


Hydrogen

where why what who when and How



Berlin: Building an urban hydrogen hub



Where do we stand?

- The energy transition has stalled
- Renewable energy production is being curtailed
- Wind turbines stand still
- Photovoltaics are capped
- Payment is made for electricity that is not produced
- 1.34 billion € in 2018/19 in Germany alone, and rising
- Efficiency is different
- The energy transition will only be complete when renewable energy is always available in terms of time and space.

Why Hydrogen?

As things stand today, there is no other energy source in the world that can better solve the challenges of the energy transition and is

- is easier to extract
- whose stock is unlimited
- whose possible applications are more diverse than hydrogen.



Is Hydrogen sustainable?

- Today, industry uses hydrogen, which it obtains mainly from fossil fuels. Worldwide 400 million t/a. Per tonne in about 10t CO₂ emissions
- Hydrogen of plasmalysis from waste and waste water is sustainable as part of a circular economy
- Hydrogen from water electrolysis is sustainable if renewable electricity is used

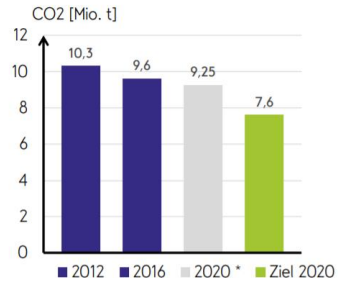


Europe's "man on the moon project"

- Extended workbench option in the battery market.
- Hydrogen technology requires competence in process and plant technology. One of Europe's economic pillars.
- Hydrogen is a cornerstone of the Green Deal and the Recovery Plan after Corona to strengthen Europe's competitiveness on the world markets. 400 billion euros are to be invested by 2030.
- Creating a sustainable perspective on the labour market: according to the EU, 5.4 million new jobs are to be created in the hydrogen economy by 2050.
- Hydrogen as an energy carrier offers greater strategic energy independence.



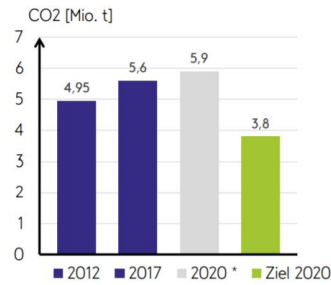
Households: Gap 1,6 – 1,3 Mio. t



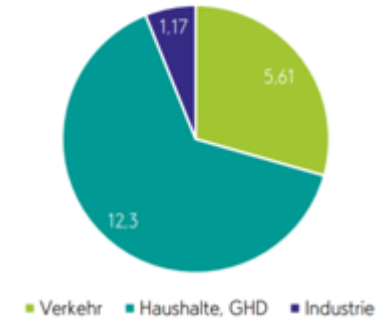
Source BEK Monitoring Report 2019, * extrapolation

Quelle: BEK Monitoringbericht 2019

Transport: Gap 1,8 – 2,2 Mio. t



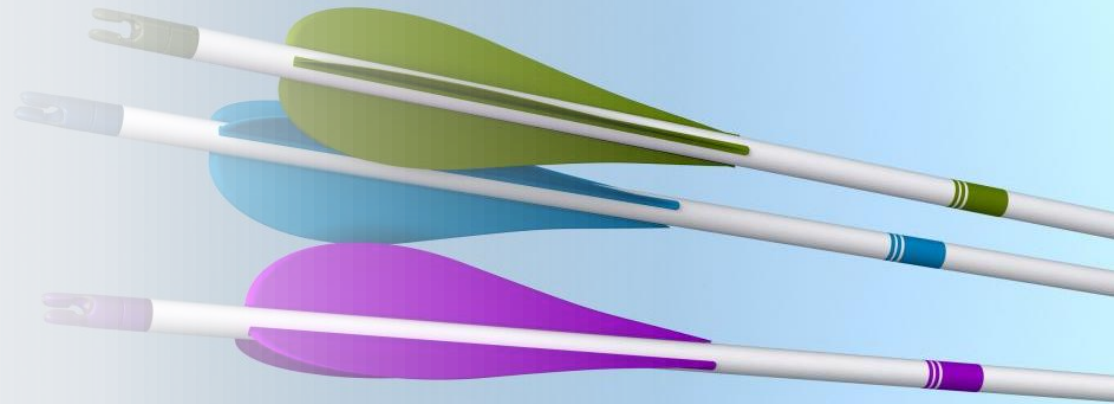
Verursacherbilanz nach Sektoren in Mio. t CO₂ (2017)



