



## Gas glut reaches Europe

Major impact on prices, security and market structure

July 8, 2010



**A gas glut is heralding the dawn of a new era.** This new era is marked by technological progress, greater convergence between global gas markets and the declining relevance of established pricing patterns in the continental European pipeline business. The areas concerned are the typical large-scale projects, the international supply relationships and the downstream trading and usage levels.

**The free-market price of gas will become the new benchmark and will be the guide for the price of pipeline gas.** We expect a pronounced buyers' market to develop in the European gas sector by 2013, with North America dictating the price trend. Following the end of the low-price phase from around 2014 onwards we do not expect to see a renaissance of the longstanding link with the oil price.

**The gas glut is bringing opportunities** for domestic customers to benefit from pricing changes and providing greater flexibility for industrial users. Traditional municipal utilities and regional energy suppliers are coming under pressure. By contrast, major opportunities are opening up for independent distributors, independent traders and newcomers. Power plant operators should review their procurement strategies. New challenges face gas producers and importers; they will not be in the same boat for much longer, as they will be competing against one another for tighter margins in future.

**The security of supply in Europe is improving.** The battle for unconventional gas deposits is in full swing. New pipelines and gas storage facilities currently appear to be less urgent. Nevertheless, there is a need to press ahead with the projects in the longer-term interest. Gas market liberalisation, the basis for the new competitive situation, must not under any circumstances be allowed to stagnate. The "Gas OPEC" is currently toothless, but its time will come. Europe should therefore invest in more open structures, globally diversified sources and new technologies – and also trust in the creative vigour of market participants.

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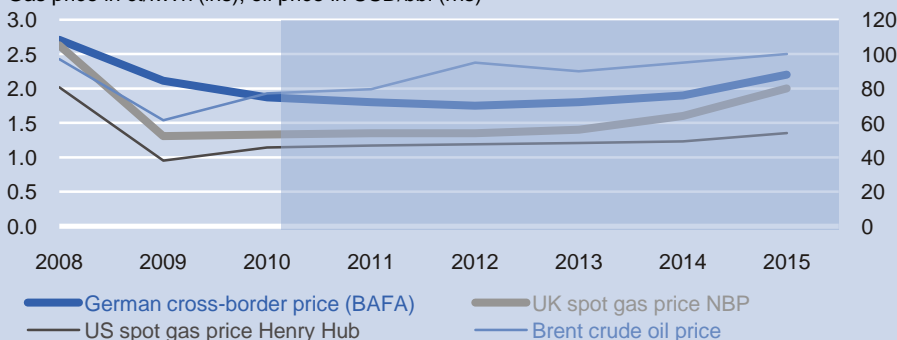
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### Price trends on the international energy markets

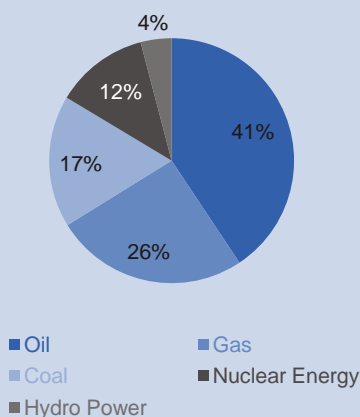
Gas price in ct/kWh (lhs), oil price in USD/bbl (rhs)



Source: Deutsche Bank Research

### Primary energy consumption in Europe

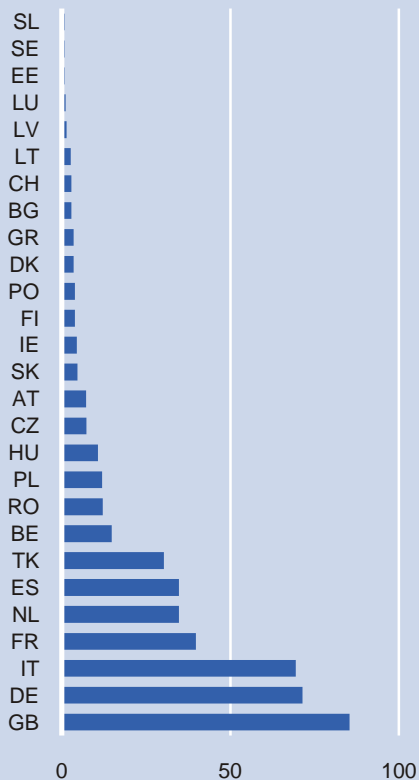
2008, shares of total consumption



Source: BP **1**

### Natural gas consumption in Europe

2008, in toe m



Source: Eurogas **2**

## New era on the European gas market

Gas supply in Europe to date can be divided roughly into three periods. Looking at the previous stages of development, the scale of the fundamental sea change currently taking place becomes clear.

Stage one can be dated up to the early 1960s. Typical of this period is that although gas was known as a source of energy, there were not yet any Europe-wide supply and demand networks. At this early stage, gas supply was at best a regional and in most cases a purely local affair. Municipal and coke-oven gas (coal gas) was produced in local gasworks by gasifying hard coal and initially served only for municipal lighting (town gas) and for domestic cooking. As yet there was no such thing as an international gas market with cross-border delivery in Europe.

Stage two began in Europe in 1959 with the discovery of the large Dutch gas field near Groningen. This was the actual nucleus of the European gas market. The Europeans hailed the finds as a geological sensation and a “second Kuwait”. And indeed, with the first cross-border gas deliveries from the Groningen field in the mid-1960s the Netherlands rose to become the first net exporter of gas in Europe. Since only seven countries bought the gas to begin with, the mainland European “market” for pipeline gas consisted of just eight countries with a monopolist supplier serving seven clients. Moreover, the United Kingdom purchased natural gas from Algeria via an import terminal completed in 1964. Later, gas and oil finds in the North Sea, made commercially interesting by the first two oil crises, turned first Norway and then Denmark into EU net exporters of gas, followed by the UK with the opening of the interconnector in 1998.<sup>1</sup> The Interconnector is a pipeline connecting the UK (Bacton) with Belgium (Zeebrugge) and hence mainland Europe.<sup>2</sup>

In 1998 stage three ushered in the liberalisation of the EU natural gas market. The EU initiative was directed primarily towards establishing a working competitive market for the mainly pipeline-bound natural gas industry. Gas supplies in the EU were increasingly being decentralised by external suppliers, with Norway and Russia in particular<sup>3</sup> gaining in relevance alongside Algeria. Nowadays natural gas is one of the preferred sources of energy in many EU countries as suppliers’ pricing policies have spurred market penetration and the consumption of gas generates relatively low carbon emissions in comparison to other fossil energy carriers (this being a comparatively recent argument). On the heating market, particularly in the aftermath of the first two oil shocks, gas heating – a fairly convenient alternative – ousted hitherto popular oil-fired heating systems. Also, natural gas became more important in electricity production throughout Europe.

<sup>1</sup> For details see Futyan, Mark (2006). The Interconnector Pipeline. A Key Link in Europe’s Gas Network. Oxford Institute of Energy Studies. March.

<sup>2</sup> In addition to the Interconnector, the BBL pipeline (Balgzand Bacton Line) has linked the UK to the Netherlands since mid-2006. Zeebrugge ticked all the boxes as a modern gas trading hub. Physically, these included pipelines and gas storage facilities. In terms of trading, a large number of buyers and sellers provided the necessary liquidity. In 2003 the virtual gas trading hub Title Transfer Facility (TTF) was opened in Holland. Today the TTF is most closely aligned in trading terms to the National Balancing Point (NBP), the major gas trading point in the UK. Historically, free trade in gas originated in the UK, from where it spread to mainland Europe.

<sup>3</sup> Russia has, of course, exported gas to Germany and Europe since the 1970s.



## Beginning of stage four of the European gas market

There are strong indications at present that, half a century on from Groningen, the fourth stage is just getting underway, bringing with it many changes and challenges for all market players. At least three observations argue in favour of this theory, pointing on balance to the dawn of a new era.

First, towards the end of the third phase gas prices for private households, SME businesses and industry surged massively up to mid-2008 in the wake of exploding oil prices. A major driver of this trend was that gas prices in important western European buyer countries such as Germany are indexed to oil prices. This contractual arrangement, which has hitherto been regarded as sacrosanct across broad sections of the gas industry and was undeniably useful to both sides while the market in gas was starting up, has come to be regarded in recent weeks as at least partially and temporarily dispensable – even in Russia, the dominant source of supply.

Second, there are strong signs that North American and European gas markets in particular, and also some Asian gas markets, after having previously existed separately are now growing closer together. Price trends in recent months are the most powerful indicators of this. The relevance of liquefied natural gas (LNG) in this context will be discussed later.

Third, technological advances play a key part, indeed they are probably the major driving force behind the two trends previously mentioned. New gas extraction technologies are suddenly turning gas deposits not deemed commercially viable until now (unconventional natural gas) into economically interesting options, paving the way for expansion in gas supplies on a scale not previously anticipated, chiefly in the US. What is more, instead of coming from the established gas producing regions the new volumes are widely distributed around the world.

On balance the new fourth phase on the gas market is hallmarked by technological progress, greater convergence between global gas markets and the declining relevance of established pricing patterns in continental European pipeline business (oil price formation). All this is radiating onto the big-ticket investment typical of the industry, onto international supply relationships and onto the downstream trading and consumption stages. The fourth stage just unfolding on the European gas market holds out many opportunities for market participants, but it also entails risks. Since these are closely related to current and probable medium-term price developments, it seems appropriate briefly to outline these and their causes.

## From market balance to global gas glut

Price trends over the past ten years have played out against a background of gradual transition from a world gas market broadly in equilibrium in terms of volume to a global gas glut. In the early years of the previous decade, the virtually balanced market situation steered market participants' expectations in approximately the same direction. Up to the middle of 2008 it was thought that global growth in demand for energy necessitated a marked step-up in the supply of gas. Steep increases in the prices of fossil energies since the beginning of the decade made building up and expanding the necessary gas infrastructure profitable. Consequently, financing for these capital-intensive projects was not usually a problem. Moreover, at least up to the middle of the decade many market

### Unconventional natural gas deposits

#### Natural gas from tight gas sands

Natural gas deposits in low permeability rock formations, known as tight sands, come under the category "tight gas". Sandstone (or carbonate reservoirs) and shale are two of the most important types of rock from which tight gas can be extracted. Gas deposits extracted from shale are also called shale gas. North America sets the pace in tight gas as it is there that the greatest potential deposits are presumed to lie.

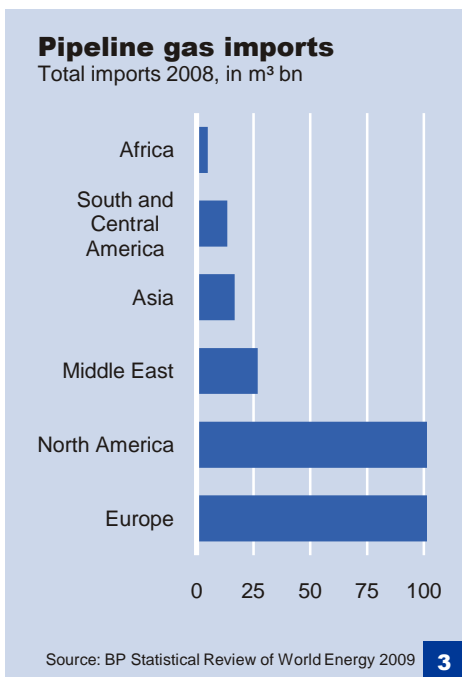
#### Coal gas

The term coal gas covers all gases occurring naturally in "mature" coal seams. These include coal bed methane (CBM) and methane associated with coal mining operations. Coal bed methane is produced, inter alia, by drilling wells into undisturbed coal seams, whereas coal mine gas is released in mine shafts as a result of mining activity. The latter type of gas can be subdivided into gas from working mines (CSM, coal seam methane) and from disused mines (CMM, coal mine methane). At present the US is the largest producer of coal gas.

#### Aquifer gas & natural gas hydrates

Aquifer gas and natural gas hydrates are both suspended in water in geopressurized underground aquifers. As a rule aquifer gas is formed in very deep groundwater strata. Gas hydrates, on the other hand, are natural gases captured in water molecules at low temperature, in the process of which they are transformed into ice-like, crystalline substances. For this reason they are often called frozen gas. Since the recovery of aquifer gas and natural gas hydrates has so far proved uneconomical, they are not produced commercially on any notable scale.\*

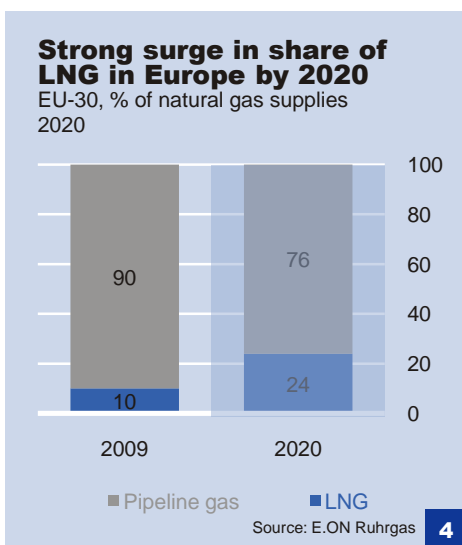
\*For details see Federal Institute for Geosciences and Natural Resources (BGR): Reserves, Resources and Availability of Energy Resources – Annual Report 2009; IEA (2009). World Energy Outlook 2009.



observers expected that the launch of trading in emission certificates in Europe would make natural gas significantly more competitive vis-à-vis fossil alternatives, it being widely accepted that the combustion of natural gas emits less CO<sub>2</sub> than hard coal and lignite. Going forward, this effect was expected to become more pronounced as heightened climate change hazards seemed inevitably to signal rising prices for tradeable pollution rights. All in all, this triggered a burst of gas-related investment, ranging from the development of new deposits through the construction of additional pipelines to additional LNG infrastructures. This investment boom – with the long time-lags typical of gas projects – is currently having the effect of pushing up the volumes of pipeline gas and liquefied natural gas available around the globe. The situation is now being heightened by the development of unconventional gas, holding out the prospect of substantial additional quantities. The gas glut we are seeing at the moment looks set to persist for some time to come, with severe repercussions on pricing.

### LNG spurring international gas price convergence

Since its early days natural gas trading in Europe has essentially been based on physical deliveries through pipelines. The increased emergence of LNG has added another means of transmission. In terms of quantity, however, pipeline gas continues to dominate trade, above all in mainland Europe. In 2009 LNG accounted for 10% of gas supplies in the EU-30.



The uptrend in prices for practically all fossil energy alternatives has enhanced the competitiveness of LNG and made infrastructural investment in the value chain (such as modern vessels to carry LNG and off-loading and regasification terminals) worthwhile around the globe. LNG has injected new flexibility and fresh impetus into the international gas trade. The new transmission vehicle has provided the world regions of particular relevance to the gas trade, i.e. the countries forming the triad, Europe, North America and Asia, which were previously practically unconnected on the gas market, with additional gas trading potential.

Research does indeed show that LNG has paved the way for intercontinental arbitrage, elevating gas trading to a new level at which natural gas prices are becoming more closely linked even between continents. Particularly in the Atlantic area, LNG transmissions have tended to nudge price movements in the same direction on what were previously highly segmented markets for natural gas.<sup>4</sup> Up to the end of the latest energy price boom the causal relationship was by no means unidirectional, with for example one region – North America, say – setting a price trend which another continent – in our case Europe – followed. In actual fact the impetus was more or less evenly spread.<sup>5</sup>

Also important to an understanding of trading activities is that neither the US nor the European side possess the liquefaction and loading infrastructure necessary for exporting LNG. This technical shortcoming is preventing loading at low-price locations and off-loading at high-price locations that would enable brisk physical trade in gas across the Atlantic. Moreover, liquefaction is too expensive for arbitrage trading. That is why liquefaction plants are not built for arbitraging purposes. The only suitable cargoes for deliveries

<sup>4</sup> See, for example, Neumann, Anne (2009). Linking Natural Gas: Is LNG Doing Its Job? The Energy Journal.

<sup>5</sup> See the development in natural gas prices on the free market (Henry Hub for the USA and NBP for the UK) since 2000.



## LNG tankers connecting markets

triggered by arbitrage are therefore those already being shipped by LNG tankers from other production areas (e.g. Africa, Qatar). If the price difference offers a great enough inducement, LNG shipments floating in the Atlantic can simply be redirected and regasified at the high-price location. Arbitrage is thus ultimately limited to cargo management (as with many other durable and non-durable consumer goods). Comparatively “small volumes” therefore balance out the regional markets all round the world.

### **Free US prices put pressure on pipeline gas prices in Europe**

In the past months some completely novel developments have occurred in the global gas trade. Key to this were technological breakthroughs with huge economic implications. Two particular features are apparent. First, in the present market situation many determinants are working in the same direction. Second, the convergence of natural gas prices is following a new pattern. It seems as if recently parameters from the US are setting the trend and European prices adjusting within a relatively narrow impact channel.

What does this process look like in detail? The real cause of the gas glut we are currently seeing is the rise in gas prices since the beginning of the last decade. This has suddenly turned the recovery of natural gas from many unconventional sources previously deemed unprofitable into an economically viable option. While it was known that the US and many other countries possessed more or less large unconventional deposits of gas in impermeable shale and coal seams (also called tight gas), the technologies required to extract this only became profitable as gas prices climbed. Essentially these enhanced gas recovery methods revolve around horizontal drilling and a hydraulic fracturing process called fracking or hydrofracking.

The innovative high-tech combination of horizontal drilling and multi-stage fracturing systems is the actual technical reason behind the creeping revolution currently taking place on the gas market.<sup>6</sup> The US Department of Energy estimates that America alone possesses sufficient recoverable unconventional gas deposits to supply the entire country for the next 90 to 120 years. Conversely, of course, this means that the United States will become less dependent on imported gas than previously assumed. The large shale gas finds in North America mean that the role played by the US on the global LNG market will have to be redefined.

### **Genesis of a new LNG world**

Until now practically all medium and long-range LNG scenarios have been based on the assumption that going forward the US would have to import ever larger amounts of energy as its domestic fossil energy resources were depleted. Most importantly, it was believed America would absorb much of the additional new supply of LNG set to flood the world market over time. America's appetite for energy thus held out the promise of keeping the global LNG market in equilibrium for the foreseeable future and ensuring that surpluses did not arise.

In reality matters have turned out differently. Already, the rise in the production of unconventional gas is shaping pricing in the US. Whereas in 2000 just 30% of US gas production came from

### **Technical breakthroughs for unconventional gas**

Horizontal drilling involves deflecting a bore from the vertical along a pre-planned horizontal trajectory to a predetermined target. This makes it possible to tap deposits of gas extending horizontally at low cost with just a few drillings, as horizontal drilling means that the layers of rock containing natural gas can be opened across large distances up to several kilometres.

By then injecting watery liquids containing special sand into the boreholes under high pressure, the rock containing the gas can be fractured hydraulically. This fracking technique ultimately creates artificial gas flows making commercial recovery possible.\*

\*For details on the drilling techniques and gas recovery, see, for example, WEG (2008). Erdgas - Erdöl. Entstehung. Suche. Förderung. Hannover. pp. 16-27.

## Half of US gas production from unconventional sources

<sup>6</sup> Similar methods are applied with unconventional geothermal energy to tap energy from hot rocks. See Auer, Josef (2009). Geothermal Energy. Deutsche Bank Research. February 2010. Frankfurt am Main.

unconventional sources, the expansion in the volume of shale gas has since pushed this figure above the 50% mark.<sup>7</sup> The new amounts enabled the spot price at the Henry Hub<sup>8</sup> pipeline, which is the pricing point for the US, to disconnect early on from the other international regional markets.

