Club of Three Webinar
23 February 2021

Europe's path to decarbonisation: how fast can we reduce our fossil fuel dependence?

Meeting summary

In February, the Club of Three held a webinar on the issue of decarbonisation and energy security, with Professor Friedbert Pflüger (Director, European Cluster for Climate, Energy and Resource Security - EUCERS); Victoire de Margerie (Chair of the Supervisory Board, Ixellion and Founder/Vice Chair, World Materials Forum); Martin Lambert (Senior Research Fellow, Oxford Centre for Energy Studies); and Jorgo Chatzimarkakis (Secretary General, Hydrogen Europe), as main speakers.

This event was made possible thanks to the UK's Foreign, Commonwealth and Development Office (FCDO), with additional support from the National Grid and Bosch UK. It involved some 30 senior figures from business, the policy field and academia in France, Germany and the UK.

Europe's energy and climate objectives for 2050 have major implications for its energy security and dependence on fossil fuels. The discussion, chaired by Club of Three Chairman Michael Maclay, put emphasis on hydrogen as a promising alternative to gas. What contribution can be expected from this fuel in years to come and what role will neighbouring countries likely play?

During the discussion, it was pointed out that the European Commission's goal of a 55% reduction in greenhouse gas emissions by 2030 compared to 1990 levels was very ambitious given that the EU had so far achieved a 24% cut. It remained to be seen whether such a target could be met. Some of the participants noted that the 'renewables first' approach adopted in Germany with its Energiewende had shown its limits. To achieve its 2030 goal, the EU would have to use all options at its disposal, including hydrogen, natural gas with carbon capture and storage (CCS) and nuclear.

The UK's hydrogen sector looked particularly promising. A study published in February by the European Cluster for Climate, Energy and Resource Security (EUCERS) at the University of Bonn and the University of Aberdeen had shown that the UK model could serve as a blueprint for European hydrogen projects. The 'twin track' approach it was pursuing consisted of developing low carbon (blue) hydrogen while building up green hydrogen production. Steam methane reforming (SMR) had an important role to play in quickly scaling up production as this could represent the bulk of the hydrogen made by 2035.

In terms of energy security, it was clear that hydrogen had a key role to play. From a technical point of view, it could provide stability to Europe's future energy supply chain by bridging the gaps left by intermittent sources of renewable power. Politically,

it would help ease the dependency on Russian gas as a sizable share of hydrogen could be domestic, from offshore wind farms for instance. Hydrogen from neighbourhood countries such as Ukraine and from Africa, including natural (white) hydrogen, would also contribute to diversifying energy supplies. White hydrogen, which is typically not very dense, could be transported over long distances thanks to the use of ammonia. In Ukraine specifically, its large biomass potential could be used for the production of hydrogen. However, one of the participants said that the EU should be careful not to replace one dependency by another in sourcing large quantities of hydrogen from Europe's periphery, especially given that regions like West Africa were currently highly unstable.

It was also pointed out that gas pipelines such as Nord Stream 2 could contribute to the supply of hydrogen to Europe, with up to 70% being transported eventually through retrofits. Countries in the Baltic region could even possibly feed their own hydrogen into the pipeline.

A broader security-related topic emerged during the discussion: resource scarcity and forthcoming shortages of critical materials used for electric vehicle batteries and other green technologies. Copper, nickel, cobalt and other minerals were going to be needed in much larger quantities to deliver Europe's decarbonisation agenda. At the same time, mine productivity was going down. According to some estimates, copper supplies were going to be under serious pressure within the next 15 years. The question therefore was whether such materials should remain key components of the energy infrastructure. One participant called for increasing the use of pipelines going forward to transport energy as opposed to copper-dependent power grids.

These challenges had generated a lot of enthusiasm for a hydrogen economy, which came from the fact that only one critical material was needed – platinum – and that the biggest producer was South Africa with whom Europe had a long standing relationship. There were also a number of ongoing projects aimed at reducing the use of platinum for the production of electrolysers by 50%.

The Covid-19 pandemic had been an accelerator for the energy transition. A recent report by the International Energy Agency had shown that electricity generation was predicted to fall across all power sources in 2020 except for renewables. It was against this background that the European Commission had published its Hydrogen Strategy.

However, there were significant cost and scale-up challenges associated with hydrogen. As one participant noted, there was no business case for investing in green hydrogen at present. Green hydrogen cost around €150-200 per megawatt hour (MWh) today, and although this was predicted to come down to €75-100 per MWh by 2030, it was still considerably more than the price of natural gas (€15-20 per MWh). The bold objectives set out in the Commission's strategy, with two lots of 40 gigawatt capacity installed by 2030, represented a huge step-up from current hydrogen projects which were in the tens of MW. This made the need for financing mechanisms particularly urgent. Luckily, there was a range of tools already available, such as

carbon pricing or the feed-in tariffs and Contracts for Difference (CFD) used to support wind and solar power. The mistake Europe should not make with hydrogen, participants heard, was to repeat the German deployment of renewables at great cost.

An industry representative explained that the strategy for the period up to 2025 was to develop large demonstration projects with a view to operating a market for hydrogen from 2026 onwards. Current plans included the construction of a scalable electrolyser with an initial output of 100MW in the port of Hamburg.

One further interesting discovery during the pandemic, relevant to the vaccination strategy, had been how innovation had tended to come not from the big established companies but from the smaller, nimble players - and this was proving true with hydrogen technologies.

The future of hydrogen was to a large extent linked to that of CCS. Few projects had been successful around Europe so far. Norway's Northern Lights project, which had just been approved in December 2020, had relatively moderate capacity. Other countries like the UK had quite a bad track record in this area, having cancelled a £1bn competition for CCS in 2015. However, there were reasons for optimism as the government was now considering the deployment of several CCS clusters.