



Germany's great hydrogen race

The corporate perpetuation of fossil fuels, energy colonialism and climate disaster



**Corporate
Europe
Observatory**

March 2023
www.corporateeurope.org

Author: Pia Eberhardt
Edited by: Ann Doherty
Coordinated by: Belén Balanyá
Design and graphics by: Gerard Casadevall Bach
Thanks to: Andy Gheorghiu, Lasse Thiele,
Jenny Simon, Katharine Ainger and all interview partners
for valuable insights and comments.

Published by:
Corporate Europe Observatory
March 2023, Brussels

Contents of this report may be quoted or reproduced for noncommercial purpose, provided that the source of information is acknowledged.



Corporate Europe Observatory (CEO) is a research and campaign group working to expose and challenge the disproportionate influence that corporations and their lobbyists exert over EU policy-making. CEO works in close alliance with public interest groups and social movements in and outside of Europe to develop alternatives to the dominance of corporate power.

www.corporateeurope.org



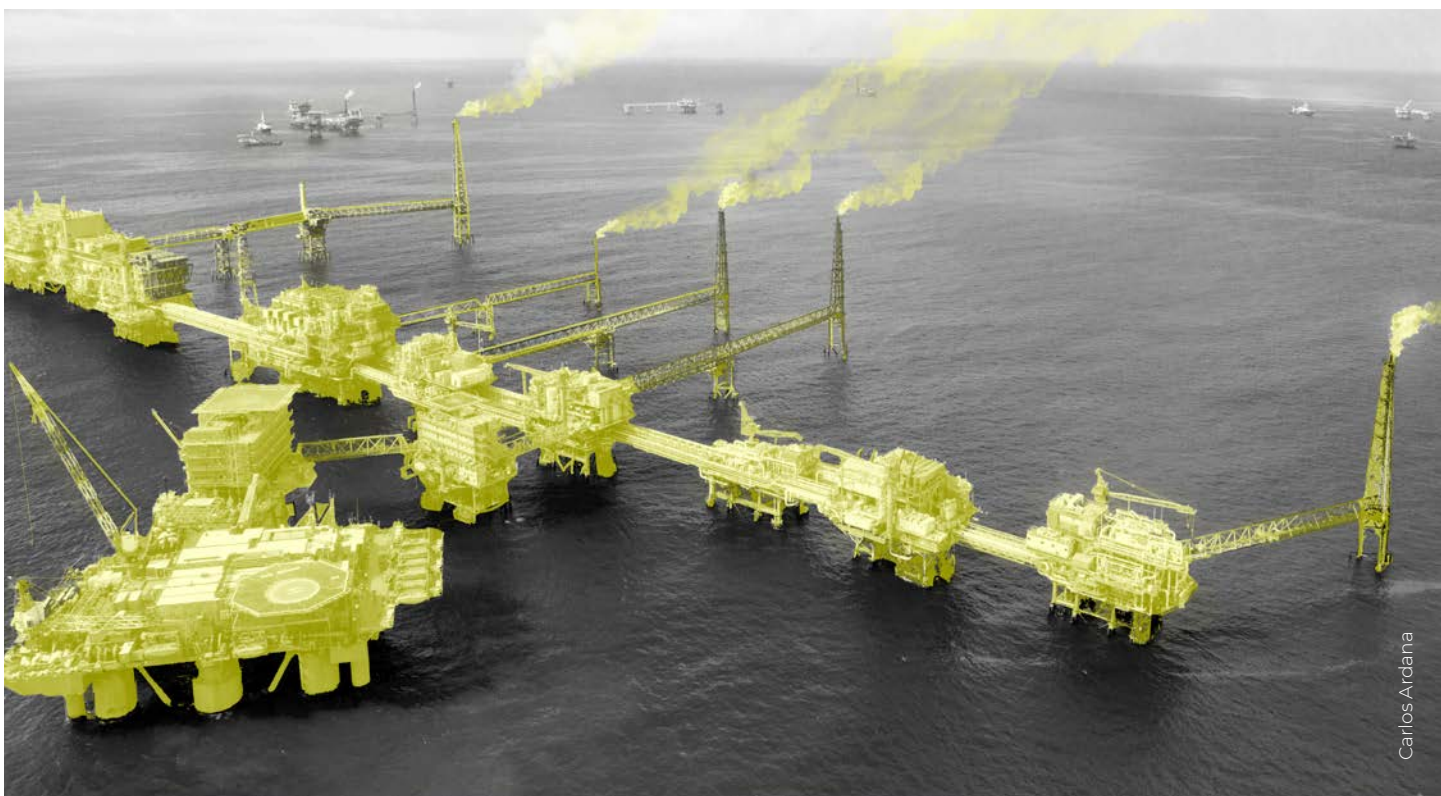
Executive summary

For years, Germany has hyped hydrogen as the centrepiece of a climate-neutral economy and the EU has welcomed this alleged 'miracle gas' with open arms. Germany's influential role in setting the EU's agenda has contributed to hydrogen being now at the core of EU climate and industrial policies, and Brussels plans to spend billions in public subsidies to spur Europe's hydrogen sector.

This hype ignores several dirty facts. First, 99 per cent of today's globally produced hydrogen is 'grey' hydrogen made from fossil fuels, with annual CO₂ emissions exceeding those of the entire country of Germany. Second, fossil-based 'blue' hydrogen, which is being promoted as a 'low-carbon' alternative, has a climate footprint that is nearly as bad when its total emissions are taken into account. Finally, even 'green' hydrogen, which is considered 'carbon free' but accounted for only 0.04 per cent of global hydrogen production in 2021, comes with serious challenges and risks. It is energy inefficient, behaves as a potent indirect greenhouse gas, and production on a large scale requires vast amounts of land, water and renewable energy. Its production can fuel 'green grabbing' – the appropriation of land and resources for environmental ends. An inflated demand for hydrogen is also being used as a Trojan horse to prolong the use of fossil fuels.

More and more experts are thus warning that an energy economy focused on hydrogen will actually increase emissions. The German Advisory Council on the Environment, for example, an expert advisory body of the German government, has stated that hydrogen "cannot play an overarching role" in solving the climate crisis.

Why then does hydrogen enjoy such a privileged position in German and EU politics today? Who is driving the German hydrogen craze, and who is benefitting from it? And what are the likely impacts for prospective green hydrogen export countries? These are the questions addressed in this report.



Key findings

- **Behind Germany's hydrogen dash lies a broad network of companies, industry associations and consultancies.** More than 100 German businesses have been identified as key players along the value chain for green hydrogen. Many of them are from or have ties to the fossil fuel and other polluting industries, and they are jumping on the hydrogen bandwagon to lock in harmful infrastructure as well as production and consumption models.
- **Germany's hydrogen lobby employs hundreds of lobbyists and spends millions on influencing German politics.** Chemical giant BASF, for example, a large user and producer of fossil hydrogen, had a lobby budget of €3.8 million in 2021 and currently employs 24 lobbyists. Germany's largest energy lobby group BDEW, whose member companies are responsible for 90 percent of fossil gas sales in Germany and who are betting on hydrogen to stay in business, has 51 lobbyists and a lobby budget of €7.1 million in 2021. Such lobby power allows the hydrogen industry to follow and influence complex regulatory processes and to secure lobby meetings with key decision makers.
- **Like past German governments, the current coalition of Social Democrats, Greens and Liberals grants privileged access to the gas lobby,** a driving force behind the hydrogen hype. From December 2021 to September 2022, high-ranking government officials met with gas lobbyists on average once a day. These meetings included several behind-closed-door conversations about hydrogen with lobbyists from fossil fuel majors like RWE, Equinor and Wintershall Dea as well as engineering giants like Siemens Energy (which manufactures gas pipeline components and electrolyser plants to produce green hydrogen) and MAN Energy Solutions (a subsidiary of car behemoth Volkswagen, which produces electrolyser components and engines for the automobiles and ships that it plans to fuel with hydrogen).
- **The hydrogen lobby has co-drafted the German H2Global public funding scheme.** This scheme arose from the Business Alliance for Energy, an industry-only forum created by the German Ministry for Economic Development and Cooperation that paves the way for the early involvement of industry in the Ministry's hydrogen strategy. The Hydrogen and Fuel-Cell Association (DWV), an influential lobby group in the hydrogen sector, seems to have played a key role in drafting the concept for H2Global. The German government has allocated more than €4 billion (following an initial endowment of €900 million) to the funding scheme to spur green hydrogen exports to Germany.
- **The German government's main hydrogen advisory body, the National Hydrogen Council, is dominated by corporate lobbyists** who steer Germany's hydrogen policy in the interest of their profits. These 25 experts include representatives from 15 companies from across the hydrogen supply chain: gas company Linde, grid operator Open Grid Europe, car manufacturer Daimler Truck, chemicals producer Covestro, and so on. The two environmental NGOs on the Council can always be overruled, and global justice groups are completely absent from the body despite Germany's dependence on hydrogen imports.
- **Germany's recent shift to blue hydrogen has been one of the lobby's biggest wins.** Unlike Germany's 2020 hydrogen strategy, the updated version (which was being finalised at the time of writing), explicitly foresees the use and public funding of fossil-derived blue hydrogen. Projects to import blue hydrogen and its derivatives are already in the planning, for example with both Norway and the United Arab Emirates.

As its carbon balance can be worse than the 'traditional' burning of coal, oil and gas, the scaling up of blue hydrogen risks driving up emissions. Some experts warn that investments in blue hydrogen are worse than inaction on climate change, not least because they lock in the fossil fuel economy.

- **Germany has established hydrogen alliances and partnerships with at least 26 potential export countries, many of them in the Global South.** Berlin plans to cover two-thirds of its future green hydrogen demand with imports and is set to become Europe's biggest importer of the gas, with an estimated 60 to 70 per cent share of the future EU/UK import demand. German corporations are keen participants in this global quest, and accompany ministers whenever they go on hydrogen missions.
- **German-backed green hydrogen projects abroad follow colonial patterns.** Resources are appropriated while negative impacts like ecological damage and energy scarcity are conveniently outsourced. Conflicts over land and water use are already becoming apparent and could intensify over the next years. There are also concerns about the livelihoods of fishing communities as a result of mega ports and other export infrastructure, as well as pollution from the waste of the desalination plants that are needed to obtain water for green hydrogen production in arid regions.
- **A shocking example of human rights violations connected with green hydrogen projects is Saudi Arabia's planned megacity Neom,** where Thyssenkrupp will install a huge electrolyser to produce hydrogen for export. Ancient tribes have been forcibly evicted from their land to make way for Neom. Several protestors have been sentenced to death because of their resistance to the eviction, and one of them was shot dead by security forces in April 2020. Nonetheless, the 2021 German-Saudi Arabia hydrogen cooperation seeks to implement joint projects in Neom. Such cooperations risk the reproduction and legitimisation of authoritarian regimes in the name of sustainability.
- **Hydrogen projects in the Global South tend to be centralised mega projects and lack civic participation.** A mapping of 27 mostly African countries could not identify a single hydrogen project in which the community was consulted prior to the decision to proceed with the project. A small group of political and economic elite is likely to profit from these top-down processes.
- **While the German state-industrial complex has lobbied to delay the EU's sustainability criteria for green hydrogen, it has developed nice-sounding standards to create acceptance for green hydrogen projects abroad.** But these standards apply only to a few select sites, and they ignore key issues such as communities' prior and informed consent. Community organisers have criticised the prospect of green enclave projects that will not become an integral part of their economies due to the lack of local ownership.

This report concludes that the looming hydrogen colonialism in the EU and Germany fails to deliver on global justice and energy democracy concerns as much as it fails to deliver on its key promise: to help tackle the climate crisis. Instead, there is a real risk that the hydrogen race will delay action to structurally decarbonise the economy: for example, increasing the energy efficiency of buildings (rather than heating homes inefficiently with hydrogen), transitioning to agroecological farming (rather than just greening synthetic fertilisers) and reducing traffic (instead of wasting energy on hydrogen-powered cars).

It is time that social justice and climate movements stand up against project hydrogen and the damage it will likely cause to communities and the planet.

Contents

Executive summary	3
Introduction	7
Beware the hype: hydrogen's dirty truths	9
Meet Germany's hydrogen lobby	13
Letting polluters run the hydrogen show	18
Not a bridge, but the end point? Germany's shift towards blue hydrogen	22
The Global South's looming green hydrogen curse	24
Conclusion	33
Endnotes	34

Introduction

It was yet another human rights crackdown in Saudi Arabia. In autumn 2022, three men were sentenced to death; two others had been given 50-year prison sentences. All they had done was to protest their eviction from their homes to make way for Neom, the regimes's planned megacity. "These shocking sentences [...] show the Saudi authorities' callous disregard for human rights, and the cruel measures they are prepared to take," commented human rights group ALQST.¹ The group had long called on businesses involved in Neom to either use their leverage with the Saudi authorities to quash the unjust verdicts or to withdraw from the project.²

In September 2022, around the time of the verdicts, representatives of one German corporation active in Neom had indeed travelled to Saudi Arabia. Top bosses from engineering giant Thyssenkrupp, which will install an electrolyser to produce hydrogen in the megacity, were part of a business delegation accompanying German Chancellor Olaf Scholz to the Gulf. The goal of this "energy shopping tour,"³ as the trip was framed by the Left opposition party, was to grant German industry access to hydrogen projects in Saudi Arabia as well as to hydrogen exports leaving the country. The grim human rights situation apparently did not dampen spirits, and the German delegation's mission was accomplished.

Welcome to Germany's brave new hydrogen world.

How Germany shapes this new hydrogen world will have serious repercussions on the EU level. Germany's strategy on this trendy gas "has had the strongest influence on hydrogen discussions in Brussels," says a former researcher from climate think tank E3G.⁴ Again and again, the German government – in close cooperation with the pro-hydrogen fossil fuel lobby – has used its influence to push hydrogen on the EU level, for example, during the German Presidency of the EU Council in 2020.⁵

As a result, hydrogen has become a cornerstone of EU policies and the EU plans to spend billions in public subsidies to spur its hydrogen sector. The bloc's REPowerEU plan set the EU's 2030 targets for green hydrogen to 20 million tonnes, with one half to be produced at home and the other half imported.⁶ Compare that with the less than 0.04 million tonnes of green hydrogen that were produced globally in 2021⁷ and you get an idea of how impossibly high that target is. The EU also plans to scale up hydrogen infrastructure, and the gas industry is lobbying for a 'Hydrogen Backbone' that would include 53,000 kilometres of hydrogen pipelines – partly retrofitted fossil gas infrastructure and partly new – by 2040.⁸ Again, this would be a massive ramp up from the mere 2,000 kilometres of pipelines that are currently able to carry hydrogen in Europe.⁹

Germany's hydrogen strategy will also have impacts on global supply chains and trade routes. While the government is investing heavily to produce green hydrogen at home, it plans to cover two-thirds of its future demand for the gas with imports. In fact, Germany is set to become Europe's biggest hydrogen importer, with an estimated share of 60 to 70 per cent of the future combined EU/UK import demand.¹⁰ This explains why German politicians have been touring the globe to sign deals with potential export countries over the past months.

This phenomenon is reason enough for Corporate Europe Observatory to unpack the German dash for hydrogen. Who is driving it and who is benefitting from it? How 'green' is Germany's hydrogen economy? What are the likely socio-economic and ecological impacts in prospective green hydrogen export countries, many of which are in the Global South?

These are some of the questions addressed in this briefing. But let us start with some basics: the difference between the hype and reality of hydrogen.

