

Europe's Gas Blues

Hard Times, But No Looming Crisis

Center for Strategic and International Studies

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An Anatomy of Europe's Energy Insecurity

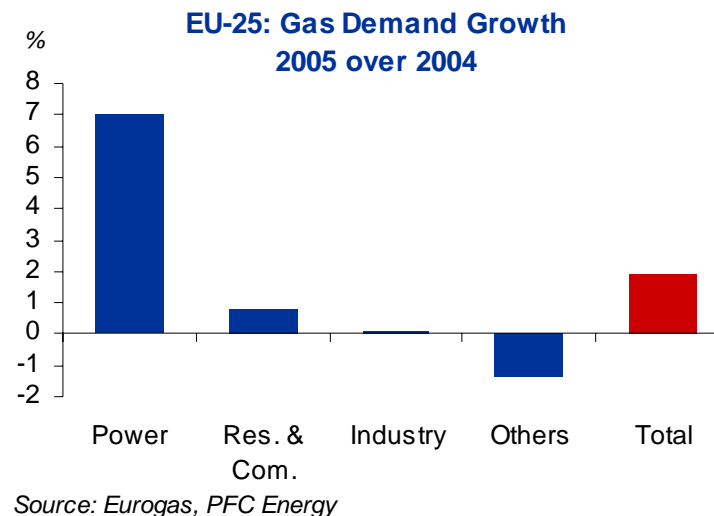
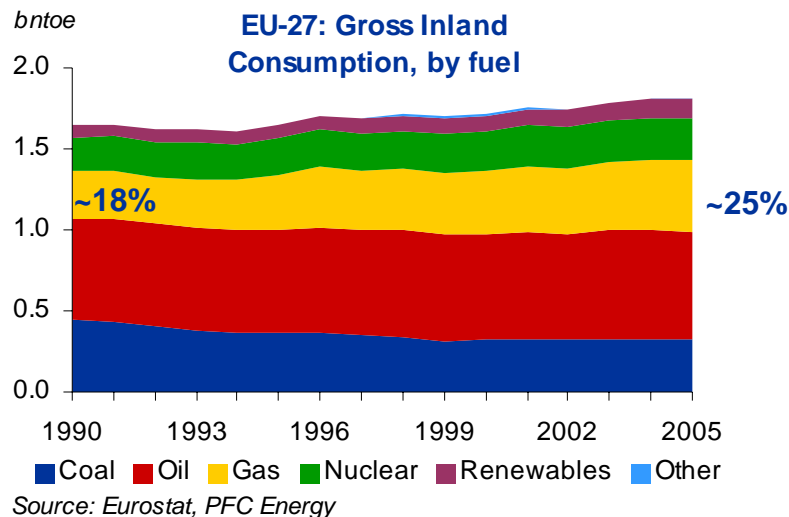
- **High prices, high costs, a lot of geopolitical uncertainty**
- **European gas supply has peaked – growth only from Norway**
- **Europe is divided on how to enhance its energy security**
- **Tense relations with Russia – fears of disruption and “blackmail”**
- **Diversification projects are being delayed**

- **Europe's import dependence is growing, but dependence on Russia is not**
- **Difficult for Russia to significantly increase market share in Europe**
- **Short-lived transit disputes will continue but will remain limited**
- **New supply into Europe facing some delays, but overall trend is positive**
- **Europe's energy security position is difficult but not catastrophic**
- **Europe needs a common market, not a common external policy**
- **The issue is Russian power and geopolitical space, rather than energy**

