



H2Berlin Initiative publishes study on Hydrogen potential

Berlin identifies the basis of a hydrogen economy

The energy transition has stalled, renewable energies are not being expanded at a sufficiently fast pace. The generational project will only reach its goal when renewable energies are made constantly available in terms of time and space.

As things stand today, there is no other energy source in the world that can solve this challenge better and is

- a) is easier to obtain
 - b) whose reserves are unlimited,
 - c) whose possible applications are more diverse
- than hydrogen.

These are the central reasons why both the German government and the EU have declared hydrogen to be a key element for the success of the energy transition. The development of a hydrogen economy also requires plant and mechanical engineering expertise. Here, we in Germany and Europe are world leaders. If we follow the Federal Ministry of Economics, the aim is to become the world market leader in hydrogen technology.

Hydrogen strategies in a regional context

Many federal states such as Bavaria, the northern states or NRW have already formulated their hydrogen strategy and are gearing up to build a hydrogen economy. And the state of Berlin is in the starting blocks.

Berlin has a very special role to play here. The city is Germany's largest metropolis with charisma and a role model function. The surrounding region of Brandenburg produces a surplus of renewable energies and would like to further expand this surplus and make it available to others. Hydrogen is to be the transport and storage medium for this. Dietmar Woidke, the Minister President of Brandenburg, has already announced for his state that "after coal comes hydrogen".

This orientation will have significant consequences for infrastructure and value chains for the state of Berlin as a traditional energy and fuel consumer of the surrounding region.

Based on this realisation, leading business houses in the city joined forces at the beginning of this year to found the H2Berlin initiative. The goal of H2Berlin is to ramp up and develop a hydrogen economy in the capital in accordance with the national hydrogen strategy. The conviction here is that

without the introduction of the new energy carrier, the city will miss its climate targets and will not master the energy transition.

To enable a hydrogen economy in the city, a first large-scale lighthouse project is needed. Here, hydrogen is to be made available on a massive scale for several business applications in different sectors. Supply chains are to be realised, and acceptance is to be secured. Infrastructures will be provided across the board and synergies will be leveraged. Business cases are moving closer to economic viability. Mass production and industrialisation increase the competitiveness of hydrogen and replace fossil fuels in the long term.

Estimation of a utilisation potential until 2025

In order to identify the appropriate use case, H2Berlin first asked itself the question of the capital's short-term demand for hydrogen.

For this purpose, H2Berlin conducted the study Hydrogen Potential in Berlin 2025. It was found that 2/3 of the emissions are attributable to the building / heating sector. Just under 1/3 is attributable to transport. Emissions from industrial production, on the other hand, are negligible.

Particularly in the building supply and transport sectors, however, Berlin is threatened with failing to meet the targets set by the Berlin Senate in 2011 in the Energy Transition Act as early as 2020. Due to the building structure with old buildings and very dense housing, a switch to heat pumps or a purely electric supply cannot be realised without considerable effort.

The many charging points required in the city with over five-storey residential units in dense residential areas for the residents' battery electric mobility also pose a challenge. Alternative climate-neutral hydrogen drive technologies offer relief.

If we follow the study and thus the model of the Jülich Research Centre, which represents the cost-optimal path of the energy transition towards climate neutrality, Berlin will use around 9,000 t of hydrogen p.a. in 2025. Interviews with the protagonists of a hydrogen economy in Berlin show, however, that hydrogen consumption is expected to be less than 40 t/a in 2025.

Use of hydrogen in the large capital city

The H2Berlin study has identified a number of potential projects for the use of hydrogen, which now need to be evaluated. Three hydrogen hubs can be crystallised from an initial evaluation:

- a) Around the Reuter West power plant and the waste incineration plant also located there, the nearby Siemensstadt 2.0 future quarter, the BEHALA with the first hydrogen pusher Elektra and the Gartenfeld bus depot,
- b) Around the BER airport, the Waßmannsdorf sewage treatment plant, the Neu Lichterfelde future quarter, the Mercedes Benz plant in Marienfelde, and the Wista site in Adlershof.
- c) Around the Marzahn power station, whose operator has already decided to convert to hydrogen.

According to the H2Berlin stakeholders, the city and region of Berlin should not lag behind other locations in this respect.

Berlin has a very well-developed gas network. Many of the infrastructures can be used or converted for hydrogen. In addition, the capital also has a well-developed district heating network that can also be used directly with hydrogen instead of natural gas or coal-fired combined heat and power plants. A possible blending of low-emission hydrogen into the existing gas network would also be able to

immediately relieve the climate via Berlin's largest emitter, the heating sector. Hydrogen offers great advantages due to the possibility of using existing infrastructures, the grids and storage facilities.

Enabling fair competition for hydrogen

It should also be examined, for example, whether a diesel toll at the city limits for heavy trucks similar to the Swiss model could be used to promote hydrogen fuel cell trucks via a pay-per-use offer.

Similarly, substantial emissions levies could be evaluated for Berlin's inland shipping industry, whose heavy fuel oil drives are among the largest emitters of pollutants.

Why not take a cue from the city of Amsterdam, which will no longer allow diesel power generators in a few years. Every major construction site, outdoor event, Christmas market, etc. will only be supplied with climate-neutral hydrogen fuel cells from 2025.

The large double-deckers in Berlin also need a climate-neutral propulsion system other than the battery, given their weight, construction height and the distances they have to cover. The first hydrogen double-deckers are operating in Aberdeen and will soon be used in Birmingham and London.

The Heidekrautbahn project from the Brandenburg hinterland to the city centre could have a pilot effect for Berlin. Diesel on non-electrified railway lines can also be replaced by hydrogen.

The new BER Airport should take the opportunity of its construction phase and follow the Hamburg model and no longer use diesel in ground logistics. Next year, Hamburg Airport will operate its vehicle fleet completely battery-electric or with hydrogen.

Modelling an ideal hydrogen system for Berlin

The city will only be able to supply some of the hydrogen required for this itself. Just as in the past, Berlin will remain an energy sink and the source will essentially be the surrounding region. This shows that a hydrogen strategy cannot be decoupled from Berlin and Brandenburg. In order to support the two states in formulating their strategy, H2Berlin is planning a research project together with research institutions, which will model the ideal hydrogen system of the capital. On this basis, a roadmap is to be developed that will involve political decision-makers and the population in the upcoming transformation.

H2Berlin founder:



Supporting organisations:

