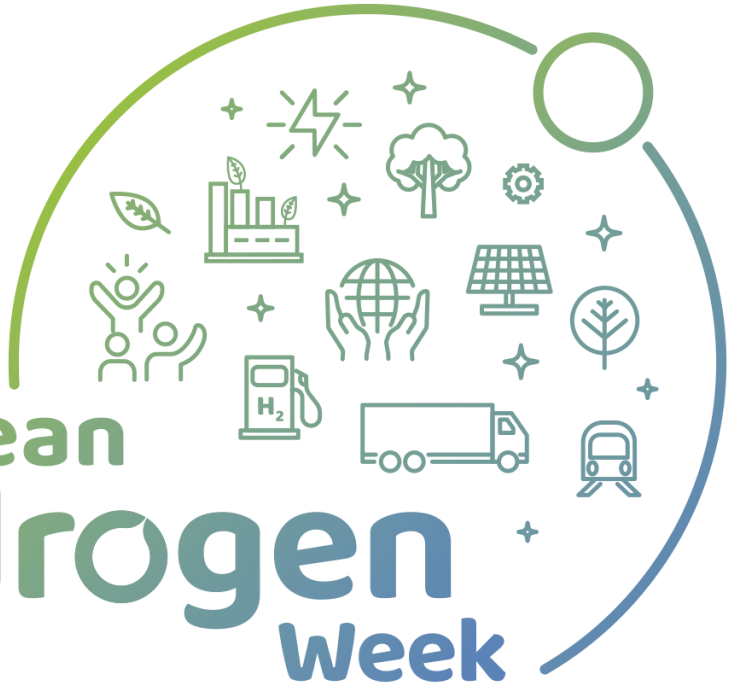
# Djewels

## Delfzijl Joint dEvelopment of green Water Electrolysis at Large Scale

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*Project supported by*

waddenfonds

Netherlands Enterprise Agency

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djewels.eu

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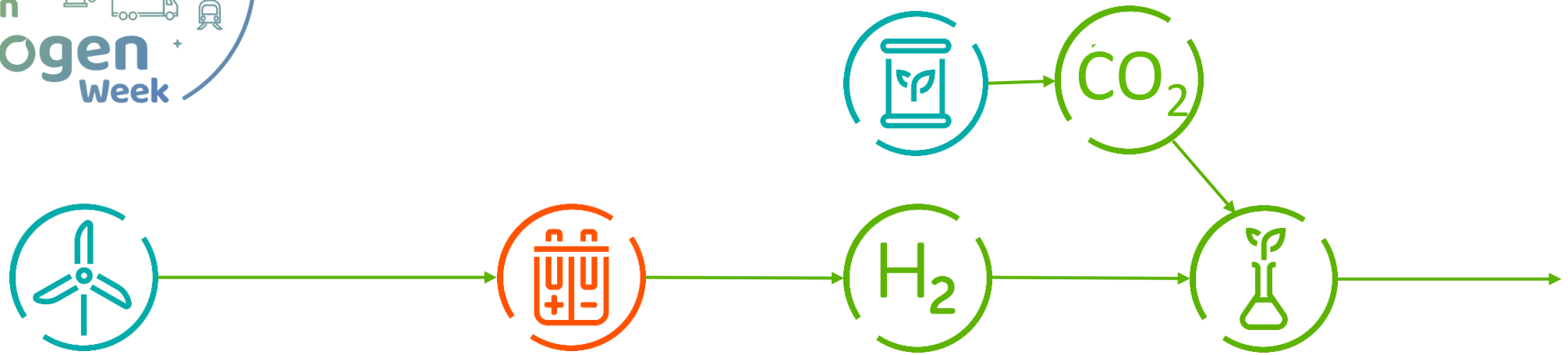
# Djewels Overview

- Call year: 2018
- Call topic: FCH-02-1-2018: Demonstration of a large scale (min. 20MW) electrolyser for converting renewable energy to hydrogen
- Project dates: 1 January 2020 – 31 December 2025
- % stage of implementation 01/11/2021: 25 %
- Total project budget: 42 M€
- FCH JU max. contribution: 11 M€
- Other financial contribution: 5.2 M€
- Partners: Nobian, Gasunie, McPhy, BioMCN, De Nora, Hinicio