***The gas price on the free market becomes the benchmark and points the way***

The consequence of this development is that LNG volumes originally scheduled for the US are no longer required there. Redirection of these volumes and their sale on the spot markets in Europe and Asia has caused gas prices to collapse there, too, as in America before them. In 2009 this trend was shored up by two factors which pushed prices in the same direction. First, the global economic recession subdued energy consumption, with the result that global demand for gas was lower than expected. Second, more and more LNG projects launched when prices were riding high (as already discussed) are recently becoming relevant to market activity. Both these drivers are of course ramping up the pressure on prices from the supply-side.

**Keen price competition in north-west Europe**

That this price trend has crossed the Atlantic from America to Europe is due chiefly to the free gas market in the UK, which is acting as something of a “release valve” for oversupply. Oversupply of LNG is ousting Norwegian gas in Britain and this is moving on to Germany instead. In north-western Europe gas from Norway is therefore increasingly coming up against gas supplies from Russia, and the prices of both are competing with production from domestic sources. The gas glut drove down spot prices at the end of 2009 to around 1 ct/kWh (i.e. below long-term averages), while the prices at German border crossings calculated by the Federal Office of Economics and Export Control (BAFA) were roughly twice as high.<sup>9</sup>

**Long-term contracts under pressure**

To put it another way, the Henry Hub spot price points the way for the spot price at the UK National Balancing Point, to which in turn the Title Transfer Facility futures market is aligned. And this price for free quantities then radiates onto all gas prices on the Continent. This also applies to prices for pipeline gas, because following liberalisation of the European natural gas market gas consumers are at liberty to choose the suppliers from whom they purchase their gas. Corporate clients and regional distributors have recently been making increasing use of this option, with the result that even long-term contracts for district gas with “take-or-pay clauses” have been affected. Ultimately, price pressures are obliging suppliers to be rather more open-minded on long-term contracts whose prices are indexed to that of oil. On balance the new-found flexibility on the part of even the major Russian gas producer signals a sea change in the gas industry.

The new international gas cosmos is thus characterised by a situation in which, unlike the previous decade, there is a unidirectional price correlation between North America and Europe (and also Asia, with certain reservations). The direction is flagged up by the Henry Hub spot price, which gas prices in Continental Europe

<sup>7</sup> See IEA (2009). p. 398.

<sup>8</sup> Many important natural gas pipelines in the US converge at Henry Hub in Louisiana.

<sup>9</sup> In view of these “summer sale prices” market observers began to question the cost effectiveness of fresh exploration and production (E&P) and infrastructure investment. Moreover, some producers reacted by shelving projects. See Weise, Jochen (2009). Leitmotiv Versorgungssicherheit. Perspektiven für das Gaswirtschaftsjahr 2009/2010. Euroforum. Berlin. October 12. p. 5.



then follow via the NBP. Whilst the price for pipeline gas previously determined events in Europe, the free gas price is now the new benchmark.

### **Implications of the gas glut for natural gas prices**

#### ***Gas prices in Europe will remain low in the medium term***

#### **Buyer's market up to 2013**

In our estimation the current cause-effect relationship will probably remain intact up to 2013, with the new surplus quantities in North America radiating onto Europe. Specifically, the American spot price should therefore continue to pressure the NBP in coming months and prevent it from rising. This free European market price will, in turn, signal the direction for Continental Europe. In the past few months gas import prices in Germany, for example, have already tended to follow prices on the free market. However, the long-term oil-indexed contracts for pipeline gas from Norway and Russia have prevented a decline in prices on such a steep scale as in Britain. It is hardly surprising that prices at the downstream trading stages through to private households have also corrected to a lesser extent. Understandably, only the importers not bound by contract are delighted with the new free gas volumes currently spilling over to Europe since they mean lucrative extra business. But for gas importers on tied contracts they represent a serious challenge.

#### **Markets will diverge again from 2014**

We expect prices in Europe to start picking up again gradually from around 2014. The major volume-based cost-drivers will be the populous countries in Asia (China, India) whose additional demand for gas will increasingly mop up the surplus quantities. In a scenario like this there is much to suggest that gas prices in the main world sales regions would drift apart again slightly. On the one hand, market prices in the US will stay relatively low as shale gas volumes increase, while on the other Europe will find itself in growing competition with Asia for freely available gas. The European spot market is therefore likely to decouple again slightly from the US market and trend upward.<sup>10</sup> The additional supply coming onto the west European market with the completion of important pipelines such as Nordstream will do little to alter this situation.

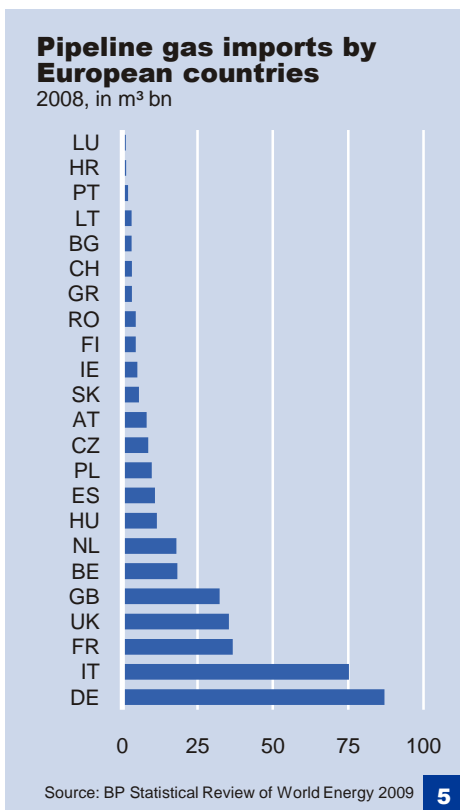
#### ***Renaissance of the old link to oil prices unlikely***

It is, however, questionable in this context whether this would mark a return to the era of oil indexation in gas contracts or whether quite new developments are probable. In our view various factors argue against a return of the peg to oil prices as we know it.

First, the intention of linking gas to oil prices was to bring long-term plannability for contracting parties and to buttress market penetration on the heating market, where natural gas initially found itself competing chiefly with oil. Nowadays, however, hardly any new-builds are fitted with oil heating. Consequently, the link now makes sense only insofar as oil is still the world's major source of energy, with the result that the price of oil ultimately also impacts other energy prices.

A second argument against the renaissance of the gas/oil price link is that modern buildings are now well insulated and therefore require

<sup>10</sup> In a scenario with a renewed explosion in oil prices, which we consider very unlikely in the immediate aftermath of global recession, all energy prices (including those for natural gas) could, of course, be sucked "upwards". The hype surrounding oil in 2007/2008, for example, did not even stop at hard coal prices which skyrocketed even without an oil price link.



less and less external energy, particularly for heating.<sup>11</sup> This means natural gas must conquer new sales markets. While playing a more important part in the coming years, gas-powered mobility will hardly be able to take up the slack. The greater use of natural gas to generate electricity seems a more promising option here. Going forward, charging all the different types of fossil power generation more heavily than at present according to their actual emissions would give natural gas an added boost. In electricity generation, namely, coal is the most serious rival to natural gas both nationally and internationally. This being the case, it would be more logical to link the price of gas to international hard coal prices. In practice such indexation has long been customary.

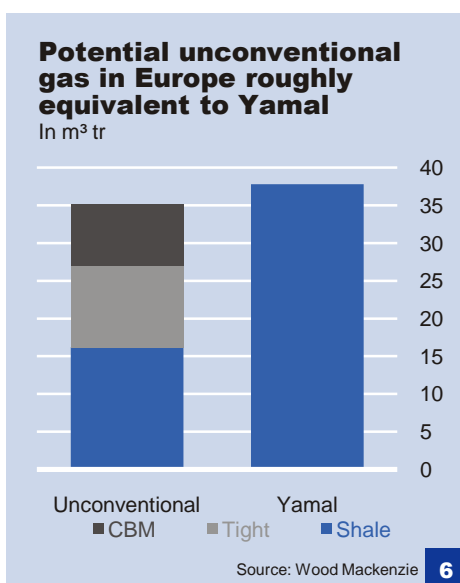
Third, recent gas-to-gas competition across the Atlantic and on mainland Europe clearly highlights that market price formation based on supply and demand is also possible for natural gas. This adequately prices current and future gas shortages. There is no question that price indexation has in the past increased the calculability of the very substantial investments the gas industry typically needs to make (e.g. expenditures on exploration and recovery in remote regions and the construction of pipelines over thousands of kilometres). Nonetheless, nowadays state-of-the-art financing mechanisms can also be used to depict and manage the challenges and risks involved. And in many sectors – the automobile industry being just one case in point – it has traditionally been customary to set up large production facilities in far-away countries even without a contractual guarantee at the time of investment promising sales for many years.

On balance it therefore stands to reason that the European natural gas industry has also embarked on a new era in respect of price formation mechanisms. Even when market prices start to head north again, there will be no simple turning back the clock.

### Repercussions on supply security

#### Impetus to unconventional gas exploration in Europe

Substantial deposits of unconventional natural gas are believed to exist in many European countries such as Germany, France, the UK, Austria, Poland, Sweden, Romania, Hungary and Ukraine.<sup>12</sup> In some places exploration is already underway. The big US corporations (foremost among them the supermajor Exxon) were slow to recognise the potential of shale gas business, with the result that they had to pay top prices to take over bold pioneering firms. Today the energy giants and oil field equipment suppliers (e.g. Exxon, Schlumberger and Shell), and many smaller companies too, are staking claims throughout Europe. As in the 1960s, Europe is dreaming of a new “gas wonderland”. In fact production could actually begin in two years in northern Germany (e.g. Lower Saxony)<sup>13</sup>, southern Sweden or Poland. However, the muted trend in prices as a result of the gas glut is currently putting a damper on development, so that significant output is not to be expected for



<sup>11</sup> See Auer, Josef et al. (2008). Building a cleaner planet. Deutsche Bank Research. Current Issues, November 2008. Frankfurt am Main. Rakau, Oliver et al. (2010). Green buildings. Deutsche Bank Research. Current Issues, April 2010. Frankfurt am Main.

