

China – The Role of Gas

An online panel event held on 3rd and 4th February 2021



A DATE WITH CHINA

“CHINA - Carbon Neutral by 2060: The Role of Gas”

Date: FEBRUARY 3 and 4, 2021
Time: 09.00-12.15 CET (both days)
4 online sessions...

- 1: Security of Supply**
- 2: Coal Phase-out**
- 3: Market Design**
- 4: Renewable Gases**

Co-Organiser:  **EU-CHINA ENERGY**
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Session Four: Renewable Gases

Participants

Jan Ingwersen, General Director, ENTSOG

Andrea Stegher, SVP Commercial & Stakeholder Engagement – Energy Transition, SNAM

Torben Brabo, CEO, ENERGINET

Didier Holleaux, Executive Vice-President, ENGIE

Dongfu (Donna) Kahrs, Founder, GLOBAL TRANSACTION CENTRE GmbH

Moderator: Erik Rakhou, Consultant, BARINGA PARTNERS

Highlights

Biogas, biomethane, hydrogen and other forms of green gas will have to play a role in meeting both China’s and the EU’s goals to become carbon neutral, because electrification cannot do it alone.

The technologies behind biogas and biomethane are already known, and scaling up production can create local jobs in rural areas, reduce CO₂ and methane emissions and provide domestic sources of gas.

These sources, and more nascent ones like hydrogen and power-to-x, may be more expensive than natural gas to begin with, but the cost will come down with development, as it has for solar and wind.

China and the EU have significant scope for cooperating in decarbonising gas. They could set common principles and standards for decarbonised LNG, and exchange expertise on digitalisation, for example.

Green gas in Europe

- The EU's hydrogen strategy reflects on the fact that electricity won't do it alone; we will need gas.
- This is about phasing in gas decarbonisation, not phasing out gas.
- A virtual system that tracks, traces and allows for trade of green gas is important.
- Biogas, biomethane, etc., provides a local source of gas, instead of importing.

Green gas in China

- There are millions of digesters in China producing methane for cooking; the IEA estimates biogas production could multiply by 10 by 2040.
- China's new waste policy makes it possible to produce more biogas from food and other waste.
- Biogas reduces the cost of LNG and fertiliser imports.
- China's gas market is growing by about one French gas market per year.
- China will plan decarbonisation in three stages - to 2030, 2045 and 2060. Each stage will use different technology, different budget, etc.
- China could leapfrog gas to hydrogen and other green gases in some areas, for example industrial clusters.
- Natural gas will still be important for improving air quality by replacing coal.
- Green gas helps avoid methane emissions and create jobs in rural areas.
- China is already incorporating digitalisation and Big Data into its development.
- China should enhance cooperation between the State Grid of China and Pipe China.

How to decarbonise gas

- With 25% renewable gas, Denmark is now looking at network planning to keep costs down.
- Guarantees of origin allow for virtual trading.
- The price of biogas will be more competitive if the price reflects the savings in CO₂, methane and fertiliser and local employment.
- Biomethane, biogas, syngas are all available now – they are not unknown technologies.
- Increased biomethane production could bring the cost down by 25-40% - not quite as much as solar and wind costs but still good.
- The price of biomethane will drop in the next 5-10 years.
- The next frontiers are power-to-x and hydrogen, which are expensive but will also see price declines.

- EU digitalisation legislation needs to take into account the fast pace of change.
- Standardisation between China and the EU would encourage gas decarbonisation.

Panel Discussion



Erik Rakhou (Moderator)
Consultant, BARINGA PARTNERS

ER: We heard this morning that China cannot copy and paste what Europe has done, but leapfrog some of our experiences, and perhaps standardise the trade of decarbonised LNG. We will focus on a net-zero gas grid and what it looks like by 2050-2060.



Jan Ingwersen
General Director, ENTSOG

Jl: I'm sure there will be a lot we can exchange between Europe and China. We share the ambitions for decarbonisation. The EU took a very important step with launching the hydrogen strategy last summer. Until then the focus was on electrification and the decarbonisation of electricity. The hydrogen strategy reflects on the fact that electricity won't do it alone, we will need gas.

We have to take the same route as electricity - decarbonising production. Hydrogen will decarbonise over time.

