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The MENA region's 'green hydrogen rush'

Germany and the EU launched ambitious 'green' hydrogen plans. To satisfy demand, all eyes are now on the MENA region

In the Arab world, Covid-19 has driven millions of businesses bankrupt. Unemployment rates are currently as high as 45 per cent. There are social tensions and huge migration flows. In such a situation, it is hardly surprising that the region is overwhelmed with excitement about promising announcements from Berlin and Brussels.

While Germany launched its green hydrogen strategy with a €9bn package on 10 June, the EU has not hesitated and announced to focus on low-carbon hydrogen as key technology for the transition with a €140bn hydrogen plan. But Europe will need to mostly outsource its hydrogen needs – and all eyes are on the MENA region for imports. Will the technology and the European hydrogen hunger bring growth, jobs, and stability?

Europe is leading the evolution of the new energy systems and has deployed ambitious targets for industrial decarbonisation. The European Commission has committed to fully decarbonise the European Union's economy by 2050 to be the first carbon neutral continent worldwide. For economies such as Germany's, this target seems impossible to achieve by electrification only, especially since its industrial playground is the automobile sector (steel) and chemical processes – both of which are very carbon-intensive.

The secret panacea is now supposed to be called 'green hydrogen': injecting green hydrogen, produced through the electrolysis of water and powered by electricity stemming from renewable sources, can be used to decarbonise a wide range of industrial production processes. For example, to allow for the GHG-free production of primary steel, hydrogen is currently considered to be the most promising solution for replacing hard-coal coke.

However, decarbonising the steel and chemical sectors with green hydrogen would double or triple the demand for renewable electricity – which is impossible to satisfy without massive imports. On top of that, green hydrogen should also get rid of greenhouse gas emission for road freight transport, shipping or energy storage. This is why the German hydrogen strategy launched on 10 June, following months of delay, is reserving €2bn for the assistance of hydrogen production abroad.

A strategy with defects

All eyes are on the Middle East and North Africa (MENA) region now, with two main questions in mind: Could the region produce enough renewable electricity? And can it set up the infrastructure for transport and export of hydrogen gas? The MENA region benefits from the highest solar irradiance in the world (the strength and concentration of the sun) and tremendous wind potential, which can be employed to produce electricity from renewable sources – and eventually green hydrogen. The deployment of renewable energy is growing very quickly in the region: it has seen a nine-fold increase of investments just in the past eight years – and energy transitions are under way in many countries. Morocco aims at having 50 per cent of their electricity being produced by renewable energy until 2030. With the UAE and Oman forecasting to achieve 30–35 per cent green energy in their total mix by 2050, some of the oil-rich Gulf States seem to have understood the threat of climate change and the benefits of energy diversification.

According to estimates, green hydrogen production in the MENA region could be half the prize of European production. Nostalgia towards the old Desertec project are enthusiastic: making the desert alleying the energy hunger of Europe. A realistic look, however, dampens any excitement: Still, most countries are having less than 10 per cent renewable energy in their electricity share – even if in 2030 countries such as Morocco and Jordan will achieve 30 per cent, the majority of the electricity will still be dirty.

Many of the countries are steamrolled by the hydrogen rush.

On top of that, producing green hydrogen for export would mean that all the available green electricity will be absorbed by the green hydrogen hunger from Europe. Arab countries will then cover their rising domestic demand with oil and gas only. Morocco, Jordan, Lebanon, and Egypt, countries which are mentioned often, are net importers of fossil fuels. Hence, there is a high risk that the focus

> on the domestic energy transitions will wither away. This would not only thwart national social and ecological transformation processes and the chance of a socially just, decentralised energy transition, but also pose great risks to the nationally determined contributions for the implementation of the Paris Agreement in those countries.

It doesn't look good on the jobs and value front either. The German strategy argues that 'for hydrogen to become a central component of our decarbonisation strategy, the entire value chain – technologies, production, storage, infrastructure and use, including logistics and important aspects of quality infrastructure – must be considered'. With this, Minister for Development Cooperation Gerd Müller promises knowledge and technology transfer in exchange for green hydrogen. But if the supply chain will require MENA countries to only produce H2 as raw material, while all next steps on the value chain, such as chemical processing, take place in Europe, not many jobs and not much value will be created.

Is it at least good for the planet?

Green hydrogen production requires mostly two resources – water and land. The MENA region is the most water-scarce region in the world, with countries such as Jordan having their water demand exceed the water supply by huge amounts. The only water available to export is the salty seawater. The MENA region is well developed in desalination technologies and produces approximately 48 per cent of the world's desalinated water. However, with desalination plants being very energy intensive, one needs to have a close look at the resource and energy balance. Some desalination projects are promising in terms of their environmental footprint: In Dubai, 95 per cent of desalinated water is produced from waste energy.

As for transport, European policymakers tend to see the infrastructure as a given: The EU energy market is connected to the MENA market through multiple pipelines (Morocco-Spain; Algeria and Libya-Italy; Syria and Turkey-EU). These are easy to utilise for green hydrogen gas instead of natural gas. Even if those pipelines would fail in transporting hydrogen from North Africa to South Europe, the region is bristling with petro-chemical expertise for the conversion of hydrogen for shipping.

On top of that, the already existing infrastructure of well-equipped LNG ports would be prepared to receive the future hydrogen vessels. However,

what they tend to forget is that the entire electricity market is not connected yet: the region's modernisation of electricity grids is moving slow. Because of conflicts and tensions to neighbouring countries, there are no interconnectors to be found. Creating a regional electricity market at this points sounds like a pipe dream.

Many of the countries are steamrolled by the hydrogen rush. But in order for the hydrogen strategy to become both environmentally and socially sustainable, the EU and Germany need to spend a bit more time in coming up with an offer that leads to sustainable growth.



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