<sup>12</sup> Potential unconventional gas deposits in Europe are roughly on a par with those in the Siberian Yamal Peninsula. See Guarrant, Richard (2010). The Role of Natural Gas. Flame. Amsterdam. March. p. 5.

<sup>13</sup> See Wallbaum, Klaus (2009). Exxon sucht in Niedersachsen unkonventionelles Erdgas. Hannoversche Allgemeine. October 4.



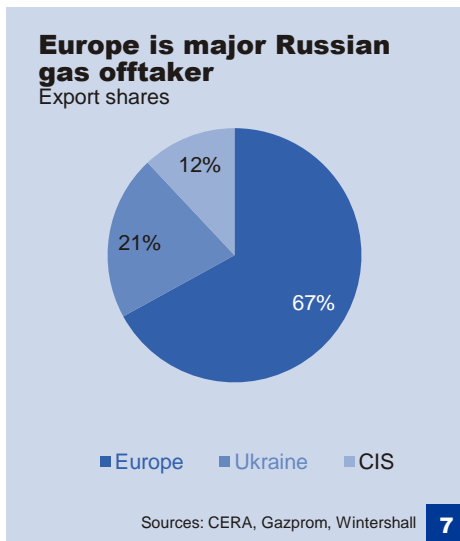


## Europe dreams of gas wonderland

another decade. Europe does have an advantage on America in that it already possesses quite a close-knit natural gas grid facilitating feed-in of the widely dispersed deposits. But owing to Europe's higher population density, environmental concerns such as potential hazards to groundwater and drinking water argue at first sight against excessive usage. Indeed, the rock strata containing gas in Europe are generally located several hundred metres beneath the groundwater. What is more, in important countries such as Poland and Ukraine the gas deposits are believed to exist chiefly in rural areas. Additionally, in the US deposits have also been exploited in densely populated conurbations – allegedly with no difficulty at all.<sup>14</sup>

### Greater energy supply security in Europe

The interruptions in gas deliveries from Russia in 2006 and 2009 acted as a wake-up call for the EU, making the security of gas supplies a major issue in European energy policy. The construction of additional pipelines enabling gas to be imported from new production areas and designed to make Europe more independent naturally throw down the gauntlet to Russia, which presently provides more than a quarter of Europe's gas. A European energy strategy geared to greater independence is being buttressed at the moment by the current glut of gas, while undermining the main supplier's position. In the future, additional gas deliveries from North Africa, also from unconventional sources, could further improve the supply situation for Europe. Russian hopes of decisive resistance to unconventional exploitation on the part of European environmental agencies and activists could prove illusory, as discussed above. So far governments and environmental associations in Germany and at the European level have not yet sufficiently addressed the new issue and its environmental implications.<sup>15</sup>



### Gas glut diminishes financial feasibility of pipeline projects

Persistently poor prices for natural gas are impacting financing calculations for current pipeline projects. Most severely affected are pipeline links up for completion in the next few years. Because of the gas glut the prices obtainable are often considerably lower than assumed up to 2008. In the wake of the recent economic and financial crisis risks are being weighted more heavily in the financing. Added to which, technological challenges in pipeline engineering involving extra costs often do not become apparent until the implementation stage. An illustration of the scale of these implications is the Baltic Pipeline. In April 2010 the operating consortium Nord Stream was obliged to ratchet up the investment costs for the 1,200 km-long conductor by EUR 1.4 bn to EUR 8.8 bn. Higher financing costs and lower end prices diminish the profitability of mega projects like these. And even pipeline projects farther down the line are now being evaluated rather more conservatively.<sup>16</sup>

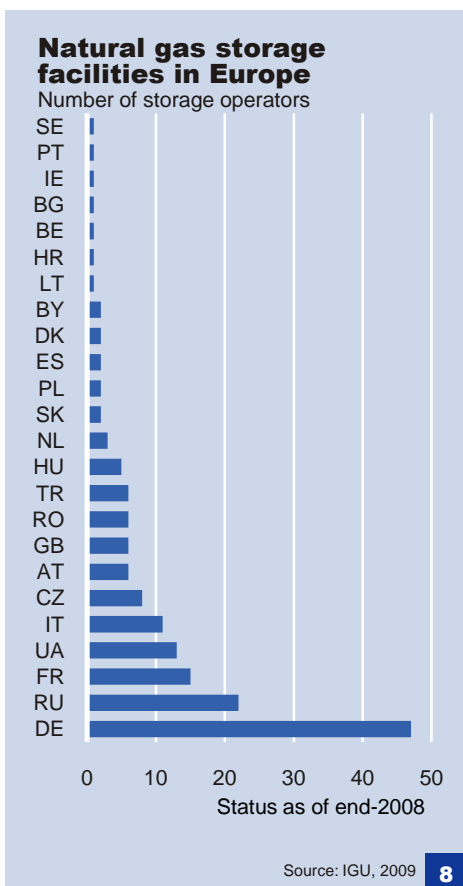
### Gas storage projects now seem less urgent

Disruptions in Russian gas transmissions through Ukraine and the emergence of a kind of 'Gas OPEC' have raised concerns in central

<sup>14</sup> See Shale Gas Seen Boosting Europe's Energy Security (2010). The Moscow Times. March 19.

<sup>15</sup> See also Shale Gas (2010). Dow Jones. Energy Weekly. No. 14. P. 6.

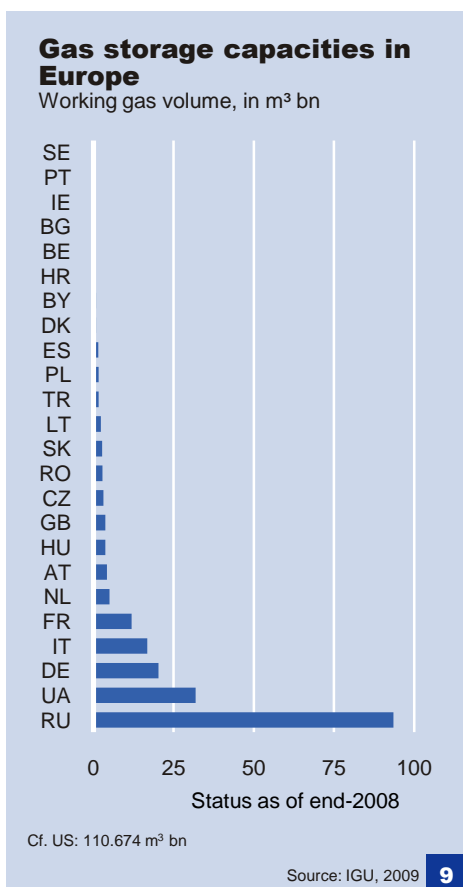
<sup>16</sup> Doubts are being voiced in some quarters that Nabucco will be completed on time. A contributory factor is that the increase to 20% of EdF's originally scheduled 10% stake in South Stream is making the Nabucco project less urgent. See Alfa Bank (2010). EdF to get 20% stake in South Stream pipeline project. Morning Brief. April 27. The project is, anyway, a thorn in Russia's side.



and western Europe over supply security. In this context, the construction of additional gas storage facilities in western Europe was intended to help cushion temporary delivery shortages and thus make supply more secure. Now, however, storage projects of this kind appear less pressing amid the unlooked-for gas glut. Nonetheless, we believe that the issue of new builds should remain on the agenda, because Europe will grow even more reliant on imports of natural gas in the coming 20 years as gas output in Denmark, Germany, Britain, the Netherlands and Norway decreases. Besides which, even the extra pipelines currently under construction by no means automatically guarantee secure supply for ever more.<sup>17</sup> Even the pipelines being built precisely with a view to reducing reliance on Russian gas (such as Nabucco) could ultimately be dependent on this gas in order to operate lucratively.

Gas storage facilities are typically extremely costly investments. So some investors active in this area consider it only natural to call for state support. In our estimation an adequate stockpiling strategy could be drawn up EU-wide, but responsibility for specific coordination of the stores should remain with the member states. Each country could lay down regulatory requirements that would increase the security of supplies. But policymakers should not take their intervention beyond a regulatory framework. Governments should refrain from setting up and operating parallel systems, because that is not the public sector's job. Ultimately, stockpiling serves the industry dealing in natural gas as an energy carrier. It is therefore in the gas industry's vital interest to put a system in place guaranteeing the promised supply security. Foreign suppliers could be integrated into this – although admittedly only very indirectly – as they also have an economic interest in stable supplier-customer relationships. European countries that have so far invested nothing or very little in their own supply provisioning should not automatically be given access to privately-run storage facilities in other countries, as this would create the wrong incentives and ultimately cause essentially meaningful investment not to be made. Capital expenditure on additional gas storage should not therefore be placed entirely on ice because of the current gas glut; instead the window of opportunity should be used to create the regulatory prerequisites for structures designed to function Europe-wide in extreme cases.

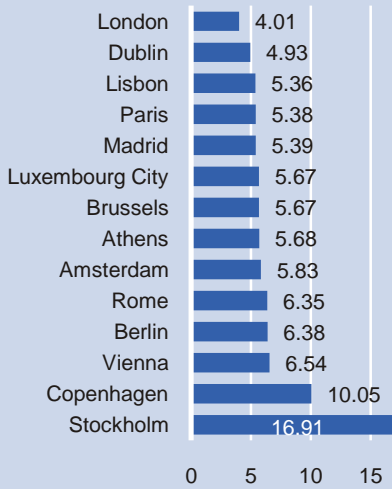
Nevertheless, storage remains a fraught issue, with the slowdown in production in Europe tending to push up storage demand on the one hand, while on the other energy savings on heating are depressing it. In the long term slightly more is likely to be stored on balance. At present, however, storage is also increasingly being replaced by LNG projects, as more vessels dock in the winter. And there are also interruptible supply contracts. Consequently the run on storage has recently eased. The latest auctions of storage capacities for the coming years went very badly. The summer-winter spread is close to zero, meaning that storage is worth nothing at present on the market. There are indications that, going forward, storage should not only be viewed in the context of technology but that greater attention also needs to be paid to market forces.



