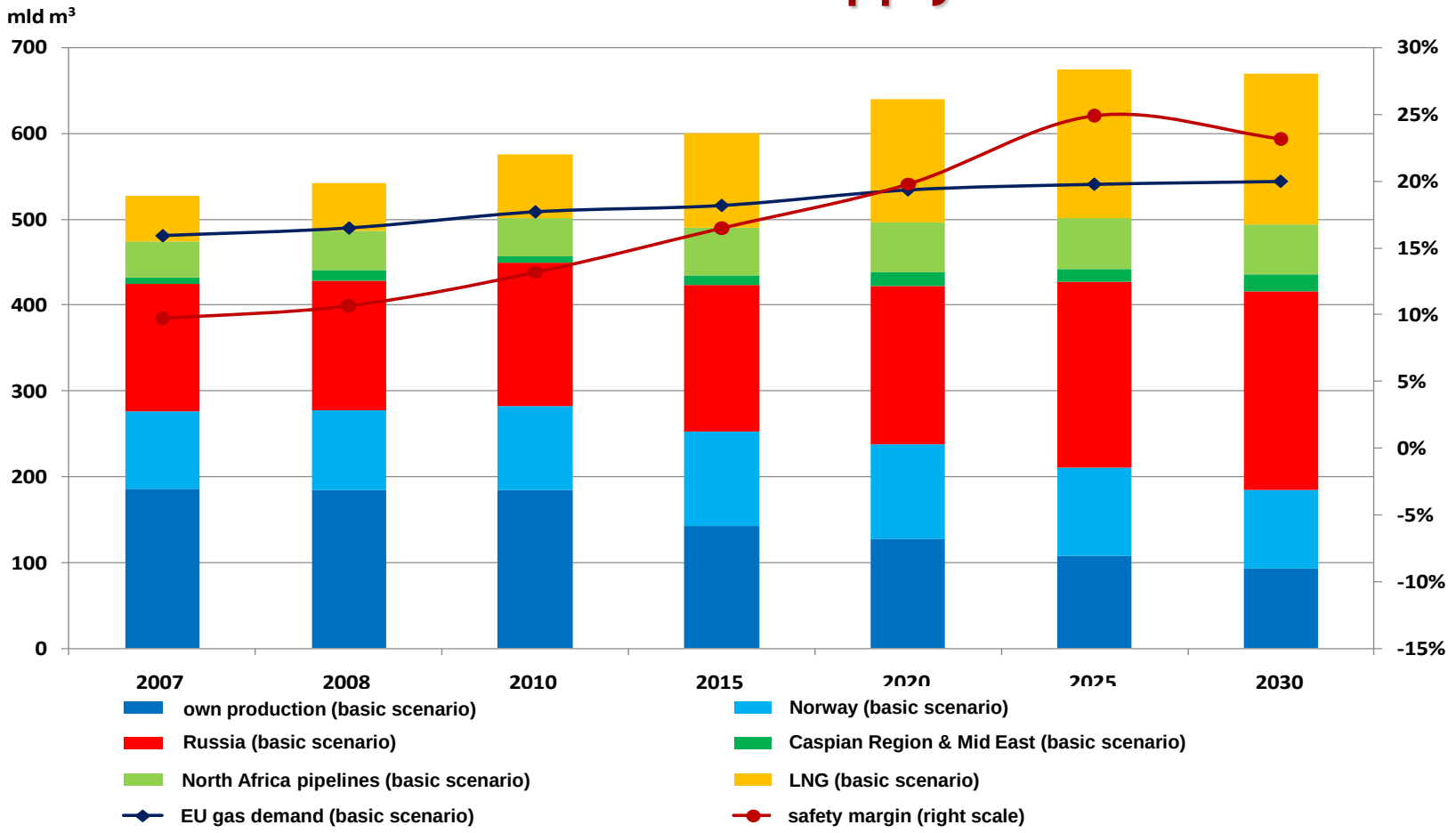
Source: Own calculation based on PRIMES Baseline 2009, CERA forecasts and BP Statistical Review of World Energy (data for 2007 and 2008).

