

China – The Role of Gas

An online panel event held on 21st and 22nd September 2022



CHINA - Carbon Neutral by 2060
'THE FUTURE OF GAS'

Date: Sep 21 and 22, 2022 Time: 09:00-10:30 & 10:45-12:15 CEST
Four sessions over two days

• Security of Supply • CCUS
• Markets • Renewable Gases

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Session One: Security of Supply

Participants

Octavian Stamate, Counsellor, Energy and Climate Action, EU Delegation to China

Matteo Tanteri, Chairman and CEO, SNAM China

Jan Stambasky, Vice President, R2Gas

Rudolf Huber, President, LNG Europe

Moderator: Matthew James, Managing Director, Energy Post

Highlights

Since last year, the gas market has changed significantly, with a very different situation in the EU and China. Whereas the EU is trying to become independent from the largest supplier, Russia (supplied 45% of total gas demand in 2021), China has a more diversified supplier arrangement. Due to the Russian invasion of Ukraine, Europe is facing significant supply shortages.

Current situation in Europe

- In 2021, Russia was the largest supplier of gas to the EU, accounting for 45% of total gas imports (pipeline and LNG).
- Due to the Russian invasion of Ukraine, Europe is facing significant supply disruptions. Urgent actions are required to stabilise security of supply in the EU, i.e., diversification of supply. In the long-term, demand could be covered by domestic renewable gases.

- Large price differences for natural gas in Europe compared to Asia and North America could lead to economic downturn and disturb social balance.
- *REPowerEU* plan - EU's response to Russia's invasion in Ukraine, aiming to reduce demand for Russian gas by two-thirds by the end of 2022 by reducing gas demand, diversifying supply and boosting gas storage.
- Under the *European gas demand reduction plan*, Member states agreed to reduce their gas demand by 15% until spring 2023.

Current situation in China - China's 14th Five Year Plan (FYP)

- Gas is key to meet China's dual carbon targets. China's gas market is mainly influenced by the 14th FYP, which emphasises the role of LNG.
- China's approach to security of supply focuses on strong diversification of suppliers, while maximising the use of domestic resources.
- China signed long-term contracts with major LNG suppliers (USA, Qatar) years ago.
- Infrastructure and storage capacity are currently insufficient - which is why there are ambitious scale-up targets.
- In 2020, Pipechina was founded, to be a major player in the transition from coal to gas.

Link between Europe and China

- China's LNG imports from Russia increased significantly in the last six months during the war. At the same time, China has started exporting LNG to Europe, about 7% of EU's LNG imports come from China.
- However, China bought only 7.6 bcm of gas from Russia - a small fraction of what Russia should supply to Europe under normal market conditions and the purchases were already planned years ago.
- China is not seen as a substitute market for Russian gas from European gas fields, as the transport would be too costly because of the geographic distance.

Session One Summary

This is a summary, not a verbatim transcript, of the key points made during the online panel event.



Octavian Stamate
Counsellor, Energy and Climate Action, EU Delegation to China

'We are much stronger when we use the power of the single market and show solidarity. It is a very important step to put our collective weight behind it and to buy gas together as Europeans and not as 27 different members.'

The EU is heavily dependent on fossil fuel imports. In the last five years, around 57-60% of the EU's gross energy consumption was covered by fossil fuel imports; 90% import dependency for gas, 70% import dependency for oil and coal.

Russia was the largest supplier to the EU in 2021, accounting for 45 % of total gas imports (pipeline and LNG), followed by Norway 23%, Algeria 12%, United States 6%, and Qatar 5%.

Due to the Russian invasion of Ukraine, Europe faces major supply disruptions – The EU's response includes the i) diversification of supply towards more reliable suppliers, ii) acceleration of energy savings, and iii) massive investment in renewable energy.

The aim of the European Commission's proposal *REPowerEU* is to reduce demand for Russian gas by two thirds before the end of 2022 by reducing gas demand, diversifying supplies and build out gas storage.