<sup>17</sup> The new supply security and Russian discount prices (up to 30%) for Ukraine could quickly evaporate in the event of another change in government.

### End-customer prices in Europe

Ct/kWh, gas prices incl. tax, Feb. 2010



Sources: VaasaEtt, E-Control **10**

### Glut should not stop liberalisation of the EU internal energy market

In 1996 the first EU-wide energy liberalisation directive – for the electricity market – came into force, followed just two years later by the counterpart for the gas market. The provisions are directed toward the establishment of a level playing field and, most importantly, an integrated European market for electricity and gas. Market liberalisation was supposed to enable consumers to choose freely between suppliers. Over time, however, implementation of the legislation revealed various flaws with, for example, individual member states not opening up their markets equally. This prompted the European Parliament to introduce amendments in subsequent years.

The attempts at liberalisation are now in their third round; following the 2003 “Acceleration Directive” (marking the second round), mid-2009 the European Parliament adopted another legislative package whose implementation is scheduled to begin in 2011. Its central focus remains concentrated on European energy market integration and the promotion of effective and fair competition.

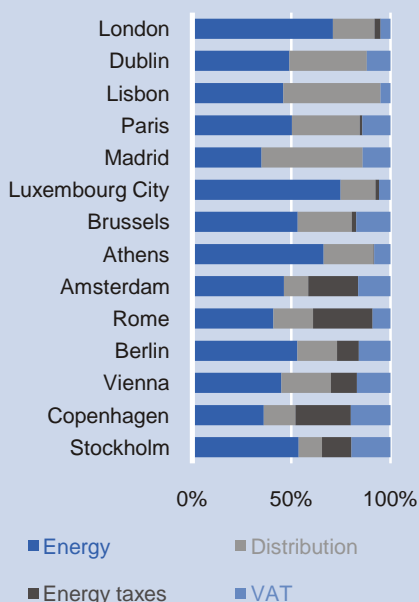
Ownership unbundling of vertically integrated electricity and gas producers plays an important part in the amendment to legislation on the internal market in natural gas. The separation of production and transmission assets is intended to facilitate network access and stimulate investment in capacity expansion. Under a compromise negotiated with some European countries, primarily Germany and France who opposed full separation, member states are now given a choice between three unbundling options: full ownership unbundling, the assignment of network management to an independent system operator (ISO solution) or independent transmission operator (ITO solution). The latter two options constitute the regulatory separation of producers and transmission system operators, leaving ownership of the networks with electricity producers. Closely linked to the unbundling requirement is the reciprocity clause, which also goes by the name ‘Gazprom clause’. This stipulates that companies from non-EU countries will be permitted to take control of energy transmission systems only if they comply with the same unbundling requirements that are imposed on EU companies.

With enactment of the third EU internal energy market liberalisation package a European Agency for the Cooperation of Energy Regulators (ACER) was also set up. This was preceded by the launch in 2006 of the European Regulators’ Group for Electricity and Gas, ERGEG. ACER takes charge of supervising cross-border cooperation between the national regulatory bodies and setting non-binding market guidelines. In general the authorities are to be assigned greater responsibility and influence. Transmission and pipeline operators in the electricity and gas sector are also each being networked into a European Network of Transmission Operators, ENTSO. This is tasked with presenting a ten-year network development statement every two years and network codes based on the ACER guidelines. The network statement will then form the basis for companies’ investment planning. Establishment of these EU-wide agencies is designed to bring together regulatory and network development planning aspects at the European level.

Further provisions in the amendment are geared to strengthening consumer rights; in this context governments are called on to create suitable framework conditions making it easier to switch suppliers.

### Price composition

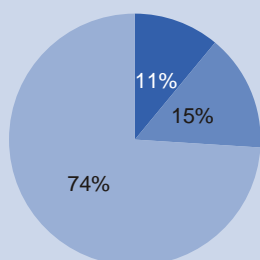
Share of gas price, in % points, Feb. 2010



Sources: VaasaEtt, E-Control **11**

### Customer switching habits since gas market liberalisation

Germany, in %

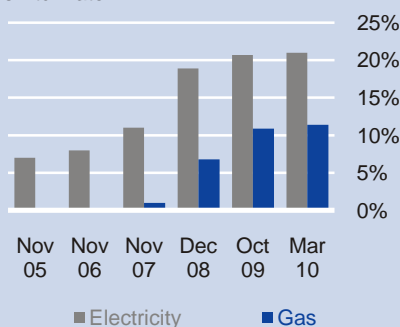


- Customers that have a new supplier
- Customers that have a new contract with their old supplier
- Customers that have not changed their contract

Source: BDEW, 2009 **12**

### Supplier switching still rare on German gas market

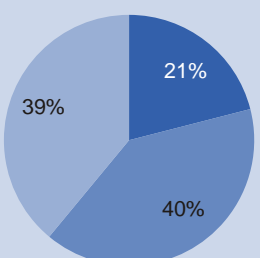
Household supplier switching, cumulative switch rate



Source: BDEW **13**

### Customer switching habits since electricity market liberalisation

Germany, in %



- Customers that have a new supplier
- Customers that have a new contract with their old supplier
- Customers that have not changed their contract

Source: BDEW, 2009 **14**

The conditions under which consumers are entitled to change their gas suppliers have now been simplified. Despite newly kindled competition as a result of the gas glut, the process of liberalisation should be continued.

### Implications of the gas glut for market participants

The dawning period of relatively low gas prices in Europe has implications for all market participants. On the one hand, customers seizing the initiative have the chance to reduce their expenditure, while on the other gas producers and suppliers should be thinking about how to address price pressures. What is happening on the German market, which is pivotal to Europe as a major hub for gas deliveries from the east and north, seems particularly interesting. The following possible courses of action can be deduced from our analysis.

#### New opportunities for domestic customers

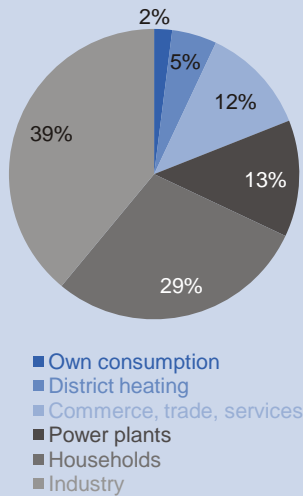
The EU – probably the most important driver of fairer competition on the European gas market – has again used the new EU energy market liberalisation package to strengthen consumer rights. New consumer legislation means that gas consumers can now switch their gas supplier within three weeks. Previously they were only able to do so with effect from the end of the next calendar month. Customers are also now entitled to a final closure account with full consumption data no later than six weeks after the change of supplier. The right to compensation is designed to curb accounting errors and delays.

These new features and the present gas glut are very good news for domestic customers. Consumers in Germany, long a virtual competition wasteland, are showing greater willingness to switch suppliers. According to a survey by the BDEW German Association of Energy and Water Industries, 11% of gas customers have already opted for another supplier. This contrasts with a scant 1% at the end of 2007. The trend is receiving fresh impetus from the rising number of supraregional providers. Admittedly, though, many customers have not yet woken up to the fact that nowadays it takes just a few mouse clicks at an internet portal (e.g. Verivox.de) to switch their provider – and that this alone can often reduce the annual gas bill for a typical household by around EUR 100. On the whole, gas prices have not yet fallen as sharply at the domestic customer level as the current gas glut would permit. This is only partly the fault of suppliers, who are understandably reluctant to pass on their lower purchase prices automatically. Private households are partly to blame for not taking a more active approach on balance to switching suppliers.

#### Greater flexibility for industrial customers

So far major industrial customers have typically covered their entire gas requirements for a whole year at a time. Consequently, the futures market is more important than spot quotations. As a result falling spot prices due to oversupply are only working through with a time lag, if indeed at all. The current intensification of competition on the gas market now offers industrial clients new chances to optimise their gas procurement. Modified full-requirements contracts enabling customers to top up part of their gas requirements on the open market and fixed quantity deliveries are possible alternatives to the previous full supply.

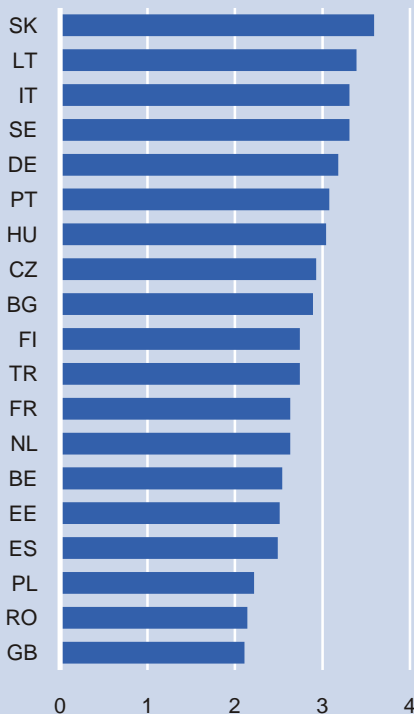
**Natural gas sales by customer group in GER**  
Shares of total natural gas sales



Source: BDEW **15**

**European natural gas price comparison\* – industrial off-takers**

Offtake 280 – 1,120 GWh, Ct/kWh



\* Prices as per April 1, 2009  
Total prices incl. taxes, excl. VAT

Sources: Eurostat, VIK **16**

Take-or-pay agreements actually designed to lessen the procurement risk for customers and the payment risk for gas suppliers are still common in business with industrial customers. In 2009 sluggish economic activity triggered a sharp drop in industrial demand for energy. Since industrial clients are obliged to pay regardless of whether they need the agreed quantity of gas or not, this naturally posed a problem – exacerbated by the fact that a resale ban was generally enshrined in the contracts. This placed customers seeking to obtain at least partial compensation for the gas they had already paid for at the mercy of suppliers’ goodwill. Germany’s Bundeskartellamt, the office of fair trading, has identified a pressing need to take action on this and is currently scrutinising these resale clauses.

