CEPS POLICY BRIEF
Thinking ahead for Europe

Europe's LNG Strategy in the Wider EU Gas Market

Gergely Molnar, Arno Behrens, Christian Egenhofer and Fabio Genoese

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Key Points

In its Communication on an Energy Union published in February 2015, the European Commission committed itself to "explore the full potential of liquefied natural gas (LNG), including as a back-up in crisis situations when insufficient gas is coming into Europe through the existing pipeline system"[1] and to address the potential of gas storage in Europe by developing a comprehensive LNG and storage strategy by the end of 2015 or early in 2016.

This is a comprehensible move in the current context. Geopolitical tensions between the EU and Russia explain the EU's willingness to further diversify its supply sources of natural gas to reinforce its long-term energy security on the one hand, and to strengthen its ability to solve future crises on the other hand. Moreover, the current market dynamics could support diversification towards LNG. Increasing the flexibility of LNG trade, decreasing LNG prices and LNG charter rates and an apparent price convergence between the European and the Asia-Pacific LNG imports would all reinforce the economic viability of such a strategy.

This Policy Brief makes three main points:

- For the LNG and gas storage strategy to work, it needs to be embedded in the realities of the natural gas market.
- The key to a successful LNG strategy is to develop sufficient infrastructure.
- The LNG strategy needs an innovation component.

[1] "A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy", Communication from the Commission, COM(2015) 80 final, 25 February 2015 (http://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF

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Gergely Molnar is Research Fellow at CEPS; Arno Behrens is Research Fellow and Head of Energy in the Energy and Climate Change research unit at CEPS; Christian Egenhofer is Senior Fellow, Head of the Energy and Climate programme and Director of the Energy Climate House at CEPS; and Fabio Genoese is Research Fellow at CEPS. This text was originally prepared and submitted on 30 September 2015, in response to the European Commission's consultation on an EU strategy for liquefied natural gas and gas storage.

The LNG and gas storage strategy will need to be embedded in the market realities

In order to be effective and to avoid any further serious mismatches between investments and market reality, the LNG and gas storage strategy should be part of a broader natural gas strategy. This latter strategy should not only consider issues related to the security of EU gas supplies but should also take into account potential future developments of European gas demand.

Regarding the supply side, the European Commission seems to hesitate in its consultation paper between a laissez-faire approach ("How much LNG comes to the EU will ultimately depend on global gas prices") and a more pro-active or even interventionist attitude ("The EU will use all its foreign policy instruments … to ensure that the EU has full access to the benefits of the growing global market in LNG"). In reality, the supply of natural gas will largely be determined by market forces. LNG will come to the EU market, provided the EU market is attractive and a clear, consistent EU energy policy is in place.

Therefore, the LNG strategy should not be too prescriptive on issues related to the LNG supply, both in terms of EU LNG infrastructure and potential future exporting countries, as investments will need to come from private companies and market fundamentals can change quickly. One exception, however, may be for the strategy to find a cost-effective role for LNG in source diversification in Eastern European countries (see next section on infrastructure). Related to this, the strategy also needs to address the dichotomy between aspirations to increase security of gas supplies with LNG and the current reality of the EU playing the role of a residual market (i.e. "getting what Asian countries do not need or cannot afford").

Gas demand, on the other hand, will continue to be influenced by European and national policy measures, including in the decarbonisation context. EU gas demand contracted by 12% between 2008 and 2013,[2] and the future of the blue fuel in the European energy mix remains uncertain in a context of low economic growth, rising energy efficiency levels, the increasing share of renewables and the inability of the EU ETS to trigger a coal-to-gas switch in the power sector. The LNG strategy should thus seek to define a space for LNG in the overall demand equation – taking into account the whole energy system and interactions between different energy sectors (e.g. between gas and power markets). This is a fundamental issue, which is largely ignored by the consultation paper. The only gas demand-side related issue addressed by Commission's paper is "LNG use in transport", which represents a negligible fraction of EU gas demand. Transport accounted for less than 0.5% of overall EU gas demand in 2013.[3]