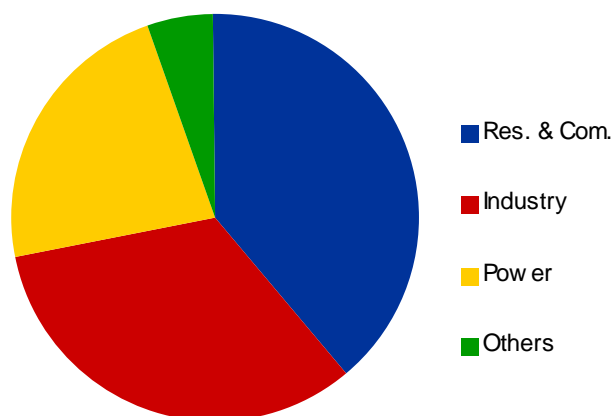
Europe's Gas Position

European Gas: A Snapshot

Gas demand driven by power – heavy reliance on three suppliers

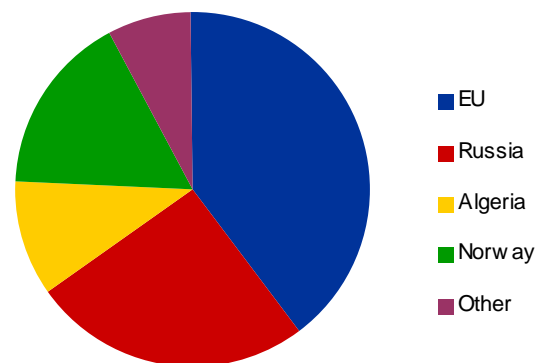


EU-25: Natural Gas Consumption (2005)



Source: Eurogas, PFC Energy

EU-27: Natural Gas Sources (2006)

