



# Oxford Energy Comment

April 2012

## Lessons from the February 2012

### European gas “crisis”

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#### *Gas Demand and Gazprom Allocation between Domestic and European Markets*

After a relatively mild winter, the first signs of a potential issue with gas supply from Russia came in late January when very low temperatures across the country drove domestic demand to unprecedented levels. Although absolute temperatures did not drop as low as the recent records set in 2006, average levels of around -20 degrees Celsius were seen across a broad geography stretching from West Siberia to the Ukrainian border, with peak lows of -35 degrees being reached in Moscow on a number of consecutive days in early February. As a result daily gas demand from Russian consumers exceeded 2bcm for the first time in the history of the country’s gas sector and during the month of February as a whole domestic Russian demand jumped by 6.8bcm (14%) compared to 2011.<sup>1</sup>

At the same time the freezing weather spread across broad areas of Europe, from Poland and Germany in the North to Italy and the Balkan states in the south, leading to a dramatic rise in nominations for Russian gas supply from almost all of Gazprom’s major customers. However, for a period of twenty days, from January 31<sup>st</sup> to February 19<sup>th</sup>, Gazprom was unable to meet all the requests for gas that it received, with a number of countries including Germany, Slovakia, Greece, Austria, Poland and Italy complaining of supply shortages.<sup>2</sup> The most extreme example of Gazprom’s inability to meet all its customers’ requests was seen in Italy, where for a number of days between February 2<sup>nd</sup> to 7<sup>th</sup> Snam Rete Gas, the Italian gas

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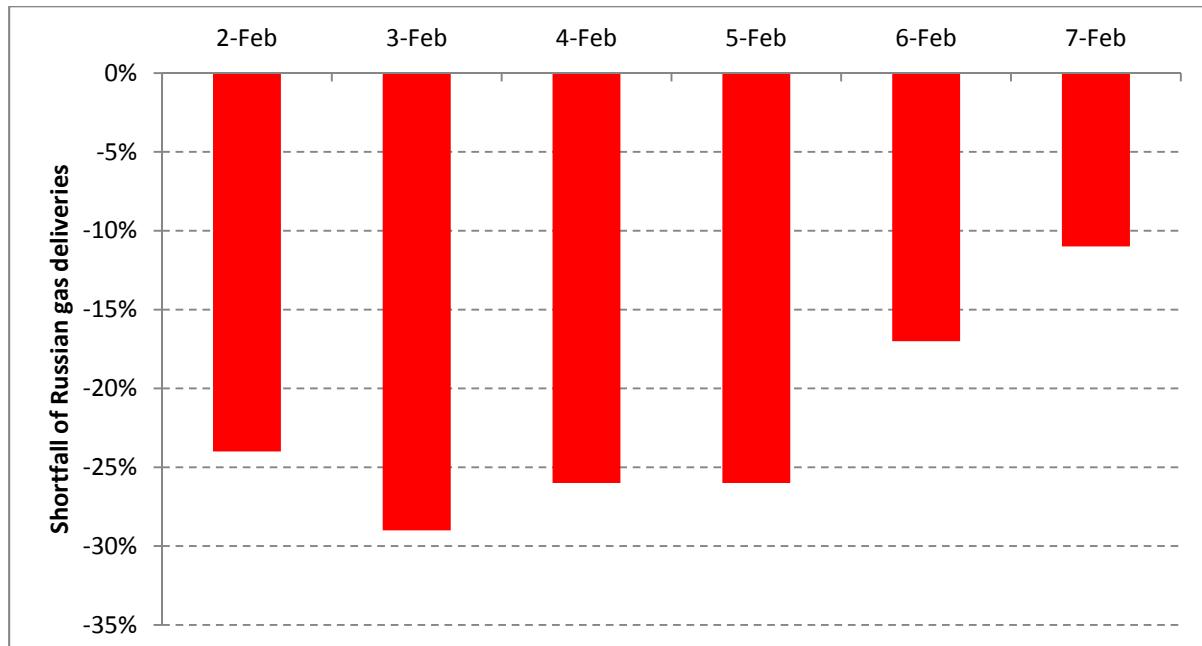
<sup>1</sup> Interfax News, 30 Jan 2012, “Russia burning through over 2bcm of gas on cold days”, Moscow

<sup>2</sup> Interfax News, 6 Feb 2012, “Naftogaz Ukraine is increasing gas selection, helping fulfil European orders”, Moscow



transporter, reported receiving up to 29% less gas than requested (see Figure 1). For example on Friday February 3rd Snam reported that it had requested 109mmc from Gazprom but actually received 87mmc,<sup>3</sup> and over the period covering the first 17 days of the month the total shortfall in supply compared to nominations totalled 278mmc.<sup>4</sup>

**Figure 1 – Shortfalls in supply by Gazprom to Italy compared to nominations**



Source: Snam Rete Gas

### *Gazprom's view of European Hubs*

The result of this inability by Gazprom to meet all of the requests for its gas was a sharp rise in prices on European hubs. In early February the gas price at the Austrian hub at Baumgarten reached \$496/mcm, well above the \$410/mcm established for Gazprom's long-term contracts in January, while at the French hub PEG Nord the price jumped as high as \$625/mcm.<sup>5</sup> Meanwhile at Europe's most liquid hub, the NBP in the UK, prices increased by 30% in the first week of February from 54p/therm to 70.5p/therm<sup>6</sup>, prompting an aggressive response from Alexander Medvedev, the Head of Gazprom Export. He claimed that the price spike and the gas shortages demonstrated that:

<sup>3</sup> Interfax Energy, 2 Feb 2012, "EU complains of Russia supply shortfall", Moscow

<sup>4</sup> Interfax News, 20 Feb 2012, "Russia weather no longer disrupting gas exports", Moscow

<sup>5</sup> Interfax News, 7 Feb 2012, "Gazprom increases gas supplies to Italy for a second day in a row", Moscow