Focusing only on the LNG and gas storage sectors while not addressing the issues related to the overall EU gas market is likely to result in inefficient investments – as was the case in the recent past – or, more likely, in no future investment in either terminals or pipelines. Between 2008 and 2014 the regasification capacity of the EU increased by around 58% from some 124 billion cubic meters per year (bcma) to 196 bcma.[4] At the same time, and as noted in the consultation paper, the volume of LNG imports decreased to 45 bcm in 2013, driving the utilisation rate of EU LNG terminals down to 24%. It is important to note, however, that a low utilisation rate does not necessarily mean that an asset is stranded. Stranded assets are those that are not economically viable. Terminals required by the market may still be economically viable even with low utilisation rates, for example when they are used for arbitrage.

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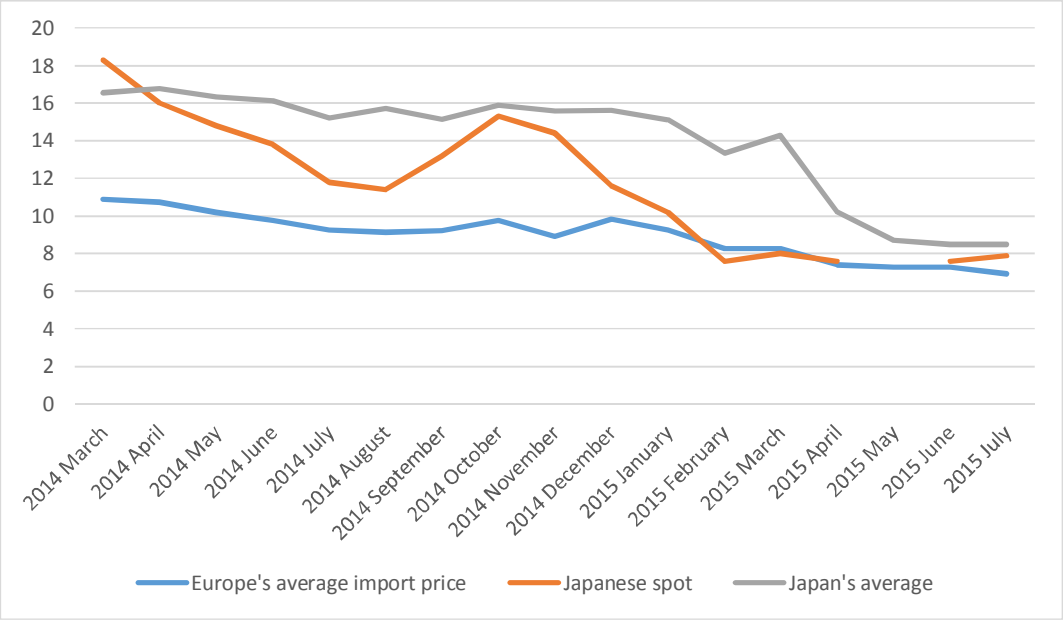
[2] BP, Statistical Review 2014.

[3] Eurogas, Statistical Report 2014 (www.eurogas.org/uploads/media/Eurogas_Statistical_Report_2014.pdf).

[4] GIE, LNG Map Dataset (www.gie.eu/download/maps/2015/2015%20GLE%20LNG%20Map%20database.xlsxa).

