

EUROPEAN GAS POLICY, DEMAND, SUPPLY AND PRICING: Global Implications

**Professor Jonathan Stern
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Oxford Institute for Energy Studies
CEE Annual Meeting
Houston, November 30, 2010**

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Examples of Published Research

- **Non-Gazprom Gas Production in Russia, James Henderson**
- **The Evolution and Functioning of the Traded Gas Market in Britain, Patrick Heather**
- **The June 2010 Russian-Belarusian Gas Transit Dispute: a surprise that was to be expected, Katja Yafimava**
- ***The April 2010 Russo-Ukrainian Gas Agreement and its Implications for Europe.* Simon Pirani, Jonathan Stern, Katja Yafimava**
- **The Impact of the Economic Crisis on Russian and CIS gas markets, Simon Pirani**
- **Continental European Long Term Gas Contracts: is a transition away from oil product-linked pricing inevitable and imminent? Jonathan Stern**

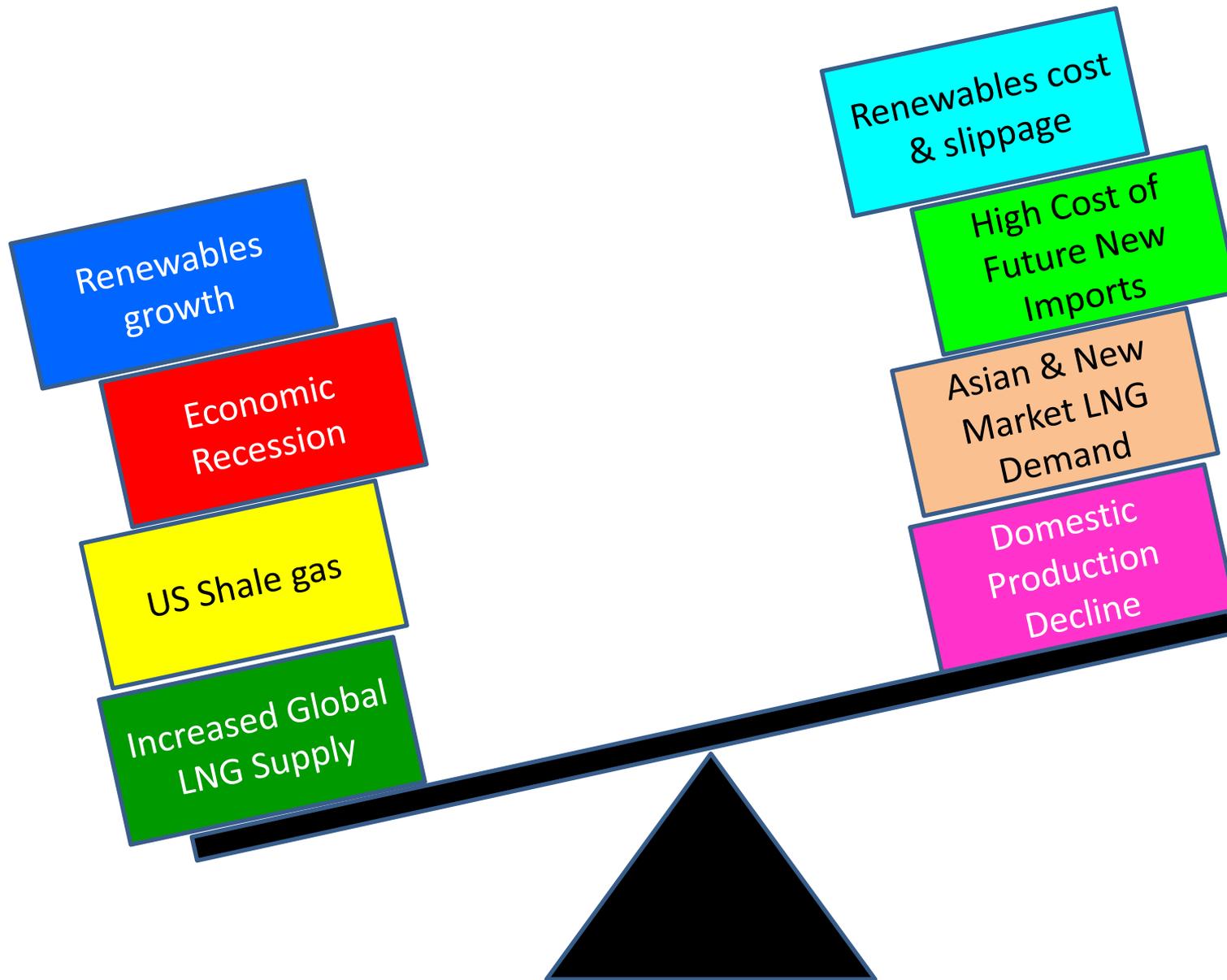
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Research in Progress

- **European Gas Demand, Supply & Pricing: cycles, seasons and the impact of LNG price arbitrage, Anouk Honore**
- **Natural Gas Markets in the Middle East and North Africa, eds. Bassam Fattouh and Jonathan Stern**
- **Algeria's gas export strategy in the 2010s, Hakim Darbouche**
- **Can Shale Gas be a Game-Changer for European gas markets? Florence Geny**
- **Gas Consumption in the former Soviet Union, Simon Pirani**
- **The Transit Dimension of EU Energy Security, Katja Yafimava**
- **The UK Natural Gas Market: Supply and Seasonal Flexibility to 2025, Howard Rogers**
- **Security of Supply in South Eastern Europe, Anastasios Giamouridis and Spiros Paleoyannis**

THE POLICY BACKGROUND AND EUROPEAN GAS DEMAND

Factors Influencing the European Gas Market





Gas is Losing the “Energy Policy Battle” in Europe

GAS INDUSTRY MESSAGE:

- Gas is lower carbon than coal and oil
- Gas is cheaper than renewables
- Therefore gas should prevail

RESPONSE OF GOVERNMENTS:

- Gas = increasing imports = increasing dependence on Russia = bad
- Gas emits carbon and is therefore part of the problem

Governments don't want gas for “security” and carbon reasons



Natural Gas as a “Transition” or “Destination” Fuel?

