

European Gas Supply Security

Pierre Noël

EPRG, University of Cambridge

CERI Sciences Po, Paris -- 19 May 2011

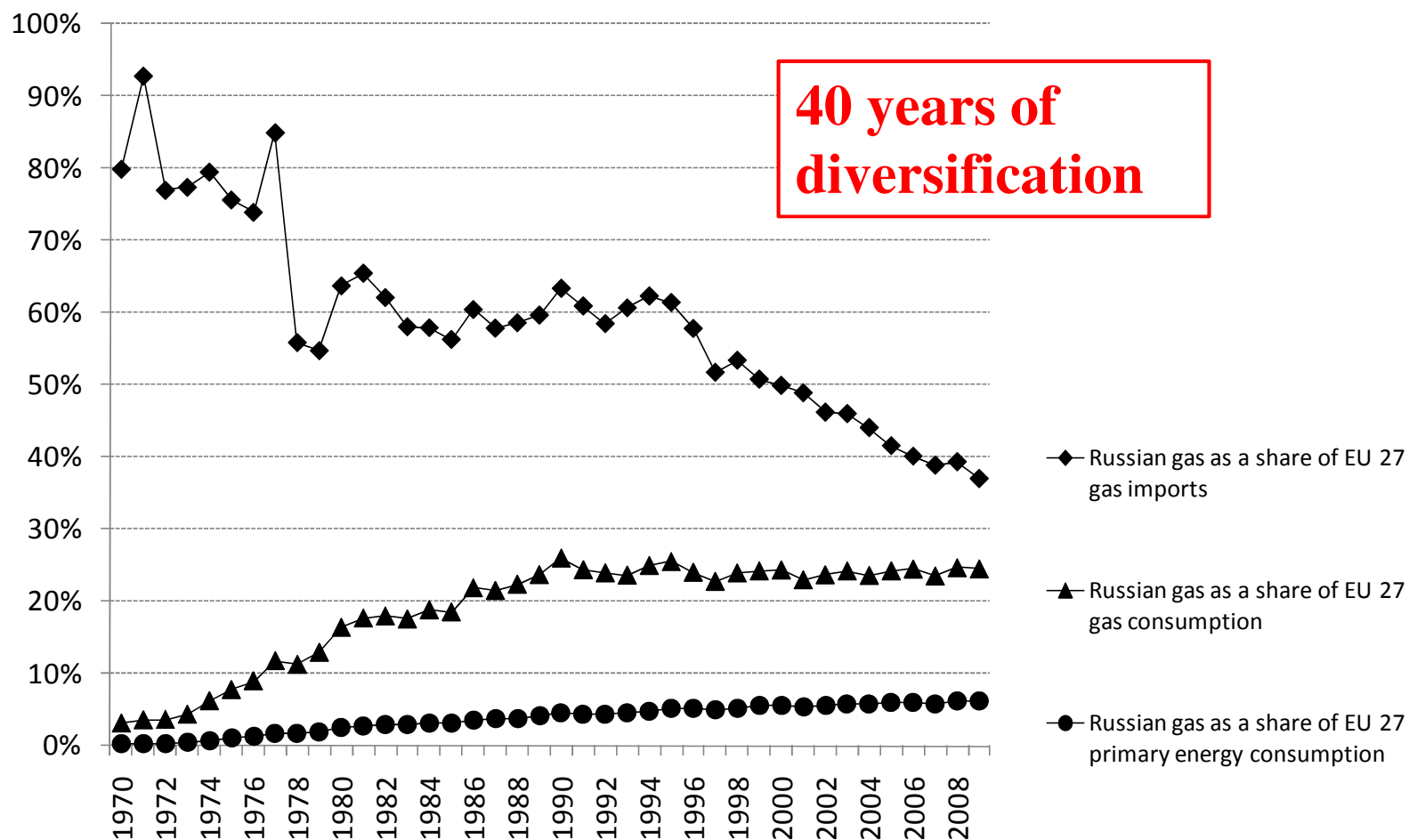
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Attracting gas, diversifying supply

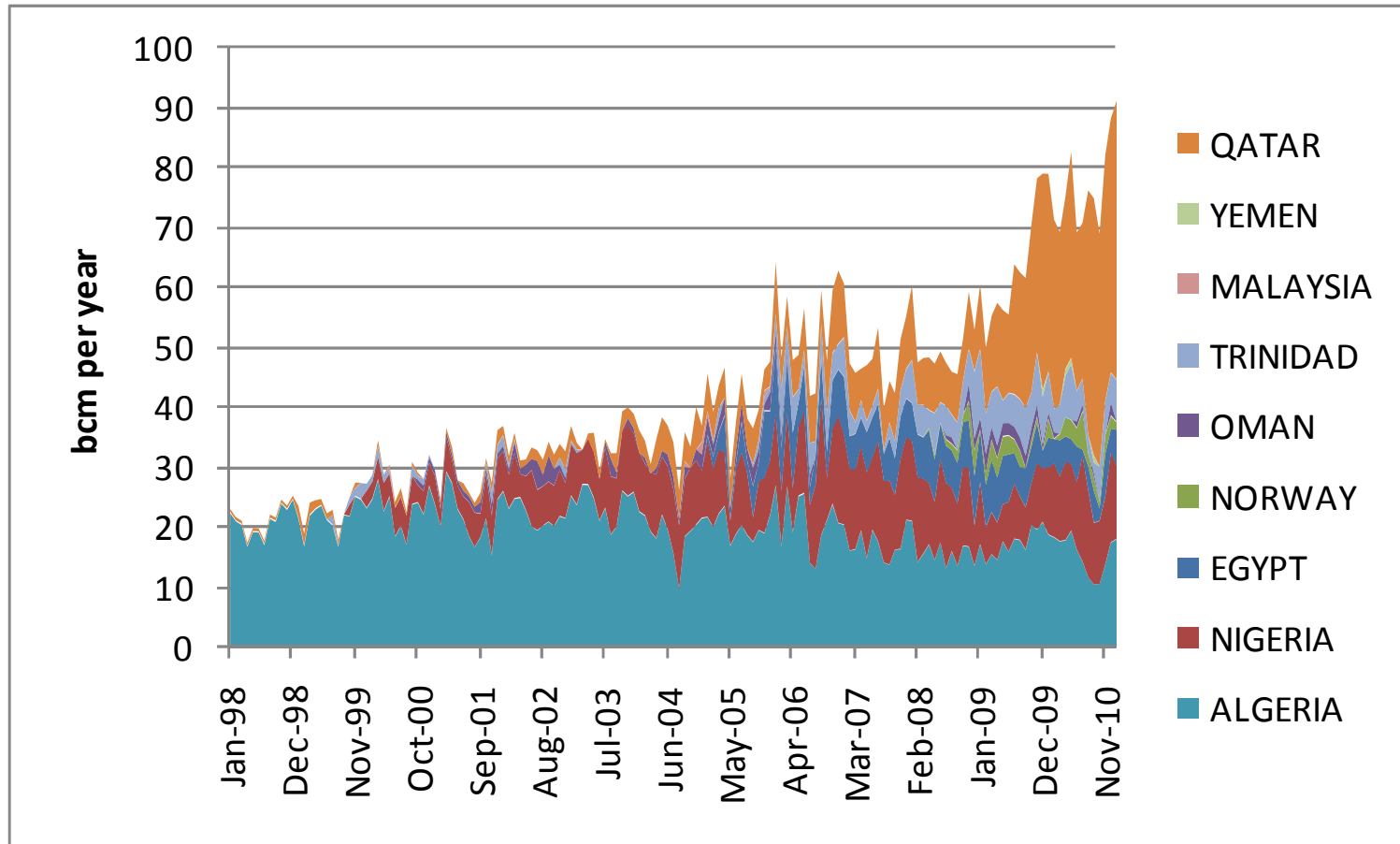
Russian gas: important, not dominant



Source: BP Statistical Review of World Energy; International Energy Agency; Eurostat

