



BILFINGER

Bilfinger Group

Service provider for the H2 industry

April 2020

Positioning

Leading service provider
for the process industry

Range of services

Solutions across the entire lifecycle of
an industrial plant

Employees

About 34,000

Revenue 2019

€ 4,327 million

**➤ Making sure our clients can concentrate
on what they do best: their core business.**

2 SERVICE LINES
Engineering & Maintenance
Technologies

4 BUSINESS UNITS

6 INDUSTRIES



Chemical
& Petro-
chemical



Oil & Gas



Energy &
Utilities



Pharma-
ceuticals &
Biopharma



Metallurgy



Cement

Energy Transition

Our portfolio to support our customers to achieve their sustainability goals



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Portfolio in Hydrogen



Consulting and Engineering

Scope

- Environment
- Safety & Risk Management
- Site Selection & Due Diligence
- Authority & Permitting
- Feasibility
- Conceptual Engineering
- Basic Engineering

Plant Construction / EPC

Scope

- Project Management
- Detail Engineering
- Procurement
- Fabrication
- Erection
- Commissioning
- Documentation
- Integration

Maintenance and Service

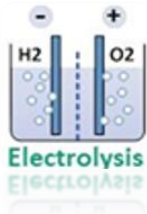
Scope

- On-Call Service
- Regular Maintenance
- 3rd party approvals
- Turnarounds
- Calibrations
- Monitoring
- Optimization

Technologies

- | | | |
|---------------------------------------|-------------------|-----------------------|
| ▪ Water Treatment | ▪ Gas Separation | ▪ Gas Regulation |
| ▪ Electrical Transformation & Control | ▪ Gas Dehydration | ▪ Gas Storage |
| ▪ Integration of Electrolyser Stacks | ▪ Gas Compression | ▪ Odorization |
| | ▪ Gas Injection | ▪ Power to Gas/Liquid |
| | ▪ Gas Monitoring | ▪ PCS/SIS |

Production

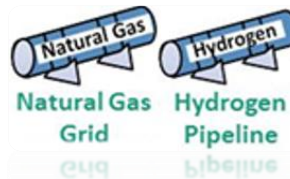


- Power Storage
- Power Transportation
- Offshore (nearby wind farms)
- PEM Electrolyser
- Alkaline Electrolyser
- Pilot/Representing Plants
- Industrial Production

Storage and Supply



- Buffering
- Underground Storage
- Above Ground Storage
- Pipeline Transportation
- Bottle Transportation/Supply



Utilisation



- Fossil Fuel Replacement
- Heat/Power Generation
- Fueling
- CO2 Footprinting Reduction
- Basics for Chemical Industry

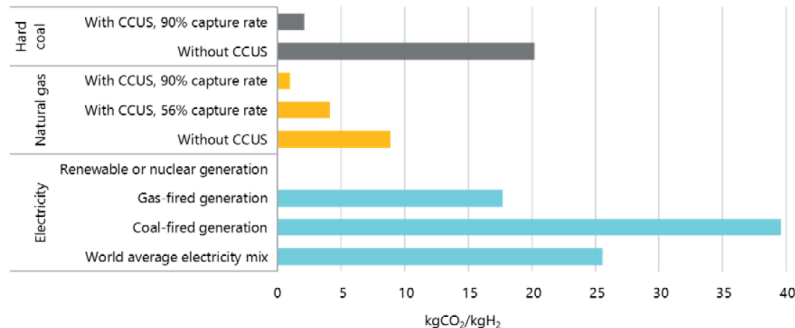


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Hydrogen Potentials

Bilfinger offers services in important engineering phases, covering:

- Market Investigations
- Due Diligence
- Feasibility Studies for on- and offshore hydrogen productions
- FEED Studies, Conceptual Engineering, Basic Engineering
- Cost Estimations
- Project Management Services, incl. Construction Management
- Safety Studies, Hazid, Hazop, SIL