# Djewels will showcase the complete value chain from renewable power to renewable methanol





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NOBIAN

Hinicio

BioMCN

McPhy Driving clean energy forward

DE NORA

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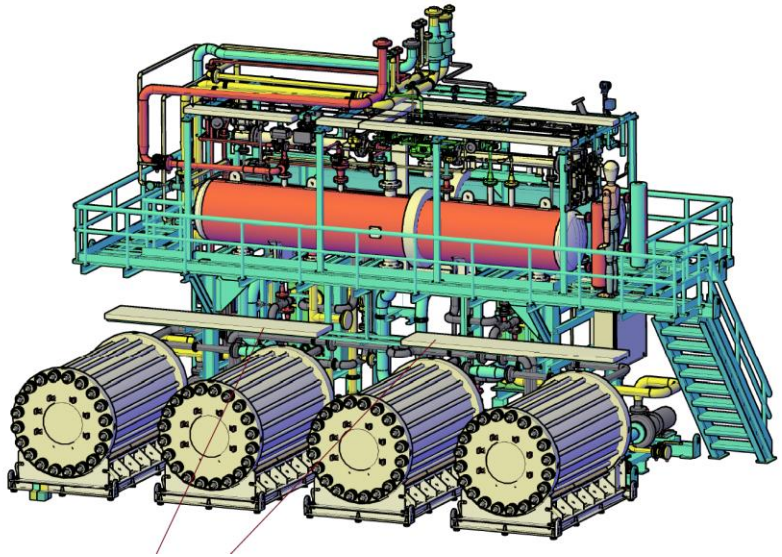
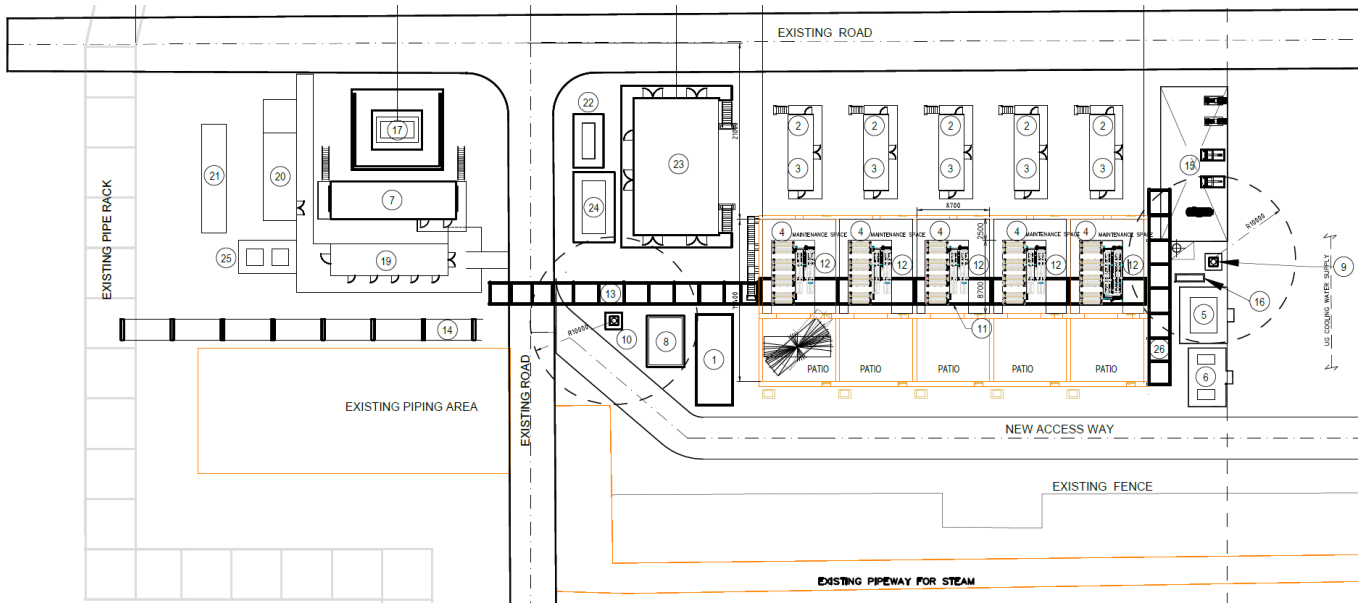
# We have completed the design and Basic Engineering for the 20MW Platform