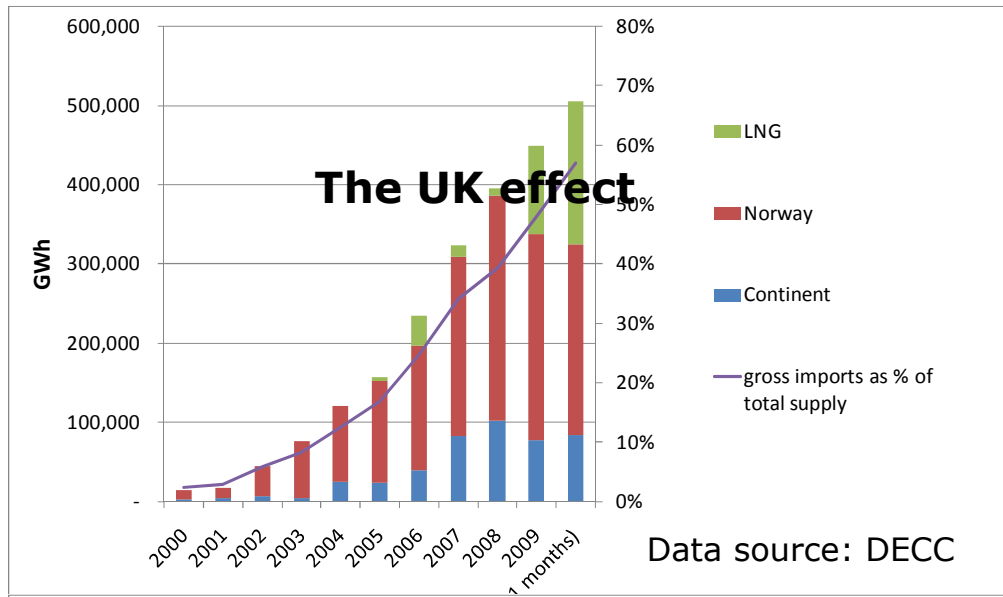
Diversification is accelerating

LNG into Europe

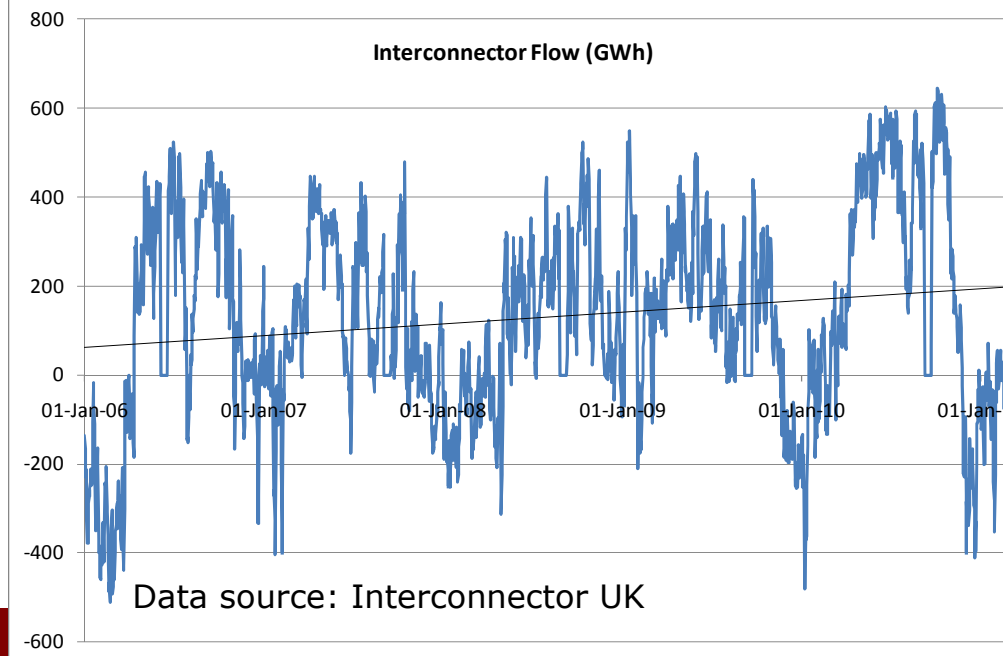


Data source: Poten Partners

UK as EU Western gas corridor



- UK imports are booming – way beyond UK ‘needs’
- Interconnector exports are growing – despite fall in UK production
- When continental oil-indexed contracts are out of the money, direct challenge from UK gas



- Emergence of a large ‘Western gas corridor’
- Based on commercial (non-subsidised) LNG terminals and merchant, point-to-point interconnectors

Conclusions (I)

- Europe's dependence on Russian is declining; supply diversity is growing rapidly
- Global gas supply and reserves are growing very fast, especially in OECD countries (US, Canada, Australia)
- Europe has no problem attracting (non-Russian) gas to (more than) compensate for EU production decline
- Europe has a large non-conventional resource base
- There is no reason to subsidise, directly or indirectly, non-economic pipeline projects meant to “reduce Europe's dependence on Russia”