<sup>6</sup> Interfax Energy, 6 Feb 2012, "Europe gets less gas from Gazprom than requested, supplies to Russia unrestricted", Moscow

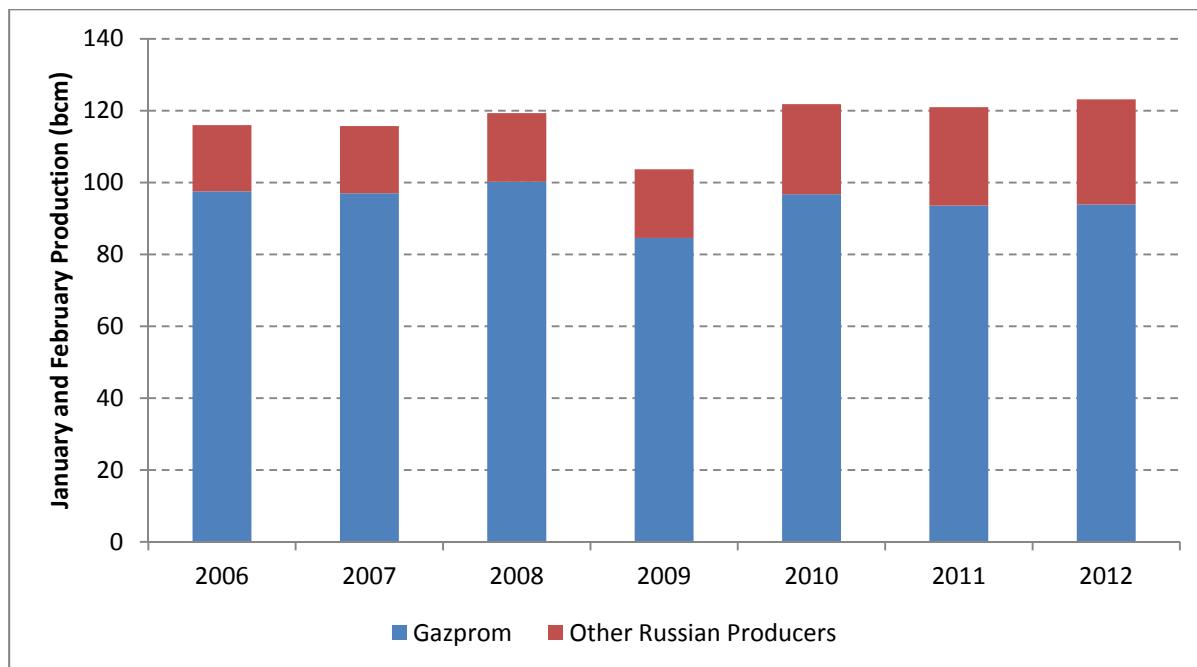


"In a crisis situation, the spot markets...have proved incapable of meeting rising demand...The under-development of the spot markets makes them vulnerable to any shocks...[and means that] there are no grounds to expect that sufficient real volumes of gas will materialise on these markets to meet demand in the future."<sup>7</sup>

Furthermore, Medvedev added that "the signals received from the EU's governing bodies and the gas market reforms they have conducted have cast uncertainty over the outlook for demand for gas supplies, which has limited investment activity by producers, especially of natural gas."

However, the logic behind this conclusion would seem to be difficult to justify from the facts of the situation as it unfolded in February 2012. Firstly, there do not appear to have been any production problems on the Russian side, caused by under-investment as a reaction to new EU rules. As Figure 2 demonstrates, output in January and February 2012 was actually higher than at any time over the last six years, including the even colder winter of 2006, although the balance of production between Gazprom and other Russian Producers has shifted in favour of the latter, who accounted for 25% of total production in 2012 compared to 15% in 2006.

