

The problems of the German hydrogen revolution - and how Saudi Arabia wants to help solve them

Andrea Claudia Hoffmann

The ecological transformation of German industry is not really gaining momentum. The German government's ambitious climate targets for 2030 are already considered virtually unattainable. Things are not looking good globally either: global consumption of fossil fuels rose to a new record high last year. At the same time, the procurement of the coveted substitute in the form of green hydrogen is faltering. Of the 130 TWh of hydrogen forecast for 2030, only around 30% can be produced in Germany because it is too expensive. All the more reason to look abroad. The Gulf region, in particular Saudi Arabia, is the main here.

Great uncertainty

The simple phrase "no energy transition without green hydrogen" is proving to be dramatically true in practice. The hydrogen revolution of the German economy, which was thought up at the green table, is in danger of collapsing even before it really gets going in steel, chemicals or heavy goods transport. One important reason for this is the great uncertainty about the prices that be achieved in the future with the sale of hydrogen as an energy source in Germany.

This uncertainty leads to a fatal, self-reinforcing cycle: on the one hand, the reluctance of investors from Germany and abroad, who are reluctant to money as long as there are no firm commitments from customers in the German economy - and on the other hand, the reluctance of customers who, although they know their needs, cannot plan their future hydrogen consumption solidly without concrete price information from the suppliers and therefore do not want to give any purchase guarantees. Investments without foreseeable pricing - a classic chicken-and-egg problem.

At the same time, demand is growing: According to the official calculations of Federal Economics Minister Robert Habeck (Greens), committed early on to green hydrogen as the path to the new age of CO₂-free industry with the now failed traffic light coalition, 130 TWh of hydrogen and hydrogen derivatives such as ammonia will be needed in Germany by 2030. However, around 70% of the coveted substance will have to be imported. The fact that only 30% can be produced domestically is not only due to a lack of sunlight.



Saudi Arabia's desire to develop into a sustainable global energy supplier became clear at the eighth FI (Future Investment Initiative) conference in Riyadh

Picture: Andrea Claudia Hoffmann

and wind in this country. Domestic production is faltering primarily because the prices for industrial consumers would not be attractive, i.e. not competitive. Even the ecologically oriented Berlin think tank Agora Industrie assumes that the costs for the domestic production of green hydrogen could be two or even three times higher by 2030 than previously calculated.

Saudi Arabia as a beacon of hope

Foundation of the world's largest hydrogen producer

This makes it all the more urgent to look at possible alternatives. Among the providers from Australia, Norway, Brazil, the Nie-

countries, Egypt and the Maghreb states, the Gulf region stands out in particular, especially Saudi Arabia. Preparations are currently underway in Riyadh to establish the world's largest hydrogen producer. The kingdom is as short of money as it is of burning sun and constantly blowing desert wind.

The project is currently being launched with the help of the Saudi Public Investment Fund (PIF) and a number of international investors. The new mega-company's main sales markets will be in Asia and, above all, Europe, with Germany playing a prominent role to its economic strength and ambitious transformation plans.

German energy manager Cord Landsmann, who has worked for E.ON and Uniper among others, will take over the management of the new company based in the Saudi capital Riyadh. Also involved are Siemens Energy, which has excellent contacts in the Gulf region because it has been researching and producing there for years, and ThyssenKrupp Nucera as a manufacturer of electrolysis technology. A cooperation is planned in which Europe and Germany will obtain hydrogen in the form of ammonia by ship from the Gulf.

Eighth FII conference fat cats meet in the "Davos of the desert"

Saudi Arabia's desire to become a sustainable global energy supplier for the whole world became clear at the eighth FII ("Future Investment Initiative") conference, to which the kingdom invited more than 2,000 CEOs to Riyadh, including Blackrock CEO Larry Fink, Blackstone founder Stephan Schwarzman and Goldman Sachs CEO David Salomon. HSBC CEO Noel Quinn also traveled to the "Davos of the desert", as did Citi CEO Jane Fraser and Morgan Stanley CEO Ted Pick.

It is the leaders of the international financial scene, the "fat cats" as they are known Wall Street, who are following the call money to the Gulf. The ecological transformation of the economy and the associated

The associated conversion of the infrastructure requires vast sums of money not only in Germany, but worldwide - and is at the same time an Eldorado for courageous and, above all, financially strong investors.