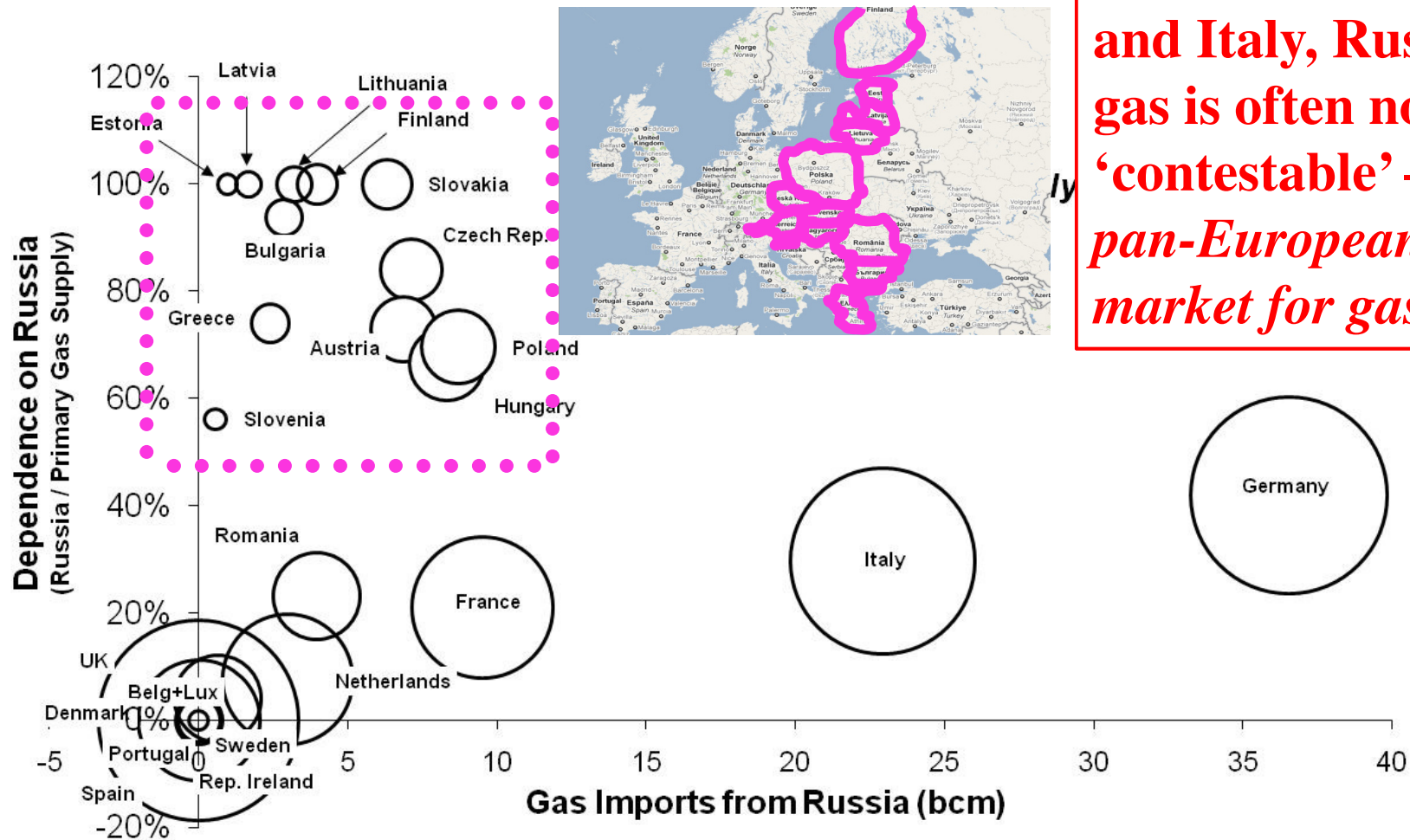
-II-

Security of Supply and the EU “Internal Market”

The market / security nexus

- Efficient markets increase welfare, including through enhanced security of supply
 - Alternative gas is available in times of crisis
 - Contestability breaks the link between contractual and political ‘dependence’
- Two key questions for EU policy makers
 - Are price differences arbitrated?
 - If not, why?
 - No transmission capacity available? Why?
 - No investment in transmission? Why?

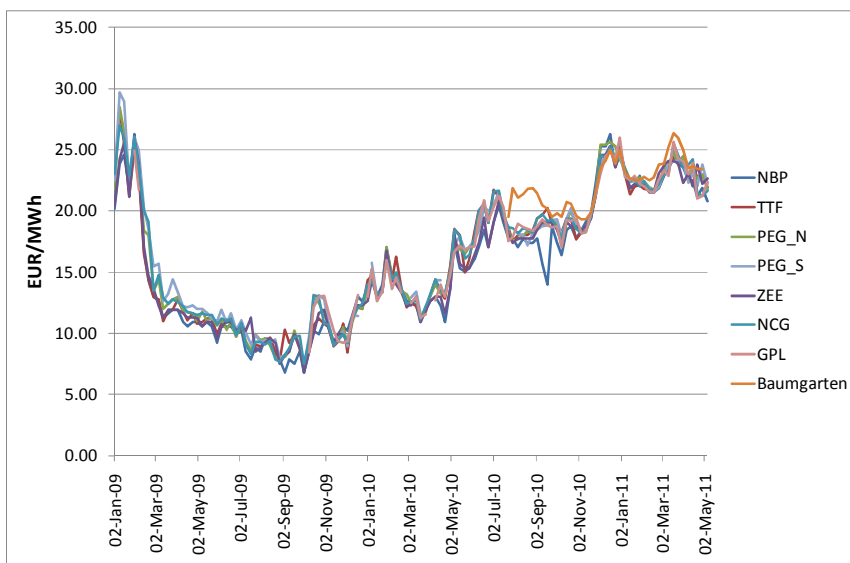
Supply diversity is in Western Europe



East of Germany and Italy, Russian gas is often not 'contestable' – no pan-European market for gas

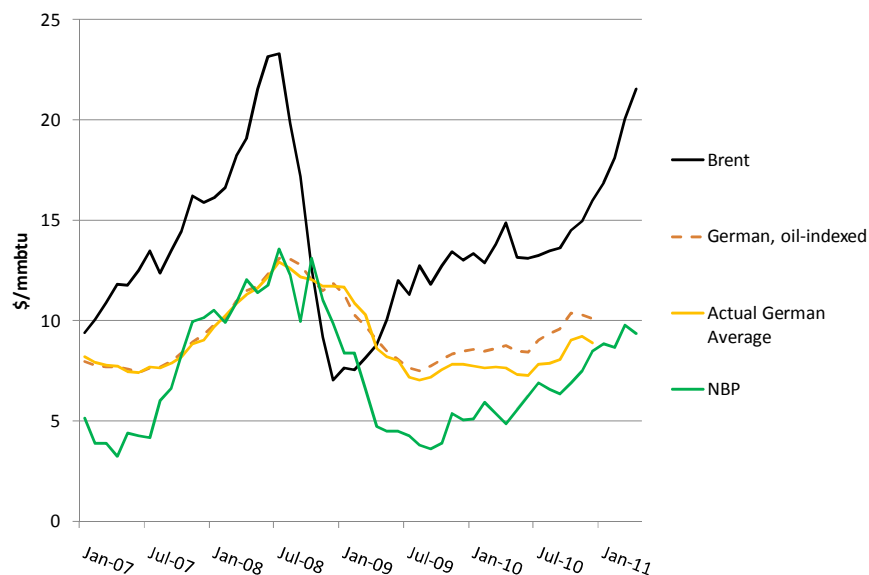
Data source: BP Statistical Review; Eurostat; National Statistics -- 2008 data

NW Europe: the market seems to work



Data source: Bloomberg

- Hub price convergence – clear econometric evidence of market integration (Hamsen & Jepma, 2011)
- Role of LNG in price convergence



- UK-Continent integration puts pressure on oil-indexation

Source: Spreadsheet sent to PN by Howard Rogers updated with data from BAFA (German Federal Office for Economics) and Bloomberg

Still no pan-European gas market

- Huge spreads between West and East not arbitrated
 - No capacity trading in transit pipelines
- EU market design prevents efficient investment?
 - TSOs & National Regulators control large entry-exit zones
 - Impossible to sell LT capacity contracts along specific paths (through entry-exit zones)
 - ...although this is how UK-Continent has been done
- European temptation to subsidise (and politicise) pipeline investment
 - ERGEG study / TYNDP / EU infrastructure package
 - Pipeline investment decisions remain centralised in Europe (within zones, and between zones)

Reforming the EU market model?