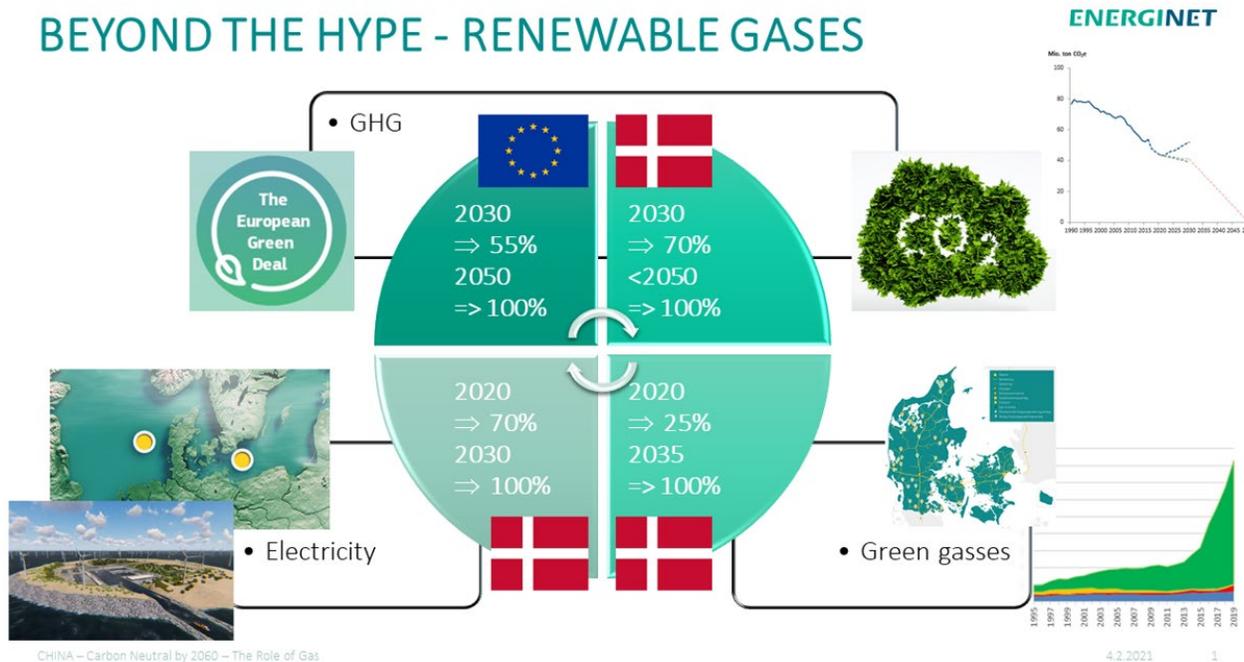
ENTSOG has developed a roadmap with three pathways for decarbonisation - decarbonising methane with biogas or CCU; switching to green or blue hydrogen; or blending hydrogen in with natural gas in the existing gas infrastructure, gradually decreasing the carbon content.

We are deeply engaged in decarbonisation and preparing the existing gas network for it. There is an opportunity to repurpose and retrofit existing infrastructure for this.



Torben Brabo
CEO, ENERGINET

BEYOND THE HYPE - RENEWABLE GASES



TB: Denmark started focusing on renewables in the 1990s, we now include renewable gases. We have very good alignment between the regulatory framework - it's very stable, looking 10-20 years ahead, with more than 90% support in parliament - and an industrial focus, with industries wanting to make money from using green energy and selling sustainable, green products.

We defined targets to decarbonise, first for electricity, then renewable gas. We established a subsidy scheme that encouraged investment and provided a good return, and discussions with end-users to make sure we move in the same direction.

The EU has an ambitious target of 55% renewable energy by 2030, in Denmark it's for 70% for all energy, so we might reach 100% earlier than the average country.

With good dialogue and cooperation with neighbouring countries, we now have interconnections and new balancing markets so we help each other across regions and countries. We have upgraded dispatching centres with artificial intelligence, etc., so we can see the exact consumption and production of renewables, making it easier.

We're now at 25% renewable gas, so new problems are coming. We have increased the level of network planning between producers of biomethane, distribution, and transmission because we need more advanced network planning to keep costs down.