**Figure 2: Russian Production in January and February 2006-2012**



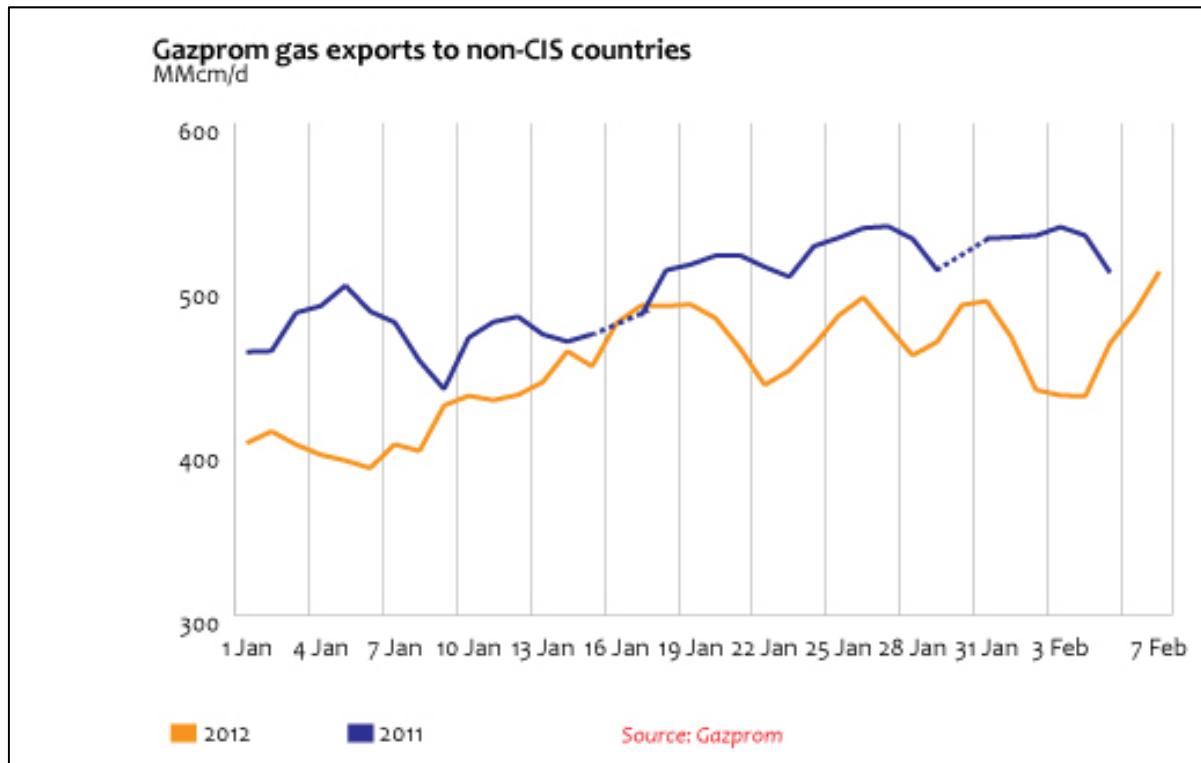
*Source: Interfax News*

The pipeline capacity for Gazprom to export gas to its European customers also appears not to have been an issue. In fact daily deliveries to Europe remained well below the levels seen

<sup>7</sup> Interfax News, 20 Feb 2012, "Gazprom says gas export requests could be met in full, criticizes EU policy", Moscow

in 2011 until February 7<sup>th</sup>, when they exceeded 500mmcm for the first time (Figure 3). However, even the 509mmcm delivered that day remained well below the daily average of 528mmcm delivered during the same period of 2011, and was significantly less than the daily maximum of 541mmcm achieved on 7<sup>th</sup> March 2011.<sup>8</sup>

**Figure 3: Gazprom daily exports to non-CIS countries (Jan-Feb 2011 and 2012)**



*Source: Gazprom*

The search for more likely causes of the shortfall, therefore, would seem to lead to a combination of political issues in Russia, excess Ukrainian withdrawals of Russian gas transiting its territory and the lack of availability to Gazprom of gas storage facilities in western Ukraine that could assist it in meeting peak demand.

#### ***Political Priority for Domestic Customers***

In a meeting with Deputy Prime Minister Igor Sechin and Gazprom representatives Andrey Kruglov and Alexander Medvedev on 4<sup>th</sup> February 2012, Prime Minister, and then leading presidential candidate, Vladimir Putin made it absolutely clear that “the top priority of the energy generation industry in general and Gazprom in particular is to meet the internal

<sup>8</sup> Interfax Energy, 9 Feb 2012, “Russian daily gas exports at record high, but still not enough”, Moscow



demand in the Russian Federation. This is a top priority.”<sup>9</sup> While it is clearly reasonable for the Prime Minister of Russia to ensure that his population’s energy needs are met, it is also interesting to note that during the same period in 2011, when domestic demand for gas had been somewhat lower, a different prioritisation had occurred when Gazprom had invoked the so-called “Schedule No.1” which allows it to call for major industrial gas consumers and power generators to switch to a stand-by fuel.<sup>10</sup> During 2011 this curb on domestic demand had been introduced for more than two weeks at the end of February and beginning of March in order to ensure that Gazprom could meet its export commitments, leading to a 15% jump in the open market price for gas in Russia. By contrast, in a situation of much higher domestic demand in 2012 (daily demand peaked at c.2.1bcm/day compared with 1.85bcm/day in 2011) but also in the run up to a Presidential election on March 4<sup>th</sup> 2012, and in the face of open popular protest against his return to the Kremlin, no such decision was made, with Gazprom Deputy Chief Executive Valery Golubev insisting that “we see no economic or technical reasons for Schedule 1.” As a result, although it is perhaps not surprising that Putin was more than ready to risk the wrath of Russia’s foreign gas customers in order to avoid further domestic instability at such a sensitive political moment, it would nevertheless appear to be the case that one clear driver of the gas supply problems in Europe was the imminence of the Russian presidential election.

The impact of this prioritisation of domestic Russian customers may then have been exacerbated by the additional intervention of the Ukrainian government to ensure adequate supplies for their domestic consumers. Certainly Gazprom Deputy CEO Andrey Kruglov, in a report to Vladimir Putin, claimed that Ukraine took 15-35mmcm per day more gas than stipulated in its contract, while Gazprom CEO Alexey Miller claimed that the excess extracted from the Ukrainian pipeline system was up to 40mmcm per day, with a total of 438mmcm being taken over a period of 15 days at the beginning of February.<sup>11</sup> The Ukrainian authorities denied this charge, claiming that any extra gas they had needed had been removed from storage and also alleging that Russian supplies into the Ukrainian pipeline had fallen from an agreed level of 490mmcm per day to only 415mmcm in early February, placing the blame for any shortfalls in Europe squarely on Gazprom’s shoulders.<sup>12</sup> Nevertheless, given the history of “excess gas withdrawal” by Ukraine during periods of cold weather it would be no surprise to discover that some gas bound for Europe had been taken for Ukrainian consumers.

In refuting Russia’s claim of “gas theft”, the Ukrainian authorities also raised the possibility of Ukrainian storage facilities being used to supply Gazprom’s European customers in

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<sup>9</sup> From the Russian Government web-site at <http://premier.gov.ru/eng/events/news/17990/>, quote from 4 Feb 2012, accessed 30 March 2012

<sup>10</sup> Interfax News, 26 Jan 2012, “Russian gas consumption hits new high, limits not yet imposed”, Moscow

<sup>11</sup> Interfax News, 22 Feb 2012, “Ukraine took gas destined for Europe at beginning of 2012 – Miller”, Moscow