Ahead of any revisions, it must be said that new contracts already contain more flexible clauses. In some cases agreement has been reached on resale of the volumes at wholesale prices. Moreover, some of the sting can be taken out of take-or-pay agreements by permitting the storage of surplus quantities or allowing them to be carried over into new supply contracts. More flexibility is certainly also in suppliers’ interests as they otherwise run the risk of permanently losing gas off-takers. Industrial and commercial customers are indeed switching in growing numbers, driving down sales by traditional gas suppliers in particular. Farther down the line the particularly price-sensitive group of industrial corporate clients is likely to turn more towards the type of structured gas procurement (tranche procurement) already customary with purchasers of electricity.

For many years industrial gas consumers in Germany have had to pay some of the highest prices throughout the EU.<sup>18</sup> The present gas glut, in conjunction with suppliers’ new-found freedom, could ameliorate this situation going forward. However, surplus volumes are currently depressing industrial prices across the whole of Europe anyway. European industry’s competitiveness would naturally be given a boost were industrial gas prices to fall to a lower level throughout Europe.

**Traditional municipal utilities and regional energy suppliers under pressure**

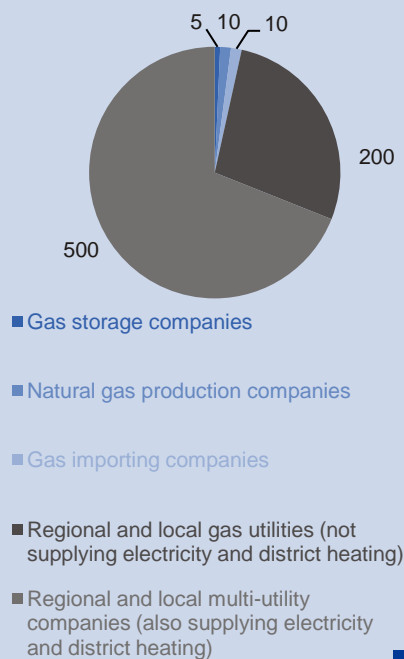
Municipal utilities and regional energy suppliers traditionally gear their procurement strategies to the border crossing price, which depends on the price of heating oil. This “anchor price”, which has so far brought security, is now turning into the traditionalists’ Achilles heel. The reason lies in the asymmetrical development in oil and gas prices since the beginning of 2009. Ultimately, the gas glut meant that at the end of 2009 gas at the trading hubs was EUR 8/MWh cheaper for the calendar year 2010 than in oil price-indexed import contracts. Thanks to the lower hub prices a standard small-volume customer (single-family house) consuming 20 MWh of gas a year could therefore save EUR 160 by purchasing from an alternative source.<sup>19</sup>

<sup>18</sup> A German industrial enterprise requiring 500 million kWh of gas a year was placed at a EUR 1.3 m competitive disadvantage vis-à-vis a comparable French facility in 2008. Yet geographically, Germany is more conveniently located for the important gas exporting countries. See VIK: Erdgas in Deutschland ist viel zu teuer (2009). Dow Jones. Energy Weekly. No. 26, p. 5.

<sup>19</sup> See Klein, Sebastian (2010). Das Ende der Vollversorgung. Dow Jones. Energy Weekly. No. 15, p. 8.

### Gas supply structure in Germany

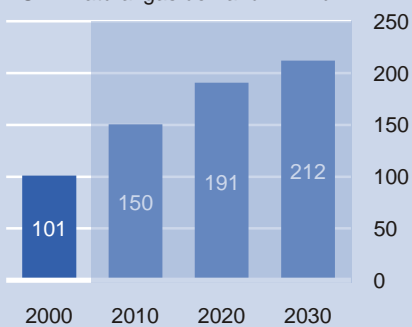
Number of companies, 2008



Source: BDEW **17**

### Increasing use of gas to generate electricity in Europe

EU-27 natural gas demand in m<sup>3</sup> bn



Source: Global Insight, 2008 **18**

The winners in the current market situation are municipal utilities and suppliers not bound by contract or who have not made any forward purchases. The trading hubs can currently offer them extremely favourable prices. There are also opportunities for independent traders and newcomers who identify the new era on the gas market as a good time to enter the market. Suppliers that can take advantage of cheap offers for their procurement but do not have to pass on these reduced prices thanks to a client portfolio consisting mainly of small-volume customers reluctant to switch their provider, can earn very good margins at present.

Meanwhile, municipal utilities with one or more large-volume customers must respond rapidly to tougher competition. Under pressure from margins and potential customer defection, the distribution portfolio urgently needs to be analysed and restructured where necessary. Reducing agreed price-indexed delivery volumes has its merits. The price and volume risks that come with large-volume customers can be contained by back-to-back procurement at the gas hubs. For domestic and other small-volume customers taking up small amounts of gas, structured procurement is more expedient. With its greater flexibility, procurement and delivery times can be optimised, for example. On balance there is much to suggest that oil price indexation in municipal gas business has passed its peak. There, too, the future presumably lies with the free market.

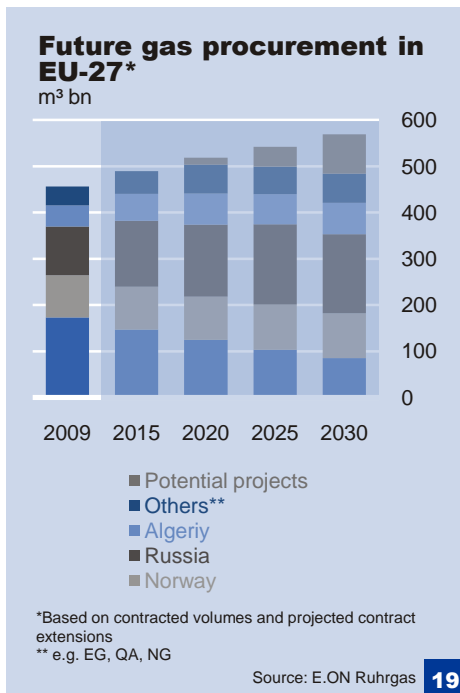
### Opportunities and risks with gas-fired power plants

The great tide of natural gas is also sweeping gas-fired power plants (along with gas and steam power plants etc.) into a new era. For several decades it was held that the gas delivery contract determined the quality of the gas power plant. But in the new age a power plant project is already deemed interesting if it is free from gas delivery contracts.<sup>20</sup>

More and more power plant operators are certain to take advantage of the price opportunities now available to them. Yet given the capital tied up in power plant construction, even in future their appetite for risk is hardly likely to run away with them. This will keep the issue of secure prices and deliveries on the agenda. For tactical reasons the old gas contracts with power plants often additionally contained price indexation to hard coal, the fuel of the greatest relevance to the power plant industry. There are some indications that on even more deregulated gas markets longer-term contracts with specific price arrangements could add value. The general energy price risk shrinks, for example, when deliveries are at least partially tied to the price of the globally dominant source of energy, oil. After all, during the last oil price hype not a single energy carrier worldwide, neither hard coal nor natural gas, managed to decouple. Additionally, long-term contracts could incorporate volume guarantees on a greater or lesser scale. Subject to sufficient flexibility (e.g. through the provision of storage facilities) this would make projects more secure. What is more, in a risk scenario the currently comfortable market situation could end sooner than expected.

Of course these procurement strategies do not have the answers to all conceivable future challenges. If, for instance, all the mega projects surrounding new energy forms that are currently under discussion in Europe and its neighbouring regions were realised in

<sup>20</sup> See Lokau, Bernhard et al. (2010). Gasbeschaffung ohne Ölpreisbindung. Energie Markt Wettbewerb. No. 1, pp. 48-50.



### Greater import flexibility

the near future, it would put traditional power station networks up for fundamental reassessment and refocus. But in future too, gas power plants' positive carbon footprint should earn them a place in the modern electricity supply pantheon.

### **Gas producers and importers no longer in the same boat**

At first sight the gas producers that have concluded long-term supply contracts with importers in western and central Europe are in an enviable position. After all, the take-or-pay agreements protect them against the gas glut in Europe. But first impressions can be deceptive. Increasingly often, importers (in many cases gas pipeline companies) are unable to offload their volumes because the market will no longer accept the prices they are asking. Large-scale industrial gas customers, small and medium-sized businesses, and a growing number of private households too, are obtaining their supplies on the free market. Customer attrition is turning purchase commitments into a problem for importers. Those able to do so escape from their import contracts. But importers that cannot go down this road, who are captive to their long-term contracts<sup>21</sup>, are becoming a risk for gas producers. After waiting a while to see how things would work out, producers are increasingly facing up to the new realities with the realisation that contractual handcuffs may drive their partners to the brink of ruin. Ultimately this would do the producing companies no good either.

In recent weeks greater flexibility is becoming apparent in traditional import business, in terms of both volumes and prices. By taking this route international gas exporters are also trying to salvage as best they can for the time being a traditional business model that has worked well over the decades, in the hope that it will get a second chance in the not too distant future. In our view their hopes are unlikely to be realised before the end of 2013 at the very earliest.