- Remove long-distance transportation -- into zones and between zones -- from TSO control and E-E pricing
 - European ‘interstate’ system separate from E-E zones
 - ISOs operating ‘European’ pipelines
 - Capacity on ‘European’ pipelines clearly defined, calculated, and sold via tradable long-term contracts
 - Would kick-start a pan-European capacity market
 - Would allow to have *small* zones, reducing inefficiencies
 - **Would allow investment decisions to be *decentralised* – a key feature of a successful liberalised market**
 - Essential to flexibly adapt to rapidly changing supply patterns

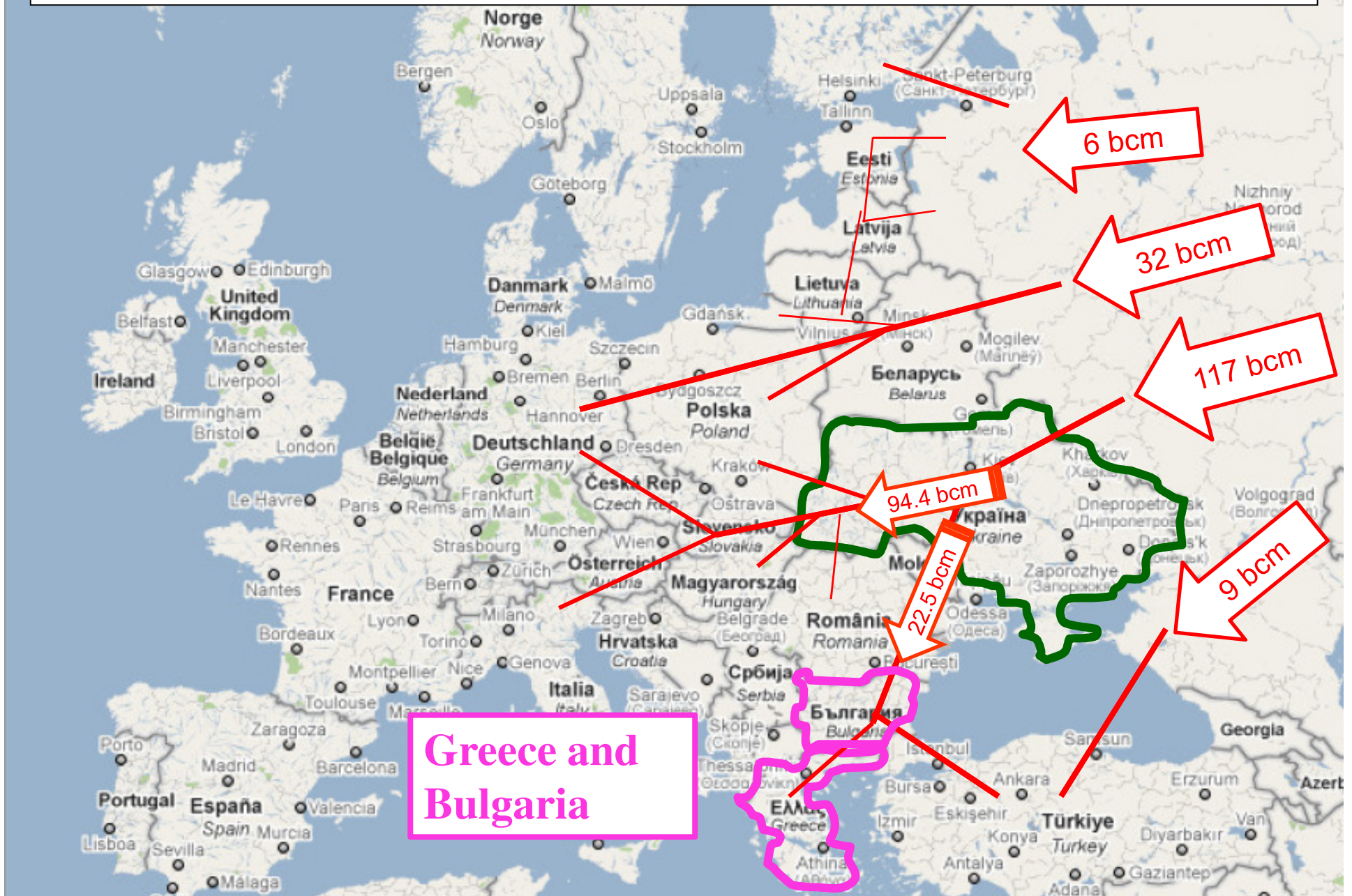
Conclusions (II)

- We will have a pan-European gas market if we have a pan-European market for transmission capacity
- The EU ‘market model’, based on large entry-exit zones, is incompatible with a market in long-distance, ‘trans-European’ transmission capacity rights
- The US experience is not transferrable but offers key concepts for reform
- The UK-continent experience (merchant pipelines, long-term, point-to-point capacity contracts with short-term trading) is a European success story