Acceleration of energy savings: The European Commission proposed the *European gas demand reduction plan*, adopted by the EU energy ministers (Council) on 26 July 2022. Member states agreed to reduce their gas demand by 15% compared to their average consumption in the past five years, between 1 August 2022 and 31 March 2023, with measures of their own choice.

In case of a substantial risk of a severe gas shortage or an exceptionally high gas demand, or if five or more member states that have declared an alert at national level request the Commission to do so, a 'Union alert' could be activated by a Council implementing decision, which would make the gas demand reduction target mandatory.

Diversification of supply: Trilateral memorandum signed between the EU, Egypt and Israel to agree on future natural gas supplies; collective purchase of gas for all Member States.

Filling up storage: Under new EU legislation, gas storage facilities to be filled to 80% of capacity by November 2020. Target will be raised to 90% in the coming years.


China: China's total gas consumption amounts to 300bcm/yr. Compared to Europe, China meets a larger share of its gas demand with domestic gas production, which has increased by 30% since 2015. China's imports have increased by about 60% since 2015 (now about 100 bcm) and are based on a diversified range of suppliers.

Figures show a 30% increase of LNG intake from Russia over the past six months. At the same time, China started to export LNG to Europe - around 7% of the EU's gas demand is supplied by China.



Matteo Tanteri
Chairman and CEO, SNAM China


The 14th FYP has probably had a greater impact on businesses in China than the war in Ukraine. Gas is key for China to meet dual carbon goals. Carbon peak could be reached before 2030, perhaps as early as 2025. Key target: Increase of annual natural gas production by 10% from 207.6 bcm to over 230 bcm.



The Overall 14th 5Y Plan

Specific targets were set for 5 areas, covering 14 items

| Area | Items | Current | Target 2025 | Variation |
|-------------------------|---|---------------------------------------|-------------------|-----------|
| Energy Security | Annual comprehensive production capacity of energy (bln Mtce) | >4.08* | >4.60 | 12.7% |
| | Annual Crude Oil Production (mln tons) | 199 | 200 | 0.5% |
| | Annual Natural Gas Production (bcm) | >207.6 | >230 | >10.8% |
| Energy Transition | Total Installed Capacity of Power Generation (billion kW) | 2.38 | 3 | 26.2% |
| | CO2 emissions/GDP (Carbon Intensity) | -18.8% from 2015-2020 | -18% in 5 Years | - |
| | % of Non-fossil Energy Consumption | 15.90%* | Ca. 20% | 25.8% |
| | % of Non-fossil Energy Power Generation | 32.59% | Ca. 39% | 19.7% |
| Energy Efficiency | % of Electric Energy at End-use Consumption | - | Ca. 30% | - |
| | Energy Consumption/GDP | 9.20% during 13 th 5Y Plan | -13.5% in 5 Years | -13.5% |
| | % of Flexible Power (i.e., storage stations) | - | 24% | - |
| Innovation Capabilities | Demand-side responsiveness (% of max electrical load) | - | 3%-5% | - |
| | Investment in Energy R&D | - | 7%+ | - |
| General | New Key Technological Breakthrough Areas | - | Ca. 50 | - |
| | Annual Living Electricity Consumption per Capita (kWh) | 775.62* | 1000 | 28.9% |


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*2020 Data instead of 2021
 Internal Sources: H2 14th 5Y Plan

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Infrastructure: To compensate for the lack of infrastructure, another 35,000 km of oil and gas pipelines are to be built (comparable to Italy's entire pipeline). In 2020 Pipechina was created as an infrastructure champion, and a potential driver for China to reach 600 bcm/yr gas consumption.

Storage: Gas storage capacity is the most important factor for switching from coal to gas, as greater storage capacity increases flexibility and creates the option of using gas in winter. China has a natural gas storage capacity of 15 bcm (less than Italy or Germany have, for example). By 2025, new storage capacities of 55-60 bcm are to be created, which is a very ambitious target.