Indeed, increasing contractual flexibility[5] made it possible to redirect LNG from the depressed EU gas market to Japan and South Korea, which were seeking to replace nuclear power generation with natural gas after the Fukushima nuclear disaster and were willing to pay the 'Asian premium' (up to twice EU hub prices). Since mid-2014, a combination of factors (mild weather, nuclear restarts in South Korea, additional supply from PNG LNG and Australia, increasing energy efficiency and China's 'new normal') resulted in an oversupplied LNG market in the Asia-Pacific region and lower spot LNG prices to the levels of averaged European gas imports. Moreover, the falling oil price is filtering through the JCC-linked long-term contracts, resulting in an average price of $8.5/MMbtu for Japan. The disappearing 'Asian premium' resulted in the collapse of LNG re-exports from Europe to Asia (viable when the spread is over $1.75/MMbtu)[6] and an increase of EU LNG imports by 24% year-on year in the first quarter of 2015.[7]

Figure 1. Gas price dynamics – the disappearing 'Asian premium'?



Source: World Bank, METI

[5] LNG trade became more flexible as a result of the European Commission's efforts to eliminate territorial restrictions from long-term LNG contracts and the willingness of certain suppliers (mainly Qatar) to negotiate flexible contracts with diversion rights.

For instance, see European Commission (2007), Commission and Algeria reach agreement on territorial restrictions and alternative clauses in gas supply contracts (http://europa.eu/rapid/press-release_IP-07-1074_en.htm).

On Qatar's gas monetisation strategy, see Bassam Fattouh, Howard V. Rogers and Peter Stewart (2015), "The US Shale Gas Revolution and its Impact on Qatar's Position in Gas Markets" (https://gallery.mailchimp.com/20fec43d5e4f6bc717201530a/files/The_US_Shale_Gas_Revolution_and_Its_Impact_on_Qatar_s_Position_in_Gas_Markets_March_2015.pdf).

[6] Platts, "Minimum Japan Korea Marker winter net forward price to pull European LNG seen at $9.20/MMBtu", 15 July 2015 (http://www.platts.com/latest-news/natural-gas/london/minimum-japan-korea-marker-winter-netforward-26149124).

[7] European Commission, Quarterly Report Energy on European Gas Markets, Volume 8, Issue 1, first quarter of 2015 (https://ec.europa.eu/energy/sites/ener/files/documents/quarterly_report_on_european_gas_markets_q1_2015.pdf).

This raises a number of issues.

1) With oil prices remaining below $60/barrel, oil-linked long-term contracts are likely to out-compete LNG.

2) The break-even price range of LNG projects in potential supplier countries (US, Canada, Australia, East Africa) enumerated in the consultation paper ($9-12/MMbtu)[8] is higher than the above-presented LNG prices.

3) The development of natural gas demand remains unclear explaining the unwillingness of EU midstream utilities to contract high amounts of LNG with a destination to the EU.

As shown in Figure 2, LNG volumes contracted for the period 2015-2020 seem to exceed projected demand. This suggests that a loose, over-contracted market will last until the end of this decade and would support the currently experienced low LNG prices. While the consultation paper notes that "capital investment costs nevertheless remain substantial, particularly for liquefaction plant", one should not forget that LNG export project costs almost quadrupled over the last decade (from $300/tpa in 2000 to $1200/tpa in 2013).[9] In today's buyer's market, this means that some projects will not go ahead. Hence, in the long-term, the market is likely to tighten as projects and final investment decisions (FIDs) are delayed pending a more favourable market environment where demand or the willingness to pay a risk premium generates prices above breakeven. The consultation paper does not address the questions either of demand or the willingness to pay a risk premium.