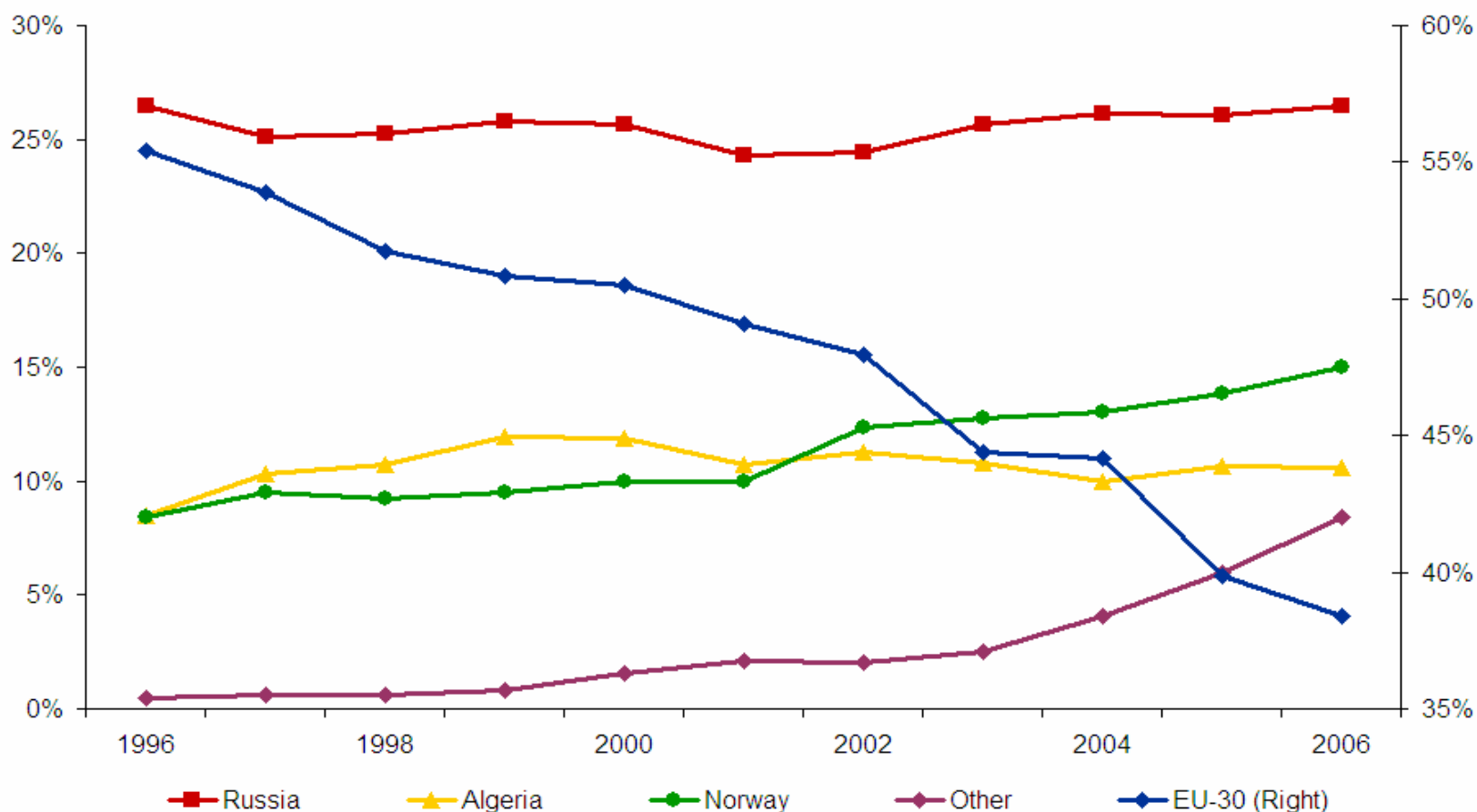


Source: PFC Energy

Is Europe Growing More Dependent on Russia?

Imports growing, but not Russian dependence; Norway & LNG winners

EU-30: Gas Supply Sources (as % Demand)



Source: Cedigaz, BP Statistical Review, Country Sources, PFC Energy

Russia: Gas Production Outlook

A complicated nexus of pros and cons

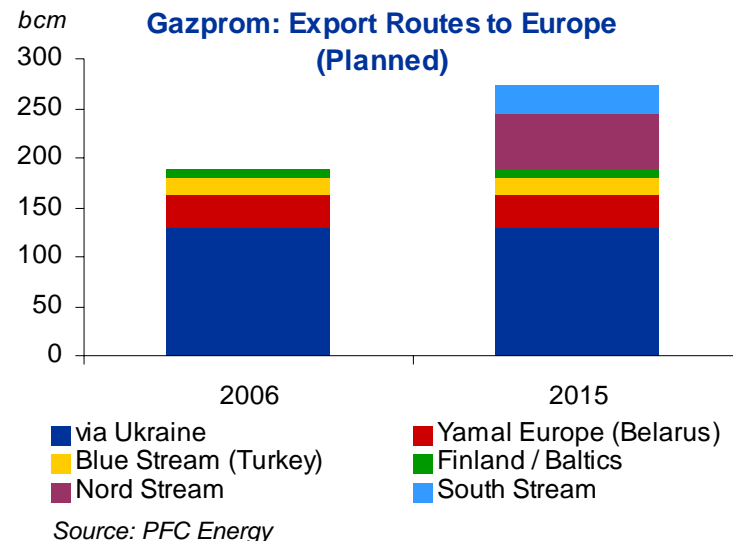
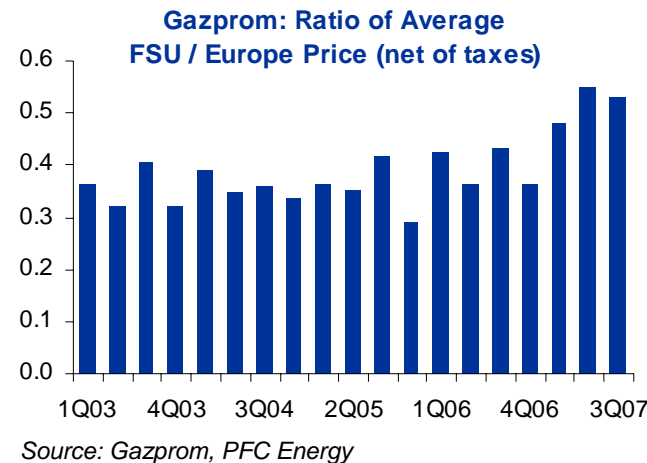


- **Gazprom's production coming largely from four major fields**
- **Will Gazprom execute its ambitious and costly development program on the timetable that Europe desires?**
- **Russian gas production growth coming from the independents (whose share of Russian production has grown from 6% to 16% in the last decade); what are their production prospects?**
- **Higher prices have yet to curb demand growth, but power reform will help**
- **What will higher prices for Central Asian gas mean for Russian gas production?**
- **Will Russia reduce gas flaring?**
- **Gazprom will do everything to meet export commitments to Europe**
 - Gazprom has extended 80% of its long-term contracts with Europe to 2025-2035
 - FSU and Russian consumer more likely to be hit in supply crunch
 - Threat to divert supplies to Asia not credible