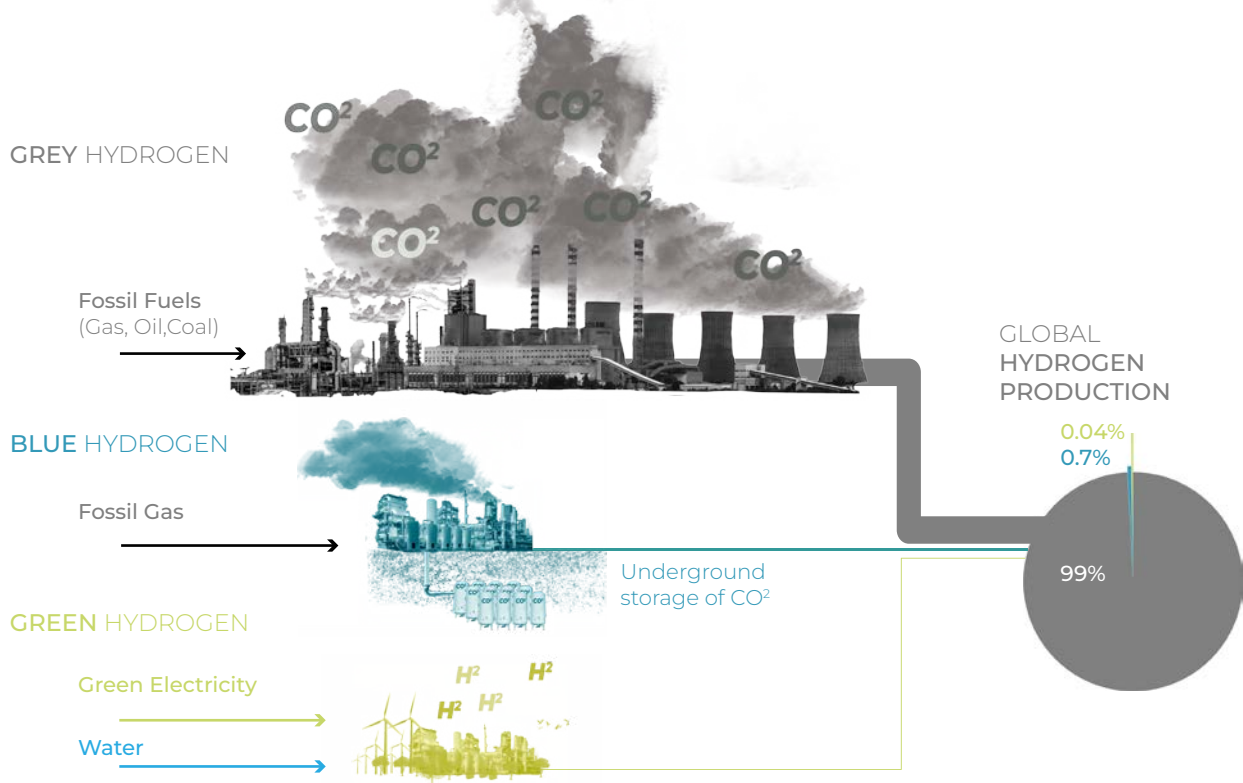


Beware the hype: hydrogen's dirty truths

Germany and the EU have been hyping hydrogen for years, promoting it as the centrepiece of a climate-neutral economy. Think for example about steel production, which could become less polluting if hydrogen was burned instead of coal, or imagine decarbonising shipping or aviation. As German Chancellor Olaf Scholz claims: "Hydrogen technologies determine the success of the energy transition and thus the entire transformation of our economy towards climate neutrality."¹¹ Media outlets sometimes call hydrogen the "green miracle gas".¹²

But this rhetoric ignores a key fact: today, 99 per cent of globally produced hydrogen is made from fossil fuels – the largest contributor to greenhouse gas emissions and thus to the climate crisis. Amongst other things, this so-called 'grey' hydrogen is used for making ammonia fertilisers and chemicals like methanol. Shockingly, hydrogen production was responsible for over 900 million tonnes of carbon dioxide (CO₂) emissions in 2021.¹³ This is significantly more than the CO₂ that was emitted by the entire German economy that same year (675 million tonnes).¹⁴

THE REALITY OF TODAY'S GLOBAL HYDROGEN PRODUCTION



Then there is 'blue' hydrogen, which is also produced from fossils, mostly gas. In 2021, it accounted for 0.7 per cent of global hydrogen production.¹⁵ To create blue hydrogen, CO₂ emissions from the production process are captured and stored underground, which is why it is often described as a 'low-carbon' gas. But this framing ignores several dirty truths, including the fact that blue hydrogen's total greenhouse gas emissions, which include methane, are only moderately lower than those of grey hydrogen (see box).

The dirty truth about CCS and blue hydrogen

Blue hydrogen is produced from fossils, mostly gas. But unlike during the creation of grey hydrogen, CO₂ emissions from the production process for blue hydrogen are captured and stored underground. This is called CCS: 'carbon capture and storage'. If the captured CO₂ is used further, it is called 'carbon capture, utilisation and storage' (CCUS).

Due to this storing away of atmospheric CO₂, blue hydrogen is often described as a low-carbon, low-emission or even CO₂-neutral gas. But this framing ignores three inconvenient truths:

- CCUS includes 'enhanced oil recovery' (EOR), which entails injecting **the captured carbon into depleted oil and gas fields in order to pump out – and ultimately burn – previously unextractable fossils**. Nearly three-quarters of all globally captured carbon is used for EOR, resulting in even more emissions.¹⁶

- Even without enhanced oil recovery, **emissions from blue hydrogen are only moderately lower than emissions from grey hydrogen**. There are two reasons for this: first of all, CCS technologies can only capture a fraction of the produced CO₂; and furthermore, a great amount of additional gas is used to power the technology, leading to increased methane emissions. Methane is a powerful greenhouse gas that increases global warming many times more than CO₂ emissions. It escapes when fossil gas is extracted and transported. When all CO₂ and methane emissions are added up, including the upstream ones that occur prior to the CCS process, the climate footprint of blue hydrogen is "more than 20 percent greater than burning natural gas or coal" directly, according to the calculations of US

scientists Robert Howarth and Mark Jacobson.¹⁷ "Hydrogen from fossil gas is a terrible idea," they conclude.¹⁸

- Even though the industry has been developing CCS/CCUS for 50 years thanks to generous public subsidies, **there are hardly any real-world projects**. According to the International Energy Agency there are just 35 commercial CCUS projects globally.¹⁹ These projects currently capture 45 million tonnes of CO₂ a year, and this is projected to rise to 220 million tonnes in 2030.²⁰ This is just 0.6 per cent of the 36.6 billion tonnes of CO₂ emitted from fossil fuels in 2022.²¹ CCS turns out to be an empty – and expensive – promise.

In short, CCS/CCUS and blue hydrogen are expensive greenwashing exercises designed to actually drive up the consumption of coal, oil and gas, rather than phasing them out.²²

Finally, there is 'green' hydrogen, produced through a process called water electrolysis that uses electricity to split water into hydrogen and oxygen. If the electricity is derived from renewable energy sources like sunlight or wind, the hydrogen is considered 'green'. In 2021, only 0.04 per cent of globally produced hydrogen was produced with water electrolysis, according to the International Energy Agency.²³

“The fossil fuel industry is lobbying heavily for the production of hydrogen. Because they know that in the short to mid-term most of the hydrogen that will be produced will be grey or blue, coming from gas.”

Hamza Hamouchene | North Africa Programme Coordinator at the Transnational Institute²⁴

In short, green hydrogen is very rare – and will continue to be so for some time. This is one reason why more and more experts warn that “overhyping hydrogen [...] risks endangering net-zero goals” as the leading science journal *Nature* put it in November 2022.²⁵ An intensely heightened demand for hydrogen will likely lead to the higher consumption of grey and blue hydrogen produced from fossil fuels; this has been shown to have an even worse carbon balance than the 'traditional' burning of coal, oil and gas.²⁶

Green hydrogen: the not-so-holy Holy Grail of the energy transition

But even green hydrogen, with its squeaky clean image, comes with significant limitations, challenges and risks:

- **Energy losses.** Green hydrogen contains only around 70 per cent of the renewable energy needed to produce it – the other 30 per cent is lost in the electrolysis process. Additional energy losses occur when hydrogen is converted into ammonia for fertilisers, for example, or when it is liquified for transport or converted back into electricity.²⁷ Concretely, this is why around five times as many wind farms are required to drive cars that run on hydrogen-based e-fuels than are needed for the same amount of battery-powered electric cars.²⁸ Wasting scarce renewable energy capacity on hydrogen use could lead to higher emissions overall when fossil fuel power plants are fired up to fill the resulting gaps in the electricity grid.
- **Hydrogen is a powerful indirect greenhouse gas.** Studies show that hydrogen has a bigger indirect climate impact than CO₂. When it reacts with other greenhouse gases in the atmosphere – for example methane – hydrogen increases their global warming potential.²⁹ This means that any leakage of hydrogen will fuel the climate crisis – no matter how it has been produced.
- **The adoption of hydrogen risks the delaying of action to structurally decarbonise the economy.** The hype around green hydrogen siphons funds and attention away from the structural changes needed to tackle the climate crisis: for example, increasing the energy efficiency of buildings (rather than heating homes inefficiently with hydrogen); transitioning to agroecological farming (rather than just greening synthetic fertilisers); and reducing traffic (instead of wasting energy on hydrogen-powered cars). Destructive industries like fossil fuels and aviation can also use the hydrogen hype for greenwashing rather than for actually shrinking their dirty businesses.

- **Green grabbing.** The production of green hydrogen requires vast amounts of resources: land, water and renewable energy. This can fuel land-use and water conflicts, human rights violations, energy poverty and the delay of the de-carbonisation of the electricity grid in producer countries. (See the chapter on the Global South's looming green hydrogen curse for these and other socio-economic and ecological risks).
- **Green hydrogen works as a Trojan Horse to prolong fossil fuels.** With unrealistically high targets for the use of green hydrogen, demand for the gas is likely to outstrip supply, allowing grey and blue hydrogen from fossil fuels to fill the gap.

The German Advisory Council on the Environment, an expert advisory body to the government, has thus warned against considering hydrogen as the solution for the climate crisis. Hydrogen “cannot play an overarching role, but rather a complementary one,” the Council stated in 2021.³⁰ In their 2022 report, the scientists on the Intergovernmental Panel on Climate Change (IPCC) also envisioned a relatively small climate change mitigation role for hydrogen.³¹

“Hydrogen is just an excuse to continue using fossil fuels.”

Claudia Kemfert | Climate economist and deputy chair of the German Advisory Council on the Environment ³²

Why then does hydrogen enjoy such a privileged position in German politics today? Part of the answer is big business. Decarbonisation presents an existential risk to German corporations, be they automakers, aircraft manufacturers or energy companies. The phasing out of fossil fuels means that their pipelines, power plants, airports, combustion engines and so on are at risk of becoming stranded assets with little to no value. For these industries, hyping hydrogen is the way out: it protects their polluting assets and delays meaningful action to decarbonise the economy.

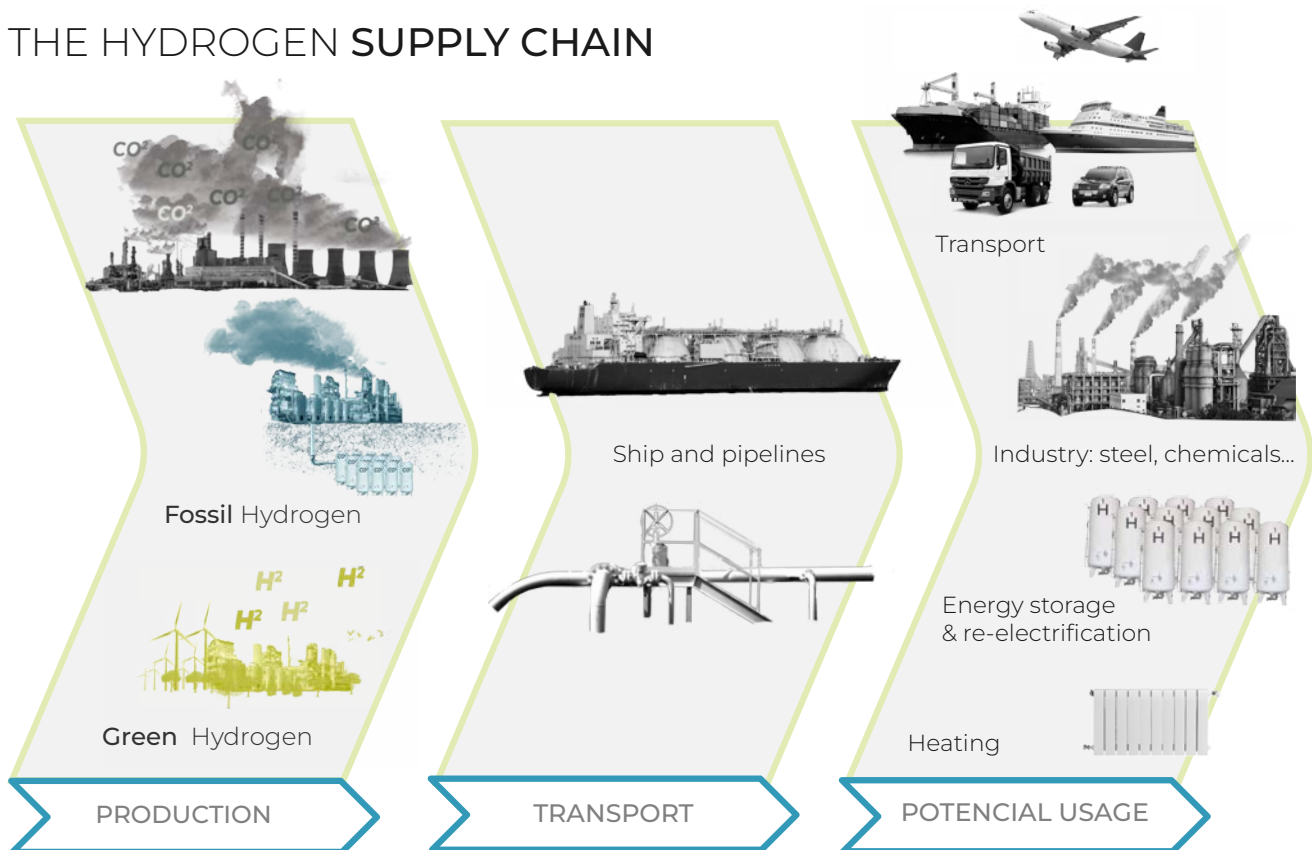


Meet Germany's hydrogen lobby

Behind Germany's hydrogen dash lies a broad network of companies, industry associations and consultancies. Many of them are from or have ties to the fossil fuel and other polluting industries, and are jumping on the hydrogen bandwagon to lock in harmful infrastructure as well as production and consumption models. There is a great deal of vertical integration in this market, and some companies are engaged in several parts of the hydrogen supply chain. At the same time, there are several clusters in the hydrogen lobby worth paying attention to:

- Fossil hydrogen producers:** Currently, 99 per cent of global hydrogen is produced from fossil fuels. With the awareness that hydrogen will be mostly fossil-based in the years to come, today's producers and their fossil suppliers have hyped hydrogen as a silver bullet solution for the climate crisis in order to ramp up business. They have also branded blue hydrogen from fossil gas as a 'low carbon' bridge to cleaner hydrogen in the future, de facto continuing gas extraction and accepting public funding to this end. Corporate examples include American-German company Linde (the world's biggest hydrogen pro-

THE HYDROGEN SUPPLY CHAIN



ducer), Wintershall Dea (Germany's largest oil and gas firm, and also the biggest fossil producer in the Arctic) and global fossil fuel majors like BP and Norway's Equinor.

