(No) solution to the climate crisis

Group work on technical solutions to the climate crisis

What is hydrogen?

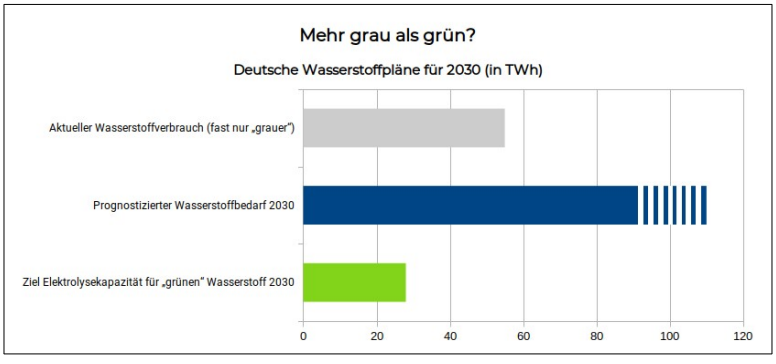
Hydrogen (H) is the most common chemical element in the universe. On Earth, it mostly occurs in molecular form: as H_2, a colourless and odourless gas which only liquefies at extremely low temperatures (below -250 °C). Research in many economic sectors has focused on opportunities to use hydrogen as a potentially climate-friendly energy carrier. Some industries have long been using hydrogen – but almost exclusively H_2 made from fossil gas.

To be rendered usable as an energy carrier, pure hydrogen must be produced from water. In the process, energy from sources such as fossil gas ("gray" hydrogen, made through steam reforming) or renewable power ("green" hydrogen, made through electrolysis) is converted and thus made transportable, storable and applicable. So no new source of energy is developed. On the contrary, energy losses occur in conversion processes.

Hydrogen colour theory (selection)

green	Electricity from renewables
gray	Fossil gas
blue	Fossil gas (or similar) + CCS (*Carbon capture and storage*)
turquoise	Fossil gas + methane pyrolysis
pink / red	Nuclear energy

Whence the hype, now?



Hydrogen is currently a more salient topic than ever, owing both to the reinforced search for industrial climate solutions and to the energy policies for more national energy independency. The German government pushes for new **LNG terminals** to import liquefied fossil gas by sea in order to reduce its dependence on Russian gas. These new infrastructures are justified by reference to a potential future

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switch to "green" hydrogen ("**H2-ready**" – but these claims are **very questionable**). This strategy was recently reaffirmed on the international stage at the **G7 summit.**[1]
In its coalition treaty, the new German government committed to doubling its "green" hydrogen capacity target for 2030 (by electrolysis). Despite claims that local production of hydrogen from renewables was the "first priority," the government's plan only aims to obtain about one-quarter of projected German hydrogen demand from such sources by 2030.[2] Thus, the largest share would have to be imported or made, as is currently the case, from fossil fuels. The EU has similarly reinforced its hydrogen targets since the onset of the war, particularly with regard to imports, and is currently negotiating a range of regulatory issues.[3] Various market forecasts predict annual growth rates of above 50% for the global "green" hydrogen market over the next few years.s[4]

Imports: Neocolonial practices?
In several respects, German and European hydrogen import plans threaten to perpetuate colonial patterns:
1) Unequal power relations: When negotiating import agreements with Southern states, states like Germany largely dictate the terms and conditions. Germany seeks to ascend to world market leadership in hydrogen technologies while African countries offer the required land and natural resources. Accordingly, with respect to hydrogen imports, the German government's coalition agreement only promises to "secure fair competitive conditions for *our* economy."[5]

2) Energy poverty and local energy transition: Mega-projects for "green" hydrogen exports from the global South tend to occupy the most favourable locations for renewable energies. This jeopardizes local renewable energy supply, especially since in many of these areas, a large share of households do not as yet have access to electricity.

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1 Boudreau, C. (2022): G7 leaders pursue price cap on Russian oil, double down on natural gas, and say major polluters can join 'climate clubs'. *Business Insider*. https://www.businessinsider.com/g7-caps-russian-oil-but-backs-natural-gas-2022-6
2 SPD; Bündnis 90/Die Grünen; FDP (2021): Mehr Fortschritt wagen. Bündnis für Freiheit, Gerechtigkeit und Nachhaltigkeit. Koalitionsvertrag zwischen SPD, Bündnis 90/Die Grünen und FDP, S. 59-60.
3 Dubbert, R., & Schwartzkopff, J. (2022): Wasserstoff ist kein Heilsbringer. Klimareporter°. http://www.klimareporter.de/finanzen-wirtschaft/wasserstoff-ist-kein-heilsbringer
4 see Facts & Factors (https://www.fnfresearch.com/green-hydrogen-market), Market Data Forecast (https://www.marketdataforecast.com/market-reports/green-hydrogen-market), Allied Market Research (https://www.alliedmarketresearch.com/green-hydrogen-market-A11310)
5 SPD; Bündnis 90/Die Grünen; FDP (2021), S. 60.

In western Africa, this is true for almost half of all households, while the overall energy mix is still dominated by fossil fuels.[6] The local population's access to renewable energy should be warranted before beginning to export energy.

3) Who benefits? Export projects of the kind now envisioned by the hydrogen industry are usually planned by transnational corporations from the global North according to their interests.[7] Little of the value added remains in the area of origin; the most attractive jobs are commonly given to specialists flown in from Europe. Likewise, the entry requirements of state subsidy programmes such as *H2Global* (Germany) benefit European corporations. The hydrogen sector is soon to be added to the Energy Charter Treaty, meaning that corporate interests in this field will receive more comprehensive legal protection from state interventions.[8] After all, the large-scale infrastructure requirements of a hydrogen export economy (pipelines, electrolysers, tankers, terminals) are difficult to fulfil other than through mega-projects. This does not favour local self-determination of economic development.

4) Local collateral damage: An unequal ecological exchange between world regions is taking place, in which Germany and Europe conveniently outsource negative impacts. Hydrogen production requires much freshwater, which in arid regions is already scarce. Desalination plants have been suggested in response; but here, usually, residues are dumped back into the sea, causing ecological damage. Moreover, conflicts over land are to be expected if large areas are appropriated for energy exports.[9]

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6 Arepo (2022): Zusammenfassung. In Fair Green Hydrogen: Chance or Chimera in Morocco, Niger and Senegal? (S. xx–xxxi). Rosa-Luxemburg-Stiftung & Arepo GmbH.

7 Kalt, T., & Tunn, J. (2022): Shipping the sunshine? A critical research agenda on the global hydrogen transition. GAIA, 31(2), 76–80.

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