-III-

Coping with supply disruptions

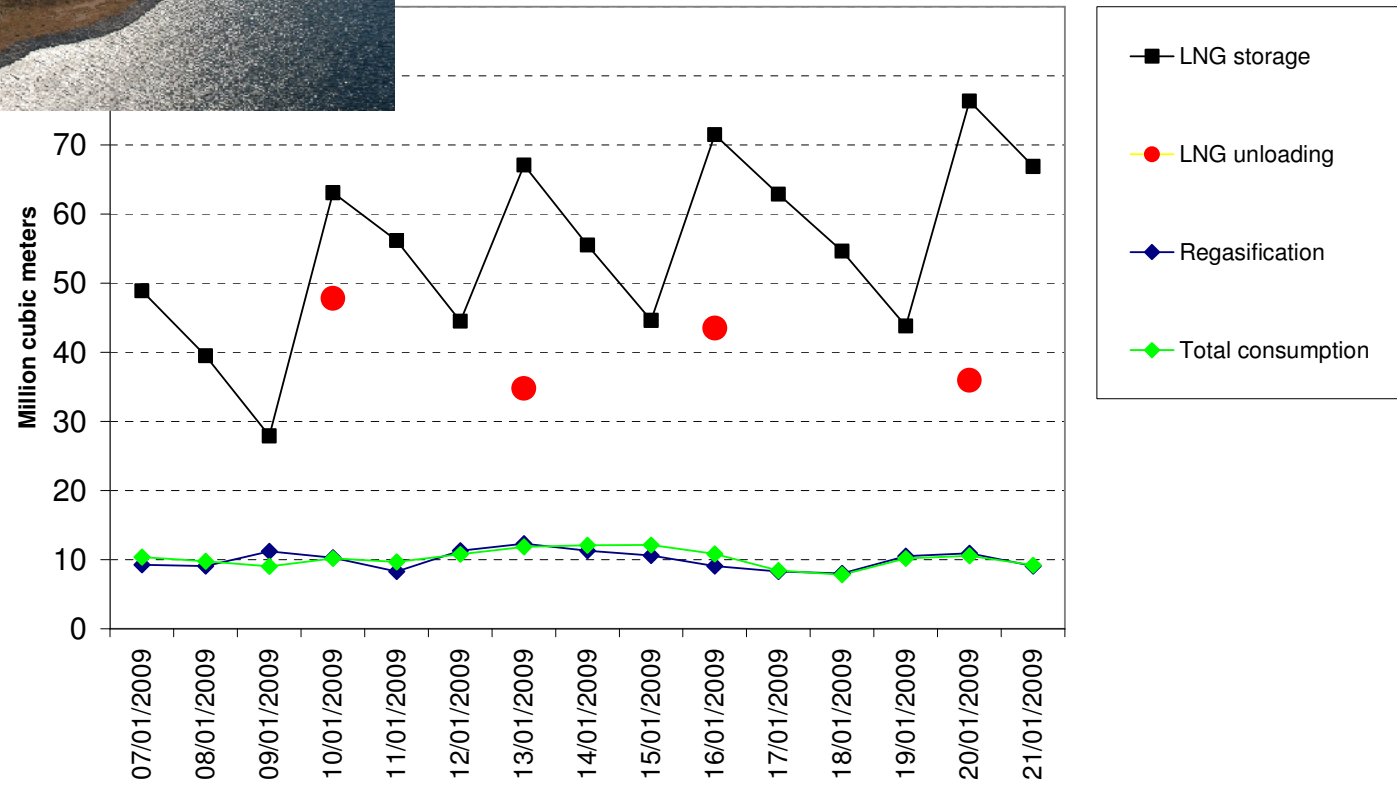
Coping with supply disruptions: 01/09



January 2009 -- Greece



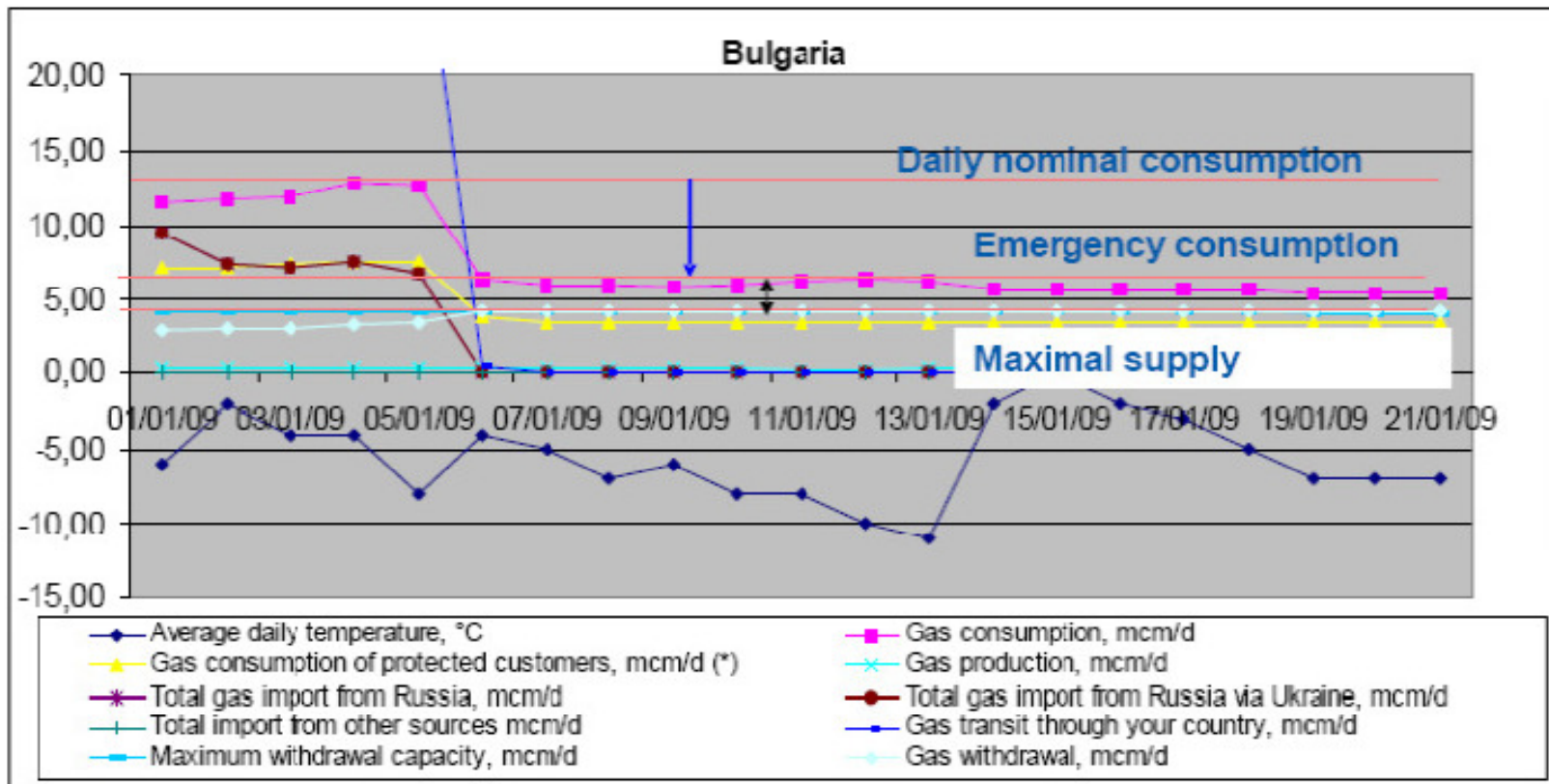
Revithoussa LNG



Data source: DESFA (Greek gas TSO) reporting to RAE (Greek energy regulator)

Demand fully met by LNG – including
spot cargoes

January 2009 -- Bulgaria

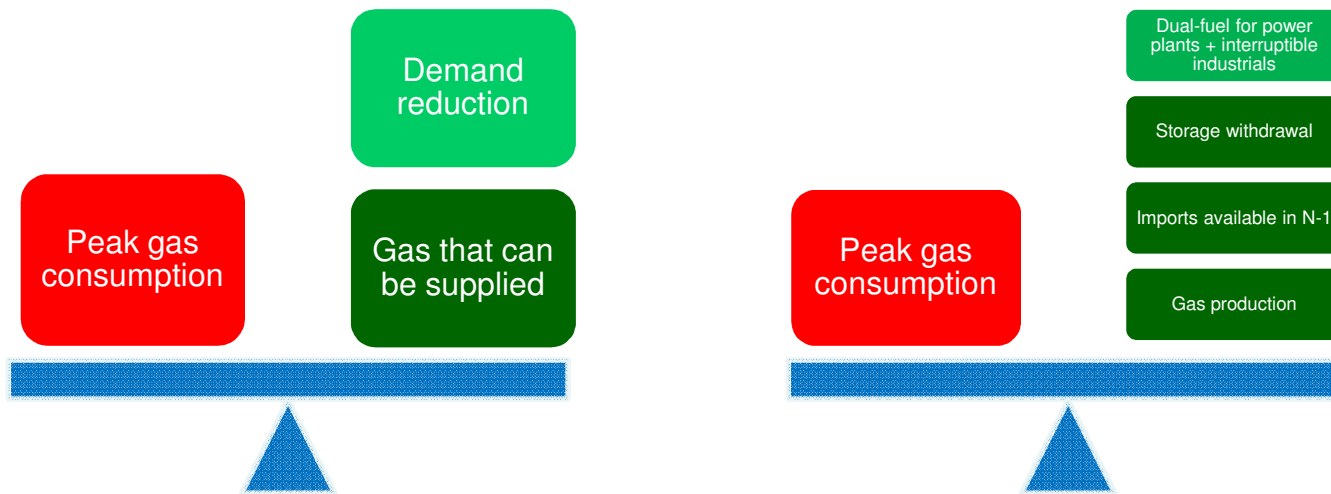


Source: Kardejak (2009)

50% of demand left unserved.