Source: The Future of Hydrogen, IEA, June 2019, page 53

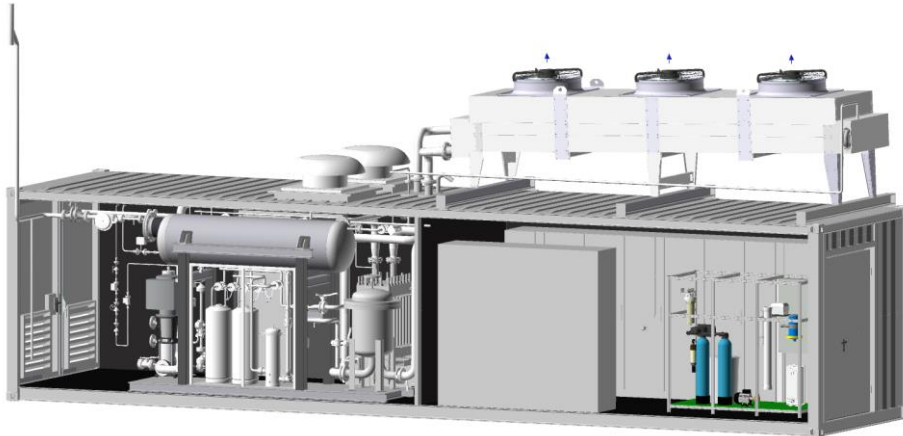


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Hydrogen Production

Bilfinger offers units and plans for the production of hydrogen (power to gas), covering:

- Engineering of the process units
- Guarantees for the gas quality
- EPC approach for small and large scale (0,5 ... 100 MW capacity)
- Integration of electrolyser packages/stacks



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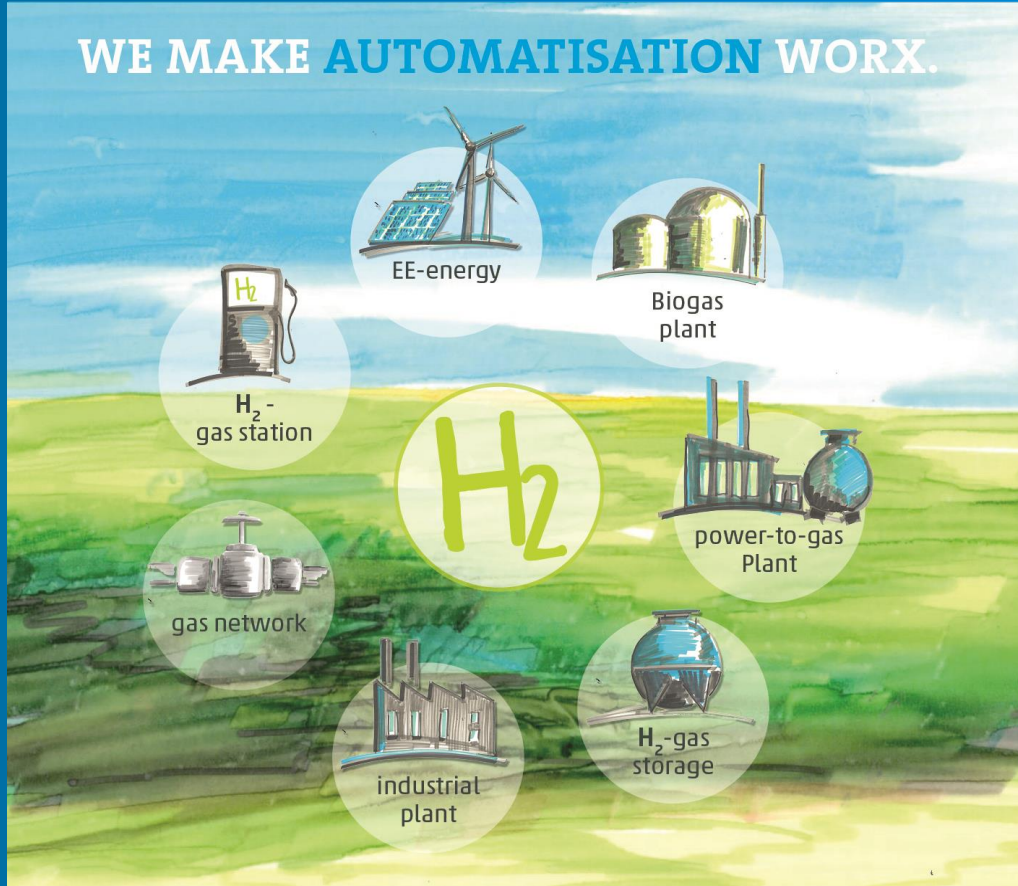
Hydrogen replacing Natural Gas