Initial Situation in Berlin

H2Berlin initiative

- Without hydrogen, the Paris climate targets and the energy transition cannot be achieved.
- Brandenburg as energy supplier of Berlin with an excess of renewable energy opted for hydrogen as energy carrier. This will have a massive impact on infrastructure and value chains of the city.
- H2 Berlin supports Europe's and Germany's Hydrogen Strategies for market ramp-up of a hydrogen economy until 2023 in Berlin,
- Helps the capital city to achieve its climate goals with sustainable hydrogen technology in circular economical processes,
- Is a regional network of companies, scientific institutions and other institutions around the topic of hydrogen and fuel cells – H2Berlin mobilises the forces – cross company – cross sector – systemic.



Hydrogen Study for Berlin

Basis of the study:

1) The **Jülich Research Centre's** model for a cost-effective and climate-friendly transformation strategy for the energy transition of the German energy system by 2050

- when optimising all possible technology options according to cost and efficiency
- Taking into account the **scenario for the cost-optimal transformation** strategy to reduce GHG by 95%

2) **Interviews with hydrogen protagonists** in the city

Results for 2025

- Gap of approx. 9000t/a



Launch of an H2 economy in Berlin - identification of suitable use cases (1/3)

H2Berlin-Hub West

H2Berlin-Hub East

H2Berlin-Hub South



The Hub comprises Reuter West / Ruhleben energy site, Siemensstadt 2.0, the Berlin harbour, Urban Tech Republic Tegel, Grunewald gas storage facility aiming at:

- Waste-to-Hydrogen production
- Combined heat and power generation
- Grid balancing services
- Powering Mobility (ships, port logistics, public transport)
- Storing renewable energy
- Technology development to market maturity

Launch of an H2 economy in Berlin - identification of suitable use cases (2/3)

H2Berlin-Hub West

H2Berlin-Hub East

H2Berlin-Hub South



Marzahn is being used as a nucleus for introducing hydrogen as an energy carrier throughout the city. Vattenfall Wärme operates a modern combined heat and power plant here. Hydrogen could be produced there via electrolysis and used for generating district heat and for mobility.

Anschub einer H₂-Ökonomie in Berlin über H2Hubs - Identifizierung geeigneter Use Cases (2/3)

H2Berlin-Hub West

H2Berlin-Hub East

H2Berlin-Hub South



The Hub comprises Berlin's BER airport, the Waßmannsdorf sewage treatment plant, the Neulichterfelde district, the Marienfelde factory site of Mercedes Benz and the Adlershof Technology Park aiming at:

- hydrogen production: in the treatment plant and the existing filling station at BER
- development of new technologies: on the site of Mercedes-Benz and in the Technology Park
- large-volume hydrogen requirements: Neulichterfelde mobility concept, bus depot, utility vehicles operated by Berlin's water authorities, BER ground logistics, synthetic kerosene used in aviation or for combined heat and power generation



Next Steps

- Hydrogen Roadmap
- Hydrogen Lighthouse Project Berlin
- Research project "Optimal hydrogen system for the capital region"
- Create framework conditions for:
 - a conversion of heavy-duty diesel transports from goods distribution centres in the surrounding region to hydrogen drives for delivery to the capital city
 - a conversion of buses and commercial vehicles in the city to hydrogen drives
 - favouring the use of hydrogen-powered passenger boats at the city's landing stages
 - a mandatory use of hydrogen stationary power generators at all construction sites, Christmas markets or open-air events
 - a short-term use of hydrogen for the supply of households



Thank you very much for your attention

Contact:
Joerg.Buisset@H2Berlin.org
+4915164310178

www.H2Berlin.org