Measuring short-term gas supply security

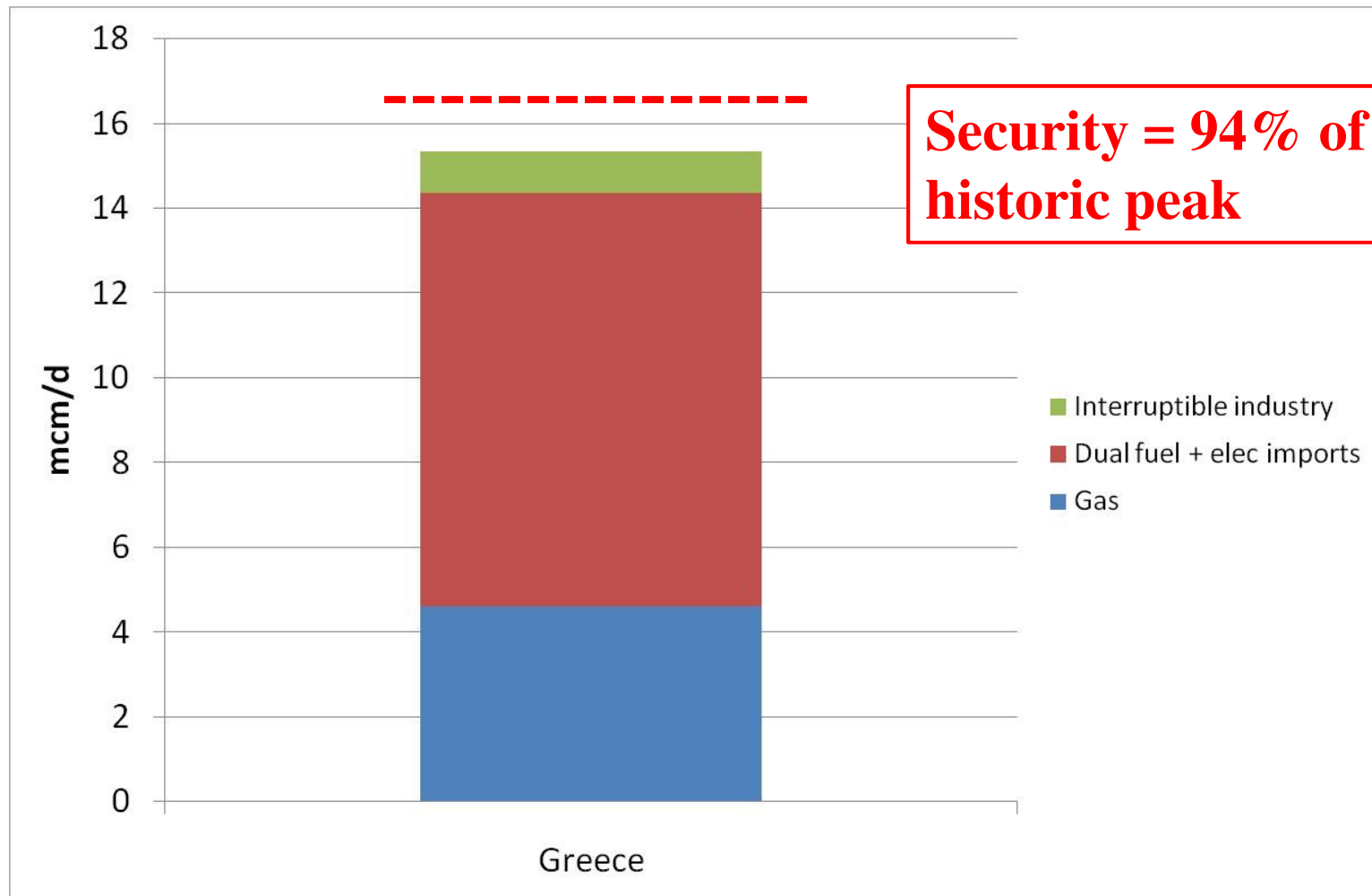
- Gas Supply Balance **when Russian Gas not Available**



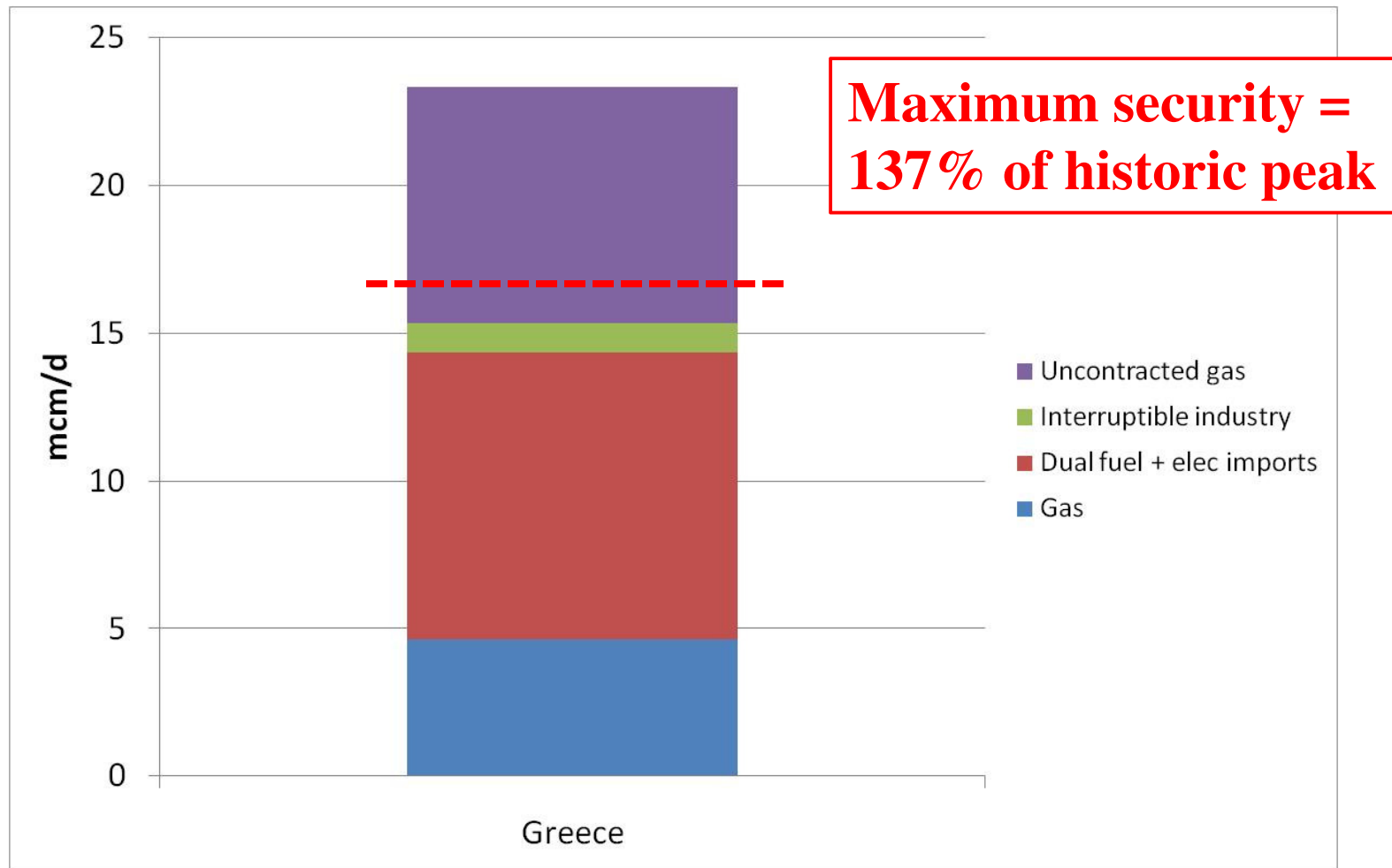
- Gas Supply Security Indicator – **1st Day of Total Disruption**

$$\text{GSS} = \text{[Green Box]} + \text{[Light Green Box]} \text{ as \% of } \text{[Red Box]}$$

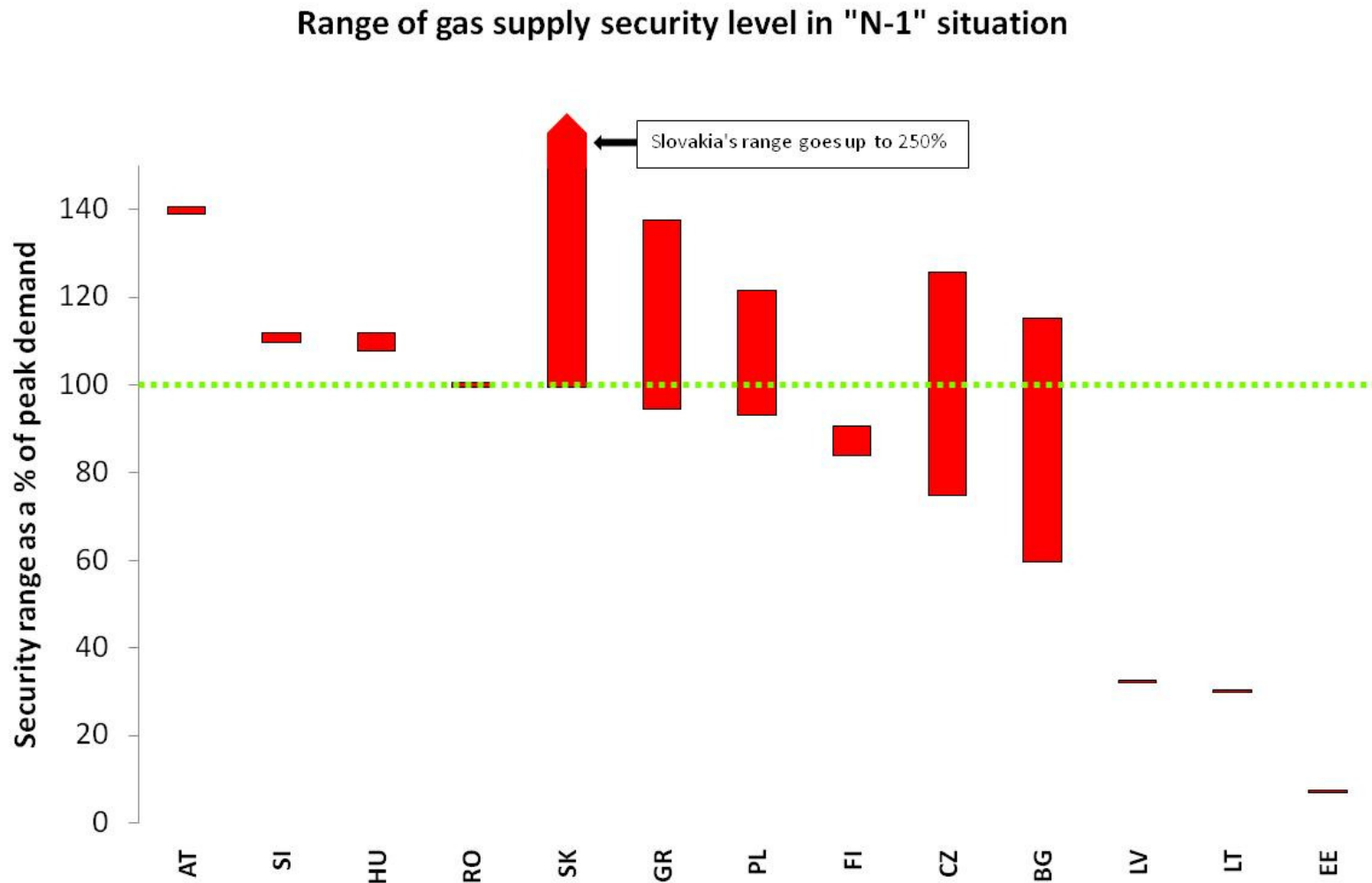
Ex.: Greece in 'N-1' – minimum security



Greece in 'N-1': maximum security



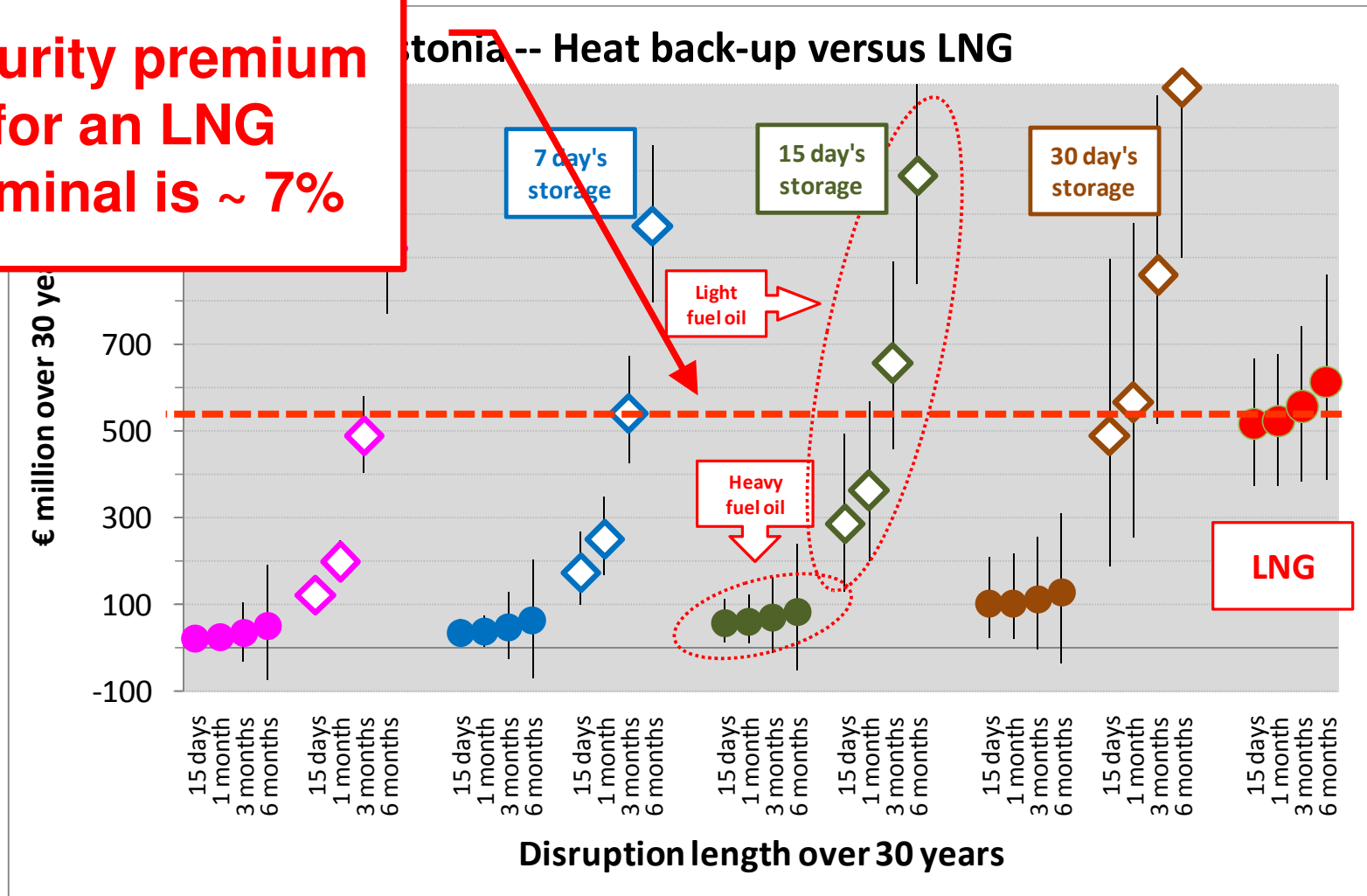
Gas security in Russia-dependent EU



Source: Noel & Findlater, 2010

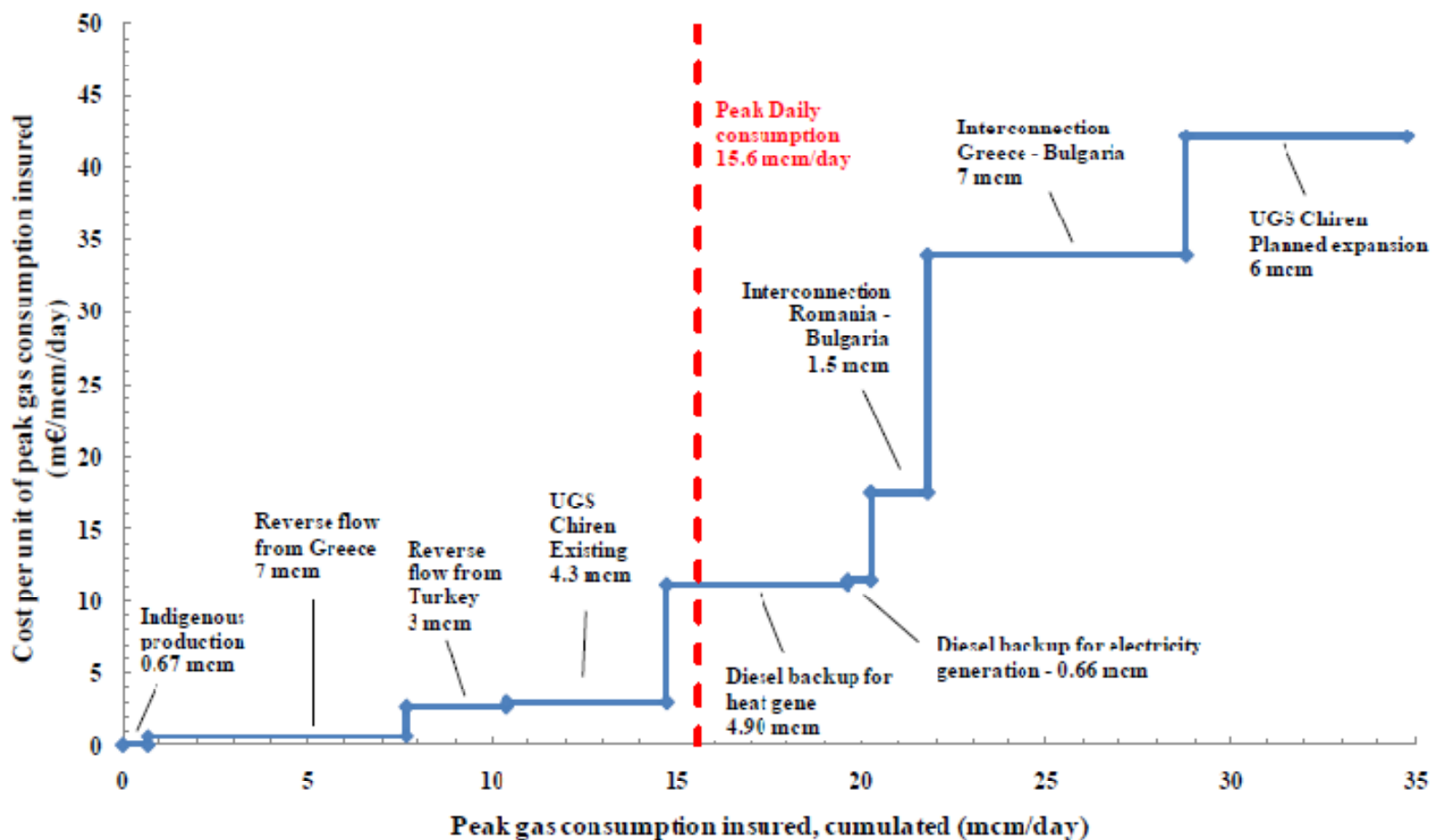
Cost of improving security: Estonia

Security premium for an LNG terminal is ~ 7%



Source: Noel & Findlater, forthcoming

Supply curve for gas security: Bulgaria



Final Conclusion: main messages

- There is no reason to believe that Europe will be short of gas and that there is a need to develop an EU strategy to ‘access’ gas reserves or diversify supplies through politically-backed projects.
- A well-functioning, pan-European gas market would increase supply security. There has been some progress but the institutional model chosen makes it very difficult to trade gas across Europe and to invest in pan-European transmission capacity.
- Even without a well-functioning market the most insecure member states can make informed – and affordable – choices to increase their ability to cope with disruptions.