

Hamburg Airport: Powerfuels and Hydrogen as base for a successful decarbonization





~2.000
employees

Destinations
in

42

countries

5th largest
airport in
Germany

17.3 mio
Passengers



155.21

5 aircraft
movements
(2019)



51%
City of
Hamburg

49 %
AviAlliance

The world's oldest
commercial airport
still located at its
place of origin

HAM: ACA 3+ (2021) / Net Zero (2030/2035)

Airport Carbon Accreditation (ACA) since 2011



Certification on six Levels – Hamburg airport is certified on Level 3 since 2014 and aims at reaching Level 3+ CO₂-Neutrality by end of 2021

ACI Europe: in 2019 more than 190 European Airports committed to almost completely reduce their CO₂-Emissions by 2050 (~100 airports till 2030) and to remove the unavoidable residual emissions from the atmosphere by technological measures.



Hamburg Airport will reach the initiative “Net Zero” earlier.

**Level 1
Mapping**

CO₂-Footprint
Determination



**Level 2
Reduction**

Reduction CO₂-
Footprint



**Level 3
Optimisation**
requirements
fulfilled plus third
party engagement



**Level 3+
CO₂-Neutrality**

Level 3
requirements
fulfilled plus
compensation

Powerfuels for groundbased vehicles: H₂, HVO & GtL



Reference for the mobility of the future – Hydrogen as energy carrier

Advancing use of 700 bar fuel cell powered cars in Hamburg Airport's own fleet as the first already used FC-EV in a good 80% alternatively powered vehicle fleet

- Mercedes GLC F-Cell
- Hyundai ix35 Fuel Cell

- Conversion of HAM's CNG-powered baggage tractor fleet to co-developed 350 bar hydrogen powered ones started, internal refueling infrastructure under planning.

- Complete change-over to paraffinic fuels (EN15940) in 2016 for the diesel powered heavy duty sector (Hydrotreated Vegetable* Oil, Gas to Liquid) *HVO,



Power fuels in Aviation: „KEROSyN 100“ and „5in5“

Project partners (i.a.):

- Refinery Heide
- Lufthansa AG
- University Bremen / TU Freiberg
- DLR - Institute for energy system networks

Contents:

- production of green H₂ by wind power and electrolysis
- utilisation of CO₂ from concrete production
- prove for technological feasibility on larger scale
- Long-term perspective: 150.000 t/a PtL-

Milestones:

- Start in 2019: LOI „5in5“ signed by Refinery Heide (producer), Hamburg Airport (distributor) and Lufthansa (user)
- detailed development / certification of „Green MeOH“ production pathway
- 20.000 t/a synthetic jet fuel (jet A 1) for HAM in 5 years („5in5“)

Hydrogen for Powerfuels: demands, sources and challenges

•HAM: aim on 150.000 t of KEROSyN needs a 700 MW electrolyser + 1 mio. t of CO₂

•Government decided a 2 % PtL quote for german aviation till 2030. This means a total amount of 240.000 t/a

•High requests on Powerfuels from industry, maritime sector, freight haulage, rail,...

•Summed curtailment of electricity volume in Schleswig-Holstein: 3.750 GWh (2019, on-and offshore)

German gross electricity consumption will increase by 26 % till 2030*: significant expansion of generation and grid capacity is without alternative

•Import of „green raw powerfuels / crude oil substitute“ as way forward

**„The future belongs to those,
who are the first to put the power of the sun into the tank, who are the first to
overtake with hydrogen, and who are the first to move forward CO₂ neutrally.”**

Horst Köhler (*1943),
former German President