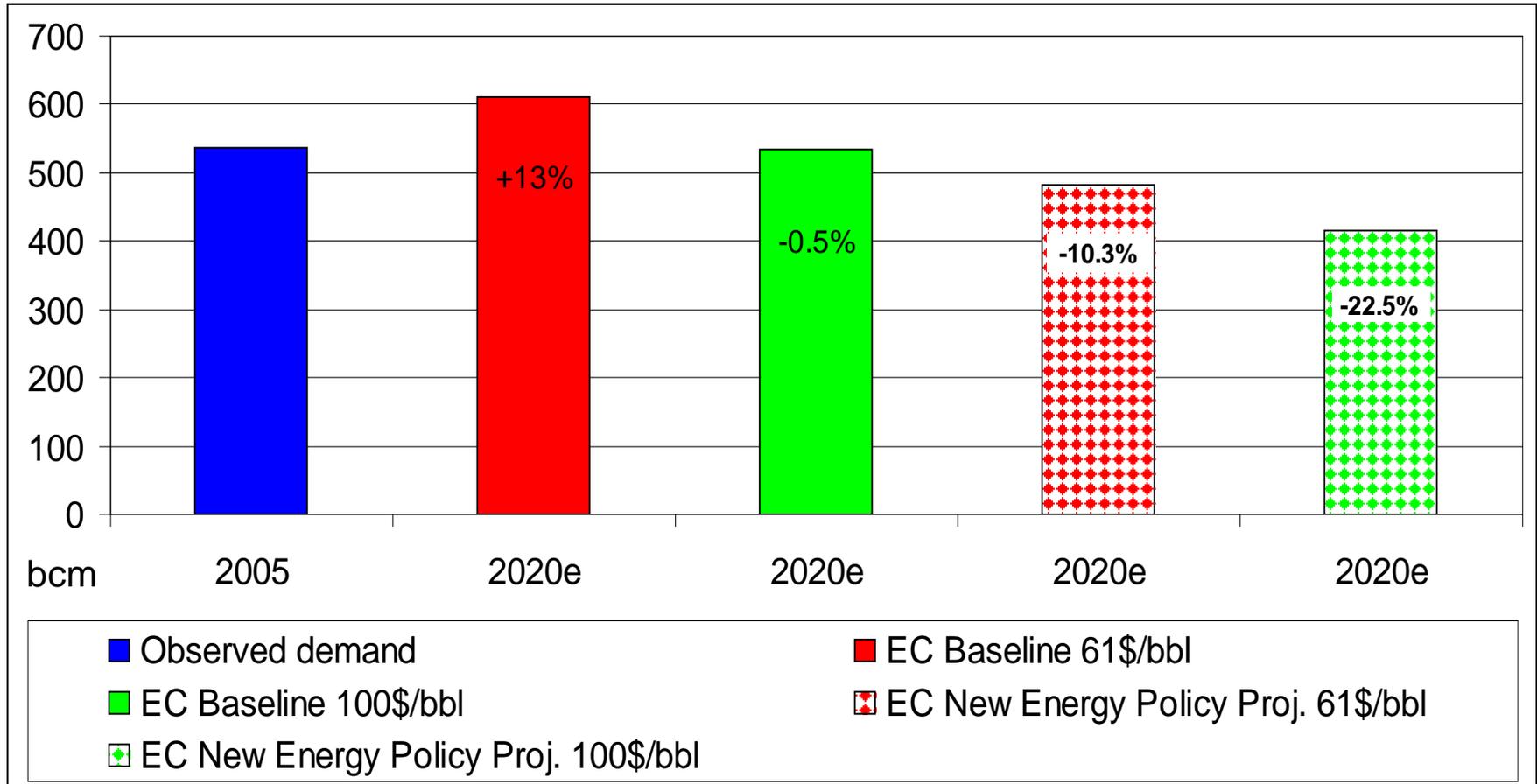
NICE SOUNDBITES– BUT WHAT DO THEY (COULD THEY) MEAN?

- **can/how can gas be part of any transition without decarbonisation?**
- **why are there no research/demonstration CCGTs with CCS in Europe?**
- **green gas (ie biogas) – possible cost and scale of development?**
- **CNG as a vehicle fuel, already rejected in favour of electricity?**

Gas has no decarbonisation strategy

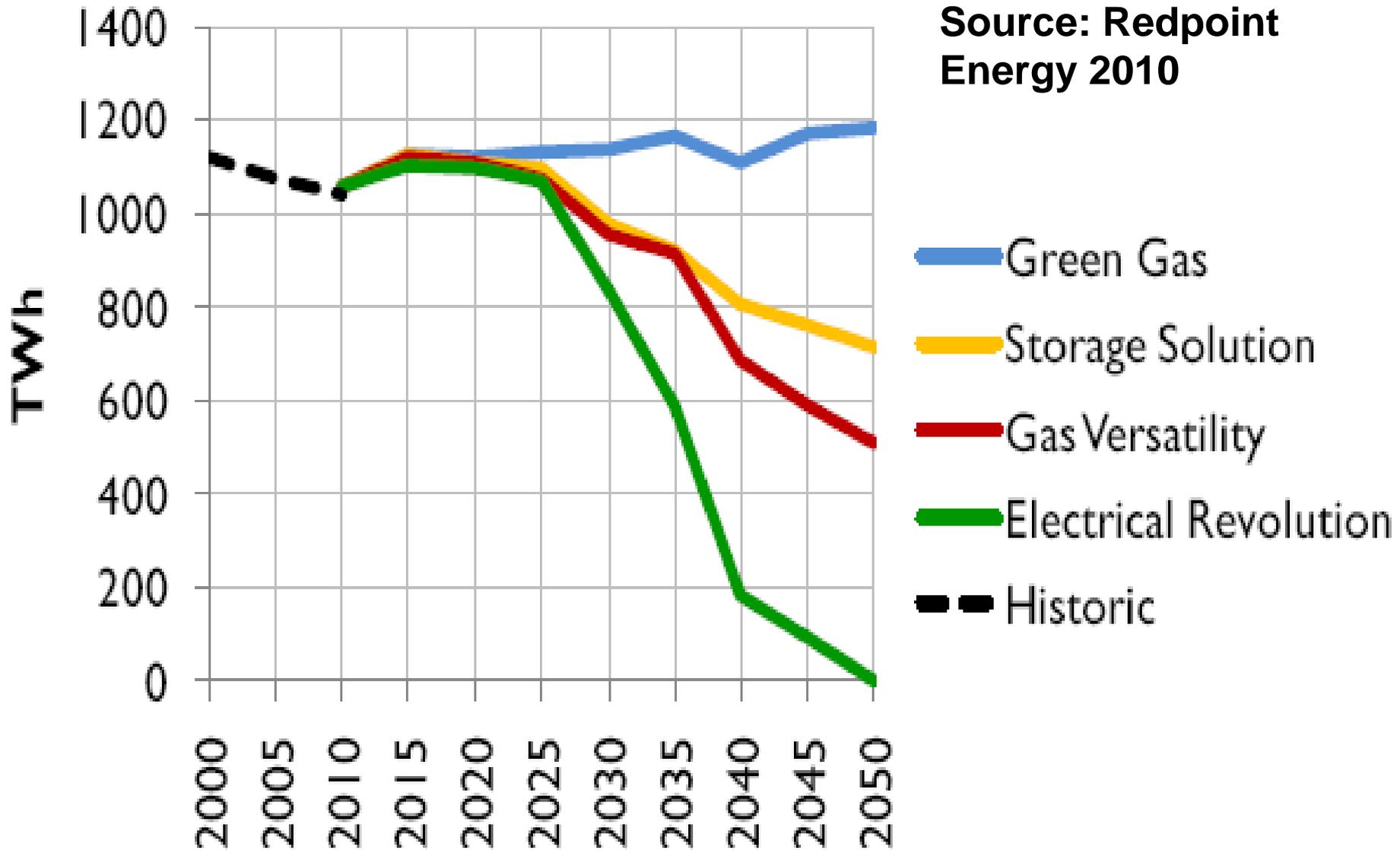


EC scenarios for natural gas demand in EU27 by 2020 including impacts of 20/20/20 policies (calculated in 2008, i.e. even before the economic recession)