EU natural gas balance
basic demand & low supply scenarios



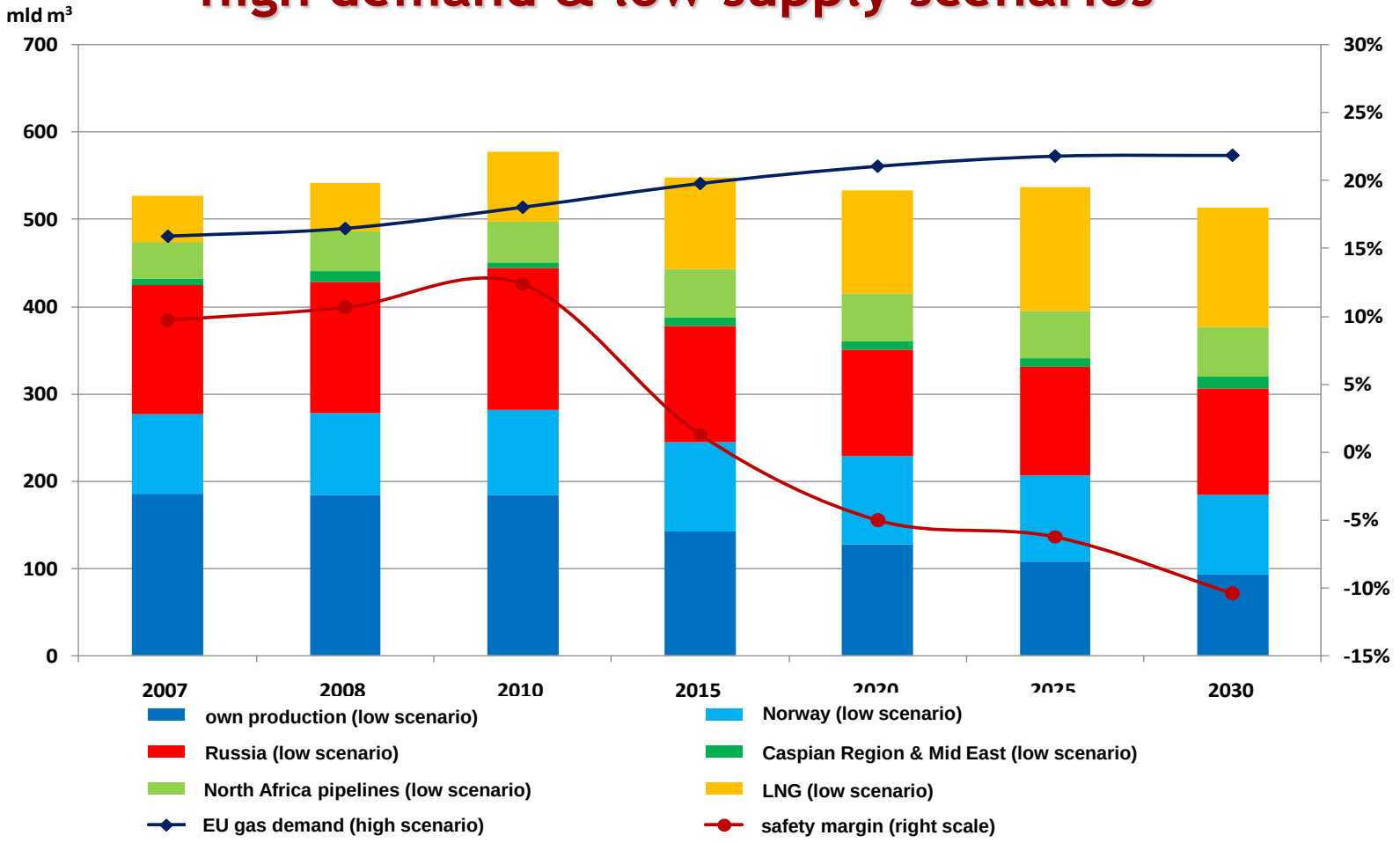
Source: Own calculation based on PRIMES Baseline 2009, CERA forecasts and BP Statistical Review of World Energy (data for 2007 and 2008).