Bilfinger performs studies with effects of hydrogen on:

- Prognoses of gas composition in transport systems
- Tightness of pipeline systems
- Storability inside underground caverns
- Limitations for process plants like gas dehydration units
- Losses with gas compressors
- Accuracy of metering and analyzing devices
- Quality of combustion in industrial and private sector



WE MAKE **AUTOMATISATION** WORX.



Bilfinger offers

- Control Units for hydrogen plants
 - automation software for plants and machine control
 - central control systems for decentralized plants
 - industrial IT
- Electrical engineering from the project
 - electrical construction for plants and machine
 - control cabinet construction and production
- Service & Maintenance
- Documentation of the total project
- Training and Education

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Hydrogen in Operation



Bilfinger offers wide range of services during Operation Phases:

- Plant optimization (energy efficiency, debottlenecking, ...)
- Evaluation of digitalization potentials
- Regular Maintenance
- On demand services
- Maintenance Optimization
- Spare Part handling
- Turnarounds



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Hydrogen References

Client: North Sea Energy 3 (NSE3)

Location: The Netherlands

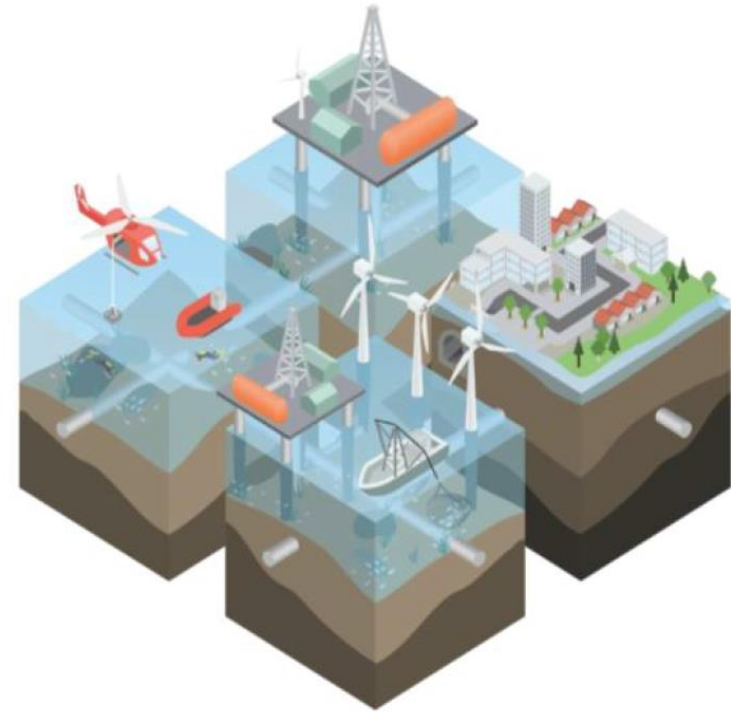


Project Description:

- Techno-economic feasibility of Hydrogen production, processing and installation (offshore & onshore)
- Conceptual/Installation design for H2 electrolyser, desalination
- Layout – 3D BIM modelling
- Market Analysis
- Environmental and legal analysis

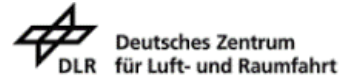
Bilfinger Scope:

- Conceptual Design
- Feasibility Study
- CAPEX figures



Source: <https://north-sea-energy.eu/en/home/>

Client: German Aerospace Center
Location: Porz, Germany

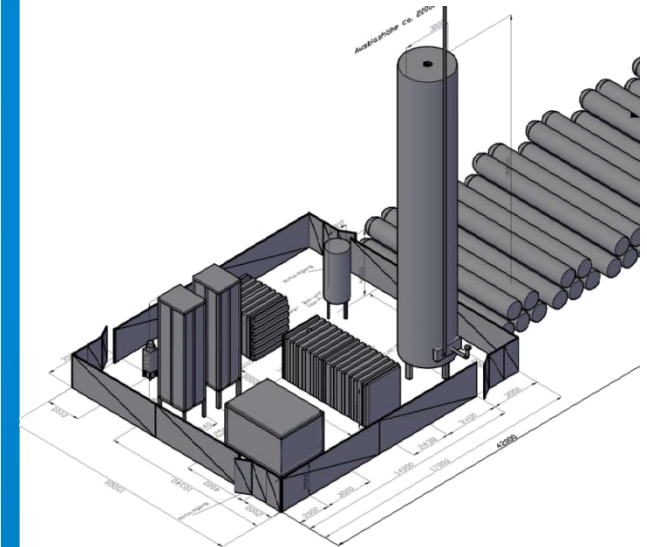


Project Description:

- Supply of H₂ cryogen < 253°C
- Storage of H₂ cryogen
- Evaporation
- Compression to 300 bar
- Storage in 300 bar vessels
- Metering

Bilfinger Scope:

- Feasibility
- Basic Engineering
- Authority Engineering
- Procurement
- EPCM



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Hydrogen References

Client: Uniper

Location: Falkenhagen, Germany



Project Description:

- Power to gas plant
- 2 MW electrolyser capacity
- Hydrogen compression
- Green hydrogen injection

Bilfinger Scope:

- Control System WinCC/S7-300
- Data Server
- Pipeline Leakage Monitoring System
- Remote Control from Dispatching



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Hydrogen References

Client: HyStock/Gasunie
Location: The Netherlands

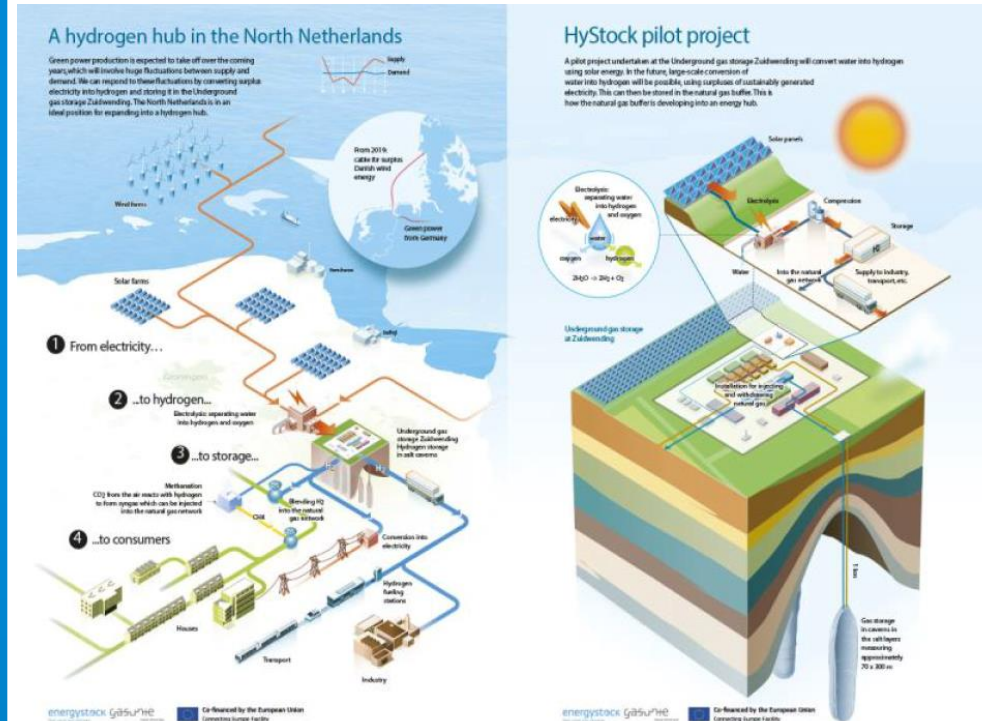
gasunie

Project Description:

- Pilot Plant (1 MW) for green electricity conversion into H₂ (Power-to-hydrogen facility)

Bilfinger Scope:

- Assistance with system integration
- High-voltage power supply integration to rapid response proton exchange unit (PEM)
- Pipeline layout and infrastructure
- Hydrogen piping and tube trailers



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Hydrogen References

Client: Air Liquide

Location: West Germany



Project Description

- Operation and Maintenance of pipeline grid for synthetic gases (H₂, N₂, CO, CO₂)
- Pipeline Length approx. 240 km

Bilfinger Scope

- Feasibility Study



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Hydrogen References

Client: N.N.

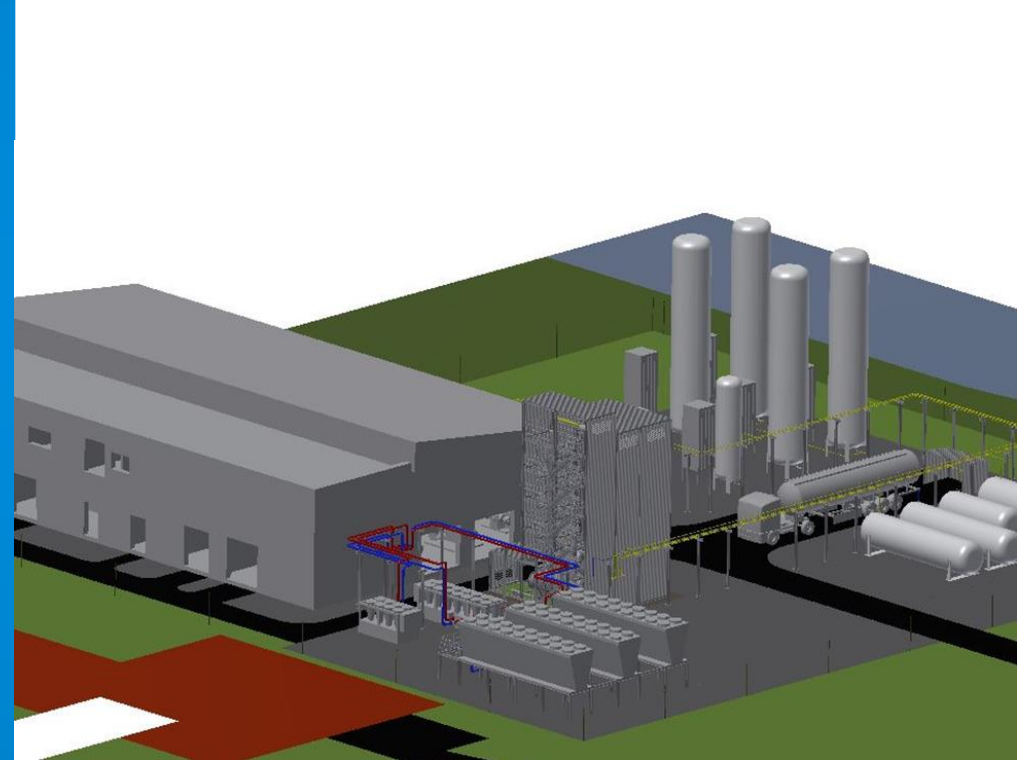
Location: Europe

Project Description:

- Hydrogen Production (6 MW)
- Methanol Synthesis out of H₂ and CO₂
- CO₂ Storage
- Methanol Storage and truck loading
- Civil Engineering

Bilfinger Scope

- Concept Study
- Pre-engineering



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Hydrogen References

Client: Siemens AG

Location: Berlin

SIEMENS

Project Description

- cryogen storage of H₂ for combustion test center
- Treatment
- Transport
- Metering

Bilfinger Scope

- Invest Estimation
- Pre-Basic Engineering
- Authority Engineering



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Hydrogen References

Client: Air Liquide

Location: Rotterdam, The Netherlands Germany

Project Description:

- Hydrogen Fueling Station

Bilfinger Scope:

- Civil/Structural Engineering
- Infrastructure Engineering
- Construction Management & Supervision
- Environmental Permitting



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Hydrogen References

Client: N.N.