<sup>12</sup> Interfax News, 3 Feb 2012, “Gas transit to Europe reduced due to cut in Gazprom supplies – Kiev”, Moscow



extremis.<sup>13</sup> Although Gazprom played down this offer as just being in the normal course of business,<sup>14</sup> it in fact highlighted an issue that has faced Gazprom since January 2006, when it made the decision to minimise its direct use of storage facilities in Western Ukraine following allegations that 7.8bcm of Russian gas had been stolen by Ukraine.<sup>15</sup> Five main storage facilities with a total capacity of approximately 20bcm are located near the Ukrainian border with Europe, and their combined daily capacity of over 200mmcm could certainly have provided sufficient output to make up the shortfall in Gazprom's supply to its European customers. Indeed Gazprom has since acknowledged its storage shortfall by announcing plans to double its total storage capacity in Europe to 5bcm by 2015, having fully utilised the 38mmcm/d daily capacity of its existing facilities this year.<sup>16</sup> Russian Energy Minister Sergei Shmatko has also recently highlighted a shortage of storage owned by Gazprom, suggesting that overall capacity is currently 9bcm below the optimal level and that an extra 122mmcm/d of daily output capacity is needed within 5 years.<sup>17</sup> The combination of all these issues would therefore seem to suggest that another key factor behind the supply shortage in February was a lack of Gazprom access to sufficient storage capacity to allow it to meet peak winter demand in particularly cold weather.

Overall, then, it would appear that one important lesson to be learned from the February gas "crisis" was that, under certain political, temperature and storage availability constraints, Gazprom does lack sufficient capacity to meet peak gas demand from all its markets. In 2011 Russian customers were forced to cut back their offtake, leading to a spike in domestic prices, while in 2012, ahead of a Presidential election in Russia, European customers did not receive all the gas they requested, leading to a similar price spike at continental hubs. However, it would also appear that this is not the end of the story, in particular given claims by Gazprom that its European customers were "asking for more than we are obligated to deliver. There is a difference between wishes and agreed contract quantities."<sup>18</sup> Furthermore, it has also been suggested that some customers asked for more gas than they actually needed in order to optimise their negotiating position with Gazprom, thereby exaggerating the extent of the gas shortfall. Indeed this latter point raises the whole question of how real the gas shortfall actually was, and whether the reaction of the market in Europe was adequate to refute Alexander Medvedev's criticism of the hub-based system.

Nevertheless it remains a fact that Gazprom was unable to meet European nominations – whether these represented real demand or commercial tactics - and in so doing deprived itself of substantial revenue from additional sales (perhaps as much as \$125mm over the three

<sup>13</sup> Interfax News, 22 Feb 2012, "Naftogaz blames Russia for decrease in February gas supplies to Europe", Moscow

<sup>14</sup> Interfax Energy, 9 Feb 2012, "Russian daily gas exports at record high but still not enough", Moscow

<sup>15</sup> For detail see Pirani, 2007, "The Ukraine Gas Sector", OIES, Oxford

<sup>16</sup> Interfax Energy, 15 Feb 2012, "Gazprom's European gas storage expansion plans", Moscow

<sup>17</sup> Interfax Energy, 26 Mar 2012, "Ministry proposes 5 year gas sector plan", Moscow

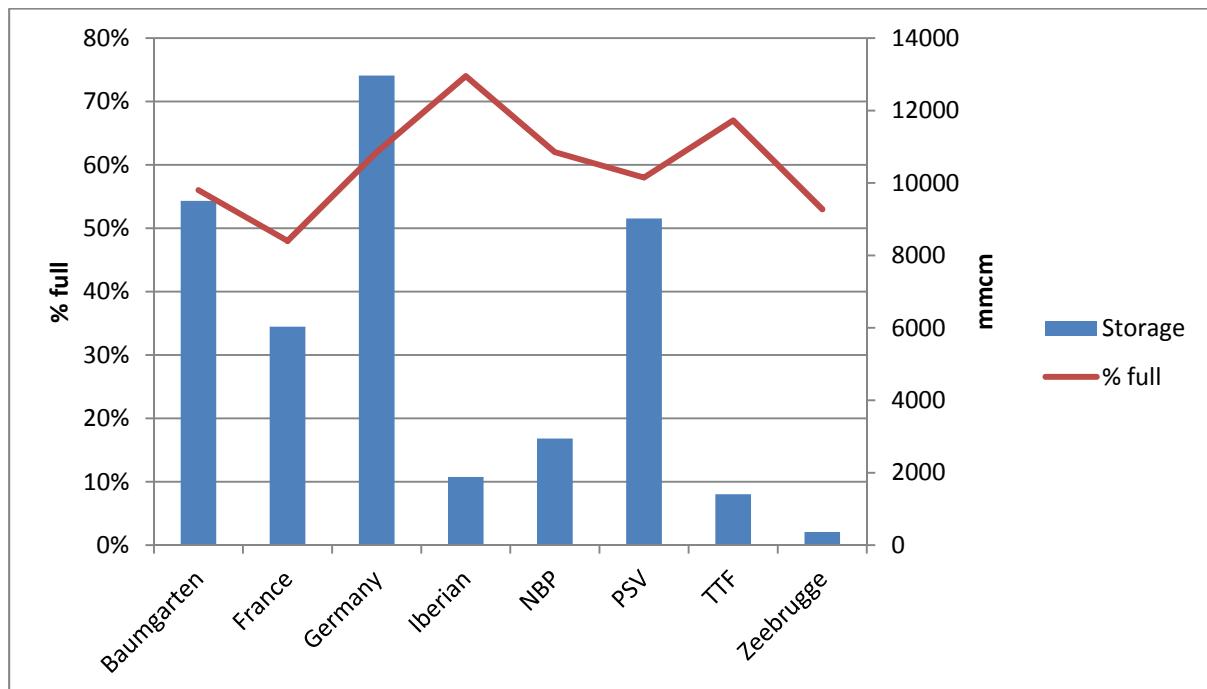
<sup>18</sup> Interfax News, 3 Feb 2012, "European companies inflate gas orders – Gazprom Export", Moscow

week period from foregone sales in Italy alone). As a result, unless we believe that Gazprom's sole motivation for doing this was to "make a point" with its European customers about the viability of hub-based prices, and irrespective of whether there were or were not any contractual obligations to meet these nominations, we have to conclude that the February 2012 episode demonstrated a limit on the physical deliverability of Russian gas supplies under certain temperature conditions.

### ***What Happened to European Gas Supplies and Prices?***

In terms of gas available from storage, there certainly appears to have been no sense whatsoever that Europe was facing a supply crisis, with European Commission spokeswoman Marlene Holzner stating that "the EU does not consider this to be an emergency situation. All EU countries can purchase gas from other EU members or take advantage of gas accumulated in underground storage facilities".<sup>19</sup> Indeed Figure 4 shows that on February 7<sup>th</sup> Europe had 44 bcm of gas remaining in its main storage facilities across the continent, with the majority remaining more than 50% full despite the fact that the winter season was only six weeks from its end.

**Figure 4: Gas in storage in Europe and share of capacity remaining as of February 7<sup>th</sup> 2012**

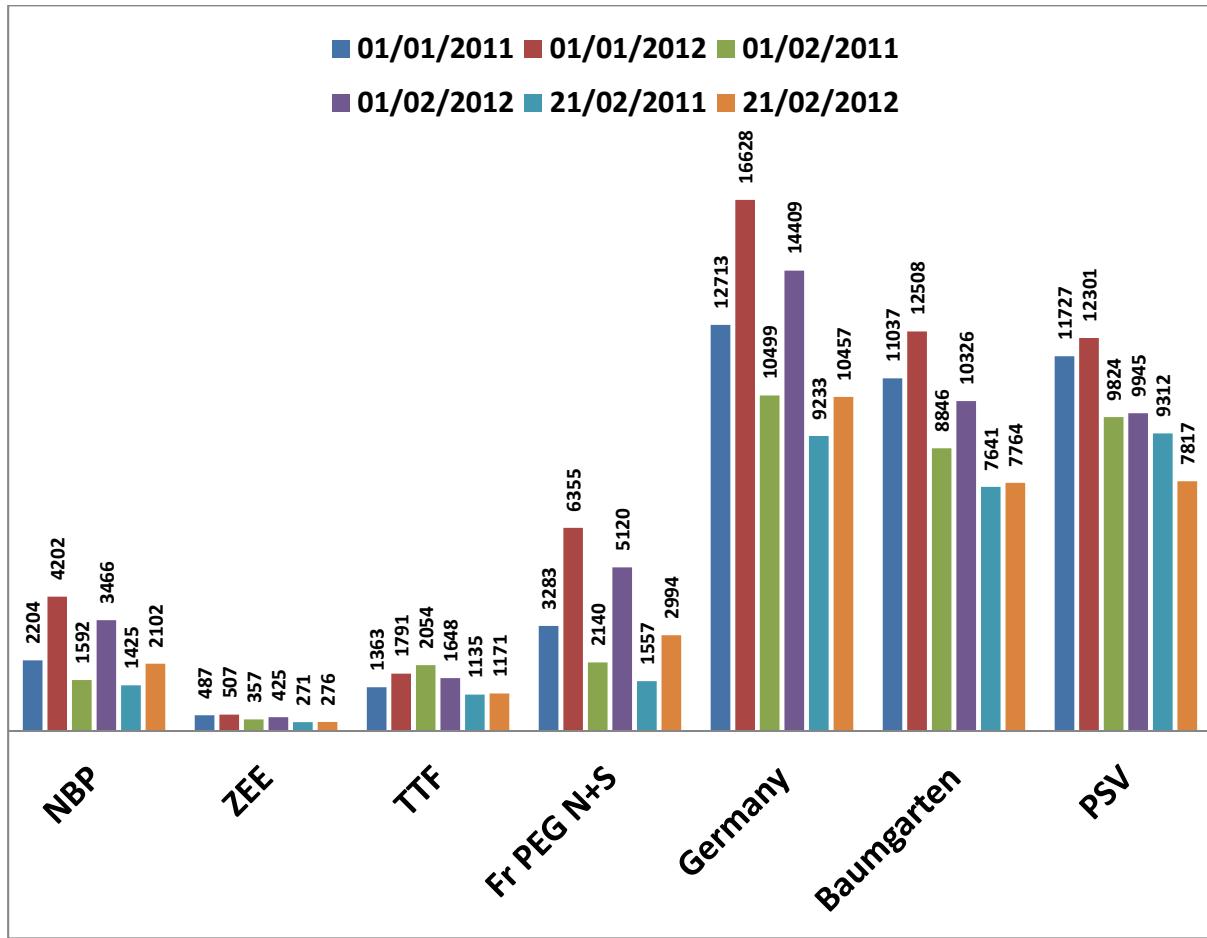


*Source: Gas Infrastructure Europe*

<sup>19</sup> Interfax Energy, 3 Feb 2012, "European spot prices surge, but no crisis looming", Moscow

Furthermore, by February 21<sup>st</sup> the impact of the supply shortfall on the storage situation in the majority of European countries had been minimal relative to the corresponding period of 2011. Overall European storage utilisation was at 47% compared to 53% in 2011, with a number of countries, such as France and the UK, having more gas in storage than last year despite significant withdrawals during the first two weeks of February 2012.<sup>20</sup> Indeed Figure 5 shows us that all the hubs had more gas in store after the 2012 cold spell than at the same date last year, with the sole exception of the Italian PSV, which saw a 16% drop year on year.