Targets for Pipeline and Storage, no specific targets for LNG

| Area | Items | Current | Target (2025) | Var |
|-------------------|---|-----------|---------------|----------|
| Natural Gas | Annual Natural Gas Production (bcm) | >207.6 | >230 | >10.8% |
| | Oil & Gas Pipeline (km) | 175,000 | 210,000 | 20.0% |
| | Gas Consumption (bcm) | Ca. 330 | 420-460 | 27-39% |
| | Natural Gas as % of Total Energy Consumption | 8.4% | - | - |
| | Natural Gas Storage Capacity (bcm) | 15 | 55-60 | 267-300% |
| Energy Transition | Natural Gas Storage as % of Natural Gas Consumption | Ca. 4.8%* | Ca. 13% | 171% |
| | Proportion of Non-fossil Energy Consumption | 15.90%* | Ca. 20% | 25.8% |
| | Proportion of Non-fossil Energy Power Generation | 32.59% | Ca. 39% | 19.7% |

Pipeline

- By 2020, NG pipelines in China is about 79,100 km and PC operated ca. 60%. There is a huge gap compared to the targets set by NDRC in 2017: **104,000 km in 2020 and 163,000 km in 2025** (NG pipelines only)
- 145 Plan seems more conservative with respect to the targets set by NDRC
- The plan mentions to «**accelerate the construction and interconnection of long-distance natural gas pipelines**»

LNG & Storage

- By 2025, **55-60 bcm of storage capacity** in total will be built in Northwest, North, Northeast, and Southwest
- The plan mentions to «**coordinate and promote the construction of UGS, LNG receiving stations, and other gas storage facilities**» to enhance «**natural gas storage and peak adjustment capabilities**»

Energy Transition

- Promote diversified utilization of biomass energy, including biomass & biogas power generation and biomass clean heat energy **according to local conditions**
- Biomethane will be encouraged in all major crop production and husbandry areas
- Biomass is considered as a **key technology** to be developed

Links between EU and China:

Media reports on China's resale of Russian gas to Europe so far is only speculation: In the first half of 2022, China bought only 7.6 bcm of gas from Russia, and the target for 2022 is 15 bcm - a small fraction of what Russia should supply to Europe under normal market conditions.

The increase in the volume of gas that China purchases from Russia was already planned years ago. The transmission of the Siberia pipeline between Russia and China has been ramped up because a second pipeline has not yet been completed. The pipeline has a capacity of 38 BCM, next year transport of 25 bcm is expected.



Jan Stambasky
Vice President, R2Gas

Security of supply in Europe is not optimal, annual imports exceeded 80% of the total consumption in 2021 (over 3,600 TWh). 41% of the gas is imported from Russia through three major pipelines (Nord Stream, Yamal, Brotherhood) and LNG imports. Only 9 EU countries do not import natural gas from Russia: Belgium, Croatia, Cyprus, Denmark, Ireland, Malta, Portugal, Spain, Sweden (and UK). Even Netherlands with its huge gas reserves in the north sea imports 32 TWh of gas from Russia.

Green Gas Potentials vs. Imports

Gas for Climate Report

- Biomethane AD (agro, waste): 62 bcm
- Biomethane gasification: 33 bcm
- Biomethane PtG: 15 bcm
- Green electricity Hydrogen: 160 bcm
- Blue (CCS) Hydrogen: 18 bcm
 - Potentially on new sites: 124 bcm
- **Total: 288 – 412 bcm**

- Nord Stream 1&2
 - 2x 27.5 bcm
- Yamal
 - 33 bcm
- Brotherhood
 - 33 bcm

- **Annual imports of non-EU gas: 337 bcm (2021)**
 - Total EU consumption: 412 bcm

Source: www.gasforclimate2050.eu

Renewable gases: Technical capacities of biomethane, green hydrogen and blue hydrogen could cover the EU's gas consumption by 2040/50 and surpass the capacity of the current three major pipelines: Nord Stream, Yamal and Brotherhood. Similar figures should also be achievable in China.

Domestic produced renewable gases are a means of security of supply, decarbonisation and a booster for the domestic economy.