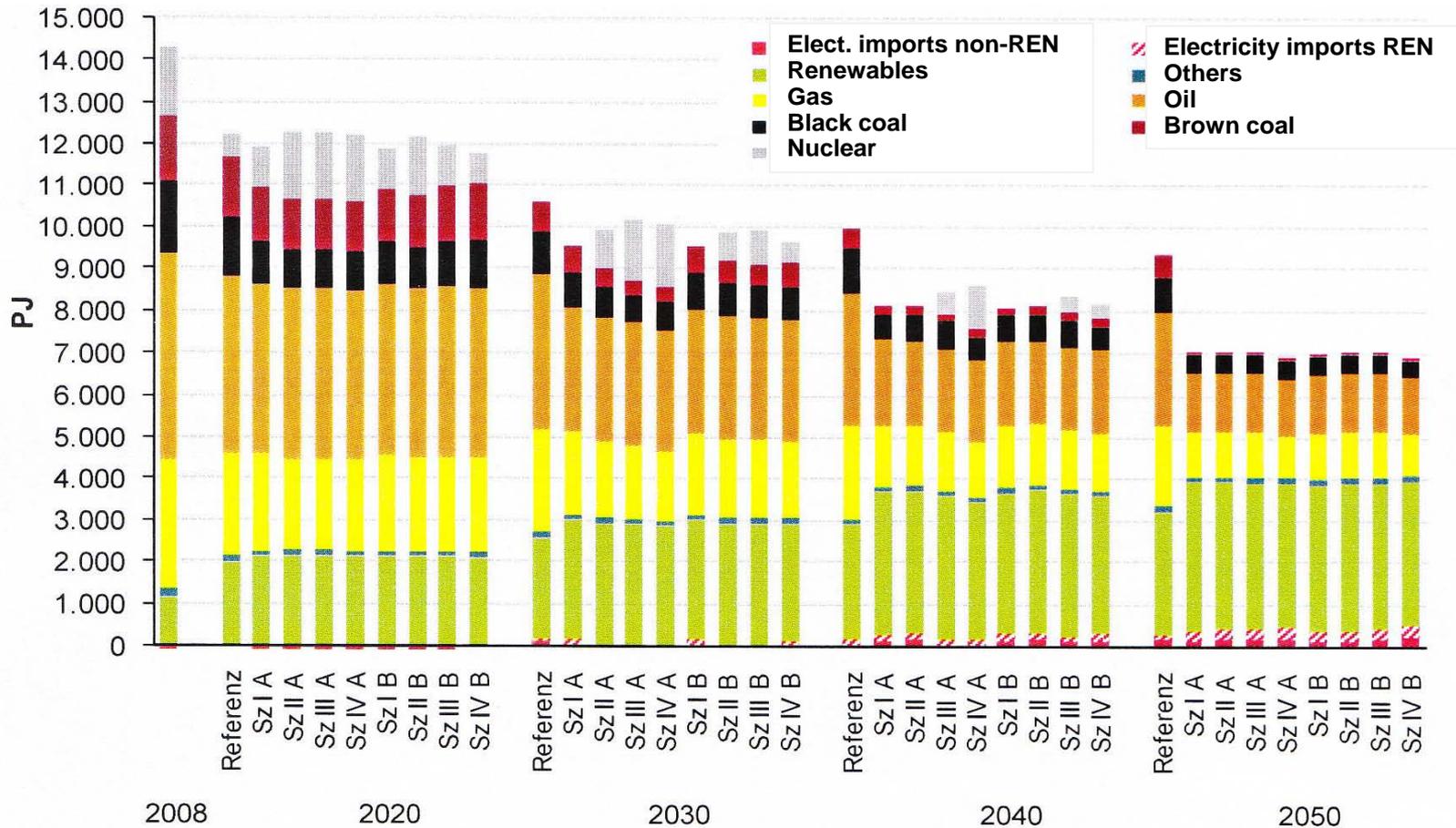
Sources: EC (2008), 2nd Strategic Energy Review (COM(2008) 781 final), Annex 1, p.19

UK Gas Demand Scenarios to 2050



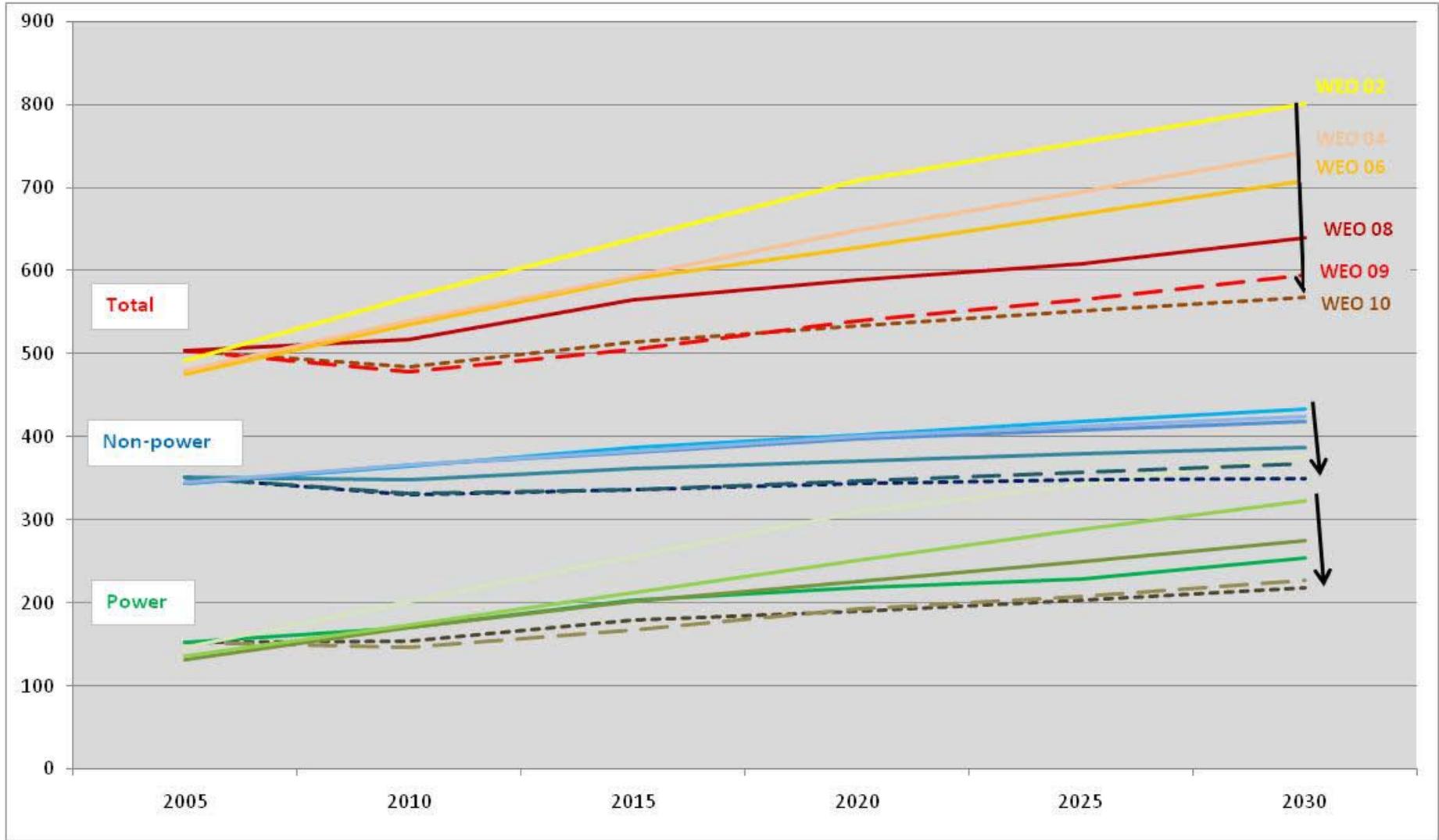
Germany: Up to 2020, not much change for gas, but sharp decline possible thereafter