Guarantees of origin have become very important for us, you need to declare that the molecule is green too. When you produce renewable biomethane in Denmark, you can sell it in Germany or Sweden or the Netherlands, you just need to have the certificate and use it for targets and other legislation.



Didier Holleaux
Executive Vice-President, ENGIE

DH: Biogas has been very present in China. You have millions of old digesters in China to produce methane for cooking. The IEA estimates that biogas production could multiply by 10 between now and 2040. That's a major challenge because you move from local production to injection into the grid.

After launching a strong policy on waste management, China has a strong potential to use waste from food in cities. This will have an impact on the countryside economy - the way farmers produce, the size of the farms and so on. Producing biogas makes savings in international trade - less LNG and fertiliser.

There's a need to jointly plan gas and power networks. In Europe, the saving between today and 2050 amounts to hundreds of billions of euros. Jointly planning and making best use of the best energy is of critical importance. It's utterly stupid, when you can avoid it, to go through power to produce heat.

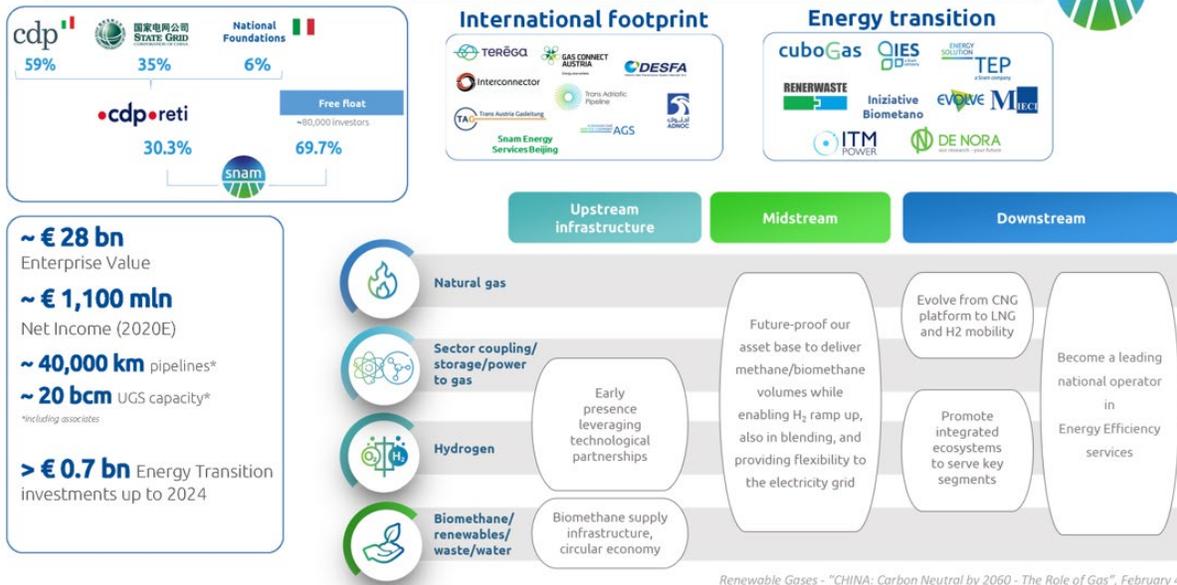
Market design is critical - the rules for producing, transporting and marketing gas. Guarantees of origin are important to create biogas and hydrogen. Storage, and how to remunerate flexible power production from CCGTs on the power network, are important questions. CCGT with biogas will be a good solution for peak power.

The potential is there for China, you need to have a plan to develop it and then implement it.



Andrea Stegheer
SVP Commercial & Stakeholder Engagement – Energy Transition, SNAM

Snam Net Zero Commitment by 2040



AS: China’s gas demand has been growing by approximately one French market per year in recent years. The scale of the challenge is in both the development of infrastructure and the combination with renewables.

We did some training for Pipe China on third-party access. It’s not a copy-paste operation. It’s very important to share experiences and acknowledge the dimension of the phenomena in China.

We have moved since 2017 from attention on third-party access and infrastructure planning to hydrogen and biomethane. It’s important to balance the two elements.



Dongfu (Donna) Kahrs
Founder, GLOBAL TRANSACTION CENTRE GmbH

DK: I worked on waste policy in China in the 1990s, and the Chinese have been moving in this direction for the past 20 years. Now is a big challenge and chance for everybody.

Worldwide, we have the technology, experts, money and markets. Not only in China but also in Europe and America. The problem is bringing everything together, because we have exported different structures, regulations, etc. Everything is different.

We need a very complex, integrated approach. The Chinese always ask where are you from, what international advantage or technology you can offer us - so it's something new from outside. We have to ask the same thing in Europe about China.

The most important thing is in China's next Five Year Plan, they have planned three stages, from now until 2030, then to 2045, then to 2060. Each stage needs a different kind of technology, goals and budget. The first big stages will be in east China - Shanghai - and in southwest China, like Guiyang.

ER: Should China leapfrog gas, for example, and start building hydrogen?

AS: Leapfrogging can be done in some areas. China has clearly set targets for 2030, 2045, 2060. Based on China's past development, you can imagine focusing for example on industrial clusters to look at how to develop hydrogen immediately rather than going to gas first.

On the other hand, I still see that to satisfy the increasing demand for energy, China will still need additional approaches -because for example the air quality issue is very urgent. For that reason the provinces are relevant. The elephant in the room is coal.

ER: We have to keep in mind that coal accounts for 50% of energy in China, so the key is a controlled transition - not rushing to the finish.

JJ: China's three phases are similar to the EU approach, slightly later. This is not about a phase out of gas, it's about a phase-in of the decarbonisation of gas. The phase out of gas will not happen, electrification will not do it all. It's about future-proofing gas grids and homes and preparing them for transporting and using hydrogen.

Creating a virtual system where you are tracking, tracing and making it possible to trade the climate value of different types of gases across distances is important for the market to develop.

TB: With renewable electricity we had development at different scales - large-scale, mid-size, local. Until now, gas has primarily come from large-scale projects outside of Europe. With biomethane and hydrogen we are on the mid- and local scale. Some of the most successful biomethane projects in Denmark come from a small farm, or waste from a household going to a local incinerator and back into the community. On the mid-scale, municipalities either alone or together are developing projects. On the gigascale, our government will make an announcement on developing energy islands.

AS: Denmark's population is smaller than a usual city in China, so the dimension of the effort is very different.

Q&A

Luis Ignacio Parada asks: We have to be prepared for higher prices over 30 years and then hope that projections are met for 2050.

ER: Transitions cost money, as we've seen with solar and wind power. At the start some governments brought €5-10 billion to a tender, and the winner would be guaranteed revenue for 15 years. That resulted in kick-starting quite a bit of offshore wind in northwest Europe. No more state subsidies are needed. Should we expect we can learn from that experience in renewable gases? What are the preconditions for the least-cost path to the transition?

DH: Biogas is not expensive. It looks expensive because we are not pricing CO₂ on the alternatives. If we do, biogas will look far less expensive. Positive externalities have to be taken into account - the form of local employment, avoided emissions of methane, savings of fertiliser.

In China, you have to take into account several things including the avoided methane and China's problem of finding work in rural areas. Biomethane and syn gas are no-regret options. It's available now. And the cost is not a real issue. The same applies to syn gas made from plastic waste and other things.

We believe that with increased biomethane production the cost of this will go down. It's not like with solar panels, the price will decrease by 25, 30, 40%, not a factor of 10. But that's quite good.

TB: Those positive externalities apply in Denmark too. The cost of producing renewable electricity has grown cheaper and cheaper over the last 20 years. Now it's so cheap we have abundant proposals from investors.

We've only been scaling up biomethane for the last five-10 years old, so we need to see where it lands in another five-10 years. It will come down. The next level is power-to-x and hydrogen, which today are extremely expensive but they will come down.

Otherwise we will not have a diverse energy supply, too much electricity leads to security of supply issues. As production costs will come down we must focus on networks.

Pascal Nahasi asks: What can the Chinese learn from Europe's developed distribution and transportation systems and the use of digitalisation and artificial intelligence for balancing the system?

DF: On the one hand commitment does not equal action, on the other hand if the Chinese promise something it means they have already prepared for it. The big city of Guiyang was poor and has transformed, with thousands of international companies established using Big Data. It means the government is trying to use Big Data to advance technologies and then to optimise the industrial

structure. In China it's not only on paper, it is already on the way - not only for renewable gas technology, but to use it to change.

What does this mean for carbon neutrality in China? We have introduced to China some advanced German technologies. They love it but it takes time because the technology cannot be used immediately, because China needs to prepare the regulations.

China has already started working based on the Big Data structure. I tell our European customers to understand the Chinese have more systematic infrastructure.

ER: There is a developed data management industry in China, and it's important to understand if we're working on common definitions and what we want to achieve with carbon neutrality.

JJ: Europe can learn from China on the usage of data. Europe has a long way to go. Digitalisation across the value chain will bring benefits. From production, via storage, to producers and vice versa.

This whole transition, both on digitalisation and decarbonisation, requires tight cooperation and alignment along the value chain.

DH: There is one issue that digitalisation will never solve - the need for long-term electricity storage, for instance from summer to winter or long days without wind or sun. That's where you need gas - natural gas, biomethane, hydrogen, because you can store it for as long as you want.

ER: There are initiatives like Bill Gates' Breakthrough Energy that are looking at energy storage, because they take impossible challenges and try to solve them. Some R&D is still needed, we need to think beyond storing natural gas.

TB: Digitalisation can become a new tool. All of our electricity metres are now digital, we have a number of different balancing electricity systems. I don't disagree that the power sector has not solved medium to long-term storage, but the gas market should be open to aiming for better use of utilisation.

The EU legislators and directives now are based on five-year-old digitalisation technology. What we can do with hydrogen, power-to-x would be illegal in the current directive, because the speed of new solutions is outpacing legislation.

AS: Digitalisation is very advanced in China, especially on the electricity side, and the gas sector can benefit from that. It would be a benefit also from the European perspective to have gas and electricity work hand-in-hand for consumers.

The Chinese challenge will be to bring both the State Grid of China - the electricity TSO - and Pipe China together. Europe can help make that happen in the most effective way.

ER: There are some challenges to digitalisation, like vulnerability of the grid.

Xiao'ai Wen asks: How can you force collaboration between the EU and China, from a strategic perspective, looking at a common goal? What about standardisation and mimicking what we do with stock exchange markets? What could we standardise together, and what should we not?

AS: One of the very important actors in the Chinese evolution is the NDRC. At that level there is European Union interaction, but also companies can provide expertise and experiences to be shared. It's not just copying and pasting, it's understanding how our experiences can help avoid mistakes. Standardisation helps understand how something can be streamlined.

DK: For standards in China there are at least five levels - company level, sector level, province levels, government levels, etc. It takes a long time from project to standard, but it can be done.

JJ: We should look into necessary and simple standardisation as possible. There are gains to be achieved on standardisation of gases - whether natural gas, LNG or biomethane - which makes it tradable. If we are now looking at virtuality of the climate content of gases you need a system of guarantees of origin, content, tracking and tracing.

AS: We have agreed that there are differences, there is a common target. We can for sure increase the interaction to get the most out of relevant experiences.

DK: China is not only the biggest carbon emitter but also the largest investor. The latest technology is here, and we need to understand how we can finish it with our mutual schedule. The common 10 years are the most important golden years.

DH: Biomethane is a no-regret option, it's available and we need to accelerate. We can cooperate because we are not in competition, it is local.

Standardisation of the colours of hydrogen - we need to be sure that when we take one colour we understand exactly the same thing about how it's been produced and its carbon content. Hydrogen from coal - black hydrogen - produces way too much carbon.

TB: I'm here to be innovative and open-minded. Industries and consumers want new services, they need to decarbonise.

JJ: It's important we all acknowledge we are not phasing out gas, we are phasing in the decarbonisation of gas.

ER: Three messages stand out from all four sessions: It is the world of clean molecules that both China and Europe are moving towards. The power and gas sectors have to work together, they can't avoid it,

even though I think sometimes they try. We have lessons in Europe on the controlled phaseout - we don't leave miners behind.

Summary compiled by [Sara Stefanini](#)

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