## Minimizing footprint and addressing scalability

**Achievement to-date**

25% 50% 75%

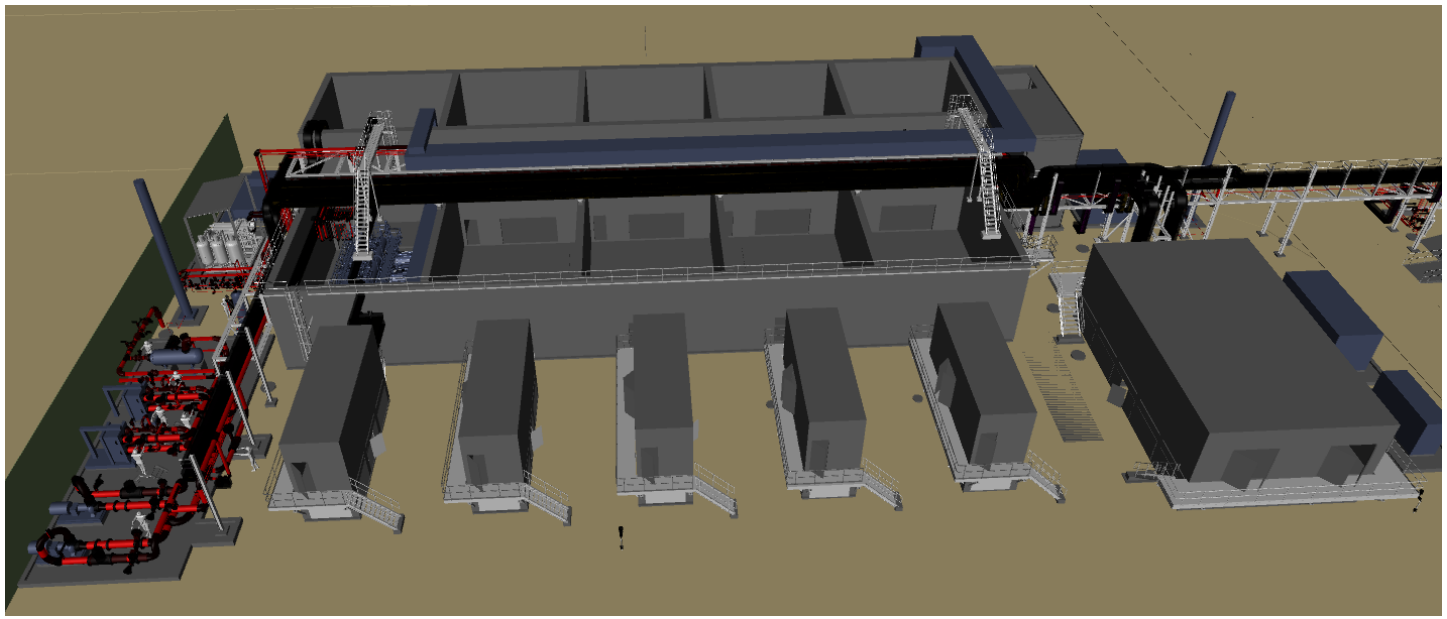




# Next major step is to start construction (ground-breaking)

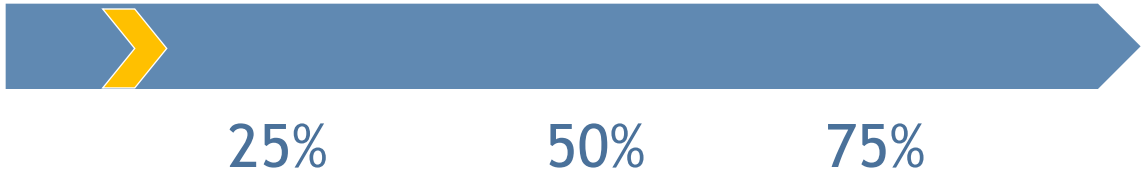
## Achievement to-date


- Permits to be published in December
- RfI for EPCm contractor completed
- FID expected ‘22



# We're preparing for the operational phase, where we will demonstrate the commercial operation in an industrial setting

**Achievement to-date**




Our aims for the operational phase:

- Demonstrating & improving the current state-of-the-art of 10s of MW electrolyser technology by significantly lowering the operating costs;
- Provision of large quantities of green hydrogen on a commercial basis for application(s) that valorize(s) the renewable character of the hydrogen;
- Demonstration of the working flexibility of the electrolyser on a commercial basis by harvesting renewable power and in the meanwhile offering grid balancing services;
- Demonstration of future economic viability of the technology;
- Operation of an electrolyser system in real life conditions.