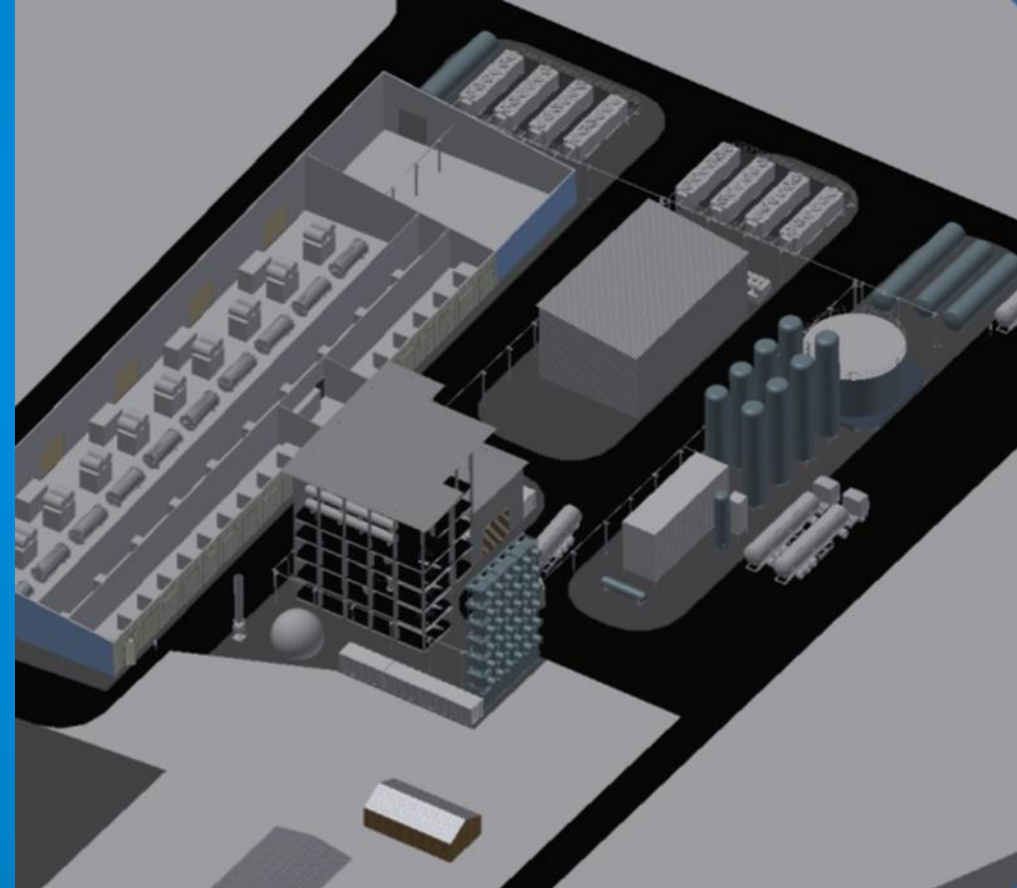
Location: Europe

Projekt Description:

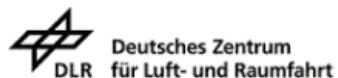
- Concept Study
- Pre-engineering

Bilfinger Scope:

- Hydrogen Production (628W)
- PtL Synthesis out of H₂ and CO₂
- CO₂ Storage
- Methanol Storage and truck loading
- Civil Engineering



Bilfinger Clients



wintershall dea



UGS KATHARINA
Erdgasspeicher Peissen GmbH





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Thank you very much!

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