Nonetheless, long-term supply relationships in a mega investment environment such as pipeline construction and gas field exploitation in inhospitable parts of the Earth certainly can make sense. In the brave new gas world, however, sufficiently flexible solutions should be sought for all parties wherever possible. Given the periodically high correlation of all fossil energy prices to oil quotations, oil price indexation remains an issue. But where prices diverge – as they are doing at present – new approaches should be taken. One possibility would be to incorporate a kind of switch clause into long-term contracts under which, in Europe-wide buyer's market situations for example, hub price indexing would replace the link to oil prices. In the event that no hedging at all were feasible in the future, some of the gigantic infrastructure investment in the gas sector would presumably stand hardly any chance of realisation.

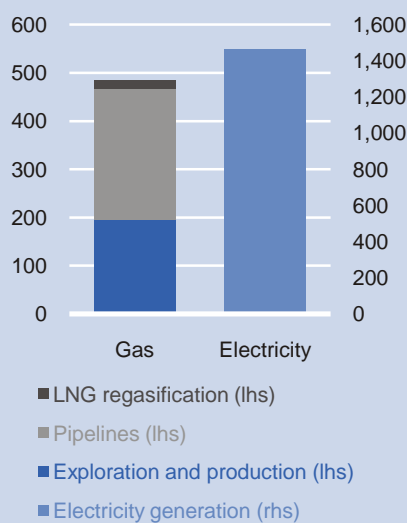
### **Gas OPEC cannot yet spread its wings, but its time will come**

Establishment of the Gas Exporting Countries Forum (GECF) in 2001 was initially a reaction to endeavours by the European Commission to eliminate long-term delivery contracts. It was not until the end of 2006 that its member countries first pronounced the option of a Gas OPEC "interesting". Today another eight members have gathered around the 'power triangle' Russia, Iran and Qatar to

<sup>21</sup> Import contracts do admittedly contain price revision clauses providing for regular adjustment of prices to the market situation, i.e. raising or lowering. But in the present situation speed means money for importers.

### EU investment in gas infrastructure and electricity generation

Investment 2008 – 2030, in USD bn\*



\*Reference scenario

Source: IEA World Energy Outlook 2009

20

### No lasting security

### Big existing pipelines in Europe

Existing pipelines	Capacity in m <sup>3</sup> bn/year
Yamal Europe	66
Brotherhood	30
Blue Stream	16
South Caucasus Pipeline (BTE)	7
Arab Gas Line	10
Green Stream	10
Maghreb Europe	12
Transmed (Enrico Mattei Gasline)	27

Sources: IEA (2009), CERRE, Gazprom, BP

21

form a kind of Gas OPEC.<sup>22</sup> Although the organisation controls around 70% of gas reserves, 40% of pipeline trade and 85% of the LNG market, from the outset it was seen as fairly insignificant. Its detractors point to the different interests of pipeline gas and LNG suppliers and maintain that a really global gas market does not yet exist. This is why they believe that – unlike oil – there is no point in having a worldwide organisation.

The latter argument no longer works. As we have already seen, LNG connects the world regions, so meanwhile the market prerequisites are in place for an international Gas OPEC. That is the bad news. The good news is that the new surplus volumes from unconventional sources are currently preventing the gas cartel from exercising any clout. It is, however, doubtful whether Europe can put its faith in the gas cartel's permanent toothlessness. We believe there are cogent reasons not to do so. First, we expect the buyer's market situation on the global gas market to be reversed in the second half of this decade owing to Asia's energy hunger, which means that sellers will once again call the shots. And secondly, the Gas OPEC is already enjoying support from a non-member country which until now has actually tended to belong on the demand side. China's enormous energy requirements prompted the country a few years ago fundamentally to realign its energy strategy. Instead of relying solely on supply contracts, China is now buying up the deposits and developing them itself. In the Gulf of Guinea, for instance, the People's Republic has worked its way up to become the dominant force in the Joint Development Zone (JDZ), where substantial gas and oil deposits are believed to exist. This means that the volumes discovered there will probably never be relevant to the world market and hence to Europe.

All in all, Europe would be well advised not to bank on its lasting unassailability. As in the case of OPEC, the gas cartel's time will come in one or two decades. Its market share will grow, partly as European sources gradually dry up, and its increased market power will enable it to charge higher gas prices. But in the next three years the Gas OPEC's latest strategy of linking spot gas prices more closely to oil price trends<sup>23</sup> as well will be stymied by the basic economic principles governing oversupply. However, should Russia & Co. soon succeed in winning over more countries to the gas cartel's side, the geopolitical dimension would assume relevance for Europe earlier.

### Gas projects of importance to the European market

The long-range growth in European countries' demand for gas necessitates development of the existing trans-European supply network to mitigate the consequences of delivery cutoffs like those that have occurred in the past. This involves the development of new gas fields and the construction of new pipelines on the one hand and the promotion of LNG trading on the other. Diversification of European gas procurement through transmission links to the gas-rich supply regions of North Africa and Central Asia plays a prominent part in this. The EU currently grants funds for 31 gas projects to improve the European energy network (the so-called Supergrid).

<sup>22</sup> The 11 members are Algeria, Bolivia, Egypt, Equatorial Guinea, Iran, Libya, Nigeria, Qatar, Russia, Trinidad and Tobago, and Venezuela.

<sup>23</sup> See Gas Exporters Look to Oil-Price Link (2010). The Moscow Times. April 20.





### New gas pipelines planned

Russia will continue to occupy a key position. Two planned pipeline projects – **North Stream** and **South Stream** – will in future provide additional facilities for transmitting Russian gas to off-takers in European countries. By circumventing transit countries such as Ukraine, both routes will improve long-range supply security. North Stream, which entails the construction of two parallel lines, each with a transmission capacity of 27.5 billion m<sup>3</sup> a year, will carry natural gas straight from Russia to Germany's Baltic Coast. Building work began in April 2010. South Stream, with annual capacity of roughly 60 billion m<sup>3</sup>, will connect Russia to the south European countries.

#### Important gas pipeline projects for Europe

Pipeline projects	Capacity in m <sup>3</sup> bn/year	Startup (probable)
North Stream (Baltic pipeline)	55 (2 x 27.5)	2011: Pipeline 1 2012: Pipeline 2
South Stream	63	2015
Nabucco	8 (final stage: 31)	2014 - 2018
White Stream	32	2016
Galsi	8	2014
Medgas	8	2010
Trans Adriatic Pipeline (TAP)	10 - 20	2012
Interconnector (IGI)	10	2012
Trans-Sahara Gas Pipeline (TSGP)	20 - 30	2015
Trans-Caspian Gas Pipeline (TCGP)	28 - 30	?
Total	~ 208	

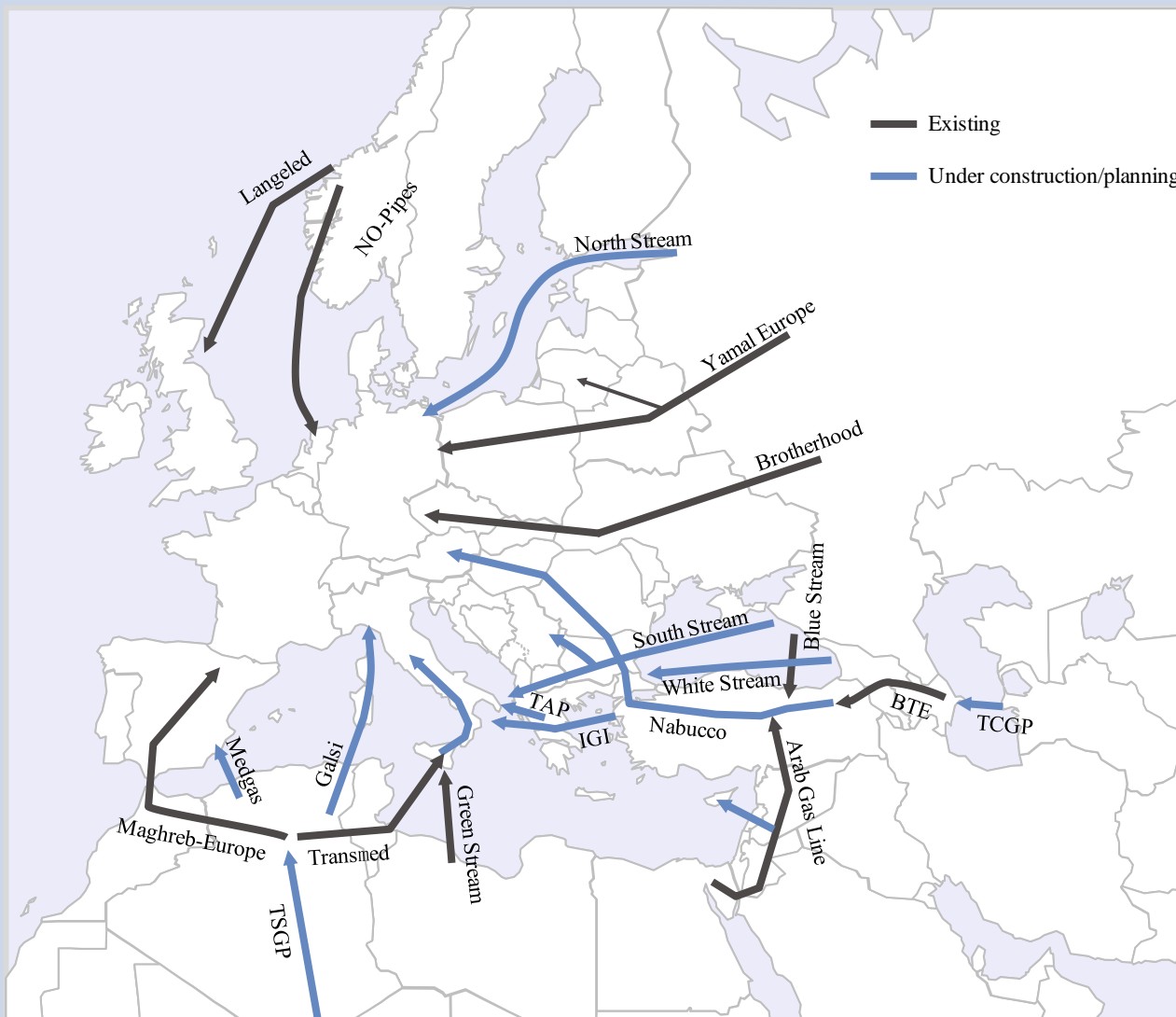
Sources: DIW Berlin, BGR, A T Kearney, RWE, Gazprom, Nord-Stream AG, South-Stream-Info, TAP AG, White Stream Company Ltd., TSGP

22

The **Nabucco pipeline** creates a link to Central Asia. Additional supplier countries such as Turkmenistan and Azerbaijan are expected to lessen dependence on imports from Russia. The route stretches from the Georgian-Turkish border via Bulgaria, Romania and Hungary to Baumgarten in Austria. From the gas hub there, 31 billion m<sup>3</sup> of gas a year will be transmitted to the remaining parts of western Europe. The existing **South Caucasus Pipeline (BTE, Baku-Tbilisi-Erzurum Pipeline)** will be hooked up to Nabucco once it is completed, so that Azerbaijani gas can be carried to Europe. At present the Nabucco project is still on the drawing board, with construction planned to start in 2011. However, lift-off on schedule is subject to a final decision being taken on the project before the end of this year. EU energy commissioner Oettinger has already announced that the pipeline might possibly not be commissioned until 2018 instead of 2014 as originally envisaged.