EU natural gas balance
basic demand & basic supply scenarios



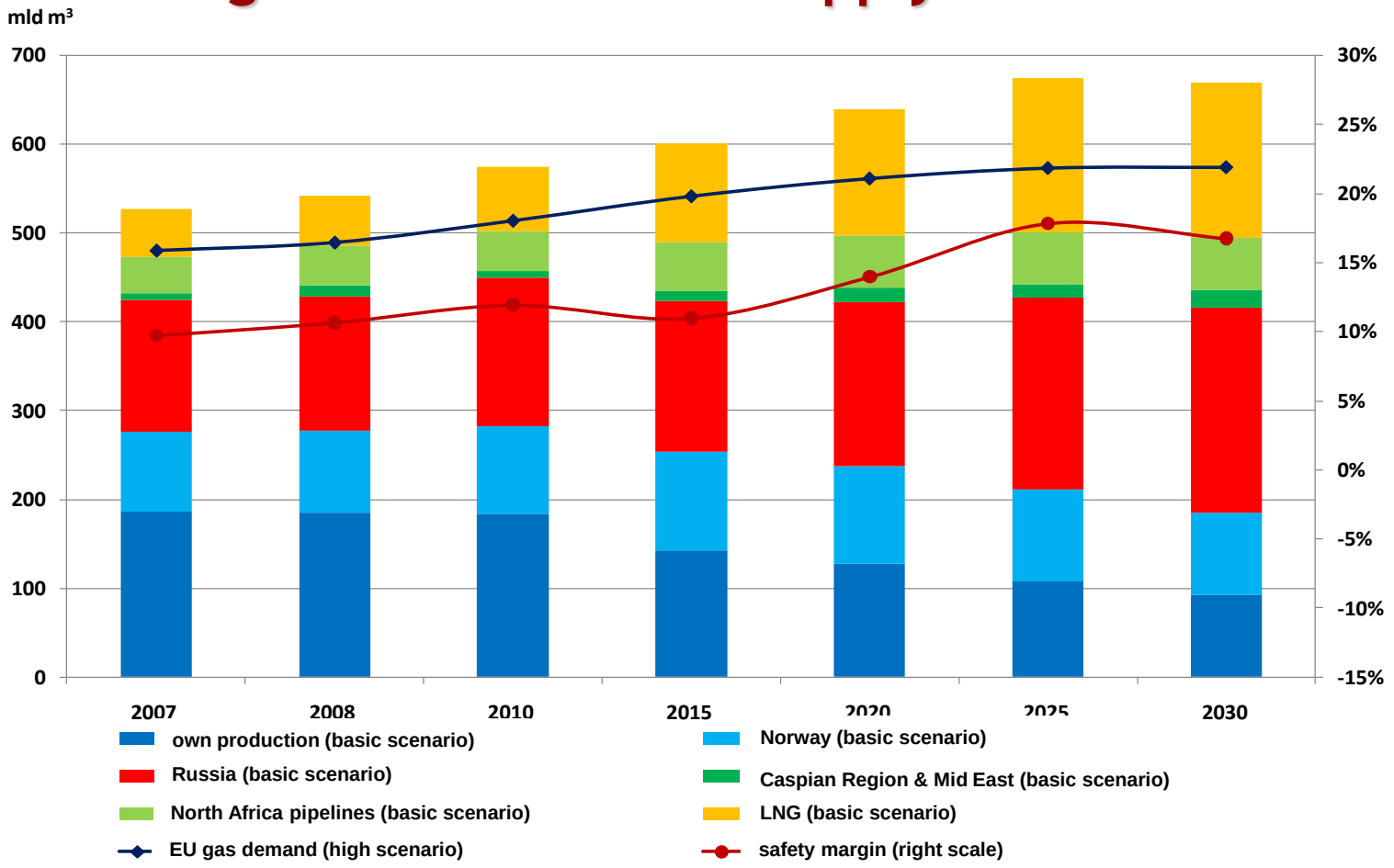
Source: Own calculation based on PRIMES Baseline 2009, CERA forecasts and BP Statistical Review of World Energy (data for 2007 and 2008).

EU natural gas balance high demand & low supply scenarios



Source: Own calculation based on PRIMES Baseline 2009, CERA forecasts and BP Statistical Review of World Energy (data for 2007 and 2008).

