



Pragmatism or indecision?

Germany's clean energy strategy reinforces support for renewables both as the source of power generation and production of hydrogen but the phase out of coal and nuclear will press competing demands unlikely to be met without natural gas. Nord Stream 2 and LNG terminal projects signal realisation of this need.

In the latest push to achieve a carbon-free future Germany in mid October established an emissions trading system for heating and transport sectors.

Under the Fuel Emissions Trading Act (BEHG), from 1 January 2021, natural gas consumed in Germany for heating will be subject to a new €25/tCO₂e carbon price.

According to calculations by the Federal Environment Ministry (BMU), the price of heating for German homes could increase by €0.6 cents per kilowatt hour (kWh).

The price aims to reduce emissions in sectors not covered by the EU ETS, and is expected to increase in value to €55-€65/tCO₂e by 2025.

It is hoped that the carbon price on gas will reduce carbon emissions through behavioural changes and fuel switching such as reduced use of gas for heating or the replacement of gas heating with heat pumps and district heating networks.

In theory, the impact could be significant given almost half of German households (19 million) use natural gas for heating, which accounts for three quarters of Germany's annual gas demand.

According to the government plan,

income generated will be returned to consumers and firms in various ways, including a reduction in the Renewable Energy Act (EEG) surcharge which makes up a key component of electricity prices in Germany.

While on the surface this looks like substantial progress a source at a major German utility noted that the carbon price will be passed directly onto consumers. Firms would not pass on the reduction in the EEG surcharge as current margins mean the price increase cannot be absorbed.

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The source added that the policy will have little impact on gas prices and gas demand in the short run. This is because renters and those who live in apartment buildings will struggle to switch to alternative sources of heating such as heat pumps, with those who do own their homes, finding the cost of switching prohibitively expensive, the source said.

Ambitious targets

The BEHG is the latest move under the framework of the country's overarching goal of reaching carbon neutrality by 2050 in line with the overall EU target.

Under the same agenda, the German government is set to phase out lignite and hard coal-fired power generation by 2038 and adopting policies to support renewables.

Renewables have reached a 46.1% share in the country's in power generation in 2019 as lignite and hard-coal accounted for 29.3%, according to Fraunhofer ISE.

In June this year, the government finalised its National Energy and Climate Plan (NECP) and the national hydrogen strategy.

Germany aims to cut its carbon emis-

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sions by 55% by 2030 compared with 1990 levels. The plan also sets targets to reduce primary energy use by 30% compared with 2008 and increase the share of renewables in gross final energy consumption to 30%, both to be achieved by 2030.

Critics say, however, that the policies are incompatible with the role natural gas has to play in Germany energy mix during the transition.

“The shift to carbon neutrality by 2050 has no role for gas in the future without carbon capture and storage, which, although theoretically allowed is hindered by NGOs and political pressure,” said Christof Merkel of Merkel Energy.

Even when Germany’s energy transition target was a 95% emissions reduction by 2050 it would have required tripling the current speed of year-on-year CO2 reduction for the next 30 years, according to a study co-authored by Wolfgang Peters of the Gas Value Chain Company and Harald Hecking from the Institute of Energy Economics at the University of Cologne (EWI). German CO2 emissions amounted to 905 million tons of CO2 in 2017, according to the study, a reduction of 27% from 1990s levels. “However, most of this reduction was achieved in the course of the 1990s when, as a consequence of the German re-unification, inefficient (and highly pollutant) East-German power plants and industrial complexes had been decommissioned,” the paper says.

The rate of CO2 reductions has dropped to an average of 8 million tons per year since 2000 and reaching a -95% CO2 reduction target would require an average reduction of 26 million tons per year, according to the study.

Gas industry experts argue that Germany’s ambitious goals would require policy decisions free from ideological biases and are unlikely to be achieved purely through renewables and electrification.

Hydrogen strategy

Nevertheless, Germany’s national hydrogen strategy places heavy emphasis on domestically produced renewables-based green hydrogen.

The role of blue hydrogen, produced from natural gas, is limited to imports.

The strategy argues that “only hydrogen produced on the basis of renewable energies (‘green’ hydrogen) is sustainable in the long term”.

The document calls for building generation units with electrolyser capacity of 5GW by 2030, corresponding to green hydrogen production of up to 14TWh and a required renewable electricity quantity of up to 20TWh. A further 5GW capacity of electrolyser capacity is planned over the following decade.

There remains a considerable gap between the additional hydrogen pro-

duction required to meet demand. The Federal Government forecasts demand at between 90 to 110TWh by 2030.

Current levels of production stand around 55TWh.

Blue hydrogen imports, likely from Norway and Russia, are expected to make up the difference in production and demand.

Gas industry experts question the viability of the government’s plan.

Peters of The Gas Value Chain Company said: “If you are really serious about hydrogen, blue hydrogen will be needed given the scale and cost reductions it can help achieve.”

In May, German gas transmission system operators determined the first steps for a hydrogen transport network, the H2 start network, to begin in 2030. Furthermore, at the end of April, a group of five companies announced plans to build the first publicly accessible hydrogen network in Germany by 2022.

Gas’s position

Based on Germany’s current energy needs natural gas has a role to play in the country’s energy mix for the coming decades.