TPES in Germany by fuel source, from various scenarios



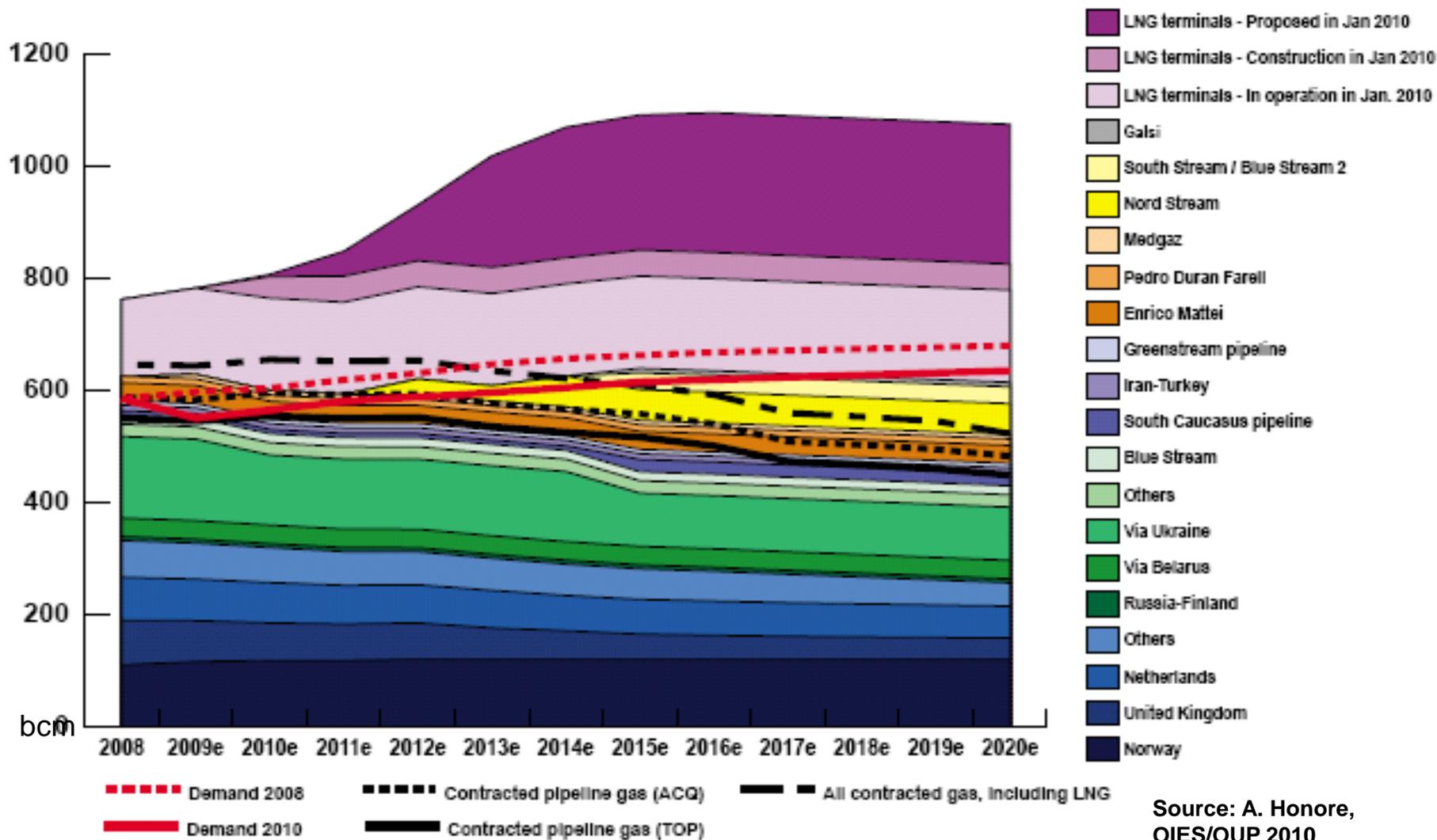
Prognos / EWI / GWS 2010

IEA European Gas Demand Projections from the WEO: 2000-2010



Sources: IEA, OECD Europe, reference scenario in WEO 2000, WEO 2002, WEO 2004, WEO 2006, WEO 2007, WEO 2008, WEO 2009 and new policies scenario in WEO 2010

OIES Scenarios for 2020: annual average growth in 35 countries in Europe of 0.6% (1.5% in the power and 0.2% in non-power)