Gazprom's Relationship with the FSU

Interdependence is inevitable – as are higher prices for FSU

- Despite rising prices, Gazprom's average FSU sales price is still around 60% of the price earned in W. Europe
- Ukraine has managed to cope with higher prices – 7% GDP growth in 2007, lower energy burden (as % of imports)
- “Bypass pipelines” are too small to “bypass” Ukraine and Belarus
 - Many Nord Stream contracts are in addition to rather than diverting existing supplies



Mediterranean Interdependence

Who is dependent on whom?

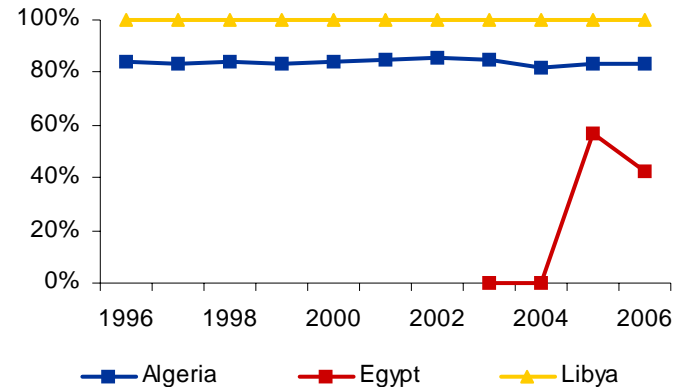
■ North Africa relies heavily on markets in the Mediterranean

- 100% of Libya's exports and ~80% of Algeria's exports went to Spain, Italy, France, Greece and Turkey
- Egypt has a more balanced export profile with only 42.5% of exports in 2006 going to Southern Europe

■ Countries in Southern Europe have lower dependence on North Africa

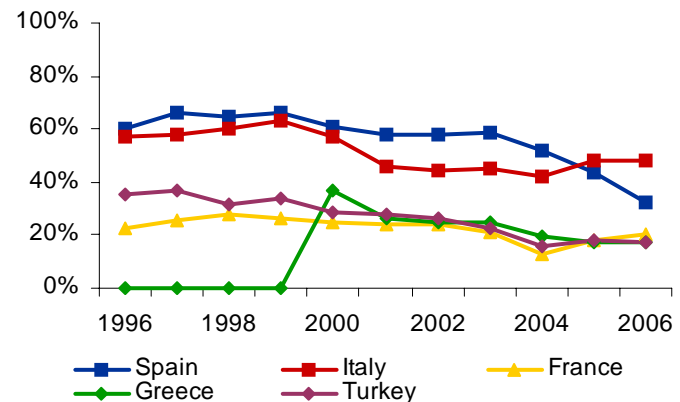
- Italy, the most dependent of all, imported 50% of its gas from the region (Algeria and Libya) and its dependence has grown with new Libyan imports after 2004
- Every other state in Southern Europe has reduced its dependence on North Africa in recent years

North Africa: Gas Exports to Southern Europe (as % of total exports)



Source: Cedigaz, PFC Energy

Southern Europe: Gas Imports from North Africa (as % of total imports)