- **Plant and technology manufacturers:** Engineering companies like Siemens and Thyssenkrupp manufacture components for gas pipelines as well as the electrolyser plants that produce green hydrogen. Companies including Schaeffler and MAN Energy Solutions (a subsidiary of car giant Volkswagen) produce components for the electrolyser industry as well as hydrogen-powered engines. While there are some small and green companies active in this market, many have a pretty dirty track record. Steel giant Thyssenkrupp, for example, is responsible for nearly 3 per cent of Germany's greenhouse gas emissions.³³
- **Gas transporters:** The builders and operators of Germany's gas infrastructure want to extend its lifespan, claiming that it will later be used for hydrogen. And they want to build even more pipelines, import terminals and gas storage facilities. These actors include the operators of long-distance transmission grids (like Open Grid Europe, ONTRAS and Thyssengas), gas storage operators (such as Uniper, Equinor, EWE and VNG) and the companies delivering gas to households and other end users (public and private utilities like E.ON, RWE and Westenergie). This component of the hydrogen lobby also includes the shipping industry, port operators and the companies behind liquified natural gas (LNG) import terminals (including Uniper, RWE and Gasunie from the Netherlands).
- **Hydrogen users – industry:** Germany's industrial giants use massive amounts of fossil gas and hydrogen to create other products. They place their bets on green and other allegedly 'low carbon' forms of hydrogen to decarbonise their industries. Examples include steel companies like Thyssenkrupp and Salzgitter as well as the chemical sector (Germany's biggest consumer of fossil hydrogen³⁴), which includes companies like BASF.
- **Hydrogen users – utilities:** Uniper, E.ON, EnBW (Energie Baden-Württemberg) and other electricity producers are betting on hydrogen – not only to keep their gas-fired power stations and related infrastructure in business but to expand them further. How? By claiming that they will initially blend hydrogen with fossil gas before making the full switch to hydrogen down the road. However, the International Renewable Energy Agency (IRENA) and many other experts warn that blending hydrogen into the existing gas grid will be costly and impractical.³⁵
- **Hydrogen users – transport:** Several players in the transport sector position hydrogen as a fuel that will reduce emissions, particularly for the long-distance transport of heavy goods. This includes car and truck makers like Daimler Truck, shipping companies like Laeisz, rail freight company Deutsche Bahn Cargo and airlines such as Lufthansa.

Airport operators such as Fraport in Frankfurt and ports including Hamburg and Rotterdam are also active hydrogen lobbyists.

- **Hydrogen users – real estate and heating:** In order to avoid insulating energy-inefficient houses, the real estate lobby is promoting the decarbonisation of the building stock by heating homes with hydrogen. This strategy is supported by gas utilities such as E.ON (keen to keep profiting from its gas grids) and gas boiler companies like Viessmann (known for its greenwashing of boilers that burn fossil gas with hydrogen labels). Numerous studies show that hydrogen is not fit for heating, as it is very costly and energy inefficient.³⁶ One study found that powering boilers with green hydrogen would use six times more electricity than the powering of heat pumps.³⁷

“Hydrogen raises hopes in many industries that they can continue their business with a few minor changes.”

Nina Katzemich | Lobbycontrol³⁸

There is thus a broad alliance of different capital fractions rallying behind ‘project hydrogen’. According to the consultancy Guidehouse, “over 100 German companies are well-positioned along the value chain for green hydrogen”.³⁹ These companies employ hundreds of lobbyists and spend millions on influencing German politics. Chemical giant BASF, for example, a large user and producer of fossil hydrogen, had a lobby budget of €3.8 million in 2021 and employs 24 lobbyists.⁴⁰ This magnitude of lobby power allows the company to follow and influence the complex twists and turns of the regulatory process and secure lobby meetings with key decision makers. From December 2021 to September 2022, BASF met at least 35 times with high-ranking officials from the German government to discuss gas issues, including hydrogen.⁴¹

Revolving door lobbyists

Alongside these individual companies, dozens of German industry federations are also drumming up support for hydrogen. Examples include the engineering lobby group VDMA (lobby budget €4.3 million; 93 lobbyists⁴²) and the BDEW, the German Association of Energy and Water Industries (lobby budget €7.1 million; 51 lobbyists⁴³). The BDEW is Germany’s largest energy association, representing over 1,900 companies – from RWE to the German branch of French multinational Engie.⁴⁴ Its members are responsible for 90 per cent of fossil gas sales in Germany.⁴⁵ The lobby group enjoys first-rate access to the German government, in particular the Ministry for Economic Affairs and Climate Action led by Robert Habeck from the Greens. From December 2021 to September 2022, he and other leading officials met 54 times with BDEW lobbyists to discuss hydrogen and other gas-related issues. Habeck’s party colleague Kerstin Andreae, a former member of Parliament who has been leading the BDEW since 2019, was almost always present.⁴⁶

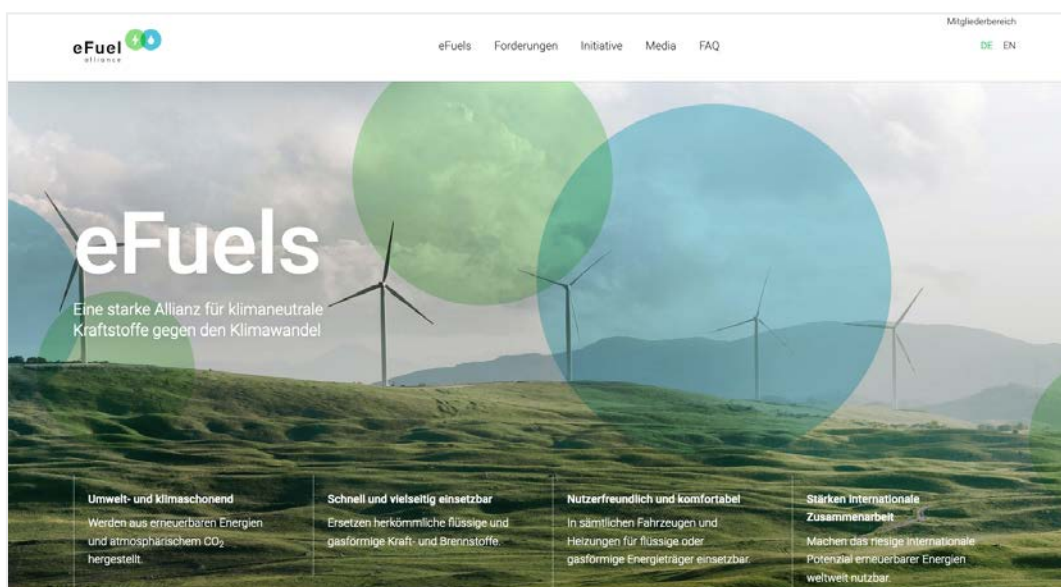
Hiring ex-politicians – who gained invaluable insider knowledge and contacts while in public office before entering the revolving door – is an important tactic for the hydrogen lobby. Take the example of Stefan Kaufmann, now an advisor to and lobbyist for Thyssenkrupp; before joining the steel giant in August 2022, Kaufmann, a former parliamentarian from the conservative CDU, was the government's 'innovation commissioner' for hydrogen. He attended the meetings of state secretaries from all the different ministries dealing with hydrogen⁴⁷ – a particularly powerful convergence in German hydrogen politics. "Mr. Hydrogen of the German government," as the industry called Kaufmann,⁴⁸ also jetted to Australia and Namibia among other places to prepare research grants and to set up partnerships.⁴⁹ Thyssen, which receives lavish public funds for hydrogen research and technology development,⁵⁰ is now able to cash in on Kaufmann's network and insider knowledge.

PR merchants and hired gun lobbyists

The lobby also invests heavily in public relations in order to influence decision makers and the public discourse about hydrogen. One particularly influential PR merchant is Future Gas (Zukunft Gas), which was more appropriately called Future Fossil Gas (Zukunft Erdgas) until late 2020. This PR and lobby group has nearly 130 members from the gas sector, amongst them associations like the BDEW and companies like Wintershall and Uniper.⁵¹ It is specialised in PR campaigns that target consumers in the greenwashing of fossil gas, for example promoting the (inefficient) use of hydrogen for heating homes and fuelling cars.⁵² "We make sure that gas is present in the minds of journalists, consumers, politicians and market partners," the PR group boasts.⁵³

And then there are the 'hired gun lobbyists': professional consultancies that lobby for corporations and design influence campaigns for them. While little is known about how they work their clients' messages into the public discourse and political decisions,

Screenshot of the website of the eFuelAlliance. Blue-green colours and alluring landscapes are used to greenwash the image of the alliance's polluting members, amongst them oil giant Exxon Mobil and car producer Mazda⁵⁴



they are clearly involved in hyping hydrogen. One example is the lobby consultancy of the former mayor of the city of Hamburg, Ole von Beust (CDU). His agency, Beust & Coll, runs several lobby platforms focusing on hydrogen.⁵⁵ The eFuel Alliance, for example, promotes the use of hydrogen-based fuels for more than 170 companies, many of them from the fossil fuel and automobile sectors. "Our goal is for eFuels to gain political acceptance and regulatory approval as a significant contributor to sustainable climate protection," the initiative explains.⁵⁶ E-fuels are produced in an energy-intensive process based on hydrogen and CO₂. They are considered too energy-inefficient to be a climate solution for cars, trucks and buses⁵⁷ – despite industry claims to the contrary.

World-EU-Germany: hydrogen lobbying on all levels

The hydrogen lobby is also active on the EU level, where hydrogen-focused lobby groups and initiatives have popped up like mushrooms. Their names include Hydrogen Europe (considered the most influential of them all) and Hydrogen Backbone Initiative (a coalition of gas grid operators lobbying for thousands of kilometres of new gas pipelines to transport hydrogen).⁵⁸ These groups are heavily populated by Germans; for example, nearly 90 of the 400 members of Hydrogen Europe are from Germany.⁵⁹ The lobby group's head, Jorgo Chatzimarkakis, who is considered to be the most influential hydrogen lobbyist at the EU level, used to be a Member of the European Parliament for the German Liberal party.⁶⁰

In addition, European and global hydrogen lobby heavyweights also show up in Germany. One example is PR giant FTI Consulting, notorious for promoting fossil fuel interests around the world and therefore also a key player in the push for hydrogen.⁶¹ The firm seems to be responsible for the PR around certain hydrogen projects run by German companies, for example, Hyphen in Namibia ([see box on page 27](#)).⁶² In November 2022, a long-term lobbyist from energy company Enertrag, which is part of the Hyphen consortium, joined the Berlin team of FTI Consulting to beef up the capacity of its energy team.⁶³



Letting polluters run the hydrogen show

Again and again, the German government has willingly helped the hydrogen lobby. Germany's 2020 hydrogen strategy, for example, which was released during the final term of Chancellor Angela Merkel (CDU), was developed in close cooperation with the fossil gas sector; other societal interests were as good as excluded. Only the determined resistance of the Ministry of the Environment prevented the strategy from providing a key role for blue hydrogen from fossil fuels.⁶⁴ This reflects a general trend in German politics, with the Ministry for Economic Affairs (at that time led by Merkel's party colleague Peter Altmaier) often intervening in domestic and EU policy decisions on behalf of Germany's biggest corporate players.⁶⁵

The current government of Social Democrats, Greens and Liberals appears to be continuing the tradition of granting privileged access to the gas lobby. In the first seven months after taking office in December 2021, Chancellor Olaf Scholz (SPD), Minister for Economic Affairs and Climate Action Robert Habeck (Greens), and other high-ranking government officials met with gas lobbyists on average once a day.⁶⁶

“It is a blessing that we have this Federal Ministry of Economic Affairs.”

Marie-Luise Wolff | President of energy lobby group BDEW, about Robert Habeck⁶⁷

The meeting list includes several behind-closed-door conversations about hydrogen, for example, between Habeck and lobbyists from RWE, or with RWE, Equinor and Wintershall Dea together. The list also features State Secretary Jörg Kukies, a former banking lobbyist and currently advisor to Chancellor Olaf Scholz. Amongst others, Kukies has talked hydrogen with the President of Siemens Energy; with Andrew Forrest, the Australian billionaire and founder of hydrogen company Fortescue Future Industries; with the CEO of MAN Energy Solutions; and with the CEO of US-based Air Products, one of the largest producers of fossil-based hydrogen today.⁶⁸ This supports what experts have told Corporate Europe Observatory in interviews: that “hydrogen is a matter for the boss” (“Chefsache”, in German), with an important role for the Chancellor's Office. And, of course, for big business.

Industry representatives appreciate the current government's craze for hydrogen and fossil gas and their privileged access. When Robert Habeck spoke at the annual congress of energy lobby group BDEW in June 2022, media reported that he was celebrated like a pop star. The head of Germany's largest and dirtiest energy company, Markus Krebber of RWE, praised the “superb impulse” that his industry

received from the government. The president of lobby group BDEW, which among others is lobbying for heating with fossil gas and new LNG terminals, was all praise: “It is a blessing that we have this Federal Ministry of Economic Affairs,” she said.⁶⁹

Corporate-government cosiness

Just how close public officials and corporate lobbyists can become, and how the latter are systematically invited to shape Germany’s stance on hydrogen, is revealed in internal documents from the German Ministry of Research and Education (released in response to a freedom of information request). When the Research Minister, Bettina Stark-Watzinger from the Liberal Party (FDP), travelled to Australia in May 2022, her ministry teamed up with German industry federation BDI and the National Academy of Science and Engineering (acatec) and invited several captains of industry to come along. “To further forge the German-Australian hydrogen partnership and fill it with life, we want to travel to Australia together with leading players in the German hydrogen industry,” Stark-Watzinger wrote to RWE, Shell, the Port of Rotterdam and others.⁷⁰ In Australia, the delegation met with banks and investors and Australian politicians and had exchanges with the minister. The group even composed and jointly chanted a song about hydrogen.

“The Hydrogen Song, composed especially for the trip, was also sung together.”

Report about the joint mission to Australia of Germany’s research minister and a business delegation⁷¹

A joint report by the Ministry, the BDI and acatec on the trip’s key “lessons for Germany” reads like a corporate wish list, calling for more public funds to encourage hydrogen imports from Australia and the expansion of Germany’s gas infrastructure, and paying no heed to the high costs and unclear feasibility of transporting hydrogen at long distances.⁷² The report argues: “Without the rapid and unbureaucratic development of terminals, pipelines into the hinterland and offtake industries, Germany will lose its credibility vis-à-vis Australia,” which it warns would make the country’s hydrogen “available to other countries”. It also suggests that Germany should adopt Australia’s “can-do spirit” on technology neutrality.⁷³ This is PR speech for promoting dirty hydrogen from fossil fuels as well as green hydrogen from renewables.

Hydrogen lobby co-drafts public funding instrument

The Ministry for Economic Development and Cooperation, another important player in Germany’s hydrogen quest abroad, also cultivates close relationships with the hydrogen lobby. In 2019, it created an industry-only forum, the Business Alliance for Energy (Unternehmensallianz Energie, now renamed the Business Alliance for Green Hydrogen). Its goal, according to an internal ministry report: “early involvement” of the industry in the ministry’s hydrogen strategy “to provide tailor-made instruments for the support of private-sector investments and projects” abroad.⁷⁴ Over 100 companies and associations from all over the value chain are involved – from Wintershall Dea and Shell to Lufthansa, and from the German industry federation BDI to the German Hydrogen and Fuel-Cell Association (DWV).⁷⁵

One “tailor-made” instrument for the industry that arose from the alliance is the funding scheme H2Global. This programme bridges the gap between the high costs at which green hydrogen is expected to be sold in the next years, and the lower price that buyers

will be prepared to pay. An intermediary will receive money from the German government to bridge the cost difference.⁷⁶ The government has allocated more than €4 billion to H2Global, following an initial endowment of €900 million.⁷⁷ German big business lobby group BDI had praise for the programme: "With initiatives like H2Global, the German government is on the right track."⁷⁸ The BDI knows well that H2Global will not only ensure hydrogen imports for German industry, but will also boost exports of German hydrogen technologies. As a result, the hydrogen consortia that Siemens, Thyssenkrupp and others have set up around the world over the past months (see chapter starting on page 24) will also likely benefit from H2Global auctions, which target producers outside the EU.