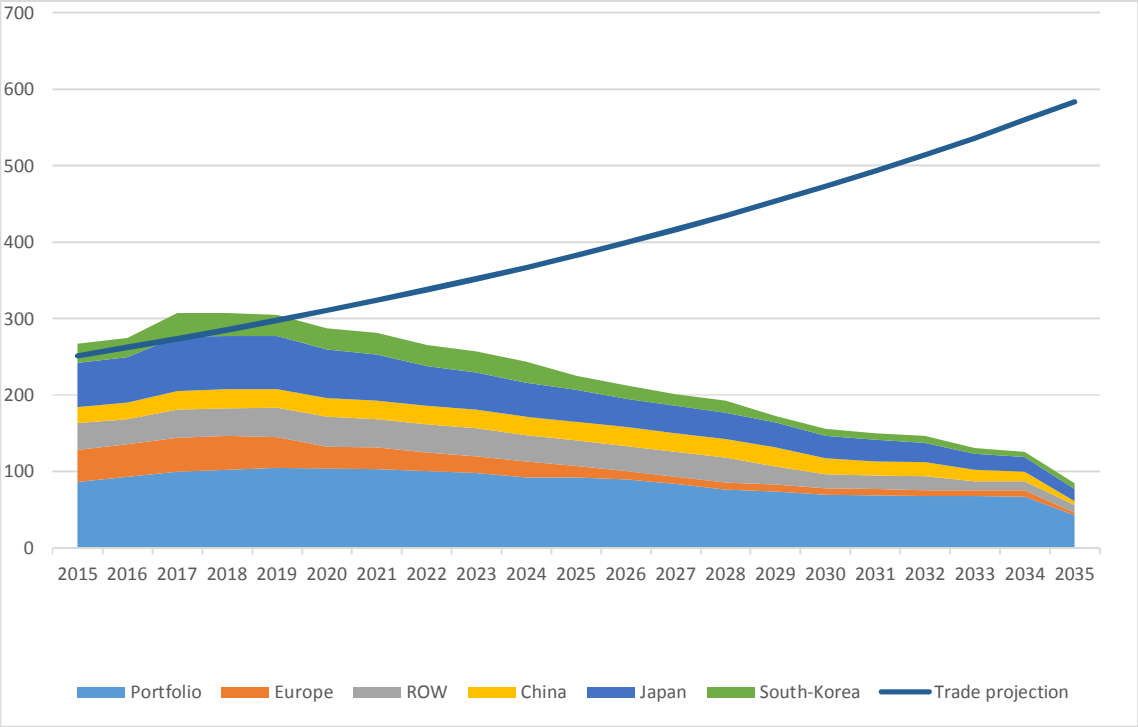
Similarly to LNG, the increase of gas storage volumes (by almost 27% between 2009 and 2015, from 85 bcm to 108 bcm) occurred in a market environment, where storage has a low value. As noted in the consultation paper "the current willingness to pay for gas storage is in some cases barely sufficient to cover the marginal cost of storage operations". For instance, Centrica's SBU decreased by 57% between the 2008-09 and 2015-16 storage years. This is partly due to the decreasing demand, but also because the overall gas system is becoming more flexible (increasing interconnectivity and LNG regasification capacities, spot trading and declining price spread between seasons).

These issues related to LNG and gas storage can be addressed if there is a shared view on the natural gas market, which also includes an understanding of natural gas in the EU electricity market.

[8] Various estimates (OIES, CEDIGAZ).

[9] Tpa refers to tonnes per annum. For an analysis of this issue, see Brian Songhurts, "LNG Plant Cost Escalation", 17 February 2014 (http://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/02/NG-83.pdf).

Figure 2. Signed long-term LNG contracts (2015-35)



Source: GIIGNL, Companies' websites.

The need for sufficient infrastructure

Given that some 95% of existing EU LNG import capacity is in Western Europe (ES, UK, IT, FR, NL, BE, PT, SE),[10] the LNG and storage strategy should explicitly aim at improving access to LNG particularly in Eastern European countries currently dependent on only one import source. Indeed, to fully exploit the benefits that could arise from LNG in this region, the EU needs a system of interconnectivity. Such a system would require: 1) additional infrastructure, either in the form of interconnectors or additional LNG terminals, including flexible LNG Floating Storage and Regasification Units (FSRU); 2) a clear regulatory framework avoiding contractual congestion at the interconnection points and 3) properly functioning gas hubs facilitating trade.

