

HYDROGEN TECH WORLD 2024, ESSEN

H2APEX

Green Hydrogen produced in M-V for the supply
of the steel industry in the Ruhr area

Axel Funke, CTO H2APEX



H2 APEX 

THE POWER OF HYDROGEN



THE CHALLENGE IS WORTH IT



28%



-57 Mil T



GREENTALKING
doing



We are System Provider for H₂-Solutions for CO₂-neutral Energy Supply

H₂-Specialist

- **EPC Partner** – help to rebuild the industry
- **H₂ Production** – make H₂ available
- **H₂ Storage** – physical & chemical



COMPANY HISTORY

AT A GLANCE



- **2012:** Start focus on green hydrogen
- **2020:** Europe's first green H2 eco system
- **2022:** Contracts for 5 & 10 MW H2 plants
- **2023:** Investment of exceet Group followed by IPO to Frankfurt Prime Standard
- **2023:** Land bought for 600 MW plant
- **2024:** IPCEI subsidies for 100 MW plant

More than 130 pioneers for green hydrogen



PRODUCTION MEETS SUPPLY



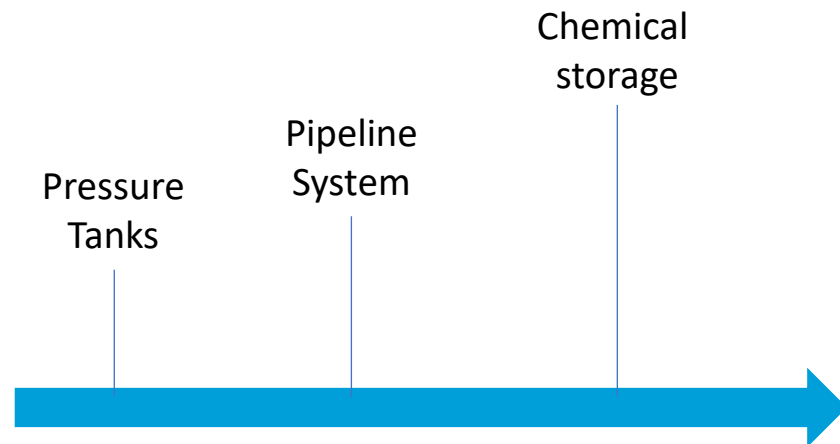
A SYSTEM BUILT TO SERVE YOUR NEEDS

Production in Mecklenburg- Vorpommern

- Offshore Wind
- Existing gas pipeline infrastructure



Transport from Mecklenburg-Vorpommern



PRODUCTION

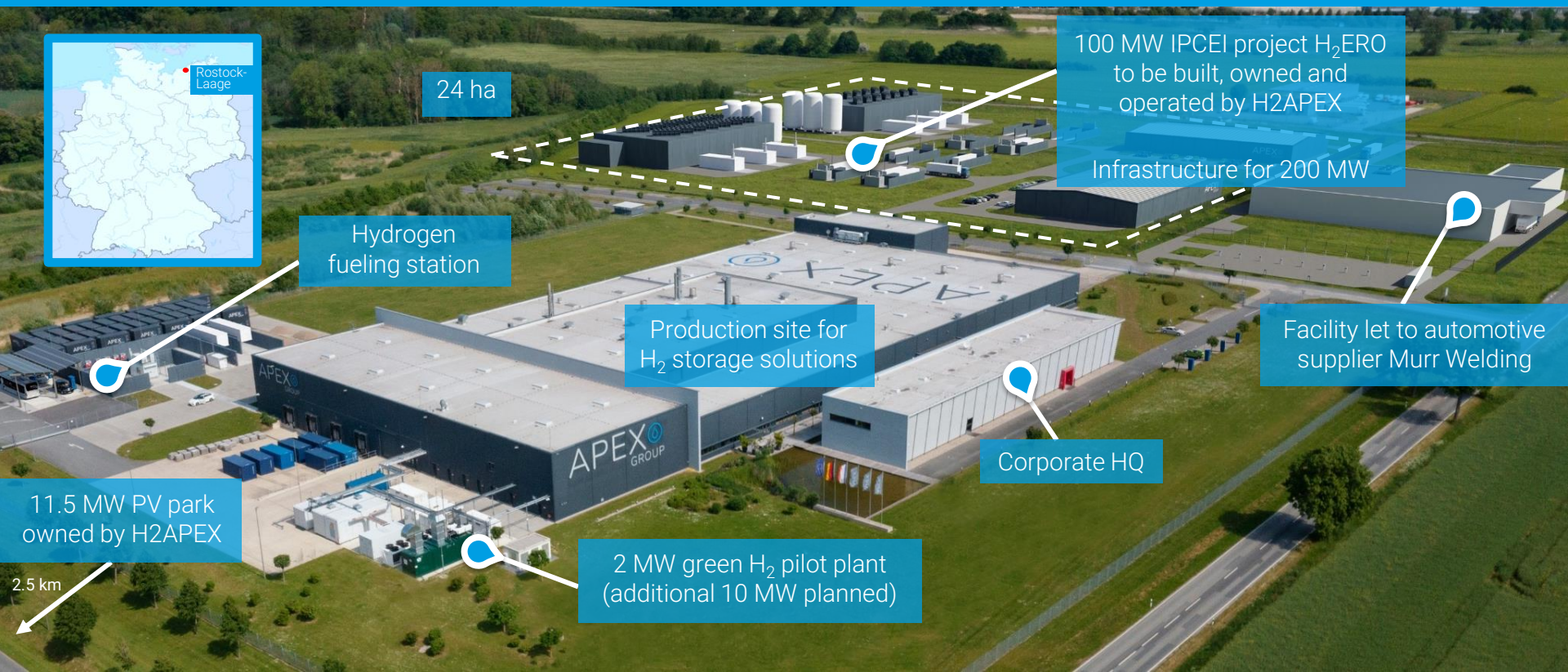
3 sites built and planned



HEADQUARTER IN LAAGE



FIRST SIZEABLE HYDROGEN PRODUCTION IN GERMANY – BUILT ALREADY IN 2021



Rostock-Laage

24 ha

100 MW IPCEI project H₂ERO to be built, owned and operated by H2APEX

Infrastructure for 200 MW

Hydrogen fueling station

Production site for H₂ storage solutions

Facility let to automotive supplier Murr Welding

Corporate HQ

11.5 MW PV park owned by H2APEX

2 MW green H₂ pilot plant (additional 10 MW planned)

2.5 km

FUEL CELL

H₂ STORAGE

BATTERY STORAGE

WE HAVE THREE YEARS OF EXPERIENCE IN
OPERATING A GREEN HYDROGEN ECO SYSTEM

Electrolysis capacity:

Type:

Manufacturer:

H₂ production:

2 MW

Alkaline

McPhy

36 kg/h

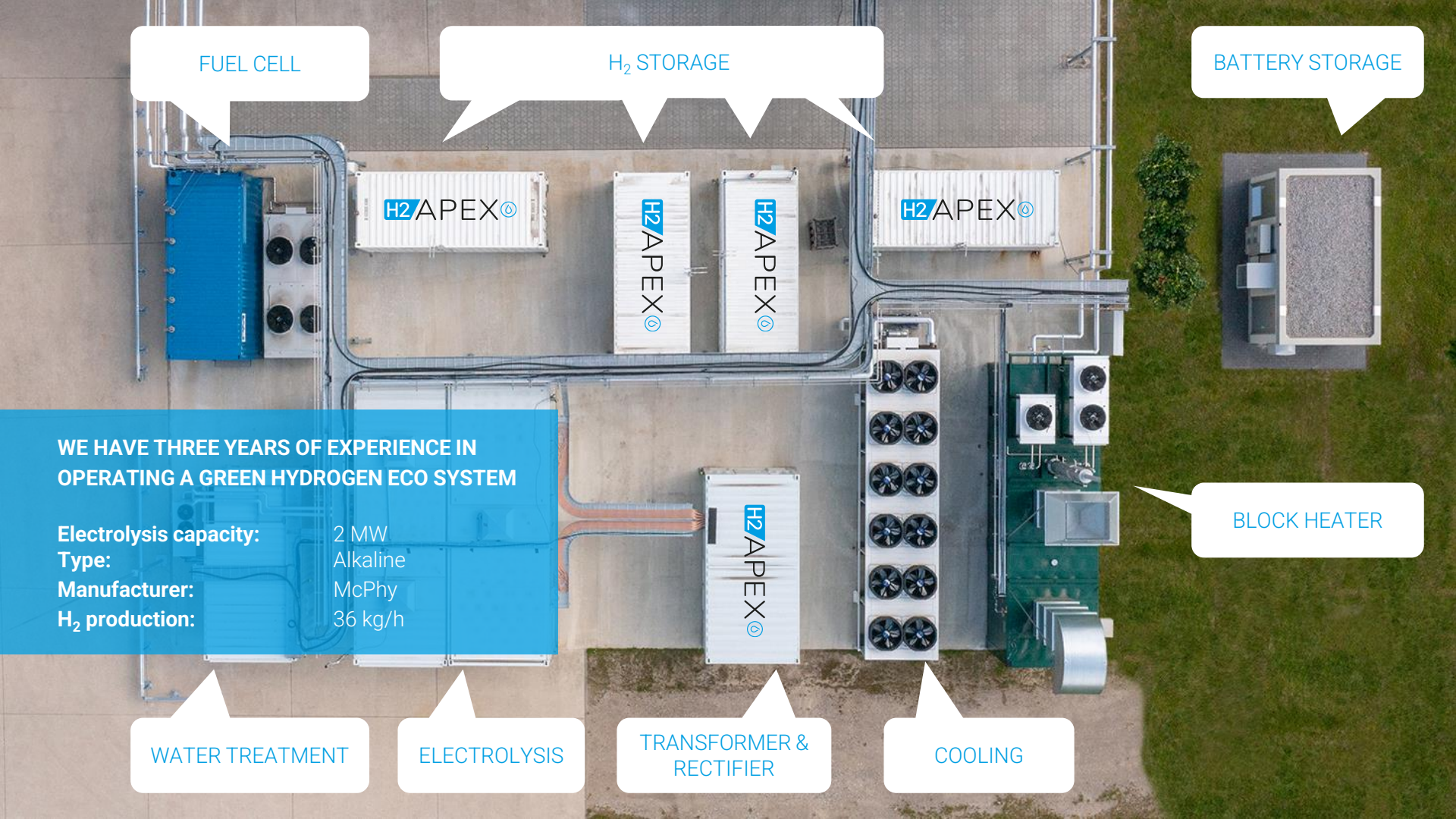
WATER TREATMENT

ELECTROLYSIS

TRANSFORMER &
RECTIFIER

COOLING

BLOCK HEATER



IPCEI PROJECT H2ERO

Land:

- owned by H2APEX

Electricity:

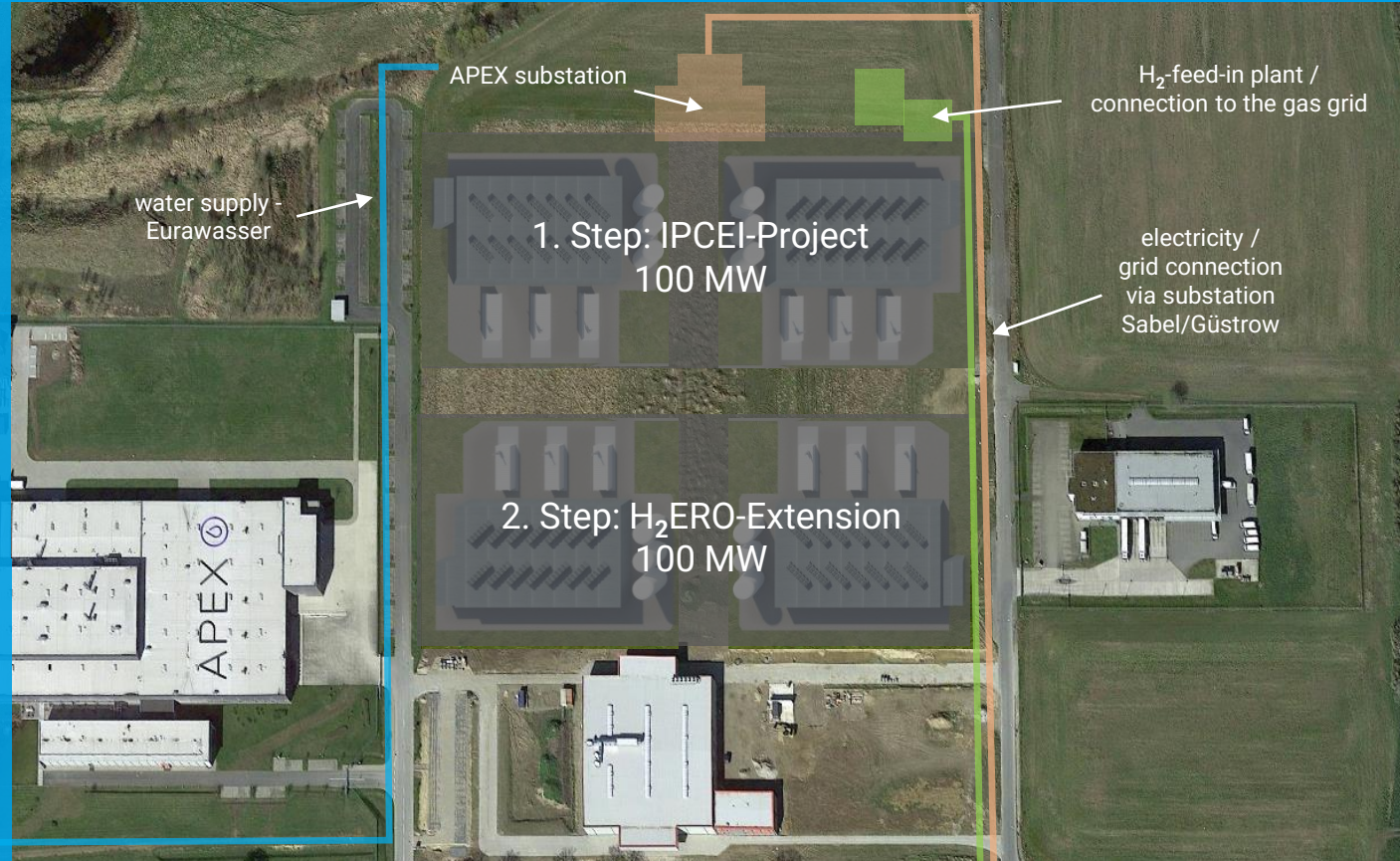
- 50hertz
- 300+ MW possible
- direct grid connection
- to wind farms & PV-parks

Gas grid:

- ONTRAS/IPCEI
- connection to the H2 starting network „doing hydrogen“

Water:

- Eurawasser
- 30 m³/h water supply
- sewage treatment plant water



LUBMIN PROJECT

100 – 600 MW ELECTROLYZER CAPACITY



H₂ GAS NETWORK “FLOW”



LARGE-SCALE PRODUCTION OF GREEN HYDROGEN IN LUBMIN

- **Electrolysis capacity:** 100 MW (up to 600 MW)
- **H₂ production:** 9,000 t p.a. (up to 54,000 t p.a.)
- **CO₂ reduction:** min. 75,000 t p.a.
- **Water:** 30 m³/h from wells plus seawater extraction
- **Gas grid connection:** Gascade H₂-feed-in-plant
- **Planned start of operation:** 2027

STATUS UPDATE

- 5.2 ha of land acquired in 07/2023
- 1 GW of power secured from Lubmin substation in 10/2023
- Environmental report and plant planning in progress

PROOF OF CONCEPT

- Future-proof availability of renewable energy thanks to off-shore wind parks with direct power connection to Lubmin
- H₂ off-take via connection to future H₂ gas network “FLOW”; already existing gas pipelines NEL, EUGAL and OPAL