EU natural gas balance
high demand & basic supply scenarios



Source: Own calculation based on PRIMES Baseline 2009, CERA forecasts and BP Statistical Review of World Energy (data for 2007 and 2008).

About Energy Studies Institute

Energy Studies Institute
is a Polish consulting company dedicated for Oil&Gas sector.

Our services are well-known in heavy chemistry business and power generation (CHP) based on natural gas.

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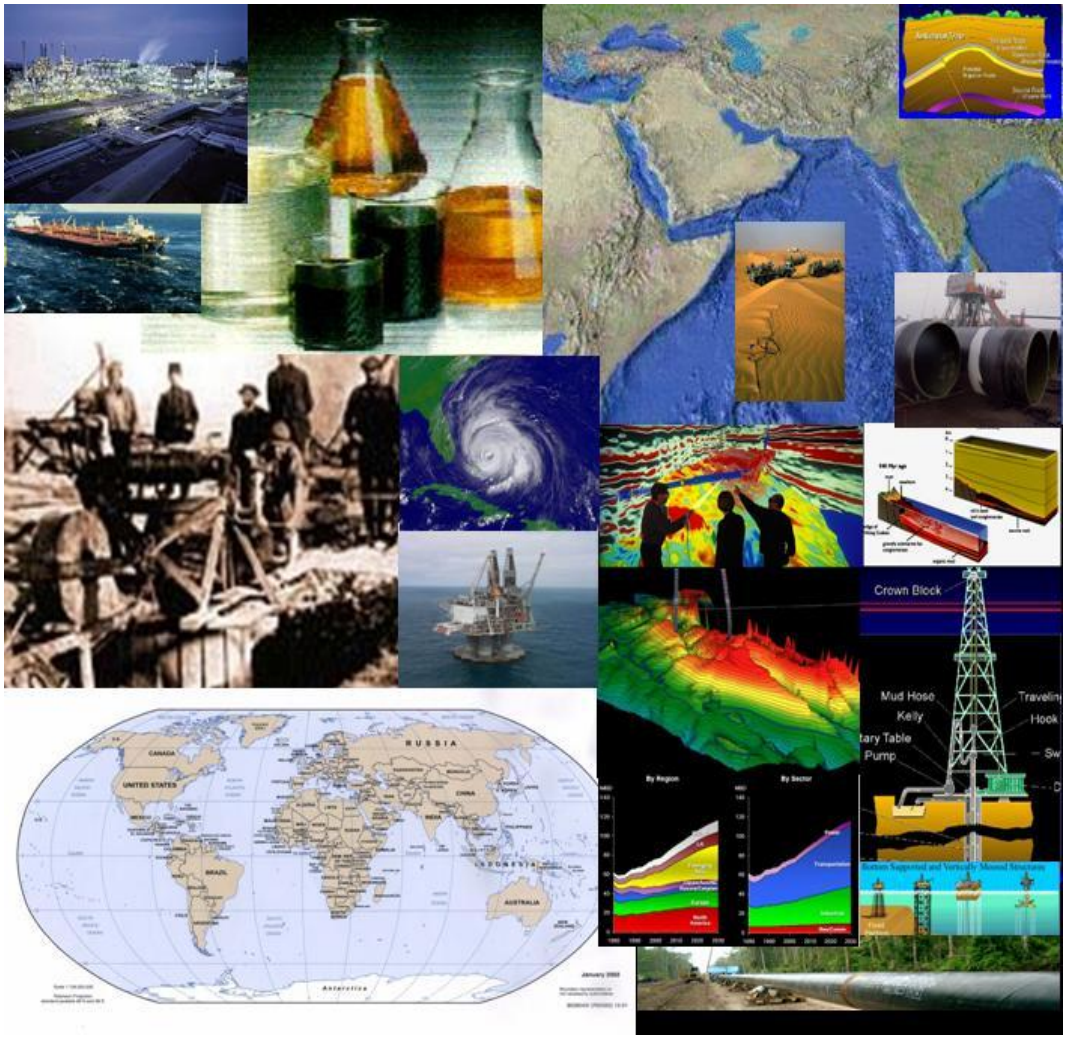

Thank you very much !

☺

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