While adopting policies that support investments in renewables, German politicians and companies remain committed to new natural gas infrastructure projects, including both new pipelines and potential LNG terminals.

Peters argued that the phase out of coal and nuclear power generation will create a gap that will have to be filled with gas-fired generation.

“Gas will play a crucial role in the future with the coal and nuclear power phase out being the real wake up call that there are few alternatives,” he said.

In 2019, natural gas accounted for 10.9% of electricity generation, with nuclear, lignite and hard-coal generation accounting for 45.9% of the total, according to ICIS data.

Peters’ said the share of natural gas in electricity production will continue to grow, as it competes with renewables to replace lost generation.

Germany has pledged to decommission all of its nuclear power plants by 2022, with

coal set to be phased out by 2038.

Germany’s total annual gas demand in 2019 increased by 2% to 93.8bcm, according to ICIS data.

Imports

Germany has been heavily reliant on Russian gas with additional imports coming from Norway and the Netherlands.

In 2019, Germany imported 58 billion cubic metres (bcm) and 27bcm from Russia via the Nord Stream and Yamal pipelines respectively, three times the 28bcm imported from Norway.

Germany has a total of 44bcm/year in long-term supply contracts (LTC) with Russia’s producer Gazprom, which expire in 2030 at the earliest.

The construction of the Gazprom-led Nord Stream 2 pipeline is expected to double Russia’s direct export capacity to the EU via Germany to 110bcm/year, which would consolidate its place as Germany’s biggest supplier.

The project has never been favoured by the EU and is facing strong opposition from the US. The pipeline had been originally scheduled to launch at the end of 2019, but has been on hold since the imposition of US sanctions in December 2019.

German politicians, however, remain committed to the project.

German foreign minister Heiko Maas on 17 October said that “Nord Stream 2 will be completed but the timing remains uncertain”.

In response to the renewed threat of US sanctions on the pipeline Maas added: “We Europeans make our own decisions about our energy policy and energy supply. After all, we haven’t criticised the United States for having more than doubled its oil imports from Russia last year and for becoming the world’s second largest importer of Russian heavy fuel oil.”

LNG terminal plans

There are currently plans for an 8bcm/year LNG terminal to be constructed at Brunsbüttel, and another Floating Storage and Regasification Unit (FSRU) with 10bcm/year capacity to be built at Wilhelmshaven.

For comparison, the Netherlands’ Gate terminal has a 12bcm/year capacity.

The Brunsbüttel LNG Terminal is supported by Gasunie, Oiltanking and Vopak, and is currently in negotiations with German utility RWE for binding legal contracts for LNG imports which are expected to conclude by the end of this year.

The FSRU at Wilhelmshaven is being built by Uniper subsidiary LNG Terminal Wilhelmshaven (LTew). The developer launched the expression of interest process for the terminals construction in September.

Opinions regarding the need for LNG

Most of the CO2 reduction was achieved in the course of the 1990s when inefficient and highly pollutant East-German power plants and industrial complexes had been decommissioned

terminals in Germany vary among industry experts.

Merkel of Merkel Energy said that building an LNG terminal is key to tackling the “duopoly of supply” that Norway and Russia have over gas flows into Germany. He argues the two terminals would diversify Germany’s gas supply and open the market to greater competition.

Merkel notes he is in favour of FSRU terminals such as that being built at Wilhelms-haven which can be removed after 20 years and shipped to other ports where needed.

In his view, LNG terminals are cheaper and allow for shorter to medium term purchases of gas from a growing LNG market without a large capital outlay, which is a better option if natural gas is to be phased out by 2050.

Additionally, at the Brunsbuttel project, German LNG Terminal and RWE signed a memorandum of understanding to jointly explore green hydrogen opportunities through the LNG terminal.

This would place the project in line with Germany’s hydrogen strategy, though it remains to be seen how this will work out.

According to Merkel, the Nord Stream 2 project was conceived under different market conditions and has now become obsolete. “Nord Stream 2 would not have gone ahead should it have been considered today,” he said arguing in favour of LNG terminals to meet Germany’s gas needs.

It seems that the Russian government may have similar views following the news in July that it had instructed some of its leading energy companies to establish large scale hydrogen production capacities by 2024 and is considering using Nord Stream 2 to transport the gas.

Peters, however, has a different view, arguing that northwestern Europe is almost a single gas market and Germany can use the Gate terminal to have access the LNG market. He stated that the support for the construction of LNG terminals is a political move by Germany to appease the US.

Split direction

When looking at the policy development of natural gas infrastructure in Germany and green hydrogen separately, the aims are abundantly clear.

LNG terminals and additional pipeline capacity will diversify German gas supplies, introduce a greater degree of competition in the market, as well as strengthening its position as the largest physical gas market in Europe and a key gas transport hub.

Similarly, the hydrogen strategy aims to make Germany a key global producer of green hydrogen, setting electrolyser capacity targets for 2030 and beyond, limiting blue hydrogen to imports only.

Whether it is possible for Germany to commit to the development of both policies during a transition to carbon neutrality by 2050 is the question that will continue, in the short run at least, to remain unanswered and divisive.

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