The need for better gas interconnections is most evident in the Baltic region, where currently Lithuania (with 4 bcma of LNG importing capacity) has an interconnection of 2 bcma only with Latvia, while Estonia (planning 6.5 bcma of LNG-importing capacity) has currently no gas interconnectors with its Baltics neighbours.[11] Similarly, while presenting its future Swinoujscie LNG import plant (5 bcma capacity),[12] Poland has no major interconnectors with most of its neighbours and no transmission capacity will be added under ENTSOG's Capacity Low Firm Scenario (based on the FIDs already taken).[13]

[10] GIE, LNG Map, May 2015 (www.gie.eu/index.php/maps-data/lng-map).

[11] GIE, ENTSOG.

[12] See, for instance, "LNG Terminal in Swinoujscie – an important investment for Poland's and regional energy security", 31 March 2014 (www.msp.gov.pl/en/polish-economy/economic-news/5297,LNG-Terminal-in-Swinoujscie-an-important-investment-for-Polands-and-regional-ene.html).

[13] ENTSOG.

Despite the importance of the interconnectors, investors do not seem to be queuing up for new projects[14] due to various well-known barriers. The issue of the regulatory and political framework plays a major role, as does the question about future gas demand. The rate of return set by national regulatory regimes, the market environment and economic growth, the clarity of signals from EU energy policy and impacts from the energy transition matter significantly.[15]

Interconnections certainly are important for the LNG strategy but they should not be the sole focus. While increasing gas interconnections between Spain and France, for example, could increase EU security of supply, there may be lower-costs solutions to achieve the same objective. For example, it may be more cost-effective to build an LNG terminal close to a vulnerable zone (e.g. South-Eastern Europe) rather than deploying large interconnection or reverse flow capacities. Also, LNG Floating Storage and Regasification Units (FSRU) may turn out to be more cost-effective than new pipelines. While a pipeline built mainly for security of supply reasons will remain unused most of the time, an FSRU that is not used can be disconnected and used for trading. Another alternative is to reload[16] the gas. Many LNG terminals allow for this. The type of infrastructure to be built should depend on a cost-benefit analysis that properly values security of supply.

Apart from cost-effective additional infrastructure, another major issue is contractual congestion.[17] According to ACER's annual report around 15% of interconnection points still suffered from contractual congestion in 2014, resulting in sub-optimal capacity utilisation.[18]

A third issue is the absence of well-functioning natural gas hubs in the CEE region and the Iberian Peninsula. According to the EFET's Gas Hub Assessments, in 2015 most of the regional hubs are lacking basic characteristics such as a consultation mechanism in English, cash-out rules, standardised contracts or accessibility to non-physical traders. The Romanian, Bulgarian and Mibgas hubs are still in their nascent phase, with the appropriate legislative and regulatory framework yet to be set.[19] While it is debatable whether there is a need for more benchmark hubs (serving as reference markets "that people can price their contracts on")[20] there is certainly a need for hubs serving as a platform for physical balancing in the CEE and the Iberian Peninsula.

Cost-effective investment in gas infrastructure, improving the procedures coping with contractual congestion and developing gas hubs in the CEE region and the Iberian Peninsula are crucial to achieve a better level of system efficiency of the EU gas market.

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[14] ENTSOG's data show that final investment decisions (FIDs) have been taken for only 15% of the total proposed transmission capacity by 2020 (20,793 GWh/day). This would add 3,177 GWh/day (approximately 100 bcma) of (full) interconnection capacity to the EU gas system.

[15] ENTSOG, TYNDP 2015, Main Report (www.entsog.eu/public/uploads/files/publications/TYNDP/2015/entsog_TYNDP2015_main_report_lowres.pdf).

[16] 'Reloading' refers to the transfer of LNG from the LNG reservoirs of the terminal into a vessel (GIE, 2015).

[17] "'Contractual congestion' means a situation where the level of firm capacity demand exceeds the technical capacity"as defined in Articles 2(21) and 2(23) of Regulation (EC) No 715/2009.