**Figure 5: Aggregated gas storage inventory**



Data source: GIE Aggregated Gas Storage Inventory

An important question, therefore, would be why more storage gas was not brought in to play? The Gas Infrastructure Europe website<sup>21</sup> historical data shows that there are two distinct patterns in storage trading across Europe: in Great Britain and Holland, the only two ‘mature’ gas markets in Europe, there is very responsive storage activity with daily variances both up

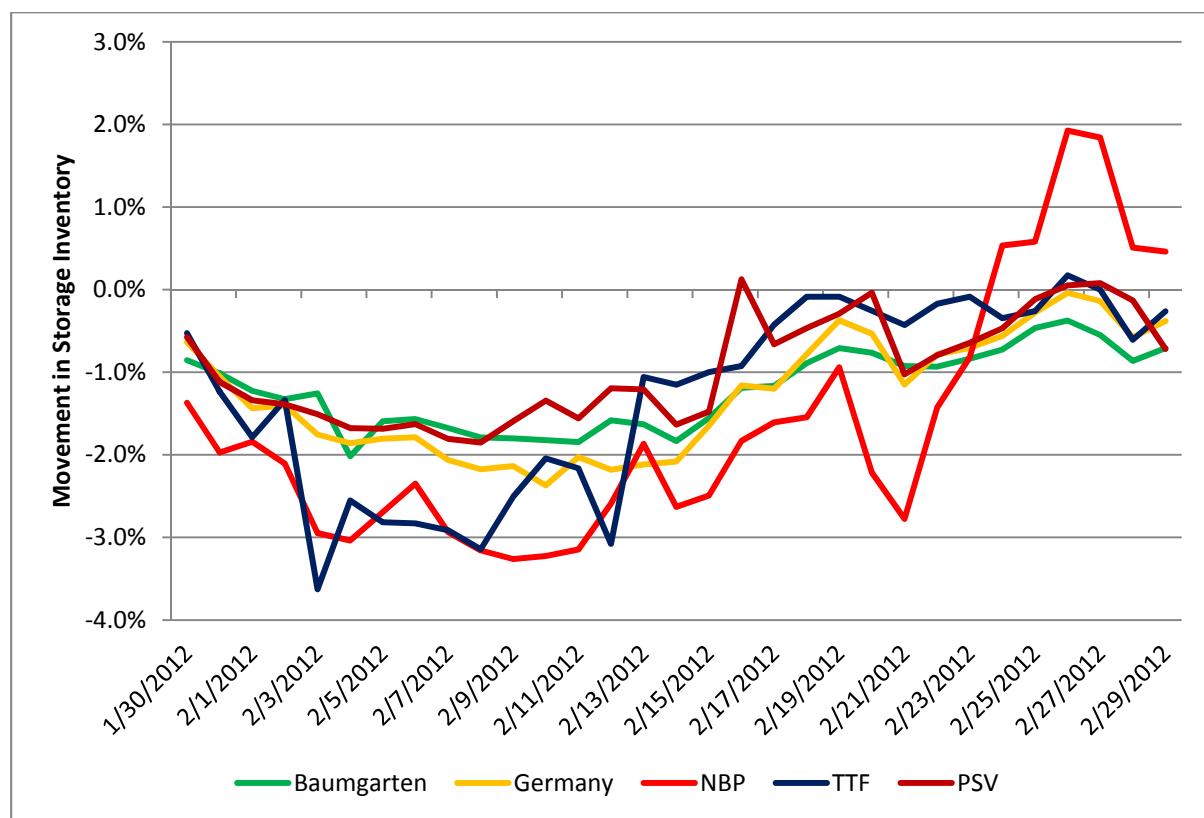
<sup>20</sup> Bentek Energy European Observer, 12 Feb 2012, “Europe recovers after Cold Snap”, London

<sup>21</sup> [http://transparency.gie.eu.com/daily\\_history.php](http://transparency.gie.eu.com/daily_history.php)

and down throughout the year; the other North West European countries show that storage is not as responsive to day-to-day supply/demand variations. At those hubs, storage is being used for seasonal balancing, with injection and withdrawal patterns decided at the start of each Gas Year. During the February 2012 cold spell, the data shows very similar withdrawal rates day/day at PSV, Baumgarten and German storage; at Baumgarten, for example, storage levels increase progressively before the winter period, followed by an equally progressive decline as the winter months go by, so that even over a two year period, there were just three sharp variations<sup>22</sup>, two increases and one large fall (followed by an almost total volume recovery the next day).

These patterns clearly suggest that storage in most Continental European hub areas is not being used in a responsive commercial way. The exceptions, as the data also shows (see Figure 6), are the NBP and TTF hubs, which did indeed react as one would expect in a market where supply was tight, with inflows and outflows moving in sharp spikes indicating the use of storage as a responsive short-term commercial tool.

**Figure 6: Daily movements in storage levels at five European hubs during Feb 2012**



Source: Gas Infrastructure Europe

<sup>22</sup> 30<sup>th</sup>-31<sup>st</sup> Dec 2010: +481mcm; 29<sup>th</sup>-30<sup>th</sup> Nov 2011: +795mcm; 21<sup>st</sup>-22<sup>nd</sup>-23<sup>rd</sup> Jan 2012: -1999/+1851mcm.



Nevertheless, despite the reaction at NBP and TTF, one potential answer to the question raised by Alexander Medvedev's criticism of the European hubs is that he is correct, and that the European infrastructure is not mature and responsive enough to deal with a gas crisis. However, this answer would seem to be contradicted by the fact that no physical gas shortages were reported and also by the examples of countries using the infrastructure in a planned and innovative manner to respond to potential shortages across the continent. Poland, for example, solved its problems by buying gas from Germany, but without any specific physical flow of gas, instead tapping into the Yamal pipeline to take gas destined for Germany and replacing it with gas in storage in Germany.<sup>23</sup>

In addition, a more subtle trading game may also have been at work in Europe during the shortfall period in February. Gas storage is normally filled during times of low demand when prices are lower (for example in summer) and it therefore becomes a source of lower cost gas. Meanwhile long-term oil-linked contracts offer a source of higher cost gas, which needs to be sold where possible at times of higher demand and prices. Therefore, at times of peak demand such as February 2012 it makes sense for buyers to nominate as much gas as possible from their long term contracts (indeed to nominate above contracted levels if possible) to meet their take or pay obligations in order to have this gas available to sell when prices are highest. This then reserves their lower cost stored gas for sale at times of lower demand and prices, thus maximizing the opportunity price arbitrage on an annual basis.