Europe will need to secure more gas post 2015



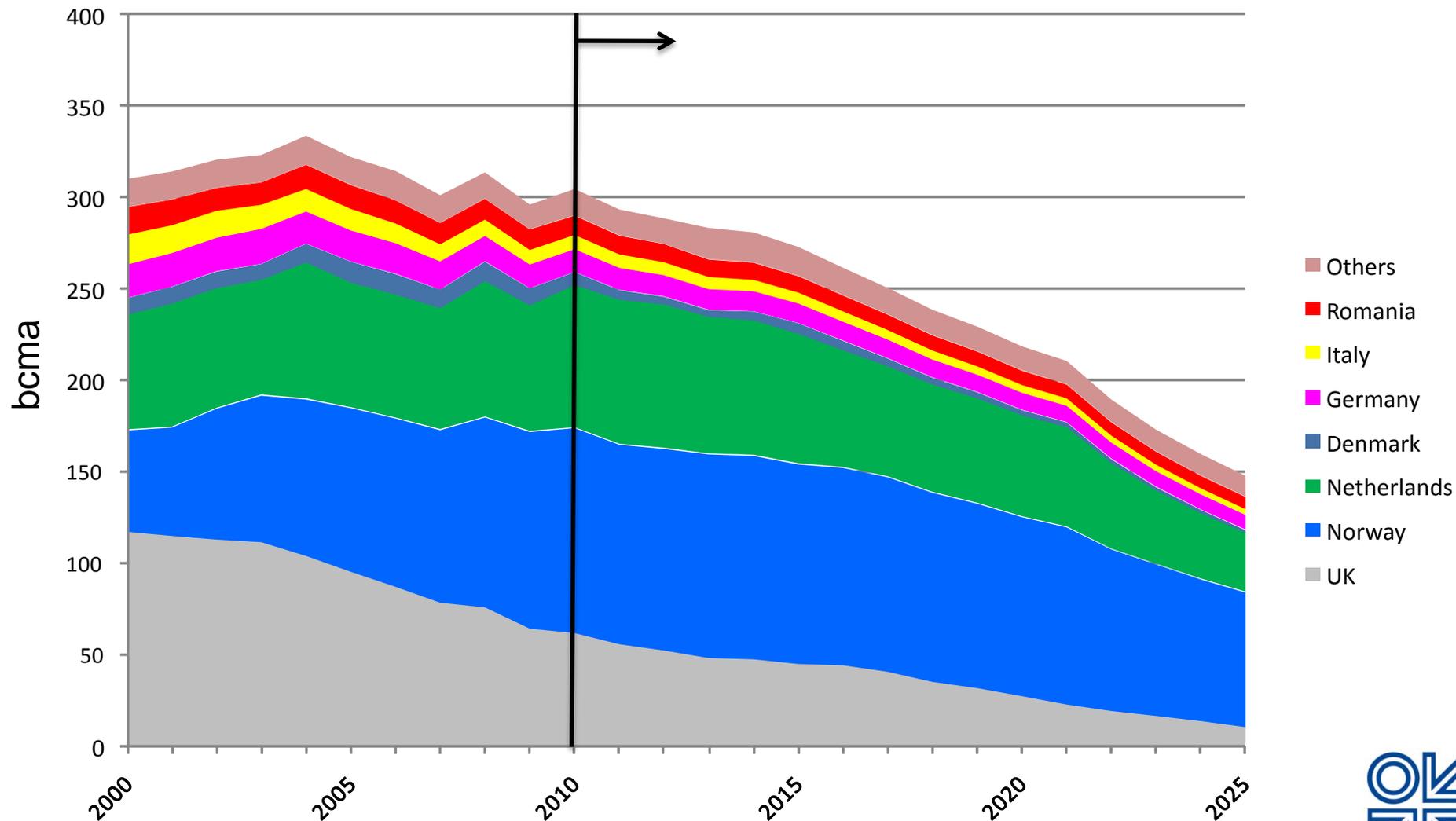
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EUROPEAN GAS SUPPLY – CURRENT SURPLUS/FUTURE SHORTAGE?

European Conventional Gas Production to 2000 - 2025



Unconventional Gas in Europe

- Commercial reserves most likely to be developed first in Poland and Germany
- Lead time for significant production likely to be 5-10 years
- Likely that the cost base will be much higher than US, around \$8-10/mmbtu
- Surface environment and water resources may be significant obstacles
- Unlikely that the North American business model can be transplanted to Europe

Significant (ie 30 Bcm/year) production of UCG is possible but not until the 2020s



Gazprom's Gas Exports to Europe: consolidated and actual (Bcm)

	1995	2000	2005	2007	2008	2009
Western Europe	75.1	90.3	113.2	128.6	124.6	112.9
Eastern Europe	42.3	38.7	42.9	39.4	42.4	37.4
Baltic States	4.4	4.7	5.5	5.3	4.1	4.4
TOTAL (consolidated)*			161.6	173.8	171.7	157.2***
Actual**	121.8	133.7	147.0	150.5	158.8	140****

*consolidated IAS figure including all gas sold by Gazprom affiliates in Europe total does not add because of other (unspecified) export volumes; **actual Russian gas volumes exported to Europe ***does not include 7Bcm of Sakhalin LNG to Asia. ****ToP was 145 Bcm. Source 2005-09, Gazprom Databook 2009.

Projections: 2010-140** (reduced from 160!); 2011: 163.5; 2012: 170.9 Bcm**



Nord Stream Gas Pipelines



First line under construction: completing 2011/12; Second line – 2012/13??



Blue Stream 2 and South Stream Pipelines



South Stream or Blue Stream 2?

Gas Pipelines From the Caspian and Middle East Regions





Caspian Pipeline Gas Supplies to Europe to 2020

- **Azerbaijan:**
 - up to 17 Bcm of gas available by 2017 from Shah Deniz Phase 2 for: Europe, Turkey, Russia (Syria?)
 - Turkey 6 Bcm; Russia 2(?); Syria 2(?)
- **Kazakh and Turkmen supplies will depend on:**
 - Caspian Sea legal resolution
 - Resolution of Turkmen-Azeri boundaries

Before 2020, likely available pipeline gas for Europe is ~10 Bcm; can Nabucco be built on that basis? ITGI/TAP?