[18] ACER, ACER 2015 Report on Congestion at IPs in 2014, 10 February 2015 (http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/20150529_ACER%202015%20Report%20on%20Congestion%20at%20IPs%20in%202014.pdf).

[19] See in more detail: EFET, 2015 Review of Gas Hub Assessments (http://www.efet.org/Cms_Data/Contents/EFET/Folders/Documents/EnergyMarkets/VTP_Assessment/~contents/SBX28G3U3L2PNND5/2015-Review-of-Hub-Scores_final.xlsx).

[20] See Natural Gas Europe, Reaching a Fully Liberalised and Single EU Gas Market – Interview with Patrick Heather, 10 February 2015 (http://www.naturalgaseurope.com/liberalised-single-gas-market-interview-patrick-heather-oies).

This would also "enable all Member States to benefit from access to the international LNG market", as proclaimed in the consultation paper. However, to achieve this, it seems more appropriate to develop an overall gas strategy in order to approach the issue of LNG and gas storage in a comprehensive manner. Such a strategy needs to focus on the market realities.

The need for an innovation-driven strategy

Although "research and innovation" is a separate dimension of the EU's Energy Union strategy, the LNG and storage strategy should mention the considerable innovation potential of natural gas in order to give a perspective on the potential long-term role of gas in the decarbonisation process of the EU energy system.

There is considerable prospect for numerous emerging technologies related to natural gas, including in particular the following:

(1) **Production and use of biomethane.** In 2013 around 1.3 bcm of biomethane (cleaned biogas) was produced in the EU and Switzerland.[21] The industry's main concerns are the uncertainties regarding the EU energy and climate change policies post-2020 and the difficulty to form a European biomethane market. Indeed, the slow process of elaborating EU standards for biomethane hinders its trade and its use as a vehicle fuel. The European Committee for Standardisation (CEN) has been drafting the specifications of biomethane for the injection into natural gas grids and the use as vehicle fuel since 2010.[22]

(2) Natural gas in transport. Besides LNG, Compressed Natural Gas (CNG) and Adsorbed Natural Gas (ANG) should be considered as part of the solution to decarbonise the EU transport system. While the CNG and LNG-fuelled combustion engines are mature technologies requiring support at the deployment phase, ANG is currently in the "valley of death" between R&D and the demonstration stage. ANG stores natural gas at 35 bar, enabling a volumetric efficiency increase of more than 25% compared with traditional CNG storage cylinders.[23] Hence, this technology would be more suitable for use in light-duty vehicles (responsible for 15% of EU CO_2 emissions).[24]

(3) **Power-to-gas.** The transport and heating sector can also be decarbonised by creating synthetic methane from renewable electricity (so-called 'power-to-gas'). This technology branch should be further explored, especially because existing gas infrastructure could be used to transport and distribute this synthetic methane. Moreover, power-to-gas stations could provide demand-side flexibility to the electricity sector, i.e. produce when there is a surplus of renewable electricity.

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[21] European Biogas Association, Biomethane Statistics (http://european-biogas.eu/wp-content/uploads/2014/12/Biomethane-graph-20131.png).

[22] CEN/TC 408 - Project Committee - Natural gas and biomethane for use in transport and biomethane for injection in the natural gas grid (http://standards.cen.eu/dyn/www/f?p=204:22:0:::FSP_ORG_ID,FSP_LANG_ID:853454,25&cs=1A6E2885FFA69ED2A8C4FA137A6CEF3DA).

[23] For more on ANG, see Y. Ginzburg, ANG Storage as a Technological Solution for the "Chicken-and-Egg" Problem of NGV Refueling Infrastructure Development, 23rd World Gas Conference, Amsterdam 2006 (http://apvgn.pt/wp-content/uploads/adsorbed_ng.pdf).

[24] European Commission, Road transport: Reducing CO2 emissions from vehicles (http://ec.europa.eu/clima/policies/transport/vehicles/index_en.htm).

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