Source: Cedigaz, PFC Energy

Europe's Southern Corridor

Nabucco will need greater supply commitment to move forward



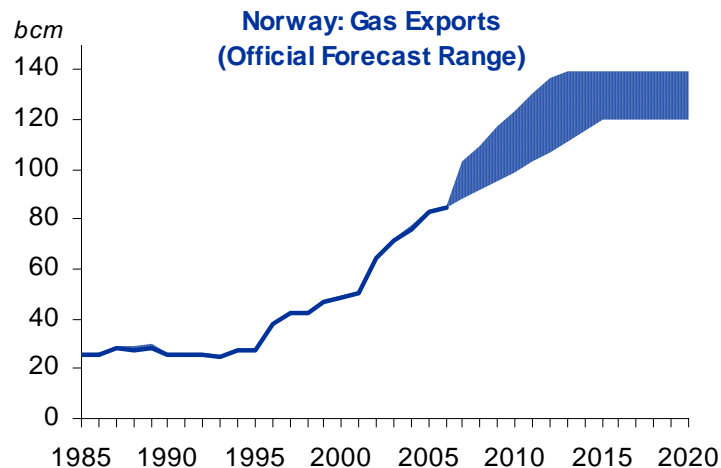
- **Nabucco is a project with many sponsors but no champion**
- **Every supplier is considering alternative options**
 - Kazakhstan to Russia
 - Turkmenistan to Iran, China, Russia
 - Iran: Iran-Pakistan-India and LNG
 - Egypt: LNG, Arab Pipeline, Israel
 - Azerbaijan to Greece / Italy
- **Russia can undermine the project**
 - Heavy dependence on Russia in the main Nabucco markets
 - Caspian Sea status critical for trans-Caspian pipeline link
- **Will Nabucco turn to Russian gas?**
- **Is Central Asian gas cheap?**

Norway's Export Potential

Major Potential for export growth in the 2015-2020 timeframe



- **Norway is the fastest growing supply source to Europe**
 - 17% market share of EU-27 in 2006
- **By 2015-2020, Norway wants to be exporting 120-140 bcm/yr**
 - The majority of exports will be via pipeline to Europe with a smaller amount being exported as LNG



Source: Norwegian Petroleum Directorate, PFC Energy

Europe's Search for LNG

A growing supply source – but with an uncertain future



- **LNG imports into Europe have tripled in past decade and could more than double in 2000-2010**
- **Liquefaction projects are being delayed due to politics, security, or supply constraints**
- **Competition with US and Pacific intensifying, but liquidity still lags**
- **Global liquefaction capacity is expected to grow more than 50% by 2012 - an average annual growth rate of 9% (~140 bcm)**
- **How much will come to Europe?**

Europe's Supply Gap?

By 2020, Europe can be relatively well supplied



- **E.ON expects a 21% supply gap by 2020 for EU-30 (equal to about 150 bcm/yr)**
 - In its 2004 estimate, the supply gap for 2020 was 30% (200+ bcm/yr)

- **PFC Energy forecasts a smaller gap – perhaps around 5%**
 - EU production outlook is similar to E.ON
 - Higher forecasts for Norway and Algeria
 - Slightly lower forecast for Russia
 - Swing will be Qatar, Nigeria, Libya
 - Excludes Iraq and W. Africa outside Nigeria