Although the Saudi state fund PIF alone has more than US\$ 925 billion at its disposal, the aim is still to involve international partners. According to its managing director Yasir Al-Rumayyan, the PIF has already invested US\$ 125 billion in the restructuring of Saudi energy production over the past seven years. He is now campaigning for foreign investors to also support the projects. However, the state fund has been attaching more and more conditions to its investments for some time now. One example of this is the law on headquarters in the Kingdom, came into force on January 1, 2024. It obliges foreign companies in the Gulf region to locate their headquarters for Middle East business in Riyadh if they wish to conclude contracts with the Saudi Arabian government.

Under the aegis of Crown Prince Mohammed bin Salman, Saudi Arabia has been preparing for the time after the oil boom for several years. The country is the second largest oil producer in the world after the USA and has far-reaching ambitions when it comes to green energy. After Saudi Arabia initially took longer than other oil-producing countries to realize the deed.

ignored the fact that the fossil age is rapidly to an end, it is now catching up at a rapid pace. The young crown prince, also known as MBS, who has ruled the desert state since 2018 and who is also in charge of the state fund PIF, is consistently investing the oil and gas dollars, for example from the exploitation of the Ghawar oil field, in green energy production: Shuaibah II, the largest solar power plant in the Middle East with 2.660 MW, the largest solar power plant in the Middle East, is due to go into operation in 2025, after the 1,500 MW Sudair solar power plant north of Riyadh was connected to the grid in 2023.

However, the most important resource for the future is the production of green hydrogen for export. Saudi Arabia currently produces around 2.5 million tons of hydrogen per year and plans to this to 2.9 million tons soon. And more is in the pipeline: the Helios Green Hydrogen and Ammonia Project in Neom is to be commissioned by 2025 and 650 tons of green hydrogen per day for export alone. Investments are also being made in pipelines, port infrastructure and shipping capacities. The sheikhs' declared goal is to produce at least 130 GW of green energy by 2030. "Saudi Arabia will be the largest supplier of green hydrogen," said Prince Abdulaziz bin Salman al-Saud at the FII conference.

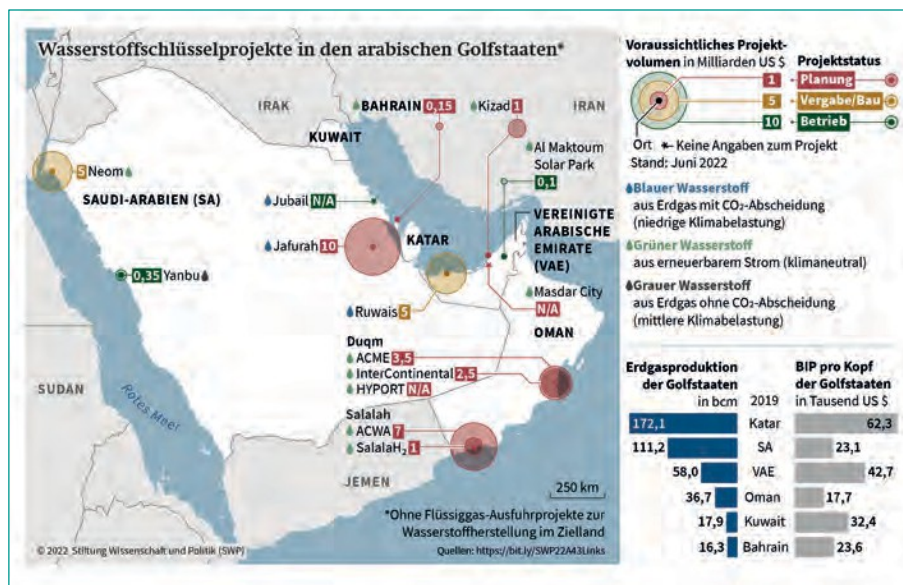


Fig. 1 Hydrogen projects in the Gulf States

Source: statista



Fig. 2 The author at the conference

Source: Daniel Goffart

Shift towards green energies - international companies join in

The Saudi energy minister is aware that by focusing on the green energy carrier, he is tapping into a gap in the market that is opening up in Europe and especially in Germany. "Show me the country that is really capable of exporting green hydrogen," he his foreign guests at the FII conference with obvious pride. "We are of doing this," the Energy Minister assured them, "we can export green energy on any scale."