% stage of implementation is the % of project *duration* (months) elapsed on 01/11/2019

# Risks, Challenges and Lessons Learned

Scale-up of technology, including compliance with industrial (safety) standards has proven more challenging than anticipated at the start.

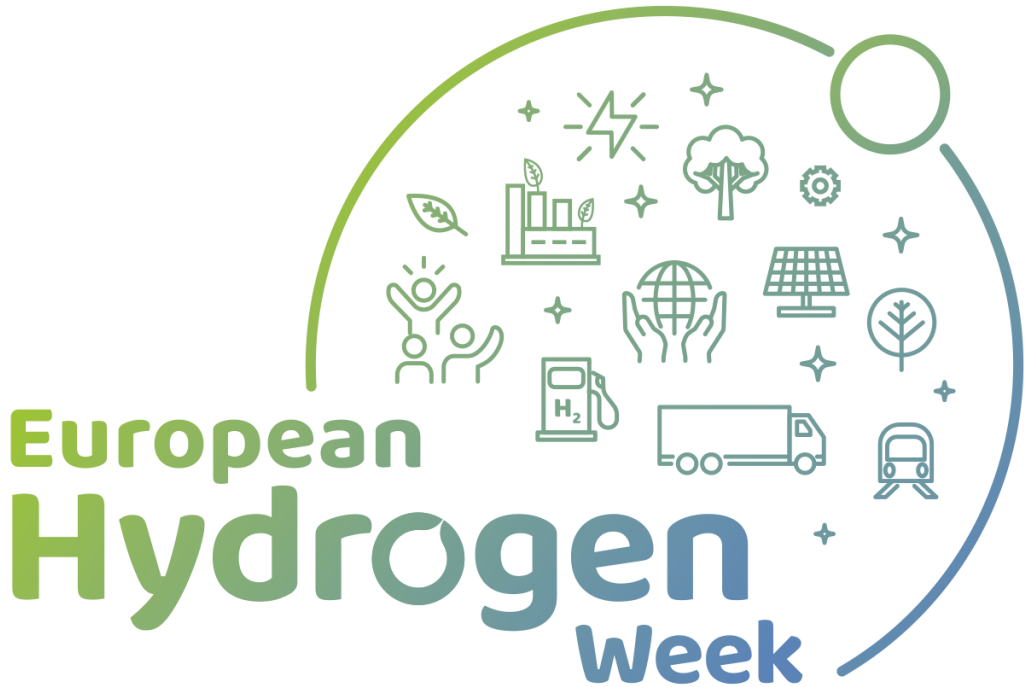
Implementation of legislation required to enable premium for renewable methanol from green hydrogen

Solutions found how to couple intermittent electricity intake / hydrogen production to industrial process (methanol synthesis)

# Exploitation Plan/Expected Impact

Scaling-up the production of green hydrogen in Delfzijl for green methanol production, followed by *replication* in other chemical clusters with further scale-up, and conversion of existing gas pipelines to hydrogen for transporting green hydrogen in large quantities to additional points of consumption.

| | |
|---|---|
| NOBIAN | • Scale-up the production of green hydrogen to answer to BioMCN's demand, as well as that of other hydrogen customers in Delfzijl (e.g. SkyNRG), including regional mobility demand<br>• To further develop and operate large-scale hydrogen production plants once the business case is proven. |
| gasunie crossing borders in energy | • Demonstrate the potential of an asset-owning business model and, potentially to replicate it. Gasunie will evaluate the potential to reuse existing gas pipelines to transport green hydrogen, notably to the main chemical clusters in the Netherland and Ruhr area |
| BioMCN | • Scaling-up the production of green methanol for meeting the increasing demand for green fuels to meet regulatory targets |
| McPhy Driving clean energy forward | • Demonstrate a new commercial product with the ability to provide grid services at a scale of interest for TSOs and to start preparing the next step in scaling of the electrolyser technology.<br>• To address potential customers for other 20MW platforms in EU countries and beyond and seek to reinforce McPhy's market position.<br>• Prepare the next generation of large electrolyser platform (100 MW and more). |
| DE NORA | • DeNora's electrodes will further increase the competitiveness of alkaline water electrolysis and enhance the future electrolyser product offer, supporting market penetration of hydrogen production by electrolysis. |

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