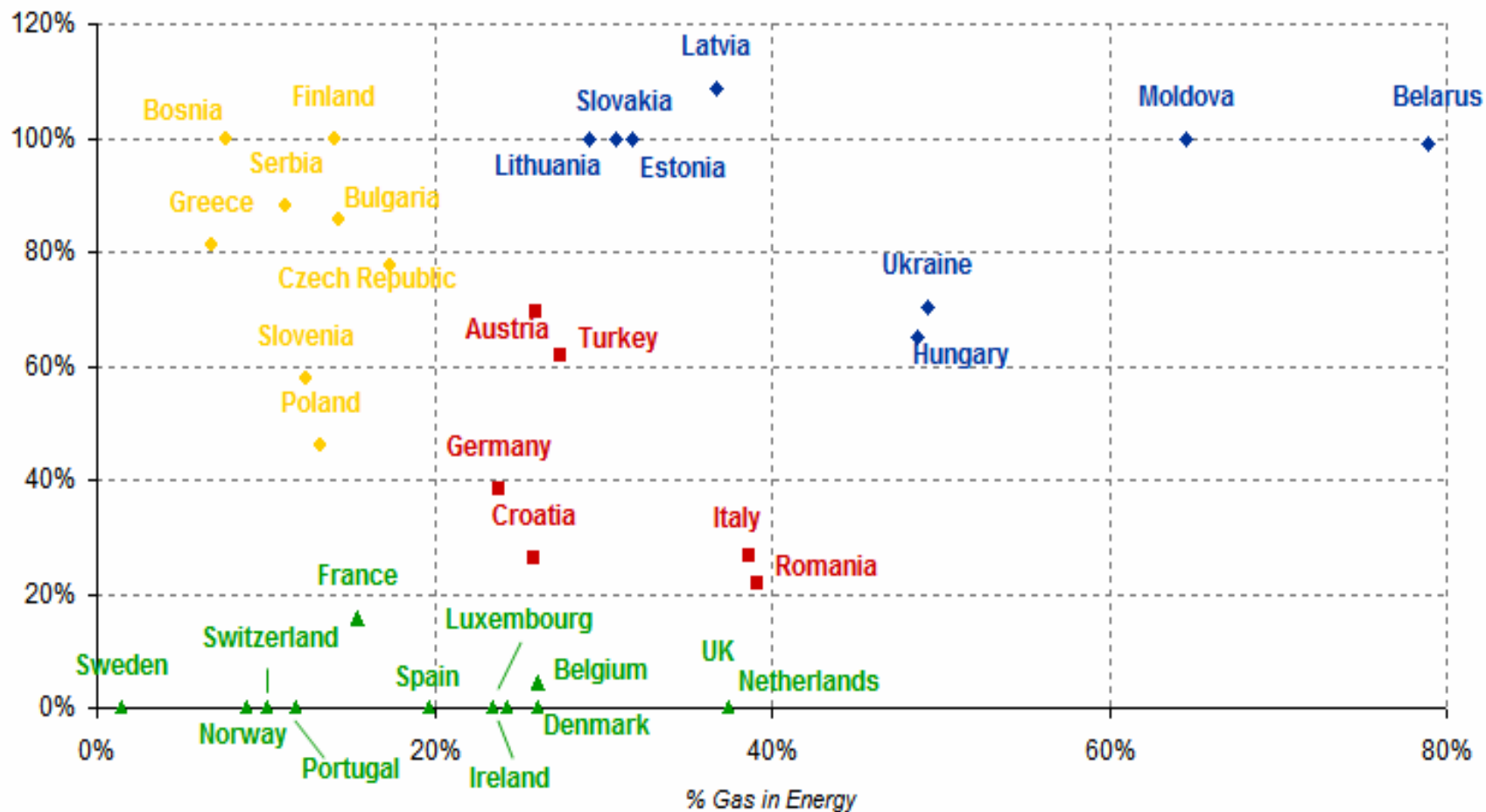
Energy Policy & Energy Security

Europe's Uneven Reliance on Russia

Almost impossible for Europe to have a common Russia policy

Europe: Gas Use in Energy Mix
and Import Dependence on Russia (2006)

% Gas Demand
from Russia



Source: Cedigaz, BP, IEA, Country Sources, PFC Energy

Europe Divided Over The Merits of Markets

Europe's disagreement over liberalization is impeding integration



- **Liberalization is proceeding slowly**
 - Incumbents maintain high market shares in their traditional markets
 - Access to infrastructure (pipeline/storage) remains problem for market entry

- **Countries are liberalizing at different rates**
 - UK, Netherlands, Spain have moved faster to implement market reforms
 - France and Germany cautious and resist break-up of former monopolies

- **Liberalization has produced cross-border investment**

- **European Commission pushing for liberalization**
 - Will ownership unbundling succeed?
 - What is the future of liberalization in the European gas market?
 - What does this mean for security?