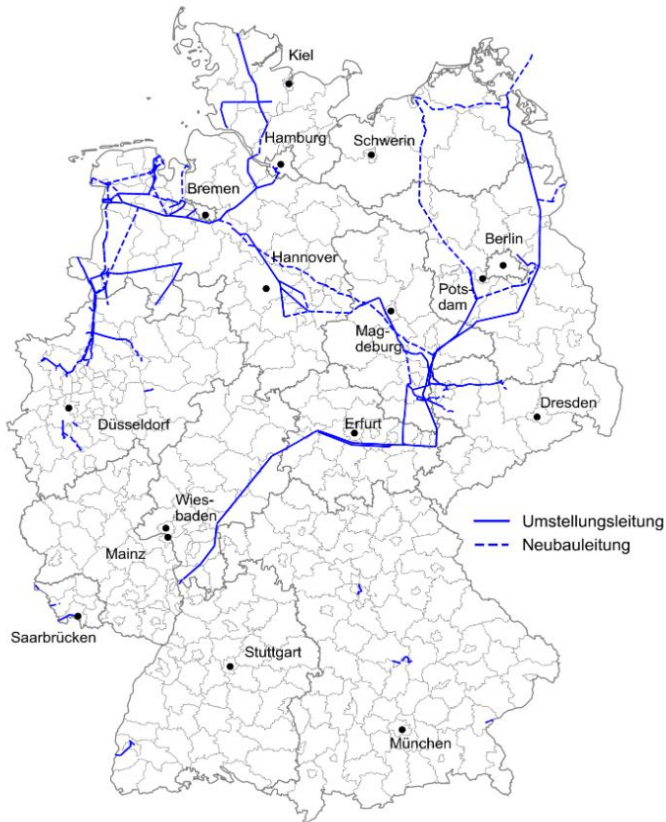
TRANSPORT



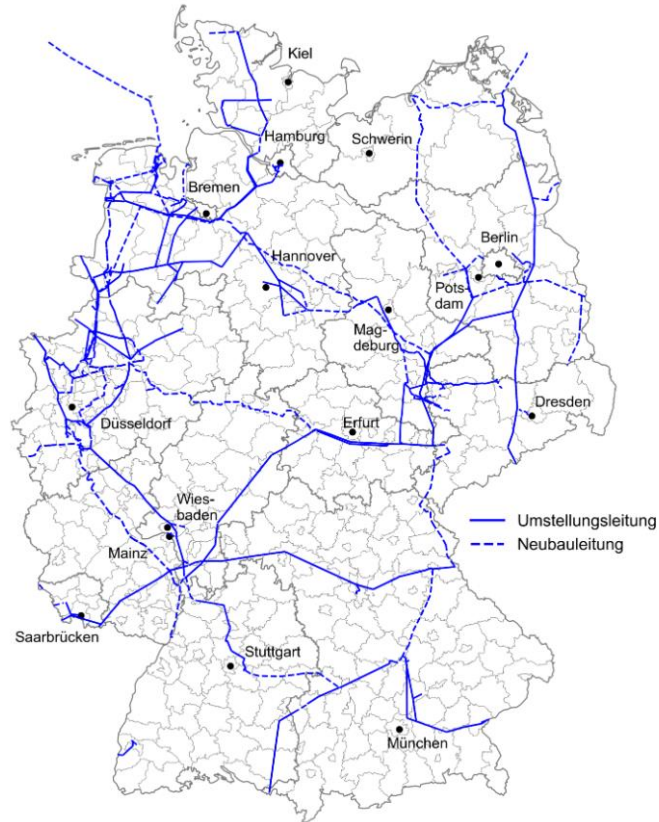
H₂ CORE NET 2029 AND 2032

H₂APEX[®]

Entwurf für das Wasserstoff-Kernnetz 2029



Entwurf für das Wasserstoff-Kernnetz 2032



Source: Transmission
System Operators
(TSOs) via FNB Gas,
Status Nov. 2023

LESSONS LEARNED

PROJECT DEVELOPMENT, DELIVERY AND OPERATION

1. The magic happens when all components are put together

- The electrolyzer technology (Alkaline/PEM) decides about the plant layout and surface area requirements
- Electrolyzer OEMs are still developing their equipment, time and quality – there is room for improvement
- Operation problems can happen in a non-mature technology

2. The regulatory makes sense

- Currently project developers need subsidies to make the projects viable and develop the market
- Payment conditions for IPCEI subsidies are unclear and need to be clarified

3. Cooperation and alignment are key for success

- Hydrogen consumers need to commit to H₂ -Offtake agreements, which are needed for project financing
- Green energy suppliers, H₂ plant developers, H₂ grid operators and H₂ consumers have to move in parallel supported by the regulators and financial institutions, otherwise the concept doesn't work



WHAT WE NEED

PROJECT DEVELOPMENT, DELIVERY AND OPERATION

- Power Purchase Agreements for Green Energy
- Connection to a Hydrogen pipeline, which will be installed in time
- H₂ -Offtake Agreements with a long duration e.g. 8 years
- Good project financing conditions
- Reliable electrolyzer OEMs, who deliver in time with good quality and low degradation
- A highly motivated team to make the projects happen
- Good cooperation and alignment between industries to develop the Green Hydrogen market in Germany





GREEN DOING

H2APEX – H₂ Transformation in action