Prospects for Iranian and Iraqi Pipeline Gas Supplies to Europe

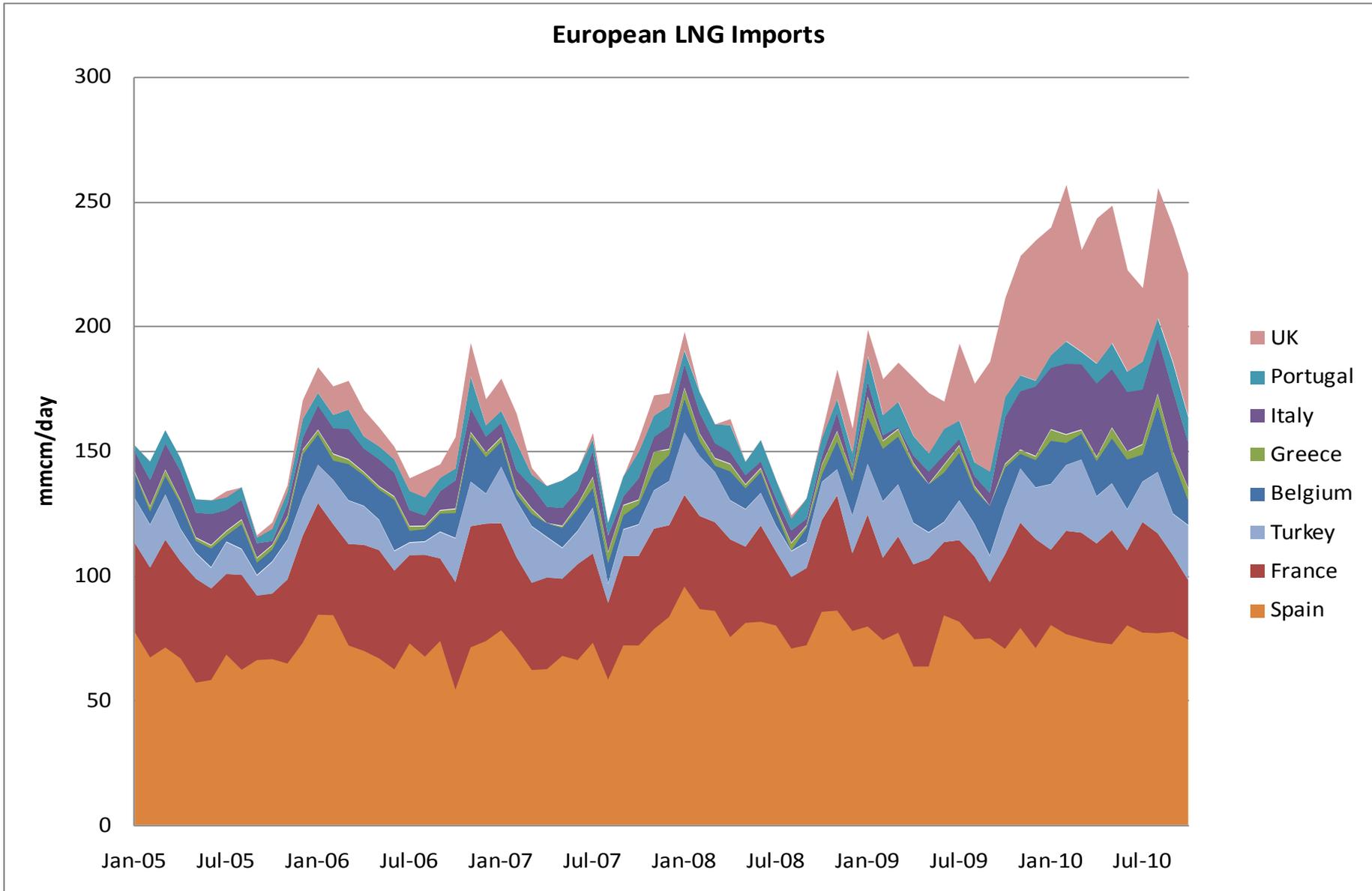
Iraq:

- Security situation post-US withdrawal?
- Degree of Kurdish autonomy to conclude and ability to enforce gas projects to meet a given timetable?
Kurdish/Baghdad gov't; Turkey/Baghdad gov't relationships
- Internal gas needs for recovery and reindustrialisation
- Security of production and export facilities
- Alternative export markets in Syria, Jordan (Egypt?)

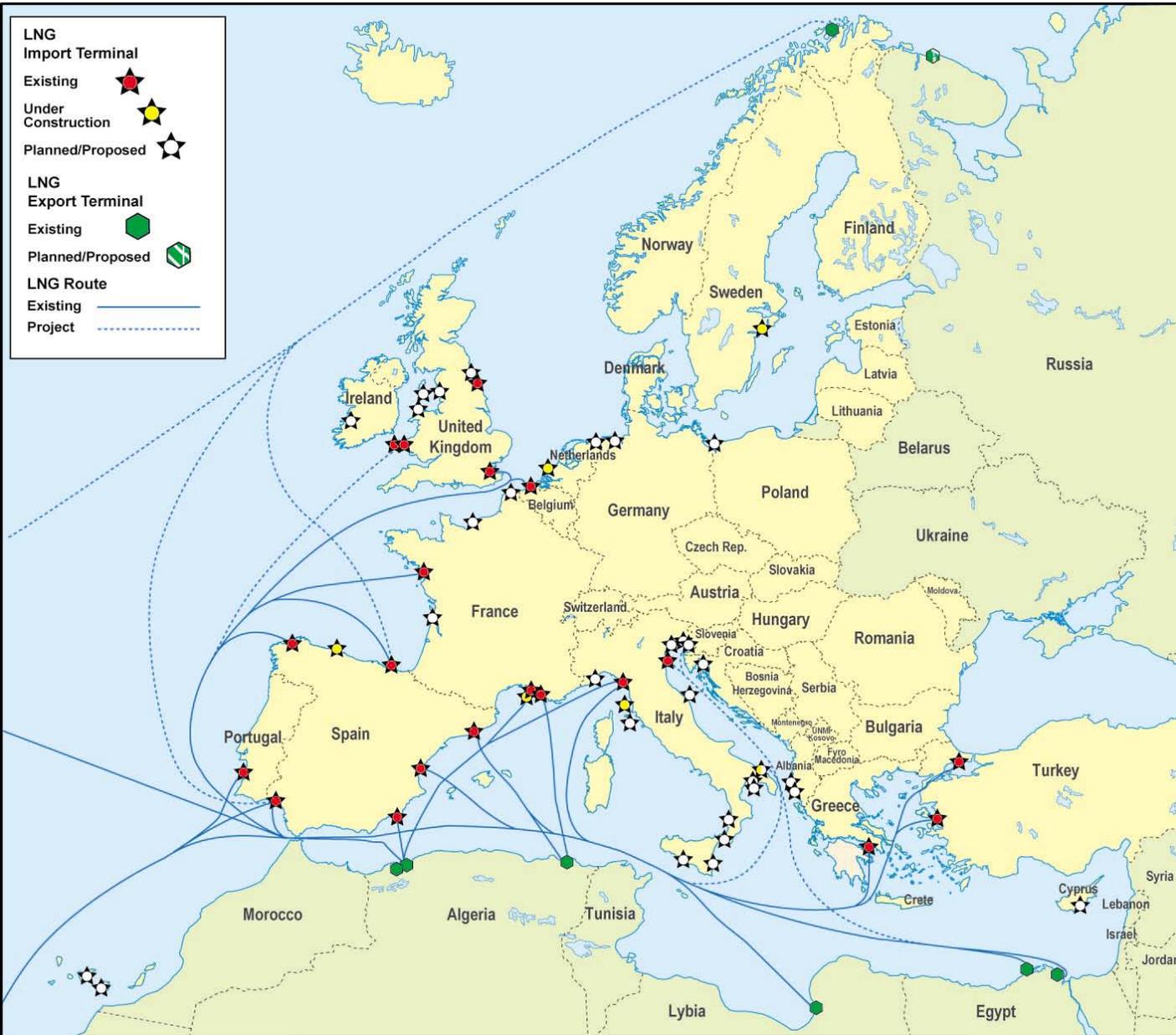
Iran:

- Net gas importer since 1997
- Massive domestic gas requirements (oil reinjection)
- Terrible track record as an exporter (Turkey)
- Sanctions (including EU) increased in 2010

European LNG Imports Jan 2005 – Oct 2010



LNG Regasification Capacity and Flows in Europe (Bcm)



Capacity:

- 164.2 Existing:
- 46.5 Under Construction
- 260.6 Planned

Flows:

- 2008: 59.4
- 2009: 71.7
- 2010e: ~85

Source: Honore, OIES



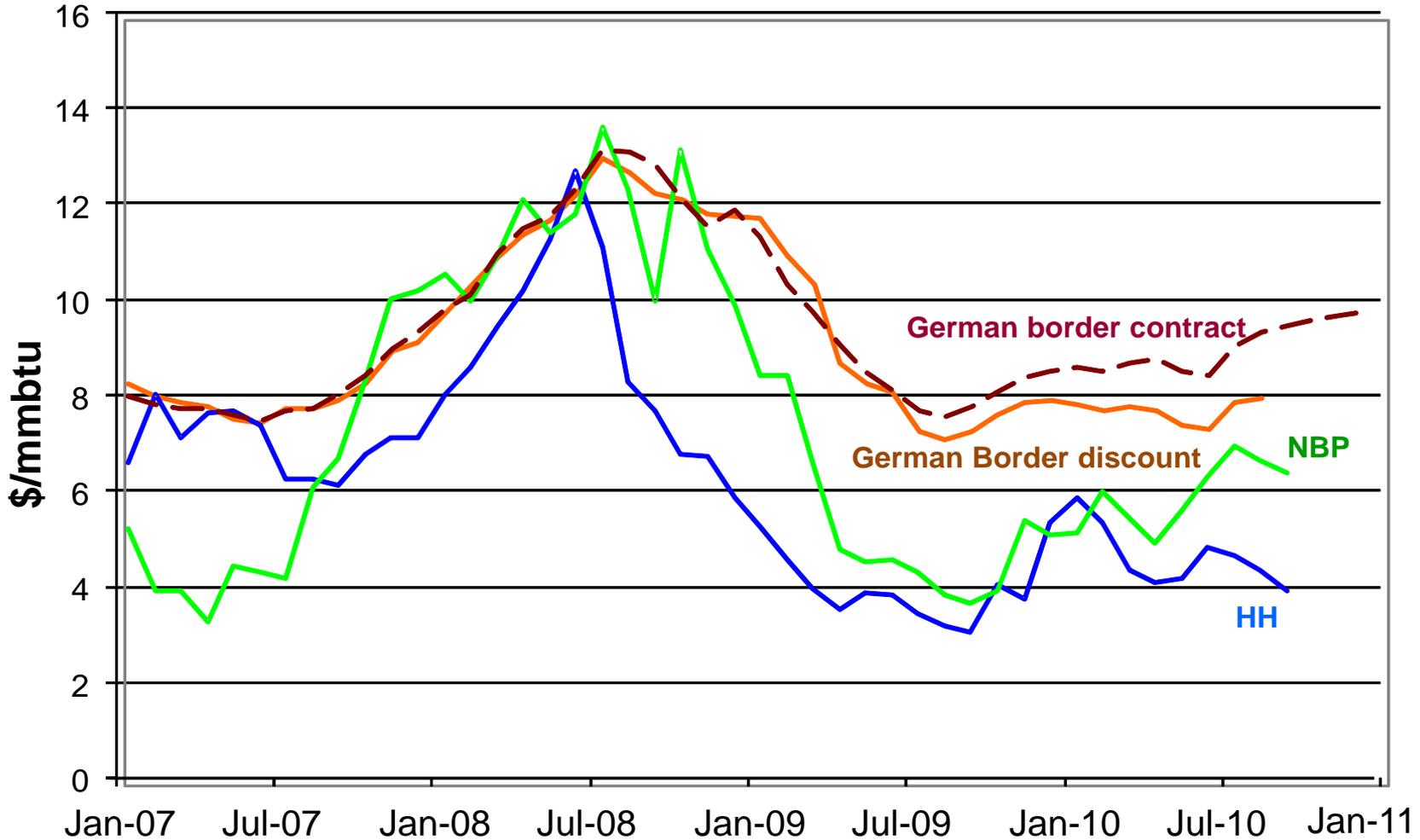
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A PRICING (AND LONG TERM CONTRACT) “REVOLUTION”?

German border, NBP and Henry Hub Gas Prices 2007 - 2010



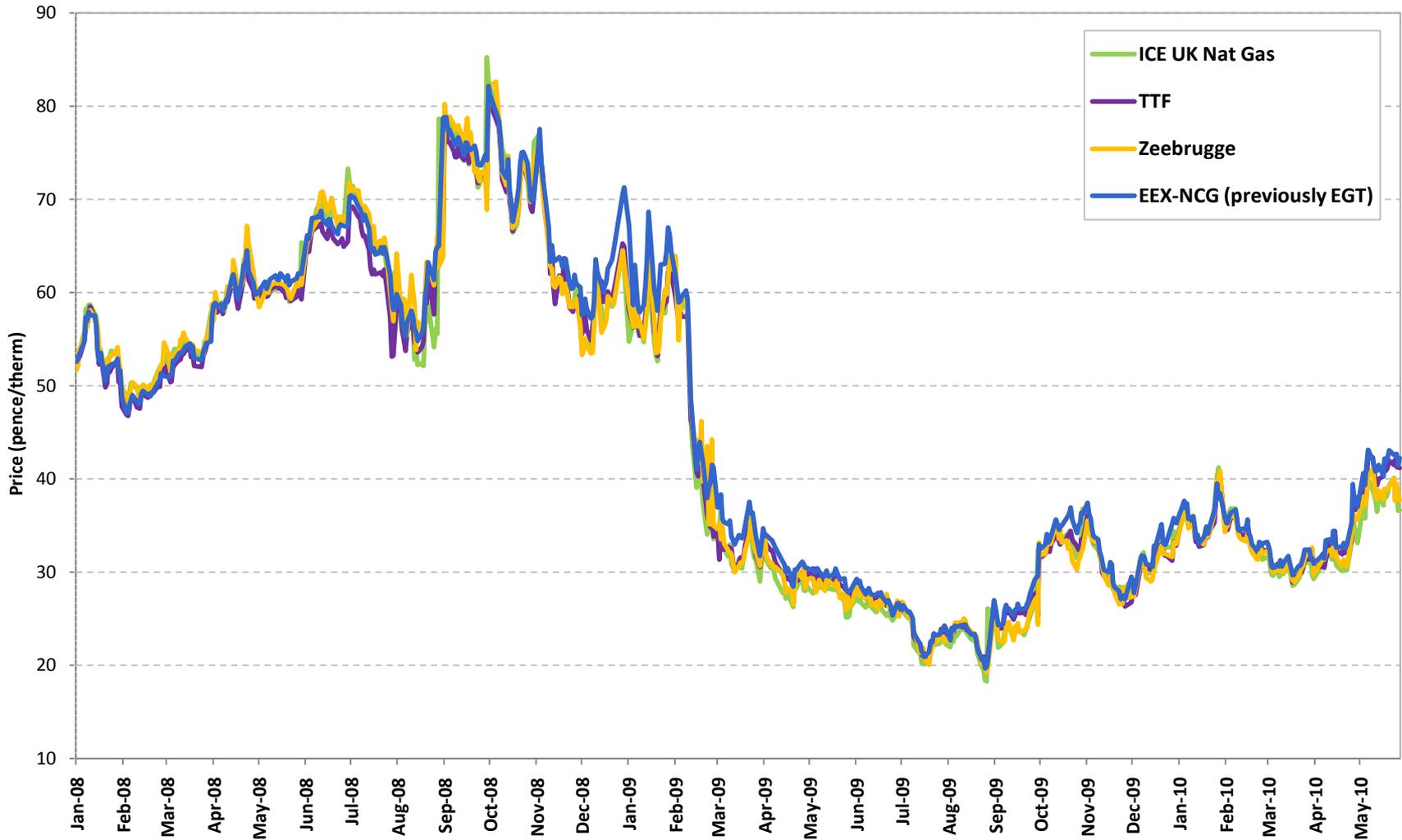
Are Continental European Hubs:

- Deep enough?
- Liquid enough?
- Sufficiently independent of manipulation?

Today, almost certainly not, but at the beginning of a price transition, there is never a perfect alternative (look at the history of NBP, Henry Hub, Brent, etc). This is not going to be a smooth transition, it is going to be a bumpy ride. BUT they are making progress and there is no credible long run alternative?



European Natural Gas Price Development





Can Long Term Contracts Survive the Passing of Oil-Linked Pricing?

- Arbitration on price provisions of long term contracts mean that some contracts may not survive the transition;
- If long term contracts no longer provide:
 - a price guarantee tied to oil
 - a volume guarantee because price will determine volume sales then..

Are they still valuable as “security of demand” for exporters? And if not, will they disappear?

Will exporters seek an alternative price setting mechanism via a “gas-OPEC”?



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OUTLOOK AND GLOBAL IMPLICATIONS



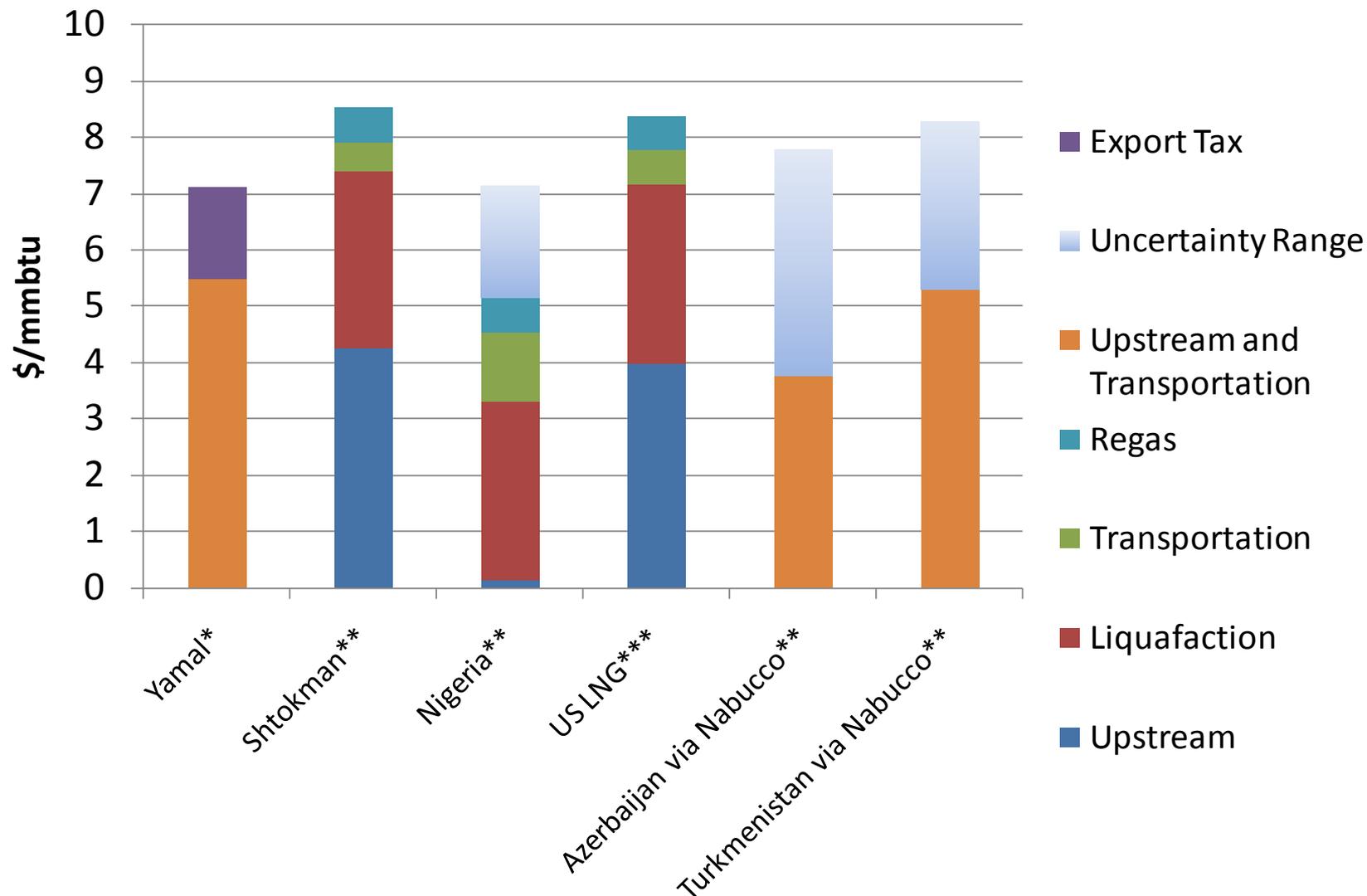
European Gas Outlook to 2020

- **Current supply surplus remains up to 2013 (and perhaps 2015 depending on economic recovery)**
- **But in the second half of the 2010s the balance looks tight:**
 - **European supply will be declining fast**
 - **No increase in deliveries from North Africa**
 - **No Caspian/Middle East pipeline supplies until late-decade (at the earliest)**
 - **Increasing dependence on LNG**

UNLESS...

- **Major increase in Russian supplies – possible but undesirable (due to “security”)?**
- **Gas demand falls due to recession/low carbon success**

Cost of New Sources of New Supply for Europe



*WEO2009, p482 plus 30% export tax.

**WEO2009, p481 plus regas @\$0.60/mmbtu.

*** Broad estimate.





Global Implications

EARLY 2010s:

- **Gas surplus discourages development of all new supply sources and creates problems for new long term contracts (even if not based on oil prices)**
- **Caspian, Middle East projects make limited progress (leaving more to go to China and Iran)**

LATE 2010s:

- **Europeans will not compete with Asia for global LNG supplies but should be paying prices high enough for new Atlantic Basin LNG projects; including US LNG exports if they can be landed for around \$8/mmbtu**