Infrastructure: Highly developed domestic grid infrastructure is required, suitable for decentralised production.



Rudolf Huber,
President, LNG Europe

Europe's enormous dependence on natural gas has led to a large price differential - the price of natural gas in Europe is about \$9 more expensive than in Asia and seven to eight times more expensive than in North America. This threatens Europe's competitive position (exports) on the international market, Europe's industry, and social cohesion.

Europe must improve its own energy position, supplemented by imports. Unlocking domestic resources includes the development of natural gas across the European continent, the expansion of biomethane and a very different approach to nuclear energy in Germany. If Europe does not tackle this problem immediately, European industry will go bankrupt.

Panel discussion

MJ asks: What do you make of this challenge in the short term, and looking further ahead with renewable gases coming into the systems - what's the picture over the next five, ten years in terms of where our investments and our attention needs to go?

MT: There's no real quick and easy solution for this winter. Taking Italy as an example, we have filled our storages to 88%. But even if the storage is filled 100%, this winter will be difficult, if there is no Russian gas. For the European government, it's time to take quick action on everything that's possible – we saw the debate on nuclear power in Germany and on coal power in Italy. In the long-term, we need to move from ideas to implementation, i.e., speed up permitting of renewable energy plants and invest into biomethane. I do believe that the energy transition will take place, both in China and the EU, but we really need to push for implementation.

MJ asks: Do you see any obstacles to the development of a market for renewable gases?

JS: Starting at the bottom, 3 bcm of total biomethane production is not that impressive. Over 20 bcm could be reached, if all electricity from biogas is turned into biomethane instead of into electricity. We definitely need higher volumes to make some impact.

MJ asks: What could achieving higher volumes look like? What hinders the development?

JS: The first obstacle was the high price of biomethane: The normal production cost of biomethane is about EUR 70/MWh, which was much higher than the price of natural gas in past years, so the development of the industry was based entirely on governmental support.

On the other hand, it's much cheaper than the current gas prices. The second obstacle are all the procedures: Starting the biomethane production process takes at least three years.

MJ asks: Regarding the EU targets that have been set for Biomethane, do you think we'll meet them?

JS: It is possible, but both financial instruments and financing must be available, and bureaucracy must be reduced.

MJ asks: What do you think needs to be done? If you had to name the top two priorities, where would you focus?

RH: First we have to look at the regulation. With any kind of new project, it takes years to complete the administration. We have seen that this can be improved, for example in Germany, where the infrastructure for LNG import was given the green light quite quickly because the urgent need was there.

Secondly, we need a budget, awareness and financial support for new indigenous energy projects. We really need to develop an open mind for this quickly. We need local politicians to create structures where they look at what they can do in their area, for example in terms of biomethane and shale gas.

There will be activists, but if we allow projects to be delayed by unnecessary legal procedures, there will be no solution. There are already very intense discussions about what can be done to find solutions. Because one thing must also be clear, if we rely on more sun and more wind, we also need more balancing power.

MJ asks: Talking about social and political resistance, the social license that is required to develop the energy mix – is that also an issue in China?

MT: It's not common at all in China to complain about new infrastructure, for example. I think the Chinese government is very careful in working in an energy transition that will not hurt the economy. Difficulties could emerge if the energy transition would have a negative impact on the economy, but as long as this won't happen, it's not an issue they consider in China. There is very strong attention from people on the quality of air, which is not a popular topic in Europe.

Wrap up:

JS: Start to develop domestic sources now as soon as possible.

RH: Work on domestic resources, and take a look at the competitive position that Europe has today in the world. If we stay as we are right now, Europe is going to be a very different place for our children, than it was for us. There's not going to be any meaningful industry anymore.

MT: One year ago, the expectation was that the energy transition is one of the few topics where Europe, China, and the US can work together. One year later, we are in a very

different situation. At least in the short term, and this is also one of the goals of the EU-China Energy Cooperation Platform, there should be a continuation of the discussion to understand what can be done and where we can cooperate.

*Summary compiled by Helena Uhde
Produced by Energy Post*