The projected **Trans-Caspian Gas Pipeline (TCGP)** will tap Turkmenistan as a new source of gas supplies for Europe. With scheduled capacity in excess of 30 billion m<sup>3</sup>, it will be linked to the South Caucasus and Nabucco Pipeline. At present concerns over the sustainability of the lines that would have to be laid across the floor of the Caspian Sea are preventing the project from getting underway.

### Important pipeline projects for Europe



Sources: DIW, AT Kearney, BGR, DB Research

The **White Stream Pipeline** is a connector featuring capacities similar to Nabucco. With it, large amounts of natural gas from the Caspian area can be transmitted directly via the Black Sea to Bulgaria and Romania. Initially it will have a capacity of around 8 billion m<sup>3</sup> a year, rising to a maximum of 32 billion m<sup>3</sup> as it is expanded in line with demand.

Because of its proximity to Europe, North Africa is considered an important supplier of gas to the southern European states. Algeria possesses one of the biggest gas fields in the world, Hassi R'Mel, which is linked to the Italian and Spanish markets by the **Maghreb-Europe** and **Transmed** Pipelines. Work is in progress on another two projects, **Galsi** and **Medgaz**, each carrying 8 billion m<sup>3</sup> a year, to secure supplies of natural gas from Algeria. The latter will probably be commissioned by the end of this year. Similarly, the projected **Interconnector Greece-Italy (IGI)** between Turkey, Greece and Italy will enable additional supplies of the same dimension from the Caspian area, for example, to southern Europe.



### LNG terminals planned in Europe

1	Fieri District, Albania
2	Omisaalj, Croatia
3	Le Verdon, France
4	Dunkirk, France
5	Le Havre, France
6	Wilhelmshaven, Germany
7	Tarbert, Ireland
8	San Ferdinando, Italy
9	Gioia Tauro, Italy
10	Taranto, Italy
11	Vado Ligure, Italy
12	Muggia, Italy
13	Zaule, Italy
14	Priolo/Augusta/Meililli, Italy
15	Porto Empedocle, Italy
16	Offshore Trieste, Italy
17	Eemshaven, Netherlands
18	Lion Gas NLG, Netherlands
19	Gdansk/Swinoujscie, Poland
20	Anglesey, UK

Source: King & Spalding (2006), IEA (2009)

24

Mid-2009 the governments of Nigeria, Niger and Algeria signed an agreement on a **Trans-Sahara-Pipeline (NIGAL, Nigeria-Algeria Pipeline)** to connect the Nigerian natural gas grid with the Algerian gas hub Hassi R'Mel. Between 20 and 30 billion m<sup>3</sup> of gas per annum would be transmitted on from Hassi R'Mel by existing pipelines to European markets. At present, however, political problems are complicating the feasibility of this project. The pipeline is scheduled to go onstream in 2015.

### LNG infrastructure in Europe to be developed

The flexibility of liquefied gas transportation offers the European market significant opportunities to diversify its gas imports. Amid rising import demand, production areas in northern and western Africa and in the Middle East (Qatar is currently the world's leading exporter of LNG) will move to the fore as suppliers. Insufficient regasification terminals in Europe have so far prevented this potential from being fully exploited. Additional capacities are already planned (or have been built), along with the construction of new-build gas receiving facilities. In May 2009 South Hook opened in the UK as what is now Europe's biggest terminal with provisional capacity of 10.5 billion m<sup>3</sup>. The second development stage will mean twice this amount can be delivered. This brings the number of regasification terminals in Europe (including Turkey) up to 17 at present with annual transmission capacity of around 130.6 billion m<sup>3</sup>. More terminals in Belgium, France, Italy, Spain and the UK will be taken into service in the next few years. For Germany, which does not yet have LNG access, Wilhelmshaven is being debated as the site for an LNG processing plant.

### Conclusion: Gas glut opens up a window of opportunity

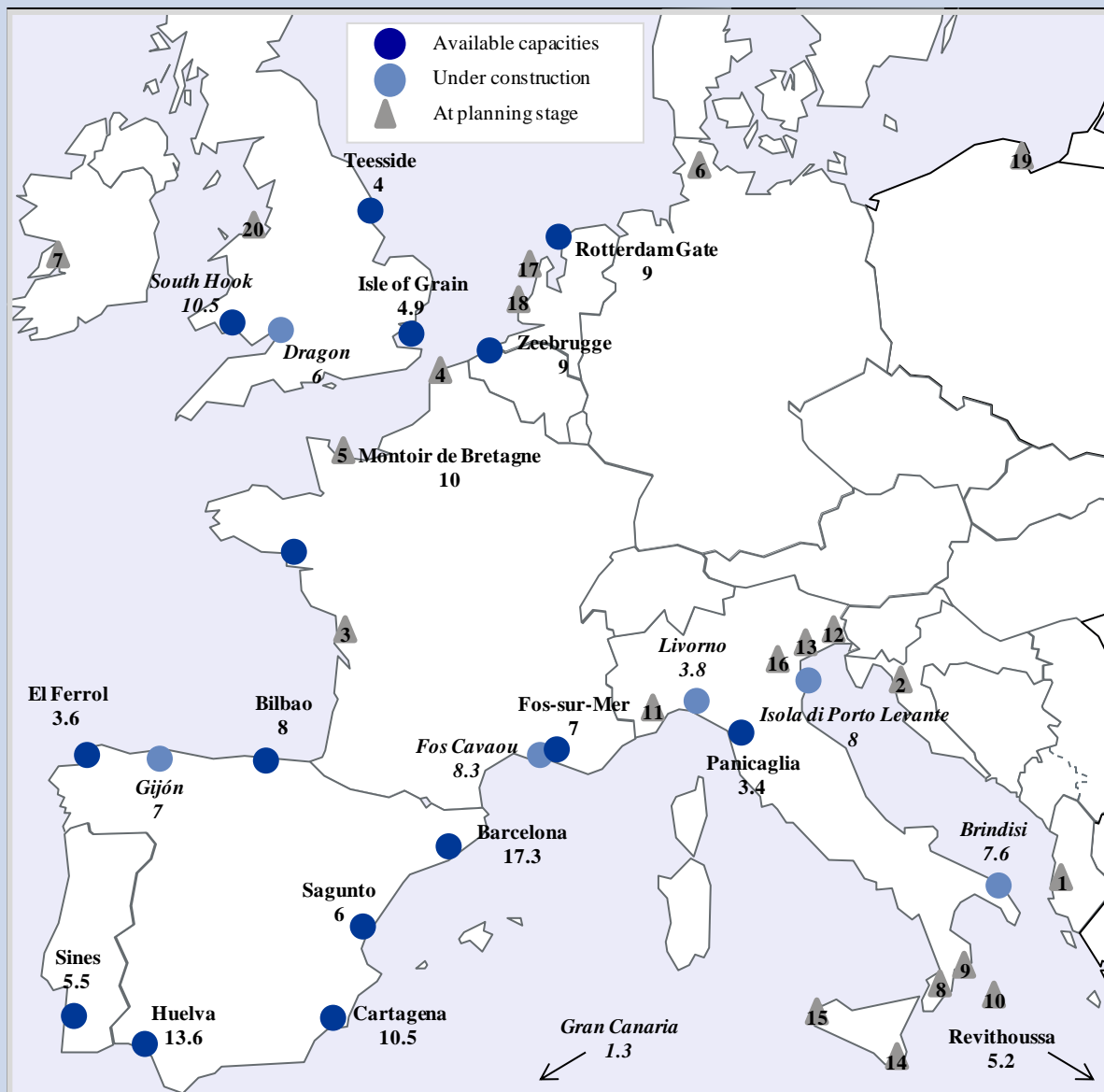
The gas glut is spilling over into Europe, opening up the way for more competition, lower gas prices and greater supply security. End customers in particular, who for years have bemoaned extremely high gas prices, should perceive the dawn of the new era on the gas market as an opportunity to cut their gas procurement costs. Given that gas prices will gather pace again from around the second half of this decade, being tempted by the present gas glut to put important long-term projects like the construction of new pipelines, gas storage facilities and LNG terminals on ice indefinitely could turn out to be a rash move. By implementing this investment, Europe could take a more laid-back view of a future energy scenario featuring a gradually more forceful Gas OPEC.

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### LNG import terminals for Europe becoming more important

Capacities in m<sup>3</sup> bn/year



Sources: DIW, King Spalding (2006), IEA (2009), DB Research

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