Indeed one could argue that in creating the impression of a supply shortfall by nominating for gas beyond contracted levels, on the assumption that Russia might not be able to deliver all that had been asked for, traders could create a market where perceived supply shortages caused a price spike that allowed maximum profit from their higher priced long-term contract gas. While it would be wrong to argue that this was the sole motivation of European buyers during February, as the weather clearly was very cold and storages were drawn down in an accelerated fashion, it nevertheless could have been a secondary reason for the high nominations of Russian gas during the period.

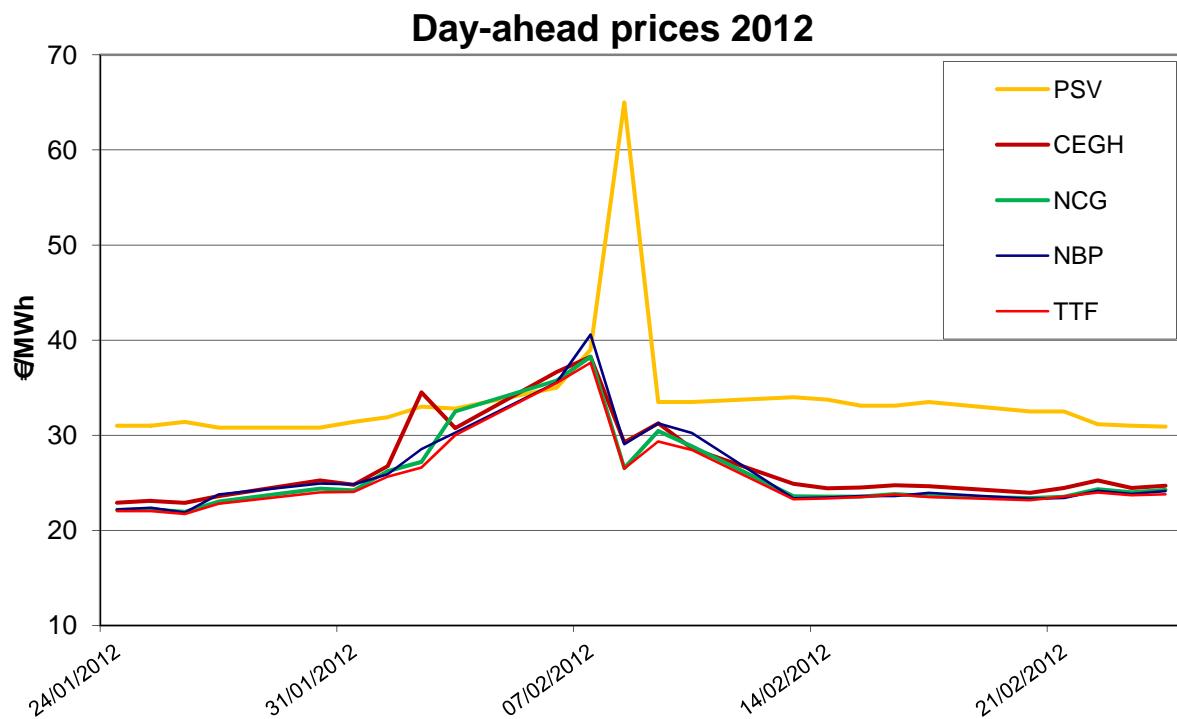
### ***Price reaction at the European hubs***

In terms of market prices during the cold spell, most of the hubs did react as one would expect during a supply crisis, whether real or perceived: they rose significantly and very quickly, giving a true market signal that more gas was urgently required. As the weather improved and the extra demand waned, prices fell again just as quickly to similar levels as previously. Figure 7 shows how the British, Dutch, German, Austrian and Italian hubs reacted to the crisis.

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<sup>23</sup> Interfax Energy, 3 Feb 2012, "Price spike tests EU market liberalisation", London

**Figure 7: Day-Ahead prices at selected hubs: 24<sup>th</sup> January – 24<sup>th</sup> February 2012**



*Data source: ICIS-Heren*

This graph shows that by and large, the price at each of the hubs is closely correlated except for the PSV which is at a significantly higher level. It also shows how they all react on a daily basis to the prevalent situation, again except for PSV which generally has a smoother curve but with a delayed over-reaction to the supply issues in early February.

These pricing signals, in North West Europe at least, did have the desired effect to help balance the gas grids. More supplies came from Norway, the Netherlands, Britain and LNG and were sold as ‘spot’ volumes on the hubs; there were also reported demand side interruptions, particularly in Germany<sup>24</sup> where, amongst others, network operator Open Grid Europe curtailed gas shipments to customers holding interruptible contracts from early to mid-February. Gas fired power stations impacted by reduced gas supplies included E.On’s 727MW CCGT Irsching 5 plant and its 823MW Franken 1 facility, both in Bavaria, as well as block 4 of EnBW’s 1260MW RDK plant at Karlsruhe.