The Kingdom's long-term goal is clear and is also stated in no uncertain terms to the global public: "We want to become the largest hydrogen country in the world," underlines Prince Salman al-Saud. He sees his country continuing in its traditional role as the "filling station of the world" in the future - albeit no longer powered solely by fossil as in the past, but with more and more "green" products in the mix. However, this "green change" in no way means that the main fossil fuel sources of income will be neglected. Oil and gas will continue to be extracted, emphasizes the Energy Minister, and nothing will unused in the ground.

However, most experts expect a shift away from fossil fuels in the medium term, specifically from 2030. This is inextricably to the ambitious climate targets of more and more countries. According to estimates by the International Monetary Fund, Saudi Arabia needs an oil price of at least US\$ 96 per barrel (159 liters) in order to finance its planned investments. However, the price of a barrel of Brent crude has been around US\$ 73 for some time. Saudi Arabia therefore needs to diversify, even if its domestic oil and gas reserves will last for decades.

The transition appears to be well underway: According to the government, non-oil revenues now account for 52% of economic output. "We are focusing more on the domestic economy and have achieved so many great things," says PIF head Yasir al-Rumayyan with satisfaction.

However, it is not only Saudi Arabia that is benefiting from the change in direction; foreign companies are also seizing their opportunity to make money from the change. Microsoft and Google, for example, have already announced plans to invest billions in the construction of new data centers in the kingdom. Thyssen-Krupp Nucera is also already involved with a major order for the planned megacity Neom. The project is to be built in the middle of the desert. The futuristic city "The Line" in the northwest of the country is to be 170 km long and 500 m high. It is set to cost 500 billion dollars and will one day enable nine million people to live a completely CO₂-neutral life.

Oxagon, the largest project to date for the production of green hydrogen, will also contribute to this. The plants for producing the sustainable energy source are being supplied by Thyssen-Krupp Nucera. Saudi Arabia is also in talks with a number of German companies for the next hydrogen project. However, because state revenues have fallen, the kingdom also putting spending in its own country to the test. As a result, some "Vision 2030" projects are being slowed down or cut back and prioritized differently.

The increasing fighting in the Gulf region since the outbreak of the conflict between Israel and the radical Islamic Hamas in the Gaza Strip is also a growing concern for some investors. "Saudi Arabia plays an important role as an anchor of stability, and we want to continue to do so," says Finance Minister Mohammed bin Abdul-lah Al-Jadaan in an attempt to appease investors. In fact, Saudi Arabia has so far managed to shield itself surprisingly well from the geopolitical crises in the Middle East. Nevertheless, analysts warn that the conflict has the potential to make the region as a whole more unstable.

"There are challenges, but I am optimistic," says Al-Jadaan with conviction. After all, a lot has already been achieved in the past few years. Unemployment has fallen from 13% to 7.9%, and the increasing proportion of women in the economy has contributed to this. Currently, 35% of the female population in Saudi Arabia is work.

Tourism has also developed much faster than expected since the opening in 2019: "We had set ourselves the goal of employing one million people in the sector by 2030. We already reached this figure last year," says the Finance Minister.

Despite all the euphoria, however, there is still a highly repressive state and massive human rights violations on the other side. The religious law of Sharia in its strictest form still applies in the country today. However, punishments are no longer carried out in public as they used to be. The dreaded vice squad has also disappeared from the streets of the capital. Instead, according to the Foreign Office, social media is now strictly monitored.

Conclusion

What does all this mean for the import of urgently needed hydrogen to Germany? When weighing up geopolitical risks and human rights issues, even critics such as the Greens have now become quite realistic. If Europe, and Germany in particular, only obtains the coveted hydrogen from countries that respect all basic democratic rights, the ecological transformation will not work.

The attitude towards so-called "blue water" is also adapting to reality. When the sheikhs in Saudi Arabia talk about "clean hydrogen", they mean something different to the German government. As

In the Gulf, the "blue" hydrogen, i.e. that produced with gas, is also considered "green", whereby the CO₂ is absorbed through capture and injection and does not enter the atmosphere. Olaf Scholz has also realized that Germany needs to become a little more flexible if the transformation with hydrogen is to succeed.

"You should", said the Chancellor recently, "Don't get lost in color theory with hydrogen".

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