Natural Gas Prices in Europe

Gas prices still set by oil fundamentals – and vary within Europe

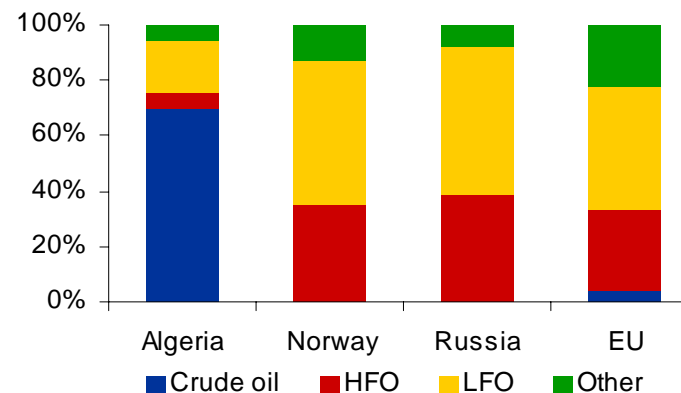
■ Oil indexation remains prevalent

- High gas prices are mainly due to high oil prices
- Around 75% of European gas prices reflect changes in oil prices
- Norway, Netherlands, and Russia price contracts relative to heavy and light fuel oil
- Algerian contracts relative to crude oil

■ Different prices around Europe

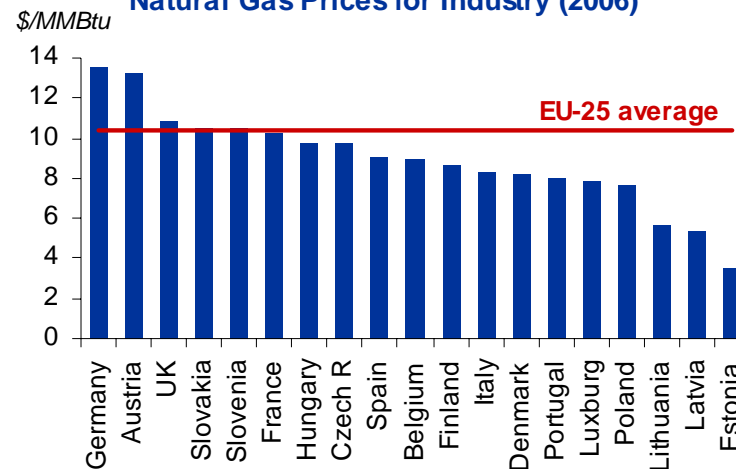
- Taxation, regulation and competition account for the differences
- Makes inter-connection difficult as low-priced countries do not want to connect with high-price markets
- Indication of strong incumbent positions that could be threatened with more competition

Indexation in Gas Contracts (2004)



Source: European Commission

Natural Gas Prices for Industry (2006)



Source: Eurostat, PFC Energy

European Gas In Comparative Perspective

European import prices resemble those in the US and Asia



- **European prices are comparable to prices in other markets (US, Japan)**
 - Germany's average import price has been fairly similar to Japan, though the US import price fluctuates based on supply and demand dynamics in N. America

- **Higher prices are due to rising oil prices, to which European contracts are indexed**

- **Prices among Europe's largest exporters are similar**
 - Algeria's average price tends to be lower than Russia or Norway

- **Links between European states are very weak**
 - In winter 2005-2006, UK crisis while Continental Europe was well supplied; Italy crisis while neighbors were well stockpiled (had to tap into strategic storage reserves)

- **Internally created crises**
 - Low rainfall has created power shortages in Europe, as have accidents / system failures

- **Was there a significant physical impact from Gazprom reducing deliveries to Ukraine?**

- **What is the best way to cope with such crises?**

- **Is Europe really open to intra-EU energy investment?**

■ **Spain's quest for gas security**

- In the late 1990s, Spain depended for ~60% of its gas on Algeria
- Rapid liberalization program that moved faster and deeper than the EU Directives
- Spain has decreased dependence on Algeria to 32.5% in 2006
- New supplies, rather than lower Algerian imports, led to change

■ **The UK's ability to deal with rising import dependence**

- Liberalization has created a multiplicity of import projects to deal with declines in North Sea fields
- By any scenario, the UK will have import channels well in excess of its needs

Final Thoughts on Energy Security

Markets can deliver security – faster than politicians



- **EU gas prices comparable to other OECD – and similar by source**
- **Reliance on Russia is steady and is unlikely grow much further**
- **Diversification is already under way and continuing**
- **Lack of integration between markets has posed a threat to energy security**
- **What behavior is undesirable and what is a true threat to energy security?**
- **Is energy an easy tool to leverage for political gains?**
- **Is energy a cause or a consequence of geopolitical tension?**



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