One point of note is that despite the price spike, spot gas prices were, on average lower than the oil-indexed contract prices over the whole month of February. Indeed, the average TTF

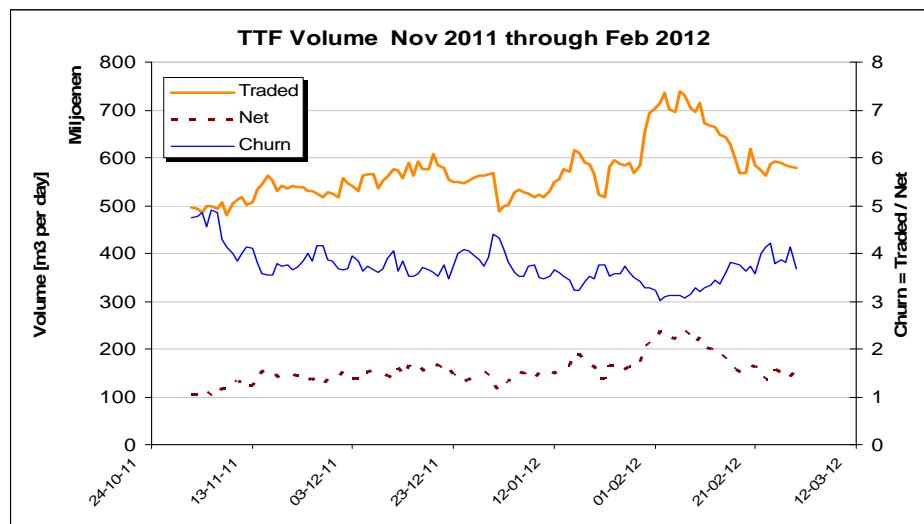
<sup>24</sup> Platts European Gas daily, April 5<sup>th</sup> 2012, p.2: “German interruptibles hit in Feb: govt”

day-ahead price for February was only 76% of the Platts NW Europe Gas Contract Indicator price for that month<sup>25</sup>.

Therefore the hubs did send out pricing signals to the market that traders did react to immediately and dynamically; they used the hubs to source additional spot gas; they used the hubs to sell excess LTC gas, if they were successful in their higher nominations and which for a few days was cheaper than spot gas; they invoked where possible interruptible downstream contracts and they price arbitrated storage against the spot market.

Interestingly, in contrast to the close price correlation between the hubs, they demonstrate very different results with regard to traded volumes: when comparing total February traded volumes against the previous month<sup>26</sup>, the French PEG was 24% down; the German NCG was 7% lower; the German Gaspool was just 2% higher; but, the Dutch TTF saw an increase of 8.5% and the British NBP a rise of 10.4%. These results do reflect the ‘maturity’ of each of the markets and the ease with which physical gas supplies can be traded through them. It is also interesting to note that, of the Continental hubs, it is TTF that was most often the ‘cheapest’ during this period and this is one of the hubs that saw substantial increases in both physical throughput and in traded volumes. The Dutch TSO (Gas Transport Services) has confirmed that it saw physical volumes increase by about 50% during the cold snap compared to the 4-month Nov 2011 – Feb 2012 average. During the same period, traded volumes increased by about 25%. This is clearly visible in Figure 8.

**Figure 8: Traded volumes at TTF Hub (November 2011–February 2012)**



*Source: Gas Transport Services*

These results clearly support the notion that liquid markets do ‘perform’ in difficult times.

<sup>25</sup> Platts European Gas Daily Monthly Averages, February 2012, pp.1-2: “Spot spikes on cold snap”

<sup>26</sup> Source: LEBA volumes in gas power emissions and coal, January 2012 and February 2012.



## ***Conclusion***

In conclusion, the shortfall of Russian supply to Europe in February 2012 offers a number of lessons, but also suggests that despite different political and commercial decisions taken by Gazprom and its European customers which caused a brief price spike, there was no specific crisis. There appears to have been no production constraint in Russia overall, but Gazprom's ability to meet peak demand from its entire customer base in times of extreme weather has been called into question. In 2011 domestic customers were disadvantaged, but in a pre-election period in 2012 priority was given to domestic rather than European customers, with the reaction in both years being price spikes in the respective markets. The failure of Gazprom to meet the full requests from its European customers may also have been exacerbated by extra withdrawals of gas by Ukraine from the transit pipeline, but also more specifically by a lack of availability to Gazprom of the ample storage facilities in western Ukraine. Indeed Gazprom and the Russian authorities have effectively admitted this in their subsequent plans to expand their European storage facilities over the next few years. Furthermore, the completion of the second Nord Stream pipeline later this year (and potentially South Stream later this decade), could also provide extra flexibility and daily capacity in future.

However, the suspicion remains that Russia and Gazprom may also have been trying to make a point during the February shortfall period. The keenness with which Prime Minister Putin and Gazprom Export CEO Alexander Medvedev criticised both EU policy and the ability of any market-based system in Europe to respond to a gas crisis suggests that they were not averse to using the situation in February to reinforce their argument. However, if this was the case, it came at a cost of forgone sales receipts which might have totalled hundreds of millions of dollars. This outcome may then have been exaggerated even further by the reaction of European buyers, who nominated as much gas from their long-term contracts as possible in order to maximise their own trading opportunity to sell their higher cost supplies into a tight and high price market environment, thus reserving their cheap gas in storage for a time of weaker demand and lower prices. As a result something of a perfect storm of perceived gas shortage may have been created, with buyers over-nominating from a seller who was perhaps unable to supply above contracted levels, but was also keen to see how the evolving European market would react.

The assertion by Alexander Medvedev<sup>27</sup> that “spot markets failed to compensate for the increased demand” is simply wrong: the markets had a logical price reaction to daily supply/demand changes which resulted in sharply higher prices, a potent commercial signal which in turn did lead to spot supplies and/or demand management and then, as the situation resolved itself, produced lower prices so that the monthly average was still below the oil-indexed average price. European hubs reacted as one would expect in a tight market and the

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<sup>27</sup> Statement on restored gas supplies to EU; Alexander Medvedev; 20<sup>th</sup> February 2012.



hub prices reflected the gas market conditions as they evolved from hour to hour and day to day, as opposed to the LTC oil-indexed pricing which does not reflect gas market conditions. While it is certainly true that the mature hubs at NBP and TTF reacted in a more responsive manner than some of the Continent's less liquid hubs, it was nevertheless the case that, overall, customers were supplied at a market price and traders were able to arbitrage a short-term supply and demand imbalance. In effect a supply crisis was averted, albeit that prices did rise sharply for a brief period as the market provided the signal for extra gas to be supplied to consumers, as one would expect in normal trading environment.