While more actors have been involved in developing H2Global, the Business Alliance for Energy and lobby group DWV appear to have played key roles. "I would like to thank you expressly for your commitment and the constructive cooperation with our Corporate Energy Alliance," a parliamentary state secretary at the Development Ministry wrote to DWV in 2021, commenting on the association's concept for what later became H2Global.⁷⁹ In essence, the hydrogen lobby has co-drafted a public funding scheme in order to fill its coffers.

Germany's Hydrogen Council: corporations in the lead

Another important body that is dominated by corporate lobbyists is the National Hydrogen Council, which was established during Angela Merkel's last term and advises the government on the implementation of the hydrogen strategy. Its 25 experts include 15 companies from across the hydrogen supply chain: gas company Linde, grid operator Open Grid Europe, car manufacturer Daimler Truck, chemicals producer Covestro – and the list goes on.⁸⁰ The Council's chair is Katherina Reiche of utility Westenergie, which is part of E.ON and operates 24,000 kilometres of gas pipelines in the west of Germany.⁸¹ Reiche, a former member of parliament from the CDU, has repeatedly stressed that she can achieve a lot through the Council.⁸²

GERMANY'S NATIONAL HYDROGEN COUNCIL

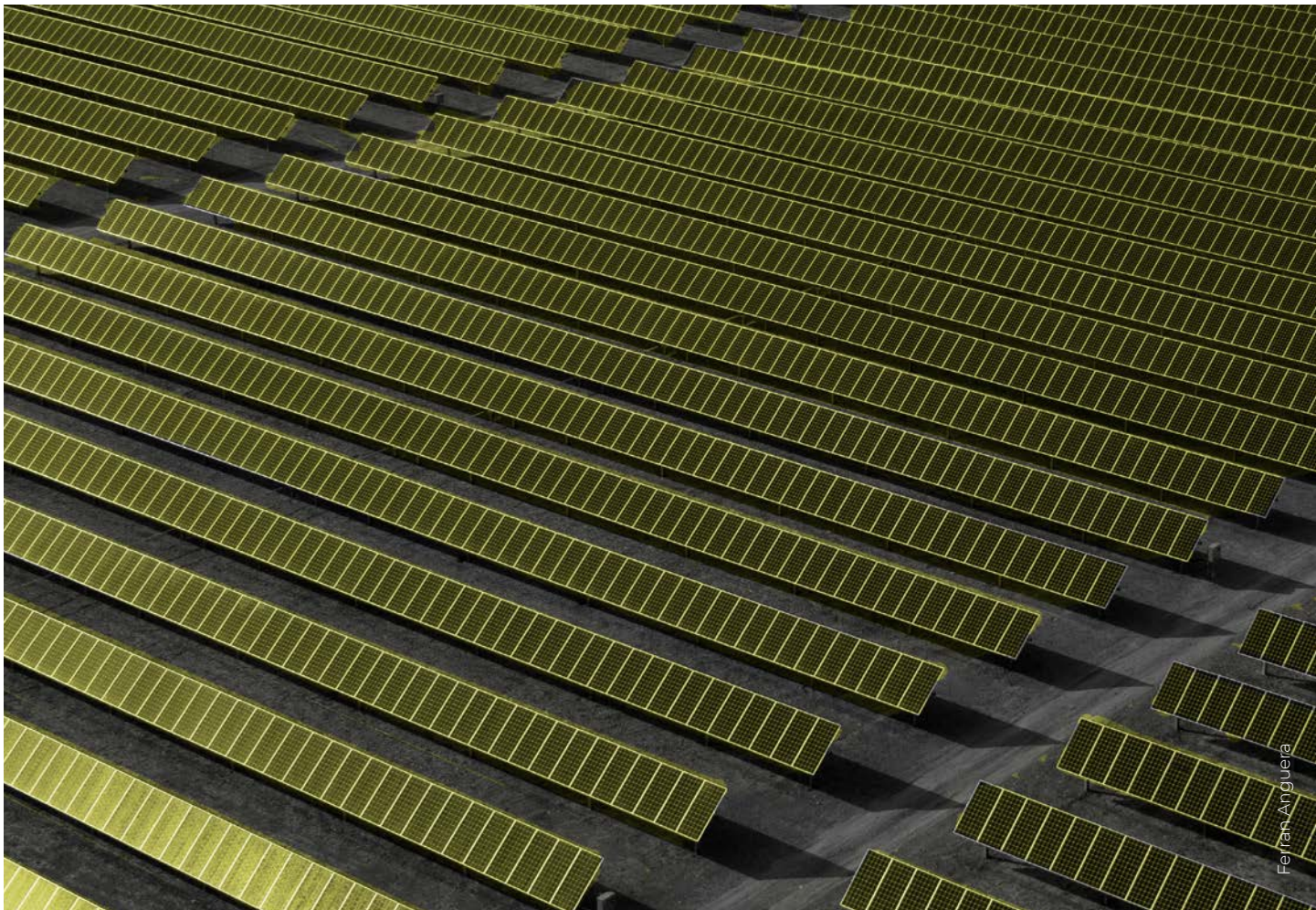


Source: Lobbycontrol⁸³

On the other hand, the two environmental NGOs on the Hydrogen Council – Friends of the Earth Germany (BUND) and Climate Alliance Germany (Klima-Allianz) – can always be overruled. There is a complete absence of global justice groups in the body, and its only trade union member, the Mining, Chemicals and Energy Industries Union (IG BCE), is notorious for resisting climate action and has developed a fossil-fuel-friendly hydrogen position together with the chemical industry lobby VCI. Both have called for a bigger role for blue hydrogen from fossil fuels in Germany's overall strategy.⁸⁴

A July 2021 report by the Hydrogen Council reflects these power imbalances, which allow the hydrogen lobby to simply assert its dominant position. When the Council called on the government to make blue hydrogen eligible for funding, all that environmental NGOs in the Council were able to do was to publish a dissenting vote.⁸⁵

Whereas the scientists on the Council, such as the representative of the Fraunhofer Institute for Wind Energy and Energy System Technology, supported the push for more blue hydrogen from fossil fuels, other academic positions are not represented there. The German Advisory Council on the Environment, for example, another government advisory body, is opposed to blue hydrogen: “Even for a transitional period, policy-makers should not support fossil-based hydrogen,” the scientists wrote in 2021.⁸⁶ They are well advised: when the full-cycle emissions of blue hydrogen are taken into account, it is dirtier than burning coal, gas and oil directly. It thus cannot be a climate-friendly ‘bridge technology’ into the future ([see box on page 10](#)).



Not a bridge, but the end point? Germany's shift towards blue hydrogen

At the time of writing, the German government was updating its hydrogen strategy from 2020. Whereas the former version contained loopholes for blue hydrogen, it stated a clear preference for green hydrogen. In January 2022, a state secretary from the Ministry of Economic Affairs continued to rule out government funding for anything but green hydrogen: "Whenever we put money on the table, it will be for green hydrogen," he said.⁸⁷

But the updated hydrogen strategy will crystallise the fossil U-turn that the hydrogen lobby has been pushing for all along. A leaked draft from February 2023 states that the German government sees "the need, until sufficient green hydrogen is available, to also use low-carbon hydrogen produced from [...] natural gas in combination with CCS". The leaked strategy also announces a "Hydrogen Acceleration Act" for 2023 and the speedy construction of new terminals and other port infrastructure to import the gas.⁸⁸

"That blue hydrogen made it into Germany's updated hydrogen strategy is one of the biggest wins of the hydrogen lobby in recent years."

Neelke Wagne | Climate Alliance Germany⁸⁹

"This is opening the floodgates," warned Constantin Zerger of environmental group Deutsche Umwelthilfe in a comment about Germany's wider fossil comeback after Russia's invasion of Ukraine. Decisions like the resurrection of coal-fired power plants, the approval of new gas import terminals and the promotion of hydrogen from fossil gas would place a "heavy burden" on the German energy transition, Zerger warned.⁹⁰

Scientists, too, have sounded alarm bells that in addition to directly increasing emissions, scaling up blue hydrogen will risk strengthening the lock-in of the fossil fuel economy. The CCS technology that it requires consists of entirely new infrastructure – capture plants, CO₂ transport pipelines, storage facilities – all linked to fossil fuel production sites. This will necessitate large capital investments, making it even harder to turn away from the fossil fuel energy system.⁹¹ "Government investment in these technologies is actually worse than doing nothing on climate change," a public policy think tank from Australia has warned.⁹²

And yet German taxpayer money will soon start flowing. A government proposal for the financial support of companies wanting to switch to “climate-neutral production processes” lists the use of blue hydrogen as one of the eligibility conditions for funding. A priority for green hydrogen is missing from the draft, which was proposed by the Ministry for Economic Affairs in December 2022 and is currently under discussion.⁹³ According to media reports, the funding programme “will be endowed with an amount in the middle double-digit billions”.⁹⁴ That is a heap of money for fossil hydrogen infrastructure.

Habeck's blue hydrogen shopping tour

When it comes to imports, Germany has already ‘gone blue’, for example in its partnership with Norway. In January 2023, both countries agreed on the delivery of blue hydrogen from Norway to Germany: “We will jointly plan the use of hydrogen produced from natural gas with Carbon Capture and Storage (blue hydrogen) for a transition period.”⁹⁵ Green hydrogen, they stated, would follow later. German RWE and Norwegian oil giant Equinor say they plan to build a new pipeline to transport the gas and store the CO₂ “under the seabed of Norway”.⁹⁶ Environmentalists from Germany and Norway have rejected the plans “as another roll backwards towards the fossil past,” stressing that: “Blue hydrogen goes hand in hand with natural gas production and fossil infrastructure and ties up money and resources that are then lacking in green technologies.”⁹⁷

“Mr. Habeck is doing a good job for Germany here.”

Martina Merz |CEO of Thyssenkrupp, who accompanied Habeck to the UAE and other Arab states⁹⁸

Another example is the United Arab Emirates (UAE). When Robert Habeck visited the country in March 2022, 22 major German companies were on board, including Linde, Siemens and Thyssenkrupp.⁹⁹ Several projects to deliver blue ammonia from the UAE to Germany were agreed upon (blue ammonia is made from nitrogen and fossil-based blue hydrogen, and is used for the fertiliser and other industries). When the first delivery from ADNOC (Abu Dhabi National Oil Company) arrived in Hamburg in October 2022, Habeck greeted the “low-carbon ammonia from the UAE”¹⁰⁰ rather enthusiastically. But according to news agency *Bloomberg*, ADNOC used the CO₂ that was captured during the production to extract even more fossil fuels with CCUS ([see box on page 10](#)).¹⁰¹ ADNOC is very open about its CCUS activities, which it wants to massively scale up to give “the UAE a major role in the emerging hydrogen market”.¹⁰²

Geography Professor Natalie Koch from the University of Heidelberg, who has researched the hydrogen agenda of the Gulf Cooperation Council, sees the “risk that hydrogen development in the region will become subject to a lock-in effect whereby blue hydrogen is not a bridge but the endpoint”. She argues that with the Gulf being “so far away from being able to produce green hydrogen,” the idea that hydrogen infrastructure needs to be ready when green hydrogen finally becomes a reality is highly problematic. It is worthwhile to quote her at length: “If the myth that blue hydrogen is a minor detour on the road to green hydrogen takes hold internationally [...] then these privileged [oil and gas] industries are especially well positioned to tap into their existing infrastructures to produce blue hydrogen for potentially decades. As energy insiders from around the world know, once the infrastructure is in place, path dependency has an astonishing power to keep people buying even after they realize that the myth of a ‘green’ future has been a lie all along.”¹⁰³

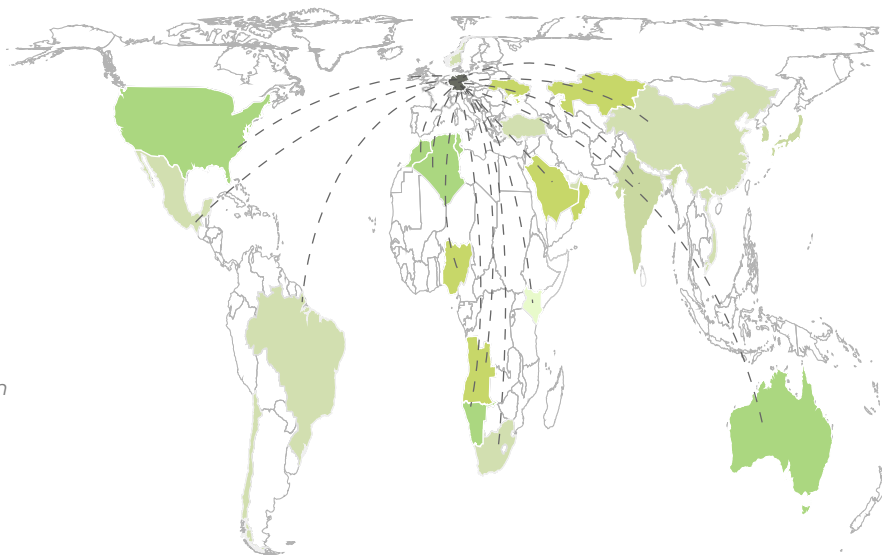
The Global South's looming green hydrogen curse

Germany plans to cover two-thirds of its projected future green hydrogen demand with imports, initially mostly in the form of derivatives like ammonia. In fact, Germany is set to become Europe's biggest importer of green hydrogen, with an estimated 60 to 70 per cent share of the future combined EU/UK import demand.¹⁰⁴ For months, German politicians have been touring the globe to sign deals with potential export countries (see map below). An import strategy is being prepared for 2023.

According to the government, Germany's envisioned imports of green hydrogen will also benefit the exporting countries. "The production of green hydrogen [...] provides new opportunities for economic development, especially for developing and emerging economies that have a wealth of renewable energy sources," claims the Ministry for Development. Economic diversification, energy security and job creation are also mentioned as benefits.¹⁰⁵ At the same time, the Germans have taken distance from any notion of energy imperialism. When Economy Minister Robert Habeck went on a hydrogen mission to Namibia in December 2022, he stated: "The last thing we can accept is a kind of new energy imperialism." Hydrogen exports to Germany should first and foremost benefit people in Namibia, he clarified.¹⁰⁶

GERMANY'S GLOBAL HYDROGEN QUEST

- Hydrogen alliances:
Algeria, Australia, Canada, Morocco, Namibia, Tunisia
- Hydrogen diplomacy offices and dialogues:
Angola, Nigeria, Saudi Arabia, Ukraine, Kazakhstan, Oman
- Energy partnerships and dialogues with hydrogen as a priority:
Brazil, Chile, China, India, Japan, Korea, Mexico, Norway, Qatar, South Africa, Turkey, United Arab Emirates, Vietnam
- Bilateral climate and development partnerships with hydrogen as a priority:
Kenya



Source: German government ¹⁰⁷

A closer look at Germany's plans for green hydrogen imports reveals a decidedly less equitable scenario. It follows centuries-old colonial patterns, where resources like land and water are appropriated for German industry while negative impacts like ecological damage and energy scarcity are conveniently outsourced. Even though many green hydrogen projects are in a relatively early planning stage and might not be operational for a decade (or may never even materialise), conflicts on the ground are already becoming apparent and could intensify over the next years.

Land-use conflicts and human rights violations. Wind and solar farms to feed hydrogen factories with renewable energy as well as ports and pipelines for hydrogen transport need vast areas of land. "When we talk about green hydrogen, we are talking about megaprojects, which will cover huge areas," explains an expert from the German Agency for International Cooperation (GIZ). This can lead to the displacement of communities and human rights violations. For example, Thyssenkrupp is building a huge hydrogen electrolyser to produce green hydrogen in Saudi Arabia's giga city Neom; repercussions to date have included the destruction of villages, the death by shooting of a local who protested the demolition, and the sentencing to death of other protestors (see box on page 26). In Boegoebaai, a planned port and export processing zone for green hydrogen in South Africa (for which feasibility studies seem to be supported by the German government),¹⁰⁸ around 160,000 hectares of land are set to be expropriated and land conflicts have already erupted.¹⁰⁹ In the Pecém Industrial and Port Complex in Brazil, where a subsidiary of gas multinational Linde is involved in a planned green hydrogen export hub, conflicts with Indigenous communities around land, water and environmental pollution have been reported for years.¹¹⁰

Water scarcity and conflicts. Many countries on Germany's global hydrogen map are among the most water stressed in the world, including the Gulf States, Morocco, Algeria and Tunisia.¹¹¹ Population growth and climate change are expected to worsen the problem. As electrolysis requires freshwater, its use for hydrogen production would signify an additional new demand. According to Fraunhofer ISI, one of several German research institutes that have looked into the likely effects of hydrogen exports, "depending on local conditions [...] distribution issues may arise, for example, to supply the local population with drinking water or to produce food".¹¹² Some communities in African and Latin American countries have therefore suggested that there should be no hydrogen production at all in areas with water stress.¹¹³

Case study: Thyssenkrupp and the dark side of Saudi Arabia's Neom project

In Neom, Saudi Arabia's controversial planned futuristic megacity, Thyssenkrupp will install a huge electrolyser to produce hydrogen, which will then be transformed into ammonia for export.¹¹⁴ Several thousand inhabitants from ancient tribes have already been forcibly evicted from their land to make way for Neom, which aims to become 33 times the size of New York City. Villages of the Howeitat tribe have been razed to the ground; some 150 Howeitat

“The hydrogen cooperation [between Germany and Saudi Arabia] is devastating both ecologically and in terms of human rights. The green hydrogen is [...] splashed with blood.”

Franziska Müller | Junior Professor for Globalisation and Climate Governance, University of Hamburg¹¹⁵

community members have been imprisoned due to their resistance to the eviction; and several have been sentenced to lengthy prison terms of up to 50 years or even death. In April 2020, one of the protestors, Abdul-Rahim al-Howeiti, was shot dead by security forces.¹¹⁶ “They killed him to set an example – anyone opening their mouth gets the same treatment,” commented Alia al-Howeiti, another member of the tribe and exiled activist. “Neom is being built on our blood, on our bones,” he added.¹¹⁷ Nonetheless, the 2021 German-Saudi Arabia hydrogen cooperation seeks to implement joint projects in Neom.¹¹⁸ To get the ball rolling, the German government has provided €1.5 million in support for the first Thyssenkrupp electrolyser plant at the site.¹¹⁹

Pollution of ocean ecosystems. Sea water desalination plants will be needed to obtain water for the production of green hydrogen in arid and semi-arid regions. In addition to their high energy consumption, these plants produce hefty amounts of residues that are often dumped into the sea where they cause ecological damage. In the Arab Gulf region, for example, the disposal of salty wastewater (brine) full of various chemicals is already considered a significant risk to local marine ecosystems, including protected ones.¹²⁰ Brine dumping and the damage this could inflict on communities has thus been raised as a major concern in potential hydrogen export countries such as Tunisia.¹²¹ When projects involve the construction of new mega ports, there are also concerns about the livelihoods of coastal fishing communities.¹²²

Will Germany import blood hydrogen from Congo?

In the Democratic Republic of Congo, the Australian Fortescue Future Industries company wants to produce green hydrogen with energy from controversial mega dams.¹²³ The Grand Inga hydroelectric project on the Congo River would be the world's largest.¹²⁴ Long opposed by civil society, it would displace tens of thousands of people and bring high environmental costs. German utility E.ON and chemical

firm Covestro have already committed to buying large quantities of Fortescue's hydrogen.¹²⁵ While the company claims that most of this gas will come from Australia, it also wants to consider “other planned global projects”.¹²⁶ In Argentina, another Fortescue hydrogen project has been accused of threatening Indigenous land rights and nature.¹²⁷

Energy poverty. Green hydrogen requires a great deal of renewable energy. For example, the wind and solar power capacity that is envisioned for the Boegoebaai project alone is significantly higher than the sum of all of South Africa's currently installed electricity capacity. In countries facing severe energy crises like South Africa, where energy shortages and poverty are on the rise, the use of electricity to produce hydrogen for export could worsen the situation. As Rainer Baake, the special envoy for Germany's energy cooperation with Southern Africa said during a side event at the UN climate talks in 2022: "In a country where during this year 25% of the hours there was no electricity for the people of South Africa, I think it is a little bit ridiculous to use the electricity from wind and solar to produce hydrogen derivatives for the European market."¹²⁸

"Why would you sell sunshine in the form of low-cost green hydrogen to Germany? Why not invest in low-cost renewable energy for the locals?"

Clyde Mallinson | Energy expert from South Africa¹²⁹

Delayed de-carbonisation and lock-in of fossil fuel energy generation. Many of Germany's hydrogen partners produce very little green energy. In the Gulf countries, less than 1 per cent of the electricity came from renewables in 2021 (with the exception of the United Arab Emirates, with around 5 per cent). Even in the pioneering renewable country Morocco, only 20 per cent of the electricity is renewable – compared to twice that amount in Germany.¹³⁰ There is a danger that the energy transition in hydrogen export countries will be slowed down as green electricity is used to produce hydrogen exports, while more fossil fuels are burned to cover local needs. Sebastian Vagt of the Friedrich Naumann Foundation in Morocco warns: "There is a risk that Germany will get green hydrogen from Morocco and become climate-neutral, but that Morocco will burn all the more coal and gas."¹³¹ Imane Boukhatem, an energy policy researcher, makes a similar point about Algeria, arguing that "it would be more logical and just to prioritize the local energy transition needs, as opposed [...] to exporting green hydrogen and consuming fossil fuels at home."¹³² According to German research institute Öko-Institut, green hydrogen production only makes sense when at least 75 per cent of a country's electricity comes from renewable sources – otherwise it leads to higher emissions than the direct burning of fossil fuels.¹³³

Case study: Enertrag, RWE and the Hyphen mega project in Namibia

On Namibia's southern coast, the Hyphen consortium, which includes German renewable energy company Enertrag, wants to build a mega wind and solar park to produce green ammonia for export.¹³⁴ RWE from Germany has already signed up as a major buyer.¹³⁵ The project's owners stress that they are committed to sustainable development and will improve power and water supply in the region. But environmental scientists have warned of negative consequences for the country's most biodiverse region, the Tsau Khaeb national park, where the project is located: "Germany is willing to make Namibia pay for the destruction of globally important ecosystems and biodiversity [...] instead

of addressing its energy problems at home," commented Chris Brown of the Namibian Chamber of Environment.¹³⁶ Regional politicians feel excluded from the process,¹³⁷ and a watchdog has sounded alarm bells over the non-transparent land tender process, the 40-year concession for the project, and dodgy investors in the consortium.¹³⁸ Germany is thinking about supporting the project through its state-backed development bank, KfW.¹³⁹ The park will be located in the same area where imperial Germany imprisoned Nama and Herero Indigenous communities in concentration camps and brutally exploited diamond mines at the start of the 20th century.¹⁴⁰

Financial risks. There is a danger that governments will assume the risk for green projects in the case that they fail; this is what happened at the world's largest solar plant in Ouarzazate, Morocco. This mega project, backed by the German government and German companies,¹⁴¹ has been recording an annual deficit of around €80 million – a loss that is being covered by the public purse.¹⁴² In the case of Hyphen (see box on the previous page), the Namibian government may get involved through the financing of up to 24 per cent of this gigantic hydrogen project, which has an estimated value of US\$9.4 billion.¹⁴³ With a GDP of just US\$12.31 billion¹⁴⁴ this risks significantly increasing the country's debt burden. At the same time, projects for the export of hydrogen are often located in so-called 'special economic zones' with tax breaks for corporations, which lowers the revenue share for the public coffers considerably.

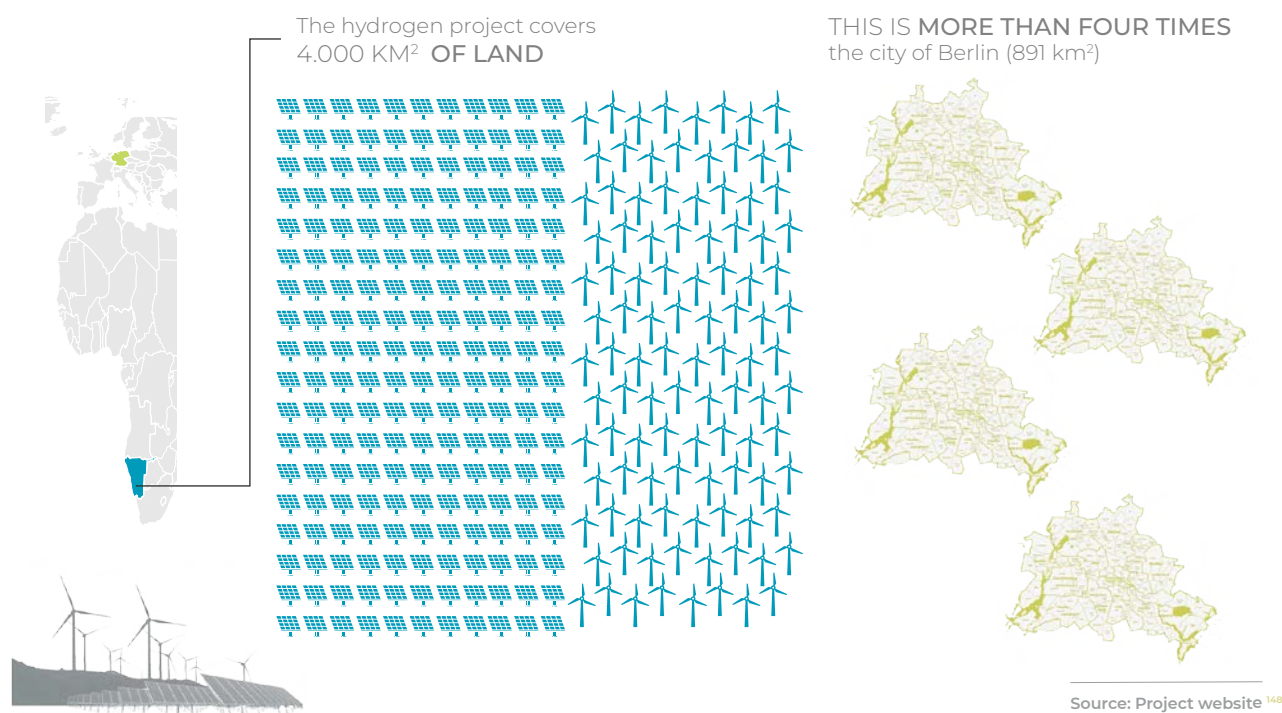
“Stop making decisions at the central level without consultation or real participation of the local communities.”

Carmen Espoz, Santo Tomás University in Santiago, Chile, on Chile's green hydrogen boom¹⁴⁵

Lack of civic participation and benefits to the wider public. Civil society in potential hydrogen export countries has criticised their governments' focus on centralised mega projects without the involvement of the local population. Tendering processes have been condemned as nontransparent, while local and regional politicians feel excluded from decisions (for example in Namibia's Hyphen project, see box on the previous page). “We have not come across a single hydrogen project with bottom-up participation and consultation of the community prior to the decision for the project,” say researchers Johanna Tunn and Tobias Kalt from the University of Hamburg.¹⁴⁶ Their research project¹⁴⁷ has mapped hydrogen projects in 27 countries, mostly in Africa. The bottom line is that a small group of political and economic elite is likely to profit from these top-down processes.

THE MASSIVE LAND NEEDS OF GREEN HYDROGEN PROJECTS

EXAMPLE: HYPHEN PROJECT IN NAMIBIA



Case study: Siemens, Porsche and the Haru Oni eFuels project in Chile

The Haru Oni project in Chile's Magallanes region produces hydrogen-based synthetic fuel to be shipped to Germany. It is run by a consortium including oil and gas giant ExxonMobil as well as the German Siemens company and luxury car maker Porsche. Chilean scientists have warned that the many wind farms required for the region's different green hydrogen projects (including one by RWE)¹⁴⁹ could "mean the sacrifice of migratory

routes of birds that are in danger of extinction". The scientists also fear that desalination plants and large ports could endanger rare species of dolphins and whales.¹⁵⁰ Porsche wants to use the gasoline in its sports cars, and makes the absurd claim that "classic and modern sports cars can be part of the solution to lower emissions".¹⁵¹ The German government provided Siemens with over €8 million for the project.¹⁵²

Legitimacy for repressive regimes. Several of the governments that are lined up to meet Germany's hydrogen demand are authoritarian. There is a risk that their human rights abuses could be whitewashed by such hydrogen partnerships with Germany. Whether in Saudi Arabia, Egypt or Algeria, these partnerships convey the message of proactive and positive cooperation, yet they are helping to reproduce fossil-based and authoritarian economic and political power structures in the name of sustainability.¹⁵³ In Morocco, a hydrogen boom could even reinforce the occupation of Western Sahara. With nearly half of its wind and solar energy to come from the occupied territories (with German-Spanish Siemens Gamesa as the key provider),¹⁵⁴ researcher Joanna Allan explains that "Morocco is making itself ever more dependent on the occupied Sahara for its energy needs." She explains that via exports, Morocco will then "implicate Europe and sub-Saharan countries as well in this colonial exploitation".¹⁵⁵

Will sustainability standards fix the problems?

Ultimately, is the Global North's hydrogen quest simply reinforcing a neo-colonial model, which has for centuries led to the dispossession of communities, environmental degradation and conflicts? Communities in the Global South are increasingly identifying this as a danger. German NGOs and parts of the scientific community have offered sustainability standards as the solution to counter the risks. Several NGOs and research institutes have written reports and position papers that include such draft standards, for example Climate Alliance Germany, the Rosa Luxemburg Foundation, the Heinrich Böll Foundation together with Bread for the World, the Öko Institut, and the Fraunhofer ISI.¹⁵⁶

Their work has been echoed by parts of the corporate hydrogen lobby, including Germany's industry-heavy Hydrogen Council.¹⁵⁷ More importantly, the German government, in close cooperation with industry, has developed detailed sustainability criteria for the H2Global funding scheme for green hydrogen exports to Europe. Exporters have to show that their operations are not close to environmentally sensitive areas; they must also invest in trainings for employees, follow International Labour Organisation standards, refrain from using drinking water in arid areas, and manage waste sustainably when desalination is used. They must also invest in kindergartens, schools or hospitals. Further, exporters "shall ensure" that no parts of the project "require Forced Resettlement" or that "Forced Resettlement has taken place at the site [...] within the three years preceding" the project.¹⁵⁸

The lobby battle around EU standards for green hydrogen

In a fierce lobby battle, Europe's hydrogen industry managed to cripple the EU's so-called 'additionality' rules for green hydrogen. Under these rules, the production of green hydrogen would have required the building of 'additional' new renewable energy installations – instead of just sucking up scarce existing capacities. In that way, the green electricity used for hydrogen would not be missing from the grid.

German and European hydrogen lobbyists successfully lobbied to weaken the rules, which the European Commission had formulated as part of the delegated acts to the Renewable Energy Directive. In 2021 and 2022, they bombarded the Commission and EU governments with scaremongering letters and sign-on statements. In December 2021, for example, a group of 22 mostly German corporations warned Commission President Ursula von der Leyen: "If the production criteria are interpreted and designed too rigidly, the ramp-up of the much needed green hydrogen market in the EU would be made significantly more difficult, more expensive and delayed by years." Amongst other things, the companies – RWE, Siemens Energy, Daimler Truck, Thyssenkrupp and many more – demanded a transition period and a 'grandfathering rule' to exempt certain hydrogen plants from additionality until 2030. "In the ongoing discussion, the European Commission needs to decide whether Europe is in the global race for hydrogen to win or to watch," the lobbyists warned.¹⁵⁹

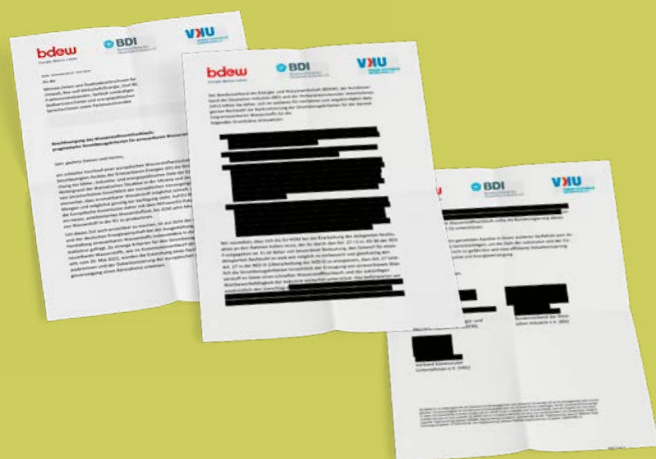
The German government sided with the lobbyists. In December 2021, State Secretary Patrick Graichen from the German Ministry of Economic Affairs wrote to the Commission: "More flexibility for the criteria of additionality of renewable electricity for the production of renewable hydrogen is needed, particularly in the market ramp-up phase." Although credible sustainability criteria were needed, Graichen argued that "during the market ramp-up phase, the emphasis should be more on favourable investment conditions".¹⁶⁰

The final delegated acts, which the Commission published in February 2023,¹⁶¹ cater for the wishes of the hydrogen lobby. They include a transition period, according to which additionality requirements will only apply from 2028 onwards. Hydrogen projects that are running by then will not be required to build any new renewable installations before 2038.

"I have to say that I find Germany very constructive."

Jorgo Chatzimarkakis | Lobby group Hydrogen Europe, on Germany's position on the delegated acts.¹⁶²

As this also applies to green hydrogen imports, it means that any electrolyser built anywhere in the world prior to 2028 can produce hydrogen considered 'renewable' in the EU, while using up scarce renewable energy from the communities' electricity grids. This risks driving the grid towards incorporating more fossil fuels to fill the gap, exacerbating climate change. The sucking up of scarce existing energy resources could also increase energy poverty on the ground.



Excerpt of one of many lobby letters on the delegated acts. The positions that the lobby groups urged the German government to pursue have been blackened out by the Ministry of Economic Affairs, which released the letter in response to an access to information request.¹⁶³

Importantly, these standards will apply to only a few select hydrogen projects that will benefit from H2Global funding. And how strictly they will be verified and enforced in practice is a whole different story (and currently still up in the air). The fact that both the German government and the country's big businesses have lobbied to water down legally binding standards for green hydrogen on the EU level ([see box on the previous page](#)) should give cause for concern about whether they are truly serious about a socially and ecologically just hydrogen economy.

Nonetheless, the H2Global standards suggest that the German state-industrial hydrogen complex is actively trying to create consent for hydrogen – including amongst communities in export countries as well as NGOs and the wider German public. The draft of the government's upcoming updated hydrogen strategy also mentions “good governance” standards as a planned measure “to increase the acceptance of projects”.¹⁶⁴

Germany first, global justice second

At the same time, communities in the South do not want to be fobbed off with such standards. “We don't need small little island pockets dotted around the continent, which do not become an integral part of our economy,” said Ulrich Steenkamp, an environmental justice activist from Johannesburg who is with Earthlife Africa, to German climate activists during a workshop on hydrogen in January 2023. “I'm not talking about hydrogen companies building clinics in regions without money for doctors and nurses. I'm talking about German car manufacturers building plants in South Africa that use green steel from green hydrogen and all of that has been produced here. I'm talking about actually amplifying the economic possibilities of the communities that will be impacted by hydrogen projects. And I'm talking about true community buy-in, based on public participation and free, prior and informed consent,” Steenkamp said.¹⁶⁵

Yet exactly this perspective is missing from Germany's ‘sustainable’ approach to hydrogen. Prior and informed consent of communities, for example, is absent from the otherwise detailed sustainability criteria of H2Global. There are neither requirements for the transfer of technology nor obligations for projects to be designed in such a way that producer countries will benefit from value creation along the full hydrogen production chain. These countries are meant to remain exporters of hydrogen and its derivatives – and not, for example, exporters of green steel. German chemical lobby group VCI and the chemical trade union made it crystal clear in their joint hydrogen position paper: “International cooperation and imports of energy carriers are important and rational, but they must not lead to the relocation of the value-adding stages of the value chain from Germany.”¹⁶⁶

This ‘Germany first’ approach is also reflected in the fact that the tender bids for H2Global – meant for hydrogen sellers from outside of the EU – have to be submitted in German, and suppliers must show that they have been present on the EU market for several years.¹⁶⁷

Climate colonialism going hydrogen

This supports the analysis of Algerian researcher-activist Hamza Hamouchene, who sees hydrogen projects in the Global South as “dictated from the outside with a huge push [...] for German or European corporations to lead these projects” and to gain the monopoly on related technologies.¹⁶⁸ This, he says, is climate colonialism: “The agenda is driven from the outside with the complicity of the ruling classes.”

Lucio Cuenca, director of the Latin American Observatory on Environmental Conflicts (OLCA) agrees: “History is repeating itself. It is an energy transition designed in the North without taking into account all its impacts, which again we countries in the South are paying for.” He adds: “The industrialised countries and the corporations want to present a solution to the climate crisis without changing their consumption patterns and production methods. But we must not leave the solution to the climate crisis to corporate power, because corporations always seek profit.”¹⁶⁹



Conclusion

The corporate-driven green hydrogen race unfolding in Germany and the EU follows centuries-old colonial patterns: resources are being appropriated to fuel Europe's economy, while negative impacts like ecological damage and land conflicts are conveniently outsourced to the periphery. In addition, German-European plans for a hydrogen economy aim to consolidate and reinforce corporate power structures, including a centralised energy system based on large infrastructure in the hands of a few powerful corporations.

But the hydrogen hype does not just fail when it comes to global justice and energy democracy. It also fails in its key promise: to help tackle the climate crisis. Through the de facto scaling up of fossil-based hydrogen for years to come, the hype around 'green' hydrogen will drive up emissions and deepen the lock-in of the fossil fuel economy. It also fails to address energy poverty in the midst of a cost-of-living crisis and exploding energy bills.

“The real question is: how can we build a society that consumes and lives within the sustainable boundaries of the planet? Hydrogen is not the answer and will never be. And no other technology will be either. The answer is much more holistic and touches on all aspects of the society.”

Imen Louati, Rosa Luxemburg Foundation, Tunis¹⁷⁰

It is therefore not surprising that big business and the fossil fuel industry love hydrogen. It protects their polluting assets and profits – and even provides false justification for their expansion. The hype also siphons funds and attention away from much needed climate action, which would bite into corporate profits. Hydrogen is a hoax that distracts from the real solutions, which include increasing the energy efficiency of buildings (rather than heating homes inefficiently with hydrogen), transitioning to agro-ecological farming (rather than just greening synthetic fertilisers) and reducing traffic (instead of wasting energy on hydrogen-powered cars).

It is time that climate and social justice movements stand up against the looming hydrogen colonialism of Germany and the EU and the damage that the whole scheme will likely inflict on the planet.

Endnotes

1. ALQST (2022) Death sentences for men who refused to make way for Neom, *10 October*, <https://www.alqst.org/en/post/death-sentences-for-men-who-refused-to-make-way-for-neom>.
2. ALQST (2020) Open letter from NGOs calling on companies involved in Saudi Arabia's NEOM project to condemn human rights violations accompanying it, *2 June*, <https://www.alqst.org/ar/posts/431>.
3. Ali Al-Dailami (2022) Verrat am Jemen – Scholz-Besuch bei den Despoten vom Golf, *23 September*, <https://www.linksfraktion.de/presse/pressemitteilungen/detail/verrat-am-jemen-scholz-besuch-bei-den-despoten-vom-golf/>. Translation: Pia Eberhardt.
4. Quoted in: Nikolaus J. Kurmayer (2021) German hydrogen strategy under fire for sidestepping gas, Euractiv, *2 July 2021*, <https://www.euractiv.com/section/energy-environment/news/german-hydrogen-strategy-under-fire-for-sidestepping-gas/>.
5. Corporate Europe Observatory et al. (2020) The Hydrogen Hype: Gas Industry Fairy Tale or Climate Horror Story? https://corporateeurope.org/sites/default/files/2020-12/hydrogen-report-web-final_3.pdf. p. 36f.
6. European Commission (2022) REPowerEU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition, *18 May*, https://ec.europa.eu/commission/press-corner/detail/en/ip_22_3131.
7. According to the International Energy Agency, 94 million tonnes of hydrogen were produced in 2021, with a mere 0.04 per cent of total global production coming from water electrolysis. See: International Energy Agency (2022) Global Hydrogen Review 2022 *September*, <https://iea.blob.core.windows.net/assets/c5bc75b1-9e4d-460d-9056-6e8e626a11c4/GlobalHydrogenReview2022.pdf> p. 71.
8. European Hydrogen Backbone Initiative: <https://ehb.eu>.
9. International Energy Agency (2022) Hydrogen Supply, <https://www.iea.org/reports/hydrogen-supply>.
10. Guidehouse (2022) Covering Germany's green hydrogen demand: transport options for enabling imports, <https://guidehouse.com/-/media/www/site/insights/energy/2022/transport-options-for-covering-germanys-green-hydrogen-demand.pdf>, p.11.
11. Bundesregierung (2022) Rede von Bundeskanzler Olaf Scholz zur Festveranstaltung der Deutschen Akademie der Technikwissenschaften am 18. Oktober 2022 in Berlin, <https://www.bundesregierung.de/breg-de/service/bulletin/rede-von-bundeskanzler-olaf-scholz-2137650>, Translation: Pia Eberhardt.
12. ZDF (2022) Warum Wasserstoff ein Hoffnungsträger ist, *24 August*, <https://www.zdf.de/nachrichten/wirtschaft/wasserstoff-kanada-energiewende-100>. Translation: Pia Eberhardt.
13. International Energy Agency (2022), see endnote 7, p. 71f.
14. Statista (2023) Carbon dioxide emissions worldwide in 2010 and 2021, by select country, *6 February*, <https://www.statista.com/statistics/270499/CO2-emissions-in-selected-countries/>.
15. International Energy Agency (2022), see endnote 7, p. 71f.
16. Institute for Energy Economics and Financial Analysis (IEEFA) (2022) Carbon capture: a decarbonisation pipe dream, *1 September*, <https://ieefa.org/articles/carbon-capture-decarbonisation-pipe-dream>.
17. Robert Howarth and Mark Jacobson (2021) How green is blue hydrogen?, *Energy Science and Engineering*, *2021* : 9, <https://onlinelibrary.wiley.com/doi/full/10.1002/ese3.956>, p. 1676-1687.
18. Twitter post by Robert Howarth, *13 February 2023*, https://twitter.com/howarth_cornell/status/1625261385025310728.
19. International Energy Agency: Carbon capture, utilisation and storage, <https://www.iea.org/fuels-and-technologies/carbon-capture-utilisation-and-storage>. accessed on 6 March 2023.
20. Ibid.
21. World Economic Forum (2022) Analysis: Global CO2 emissions from fossil fuels hits record high in 2022, *11 November*, <https://www.weforum.org/agenda/2022/11/global-CO2-emissions-fossil-fuels-hit-record-2022/>.
22. CIEL: Carbon Capture and Storage (CCS): Frequently Asked Questions, <https://www.ciel.org/carbon-capture-and-storage-ccs-frequently-asked-questions/>.
23. International Energy Agency (2022), see endnote 7, p. 71f.
24. PowerShift (2022) Hydrogen for the energy transition – Green solution or neo-colonial sham? *29 November*, <https://www.youtube.com/watch?v=83ayrcneM5M> minute 18'13.
25. Nature Editorial (2022) Overhyping hydrogen as a fuel risks endangering net-zero goals, *16 November*, <https://www.nature.com/articles/d41586-022-03693-6>.
26. Robert Howarth and Mark Jacobson (2021), see endnote 17.
27. German Advisory Council on the Environment (2021) The role of hydrogen in climate protection: quality rather than quantity, https://www.umweltrat.de/SharedDocs/Downloads/EN/04_State-ments/2020_2024/2021_11_statement_hydrogen_in_climate_protection.pdf?__blob=publicationFile&v=2, p. 8.
28. Transport and Environment (2021) E-fuels: why e-fuels in cars make no economic or environmental sense, April, <https://www.transportenvironment.org/wp-content/uploads/2021/04/Efuels-in-cars-briefing-correction.pdf>.
29. Nicola Warwick et al. (2022) Atmospheric implications of increased hydrogen use, April, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1067144/atmospheric-implications-of-increased-hydrogen-use.pdf.
30. German Advisory Council on the Environment (2021), see endnote 27, p. 12.
31. IPCC (2022) Climate Change 2022. Mitigation of Climate Change, https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf. The hydrogen-related findings are summarised here: Leigh Collins (2022) IPCC report: 'Clean hydrogen needed for net zero, but only where green electric solutions not feasible', Recharge, *6 April*, <https://www.recharge-news.com/energy-transition/ipcc-report-clean-hydrogen-needed-for-net-zero-but-only-where-green-electric-solutions-not-feasible/2-1-1197644>.

32. Nico Schmidt and Maria Maggiore (2020) Loopholes and lobbies: An explainer of the European Commission's Hydrogen strategy, Investigate Europe, 20 October, <https://www.investigate-europe.eu/en/2020/hydrogen-strategy-explainer/>
33. Manager Magazin (2022) Thyssenkrupp beschließt Bau der größten Anlage für CO₂-armen Stahl, 9 September, <https://www.manager-magazin.de/unternehmen/industrie/thyssenkrupp-beschliesst-bau-der-groessten-anlage-fuer-CO2-armen-stahl-a-8a02369e-a55f-440e-8249-3808b9be2f77>.
34. VCI (2023) VCI Position Kompakt: Wasserstoffstrategie, 26 January, <https://www.vci.de/ergaenzende-downloads/vci-position-kompakt-wasserstoffstrategie.pdf>
35. Michael Mazengarb (2022) Costly and impractical: IRENA warns against hydrogen blending in gas networks, Renew Economy, 6 May, <https://reneweconomy.com.au/costly-and-impractical-irena-warns-against-hydrogen-blending-in-gas-networks/>
36. Jan Rosenow (2022) Is heating homes with hydrogen all but a pipe dream? An evidence review, *Joule*, http://www.janrosenow.com/uploads/4/7/1/2/4712328/is_heating_homes_with_hydrogen_all_but_a_pipe_dream_final.pdf
37. David Cebon (2022) Hydrogen for heating? A comparison with heat pumps, 15 April, <https://h2sciencecoalition.com/blog/hydrogen-for-heating-a-comparison-with-heat-pumps-part-1/>
38. Nina Katzemich (2021) Wasserstoff: Der Stoff, aus dem die Träume der Gaslobby sind, 29 January <https://www.lobbycontrol.de/lobbyismus-und-klima/wasserstoff-der-stoff-aus-dem-die-traeume-der-gaslobby-sind-84977/>. Translation: Pia Eberhardt.
39. Guidehouse (2022), see endnote 10, p. 21.
40. German lobby register: BASF SE, <https://www.lobbyregister.bundestag.de/suche/R002326>, accessed on 6 March 2023.
41. Based on: Deutscher Bundestag (2022) Antwort der Bundesregierung. Möglicher Einfluss der Gas-Lobby auf die Bundesregierung, Drucksache 20/3927, 11 October, <https://dserver.bundestag.de/btd/20/039/2003927.pdf>. Analysed by: Lobbycontrol (2023) Pipelines in die Politik. Die Macht der Gaslobby in Deutschland, <https://www.lobbycontrol.de/wp-content/uploads/gaslobby-studie-lobbycontrol.pdf>. p. 83
42. German lobby register: Verband Deutscher Maschinen- und Anlagenbau e.V. (VDMA e.V.), https://www.lobbyregister.bundestag.de/suche/R000802/15240?backUrl=%2Fsuche%3Fq%3DVD-MA%26pageSize%3D10%26filter%255BactiveLobbyist%255D%255Btrue%255D%3Dtrue%26sort%3DRELEVANCE_DESC, accessed on 6 March 2023
43. German lobby register: BDEW Bundesverband der Energie- und Wasserwirtschaft e.V., https://www.lobbyregister.bundestag.de/suche/R000888/17066?backUrl=%2Fsuche%3Fq%3DB-DEW%26pageSize%3D10%26filter%255BactiveLobbyist%255D%255Btrue%255D%3Dtrue%26sort%3DRELEVANCE_DESC, accessed on 6 March 2023.
44. BDEW: Mitgliederübersicht, <https://www.bdew.de/verband/mitglieder/mitgliederuebersicht/> accessed on 14 March 2023.
45. BDEW: Mitglieder, <https://www.bdew.de/verband/mitglieder/> accessed on 14 March 2023.
46. Based on: Deutscher Bundestag (2022), see endnote 41. Analysed by: Lobbycontrol (2023), see endnote 41, p. 83.
47. Stefan Kaufmann: Wasserstoff, https://stefan-kaufmann.de/?page_id=20196
48. Zukunft Gas (2021) Spotlight Energiepolitik: Dr. Timm Kehler im Dialog mit Dr. Stefan Kaufmann, 14 September, <https://www.youtube.com/watch?v=AsnGMIEwJzs> minute 5'18. Translation: Pia Eberhardt.
49. This is visible in several twitter posts by Stefan Kaufmann, <https://twitter.com/StefanKaufmann>
50. See, for example: German lobby register: thyssenkrupp Industrial Solutions, https://www.lobbyregister.bundestag.de/suche/R001024/6104?backUrl=%2Fsuche%3Fq%3DThyssen%26pageSize%3D10%26filter%255BactiveLobbyist%255D%255Btrue%255D%3Dtrue%26sort%3DRELEVANCE_DESC.
51. Zukunft Gas: Mitglieder von Zukunft Gas, <https://gas.info/verband-zukunft-gas/mitglieder> accessed on 14 March 2023.
52. Nina Katzemich (2021) „Zukunft Gas“: Wie ein PR-Lobbyverband der Gasindustrie die deutsche Klimapolitik verwässert, 27 July, <https://www.lobbycontrol.de/lobbyismus-und-klima/zukunft-gas-wie-ein-pr-lobbyverband-der-gasindustrie-die-deutsche-klimapolitik-verwaessert-89585/>.
53. Zukunft Gas: Zukunft Gas. Verbandsprofil, <https://gas.info/verband-zukunft-gas>. Translation: Pia Eberhardt.
54. Homepage of the eFuel Alliance: <https://www.efuel-alliance.eu/>
55. German lobby register: von Beust & Coll. Beratungsgesellschaft mbH & Co. KG, https://www.lobbyregister.bundestag.de/suche/R002027/17516?backUrl=%2Fsuche%3Fq%3DVon%2B-Beust%2526Coll%26pageSize%3D10%26filter%255BactiveLobbyist%255D%255Btrue%255D%3Dtrue%26sort%3DRELEVANCE_DESC accessed on 6 March 2023
56. eFuel Alliance: Initiative, <https://www.efuel-alliance.eu/initiative> accessed on 6 March 2023
57. Gero Rueter (2022) Batteries versus e-fuels: Which is better?, Deutsche Welle, 25 May <https://www.dw.com/en/batteries-versus-e-fuels-which-is-better/a-61921402>.
58. Corporate Europe Observatory et al. (2020), see endnote 5.
59. Hydrogen Europe: Meet our members, <https://hydrogeneurope.eu/membership/members-locations/>, accessed on 6 March 2023.
60. Hydrogen Central (2022) Hydrogen Europe, Jorgo Chatzimarkakis – in The Beginning, There was Hydrogen, 10 October, <https://hydrogen-central.com/hydrogen-europe-jorgo-chatzimarkakis-beginning-hydrogen/>
61. Corporate Europe Observatory et al. (2020), see endnote 5, p. 25.

62. Hyphen: Team and experts, <https://hyphenafrika.com/team-experts/> accessed on 6 March 2023.
63. Politik & Kommunikation (2022) FTI Consulting: Heider und Döring verstärken Standort Berlin, 14 November, <https://www.politik-kommunikation.de/personalwechsel/fti-consulting-heider-und-doering-verstaerken-standort-berlin/>.
64. This can be seen in the participants list of the only stakeholder conference that the government organised to get input into its hydrogen strategy (in November 2019): Übersicht der Teilnehmer:innen der "Wasserstoff und Energiewende Stakeholder-Konferenz zur nationalen Wasserstoffstrategie" am 5. November 2019, https://fragdenstaat.de/anfrage/teilnehmerinnen-der-gasstrategie-2030-und-der-wasserstoff-stakeholder-konferenz/686713/anhang/IFG_220218241295.pdf, p. 20ff. See also: Deutsche Umwelthilfe (2020) Love is in the air. Germany and the gas lobby, <https://corporateeurope.org/sites/default/files/2020-06/Corporate-lobbying-DE-presidency-web%20ENG.pdf>, p. 22.
65. Corporate Europe Observatory (2020) Tainted Love. Corporate Lobbying and the Upcoming EU Presidency, <https://corporateeurope.org/sites/default/files/2020-06/Corporate-lobbying-DE-presidency-web%20ENG.pdf>.
66. Based on: Deutscher Bundestag (2022), see endnote 41. Analysed by: Lobbycontrol (2023), see endnote 41, p. 82.
67. Hans-Christoph Neidlein (2022) Energiebranche baut auf Habeck, VDI Nachrichten, 3 June, *Translation: Pia Eberhardt*.
68. Deutscher Bundestag (2022), see endnote 41.
69. Hans-Christoph Neidlein (2022), see endnote 67.
70. BMBF (2022) Unterlagen zur Delegationsreise von BMBF, acatech und BDI nach Australien vom 23. Mai bis 1. Juni 2022, <https://fragdenstaat.de/anfrage/unterlagen-zu-lobbykontakten-7/760457/anhang/anlage-dokumente-geschwrzt.pdf>, p. 1-20.
Translation: Pia Eberhardt.
71. Ibid., p. 63 *Translation: Pia Eberhardt*
72. Michael Liebreich (2022) The Unbearable Lightness of Hydrogen, 12 December, <https://about.bnef.com/blog/liebreich-the-unbearable-lightness-of-hydrogen/>
73. BMBF (2022), see endnote 70, p. 64-66.
Translation: Pia Eberhardt.
74. BMZ (2022) Ergebnisprotokoll Dialogveranstaltung der Unternehmensallianz Energie, <https://fragdenstaat.de/anfrage/kontakte-mit-interessenvertreterinnen-zum-thema-wasserstoff/765875/anhang/anl-7-protokoll-dialogveranstaltung.pdf>, p. 3.
Translation: Pia Eberhardt.
75. BMZ: Treffen der Unternehmensallianz Energie 2021-2022 unter Beteiligung des BMZ, <https://fragdenstaat.de/anfrage/kontakte-mit-interessenvertreterinnen-zum-thema-wasserstoff/765875/anhang/aufliistung-der-treffen-zwischen-dem-ministerium-und-interessenvertreterinnen-zum-thema-wasserstoff.pdf>, p. 3-4.
76. H2 Global Stiftung: <https://www.h2-global.de/>.
77. Nikolaus J. Kurmayer (2022) Scholz ups global hydrogen ambitions, dwarfs EU initiative, Euractiv, 9 November, <https://www.euractiv.com/section/energy-environment/news/scholz-ups-global-hydrogen-ambitions-dwarfs-eu-initiative>.
78. BDI (2021) Gute Grundlage für Hochlauf einer Wasserstoffwirtschaft, 22 September, <https://bdi.eu/artikel/news/gute-grundlage-fuer-hochlauf-einer-wasserstoffwirtschaft-entlang-der-wertschoepfungskette/>. *Translation: Pia Eberhardt*.
79. DWV (2021) Wasserstoff für eine nachhaltige Energiewirtschaft, <https://www.dwv-info.de/wp-content/uploads/2021/02/20210128-DWV-Broschuere-einseitig-FINAL.pdf>, p. 24.
80. National Hydrogen Council: Members of the German National Hydrogen Council, <https://www.wasserstoffrat.de/en/national-hydrogen-council/members>, accessed on 7 March 2023.
81. Westenergie: Zahlen, Daten, Fakten, <https://www.westenergie.de/de/ueber-westenergie/zahlen-daten-fakten.html>, accessed on 7 March 2023.
82. Dietmar Student (2022) Wie Katherina Reiche Deutschlands Wasserstoffmission steuert, Manager Magazin, 5 October, <https://www.manager-magazin.de/unternehmen/energie/katherina-reiche-von-eon-und-westenergie-wie-sie-den-wasserstoff-nach-deutschland-bringen-will-a-8da2c97c-0002-0001-0000-000204564791>
83. Lobbycontrol (2023), see endnote 41, p. 89
84. IG BCE and VCI (2022) Gemeinsame Strategie von IG BCE und VCI zu einer Wasserstoffwirtschaft (Version 2.0), 7 June, <https://www.vci.de/ergaenzende-downloads/2022-06-07-ig-bce-vci-h2-strategie.pdf>.
85. National Hydrogen Council (2021) Hydrogen Action Plan Germany 2021 – 2025, https://www.wasserstoffrat.de/fileadmin/wasserstoffrat/media/Dokumente/EN/2021-07-02_NWR-Hydrogen_Action_Plan.pdf
86. German Advisory Council on the Environment (2021) Statement. The role of hydrogen in climate protection: quality rather than quantity, https://www.umweltrat.de/SharedDocs/Downloads/EN/04_Statements/2020_2024/2021_11_statement_hydrogen_in_climate_protection.html
87. Quoted in: Sören Amelang (2022) Germany may use blue hydrogen from Norway for transitional period – state secretary, Clean Energy Wire, 19 January, <https://www.cleanenergywire.org/news/germany-may-use-blue-hydrogen-norway-transitional-period-state-secretary>.
88. Überarbeiteter Entwurf für die Weiterentwicklung der Nationalen Wasserstoffstrategie (NWS) nach erfolgter Ressortabstimmung, 24 February 2023. On file with the author.
Translation: Pia Eberhardt.
89. Interview with Neelke Wagner, advisor for hydrogen, climate protection and heat transition at the Climate Alliance Germany, 8 February 2023.
90. Twitter post by Constantin Zerger, 21 December 2022, <https://twitter.com/ConstZerger/status/1605520584997277700>.
Translation: Pia Eberhardt

91. Shinichiro Asayama (2021) The Oxymoron of Carbon Dioxide Removal: Escaping Carbon Lock-In and yet Perpetuating the Fossil Status Quo?, *Frontiers in Climate*, 12 July, <https://www.frontiersin.org/articles/10.3389/fclim.2021.673515/full>.
92. Ben Oquist (2022) The era of the great carbon fraud is upon us, 19 March, <https://australiainstitute.org.au/post/the-era-of-the-great-carbon-fraud-is-upon-us/>.
93. BMWK (2022) Förderrichtlinie Klimaschutzverträge – FRL KSV, 23 December, https://www.bmwk.de/Redaktion/DE/Downloads/J-L/ksv-forderrichtlinie.pdf?__blob=publicationFile&v=18
94. Marcus Theurer (2022) Habeck macht Milliarden für blauen Wasserstoff und CO₂-Speicherung locker, *Frankfurter Allgemeine Zeitung*, 1 December, <https://www.faz.net/aktuell/wirtschaft/habeck-gibt-milliarden-fuer-blauen-wasserstoff-18503701.html>.
Translation: Pia Eberhardt
95. Norwegian Government (2023) Joint Statement - Germany – Norway – Hydrogen, 5 January, <https://www.regjeringen.no/en/whatsnew/dep/smk/press-releases/2023/closer-cooperation-between-norway-and-germany-to-develop-green-industry/joint-statement-germany-norway-hydrogen/id2958105/>
96. RWE: Hydrogen pipeline in the North Sea, <https://www.rwe.com/en/research-and-development/project-plans/hydrogen-pipeline-in-the-north-sea/> accessed on 7 March 2023.
97. Deutsche Umwelthilfe (2023) Habeck zu Besuch in Oslo: Deutsche Umwelthilfe und Friends of the Earth Norway fordern „fortschrittliche Energiepartnerschaft statt fossiler Rückwärtsrolle“, 5 January, <https://www.duh.de/presse/pressemitteilungen/pressemitteilung/habeck-zu-besuch-in-oslo-deutsche-umwelthilfe-und-friends-of-the-earth-norway-fordern-fortschritt/>
Translation: Pia Eberhardt
98. Quoted in: Jens Thurau (2022) From climate protector to energy manager, *Deutsche Welle*, 21 March <https://www.dw.com/en/germany-strikes-green-energy-deals-in-uae-and-qatar/a-61200327>
99. Focus Online (2022) Gas-Verhandlungen mit den Scheichs: Diese Firmen begleiten Habeck nach Katar, 22 March, https://www.focus.de/finanzen/news/hochrangige-wirtschafts-delegation-verhandlungen-ueber-gaslieferungen-diese-firmen-begleiteten-habeck-nach-katar_id_72211423.html
100. BMWK and Senatskanzlei Hamburg (2022) First hydrogen shipment from United Arab Emirates arrives in Hamburg, 21 October, <https://www.bmwk.de/Redaktion/EN/Pressemitteilungen/2022/10/20221021-first-hydrogen-shipment-from-united-arab-emirates-arrives-in-hamburg.html>. *Translation: Pia Eberhardt*
101. Verity Ratcliffe (2022) Europe Hunts for Clean Energy in the Middle East, but How Clean Is It?, *Bloomberg*, 28 September, <https://www.bloomberg.com/news/articles/2022-09-28/europe-s-blue-ammonia-cargoes-from-saudi-arabia-uae-won-t-be-carbon-free>.
102. ADNOC: Carbon Capture, Utilization and Storage (CCUS), <https://www.adnoc.ae/en/sustainability-and-energy-transition/energy-transition/carbon-capture-storage-and-utilization> accessed 7 March 2023.
103. Natalie Koch (2022) Gulf Hydrogen Horizons. Why are Gulf oil and gas producers so keen on hydrogen?, https://publications.iass-potsdam.de/rest/items/item_6002525_3/component/file_6002526/content p. 8f
104. Guidehouse (2022), see endnote 10, p. 11.
105. BMZ: Green hydrogen and Power-to-X products, <https://www.bmz.de/en/issues/green-hydrogen> accessed on 8 March 2023.
106. Benjamin Wehrmann (2022) Germany must avoid “energy-imperialism” in hydrogen deal with Namibia – minister, *Clean Energy Wire*, 6 December, <https://www.cleanenergywire.org/news/germany-must-avoid-energy-imperialism-hydrogen-deal-namibia-minister>.
107. BMWK: International cooperation on hydrogen, <https://www.bmwk.de/Navigation/EN/hydrogen/international-cooperation-on-hydrogen/international-cooperation-on-hydrogen.html>; Auswärtiges Amt: H2Diplo, <https://www.h2diplo.de/en/>;
- BMZ (2022) Deutschland unterstützt Kenia auf dem Weg zu 100 Prozent erneuerbarer Energie, 11 December, <https://www.bmz.de/de/aktuelles/aktuelle-meldungen/de-unterstuetzt-kenia-auf-weg-zu-100-prozent-erneuerbare-energie-135366>
108. Hydrogen Central (2022) Germany Provides EUR 12,5M Funding for Green Hydrogen Development in South Africa, 18 January, <https://hydrogen-central.com/germany-eur-125m-funding-green-hydrogen-development-south-africa/>
109. Tobias Kalt and Makoma Lekalakala (2022) The green hydrogen frontier – neocolonialism, greenwashing or just transition?, *Daily Maverick*, 9 December, <https://www.dailymaverick.co.za/article/2022-12-09-green-hydrogen-neocolonialism-greenwashing-or-just-transition/> Interview with Tobias Kalt, research associate at the University of Hamburg, Germany, 2 February 2023.
110. Christian Brannstrom and Adryane Gorayeb (2022) Geographical Implications of Brazil's Emerging Green Hydrogen Sector, *Journal of Latin American Geography*, May, <https://muse.jhu.edu/article/855961>
111. World Atlas: The 10 Most Water-Stressed Countries In The World, <https://www.equaltimes.org/the-saudi-government-wants-to?lang=en#Y9kCDRPM18M> accessed on 8 March 2023.
112. Fraunhofer ISI (2020) Opportunities and challenges when importing green hydrogen and synthesis products, https://www.isi.fraunhofer.de/content/dam/isi/dokumente/cce/2020/policy_brief_hydrogen.pdf p. 18
113. Brot für die Welt and Heinrich Böll Stiftung (2022) Green hydrogen: Key success criteria for sustainable trade & production, November, <https://www.boell.de/sites/default/files/2022-11/green-hydrogen.pdf> p. 37.
114. Thyssenkrupp (2021) One of the largest green hydrogen projects in the world: thyssenkrupp signs contract to install over 2GW electrolysis plant for Air Products in NEOM, 13 December, <https://www.thyssenkrupp.com/en/newsroom/press-releases/pressdetail-page/one-of-the-largest-green-hydrogen-projects-in-the-world-thyssenkrupp-signs-contract-to-install-over-2gw-electrolysis-plant-for-air-products-in-neom-124576>

115. Quoted in: MDR (2022) Das Problem mit grünem Wasserstoff aus Saudi-Arabien, 6 December, <https://www.mdr.de/nachrichten/deutschland/politik/deutschland-wasserstoff-saudi-arabien-menschenrechte-100.html> Translation: Pia Eberhardt.
116. Alessandra Bajec (2022) The Saudi government wants to build a 'city of the future' – is it really prepared to execute those that stand in its way?, Equal Times, 28 November, <https://www.equaltimes.org/the-saudi-government-wants-to?lang=en#Y9k-CDRPMI8M> Business and Human Rights Resource Centre (2022) Saudi Arabia: Al-Howeit land rights defenders jailed for 50 years after protesting displacement for Neom mega-project; incl. co. comment, 19 September <https://www.business-humanrights.org/en/latest-news/saudi-arabia-consultancy-cos-working-on-neom-project-accused-of-continuing-to-violate-land-rights-of-al-howeit-tribe-incl-co-comments/>
117. Ruth Michaelson (2020) 'It's being built on our blood': the true cost of Saudi Arabia's \$500bn megacity, The Guardian, 4 May, <https://www.theguardian.com/global-development/2020/may/04/its-being-built-on-our-blood-the-true-cost-of-saudi-arabia-5bn-mega-city-neom>.
118. BMWK (2021) Gemeinsame Absichtserklärung zwischen dem Ministerium für Energie des Königreichs Saudi-Arabien und dem Bundesministerium für Wirtschaft und Energie der Bundesrepublik Deutschland zur Zusammenarbeit im Bereich Wasserstoff, https://www.bmwk.de/Redaktion/DE/Downloads/M-O/memorandum-of-understanding-wasserstoff-saudi-arabien-und-deutschland.pdf?__blob=publicationFile&v=4.
119. Reuters (2020) Germany to contribute 1.5 mln euros to Thyssenkrupp's Saudi hydrogen plant, <https://www.nasdaq.com/articles/germany-to-contribute-1.5-mln-euros-to-thyssenkrupps-saudi-hydrogen-plant-2020-12-16>.
120. Mustafa Omerspahic et al. (2022) Characteristics of Desalination Brine and Its Impacts on Marine Chemistry and Health, With Emphasis on the Persian/Arabian Gulf: A Review, Frontiers in Marine Science, April, <https://www.frontiersin.org/articles/10.3389/fmars.2022.845113/full>
121. Heinrich Böll Stiftung Tunisi et al. (2022) Who benefits from Tunisia's Green Hydrogen Strategy?, December, <https://tn.boell.org/en/2022/12/01/who-benefits-tunisia-green-hydrogen-strategy>.
122. Zolani Sinxo (2022) Boegoebaai harbour a bit fishy, fear small-scale fishers, 16 February, <https://www.foodformzansi.co.za/boegoebaai-harbour-a-bit-fishy-fear-small-scale-fishers/>
123. Fortescue Future Industries: Grand Inga, <https://ffi.com.au/project/grand-inga-project/> accessed on 8 March 2023 .
124. International Rivers: Inga Campaign, <https://www.internationalrivers.org/where-we-work/africa/congo/inga-campaign/> accessed on 8 March 2023.
125. E.ON (2022) Fortescue Future Industries and E.ON Partner on journey to become Europe's largest green renewable hydrogen supplier and distributor, 29 March, <https://www.eon.com/en/about-us/media/press-release/2022/03-29-fortescue-future-industries-and-eon-partnership.html> Covestro (2022) Fortescue Future Industries and Covestro announce plans to enter a long-term green hydrogen supply agreement, 17 January, <https://www.covestro.com/press/fortescue-future-industries-and-covestro-announce-plans-to-enter-a-long-term-green-hydrogen-supply-agreement/>
126. E.ON (2022), see endnote 125.
127. Amy Booth (2022) Activists raise red flag over Argentina's green hydrogen project, Aljazeera, 12 September, <https://www.aljazeera.com/news/2022/9/12/activists-raise-red-flag-over-argentina-green-hydrogen-project>
128. Quoted in: Tobias Kalt and Makoma Lekalakala (2022), see endnote 109.
129. Ibid. Quoted in: MDR (2022) Das Problem mit grünem Wasserstoff aus Saudi-Arabien, 6 December, <https://www.mdr.de/nachrichten/deutschland/politik/deutschland-wasserstoff-saudi-arabien-menschenrechte-100.html> Translation: Pia Eberhardt.
130. Our World in Data: How much of our electricity comes from renewables?, <https://ourworldindata.org/renewable-energy#how-much-of-our-electricity-comes-from-renewables>. accessed on 8 March 2023
131. Quoted in: Dunja Sadaqi (2022) Statt Gas aus Russland eher Wasserstoff aus Marokko?, SWR 2, 31 March 2023, <https://www.swr.de/swr2/wissen/statt-gas-aus-russland-eher-wasserstoff-aus-marokko-100.html>.
132. Imane Boukhatem (2022) The challenges of the energy transition in fossil-fuel-exporting countries, 5 September, <https://longreads.tni.org/the-case-of-algeria>
133. Öko-Institut (2019) Bedeutung von Power-to-X für den Klimaschutz in Deutschland, 7 November, <https://www.oeko.de/presse/archiv-presse-meldungen/presse-detailseite/2019/bedeutung-von-power-to-x-fuer-den-klimaschutz-in-deutschland>
134. Hyphen: Southern Corridor Development Initiative (SCDI) Namibian Green Hydrogen Project, <https://hyphenafrika.com/projects/>
135. RWE (2022) RWE and Hyphen explore offtake of green ammonia from Namibia, 2 December, <https://www.rwe.com/en/press/rwe-supply-and-trading/2022-12-02-rwe-and-hyphen-explore-offtake-of-green-ammonia-from-namibia>.
136. Quoted in: Ann Esswein (2022) Wasserstoff aus der Wüste, taz, 5 December, <https://taz.de/Energiekooperation-mit-Namibia/!5896715/> Translation: Pia Eberhardt.
137. Jasko Rust and Lisa Ossenbrink (2022) Germany eyes Namibia's green hydrogen, Deutsche Welle, 12 February, <https://www.dw.com/en/germany-eyes-namibia-green-hydrogen/a-63970296>.
138. IPPR (2022) Transparency concerns dog 'largest tender in nation's history', Procurement Tracker Namibia, April, <https://ippr.org.na/wp-content/uploads/2022/04/PTN16-web.pdf>
139. Arne Delfs (2022) Germany Weighs Aid for €10 Billion Hydrogen Plant in Namibia, Bloomberg, 5 December, <https://www.bloomberg.com/news/articles/2022-12-05/germany-mulls-aid-for->

10-billion-hydrogen-plant-in-namibia.

140. Steven Press (2021) As Germany Acknowledges Its Colonial-Era Genocide in Namibia, the Brutal Legacy of Diamond Mining Still Needs a Reckoning, *Time*, 10 June, <https://time.com/6072145/namibia-germany-apology-diamonds/>

141. KfW (2017) Solar power from the desert, 3 May, <https://www.kfw.de/stories/environment/renewable-energy/solarstrom-aus-der-wueste/>

142. Hamza Hamouchene (2022) The energy transition in North Africa. Neocolonialism again!, 14 October, <https://longreads.tni.org/the-energy-transition-in-north-africa-neocolonialism-again>

143. Hyphen: Southern Corridor Development Initiative (SCDI) Namibian Green Hydrogen Project, <https://hyphenafrika.com/projects/>

144. The World Bank: GDP (current US\$) - Namibia, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=NA>

Accessed on 14 March 2023

145. Quoted in: Orlando Milesi (2022) Doubts about Chile's Green Hydrogen Boom, *IPS News*, 12 October, <https://www.ipsnews.net/2022/10/doubts-chiles-green-hydrogen-boom/>

146. Interview with Tobias Kalt, see endnote 109. Interview with Johanna Tunn, research associate at the University of Hamburg, Germany, 28 January 2023.

147. Universität Hamburg: H2 Politics, <https://www.wiso.uni-hamburg.de/fachbereich-sowi/professuren/mueller/forschung/h2politics.html>

148. Hyphen: Southern Corridor Development Initiative (SCDI) Namibian Green Hydrogen Project, <https://hyphenafrika.com/projects/> accessed on 8 March 2023.

149. ReGlobal (2022) RWE Renewables to start 835 MW green hydrogen project in Chile, 8 December, <https://reglobal.co/rwe-renewables-to-start-835-mw-green-hydrogen-project-in-chile/>.

150. Orlando Milesi (2022), see endnote 145.

151. Haru Oni project, <https://www.haruoni.com/#/en>, accessed on 14 March 2023.

152. BMWK (2020) Pressekonferenz: Förderbescheid-Übergabe für eine Anlage für grünen Wasserstoff in Chile, 2 December, <https://www.bmwk.de/Redaktion/DE/Videos/2020/20201202-PK-Foerderbescheid-Wasserstoff-Siemens/pressekonferenz.html>.

153. Natalie Koch (2022), see endnote 103

154. Western Sahara Resource Watch (2021) Report: Morocco uses green energy to embellish its occupation, <https://wsrw.org/en/news/report-morocco-uses-green-energy-to-embellish-its-occupation>.

155. Quoted in: Eoghan Gilmartin (2022), Europe Is Replacing Energy Dependence on Russia With Reliance on North African Dictatorships, *Jacobin*, 27 March, <https://jacobin.com/2022/03/eu-germany-energy-green-hydrogen-repower-eu-western-sahara>

156. Fraunhofer ISI (2020), see endnote 112; Brot für die Welt and Heinrich Böll Stiftung (2022), see endnote 113; Klima Allianz (2021) Wasserstoff-Positionspapier der deutschen Zivilgesellschaft, May, https://www.klima-allianz.de/fileadmin/user_upload/Dateien/Daten/Publikationen/Positionen/210513_H2_Positionspapier2.pdf

Arepo (2022) Fair Green Hydrogen. Chance or Chimera in Morocco, Niger and Senegal?, *April*, https://www.rosalux.de/fileadmin/rls_uploads/pdfs/sonst_publicationen/Studie_Fair_Hydrogen.pdf Öko-Institut (2021) Sustainability dimensions of imported hydrogen, <https://www.oeko.de/fileadmin/oekodoc/WP-imported-hydrogen.pdf>.

157. Nationaler Wasserstoffrat (2021) Position Paper. Sustainability criteria for import projects for renewable hydrogen and PtX products, 29 October, https://www.wasserstoffrat.de/fileadmin/wasserstoffrat/media/Dokumente/EN/2021-10-29_NWR-Position_Paper_Sustainability_Criteria.pdf.

158. HPA – Annex 6.2 Additional Sustainability Requirements. On file with the author.

159. Daimler Truck and other companies (2021) Follow-up of the joint letter on the upcoming Delegated Act on Article 27 (3) RED II, 9 December, released in response to an access to information request by the European Commission: https://www.asktheeu.org/en/request/12257/response/42312/attach/5/20211209%20Follow%20up%20joint%20letter%20green%20hydrogen%20Redacted.pdf?cookie_passthrough=1

160. Nikolaus J. Kurmayer (2022) Revealed: How Germany stepped in to delay EU's 'green' hydrogen rules, *Euractiv*, 31 October, <https://www.euractiv.com/section/energy/news/revealed-how-germany-stepped-in-to-delay-eu-green-hydrogen-rules/>. The letter by Graichen can be found here: <https://fragdenstaat.de/anfrage/schreiben-graichen-an-die-eu-kommission-dezember-2021-wasserstoff-additionalitaet/743010/anhang/briefstgreuikom260199.pdf>

161. European Commission (2023) Questions and Answers on the EU Delegated Acts on Renewable Hydrogen*, 13 February, https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_595

162. Nikolaus J. Kurmayer (2022) Hydrogen Europe CEO: 'We need legal certainty now', *Euractiv*, 30 September, <https://www.euractiv.com/section/energy/interview/hydrogen-europe-ceo-we-need-legal-certainty-now/>

163. BDEW et al. (2022) Brief an verschiedene Minister/innen und Staatssekretär/innen, Beschleunigung des Wasserstoffmarkthochlaufs: pragmatische Strombezugskriterien für erneuerbaren Wasserstoff, 29. Juni. Released in the context of an access to information request by the German government, <https://fragdenstaat.de/anfrage/kontakte-mit-interessenvertreter-innen-zum-the-ma-wasserstoff-1/777682/anhang/bmhabeck.zip>

164. Überarbeiteter Entwurf für die Weiterentwicklung der Nationalen Wasserstoffstrategie (NWS) nach erfolgter Ressortabstimmung, 24 February 2023. On file with the author. Translation: Pia Eberhardt.

165. Comment made during a seminar organised by Konzeptwerk Neue Ökonomie and Rosa Luxemburg Foundation, 28 January 2023, Berlin

166. GBCE and VCI (2022), see endnote 84, p. 2. *Translation: Pia Eberhardt*

167. Baker McKenzie (2022) International: H2Global enables imports of sustainable hydrogen products into Germany and incentivizes investment in green hydrogen outside of the European Union, 12 December, <https://insightplus.bakermckenzie.com/bm/projects/international-h2global-enables-imports-of-sustainable-hydrogen-products-into-germany-and-incentivizes-investment-in-green-hydrogen-outside-of-the-european-union/>.

168. PowerShift (2022), see endnote 24, minute 19'45.

169. *Quoted in:* Sophia Boddenberg and Burkhard Birke (2022) Hauptsache Energie, 14 March, Deutschlandfunk Kultur, <https://www.deutschlandfunkkultur.de/chile-102.html>

170. Comment made during a seminar organised by Konzeptwerk Neue Ökonomie and Rosa Luxemburg Foundation, 28 January 2023, Berlin

