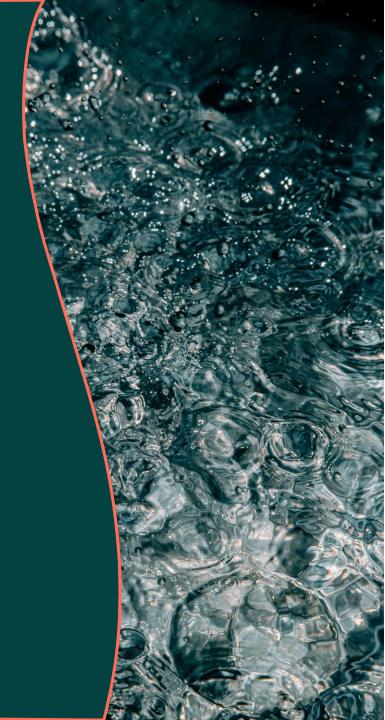
# Hydrogen pro

**Q2 2022 presentation** 

Richard Espeseth, Interim CEO Martin Thanem Holtet, CFO 23<sup>rd</sup> of August 2022



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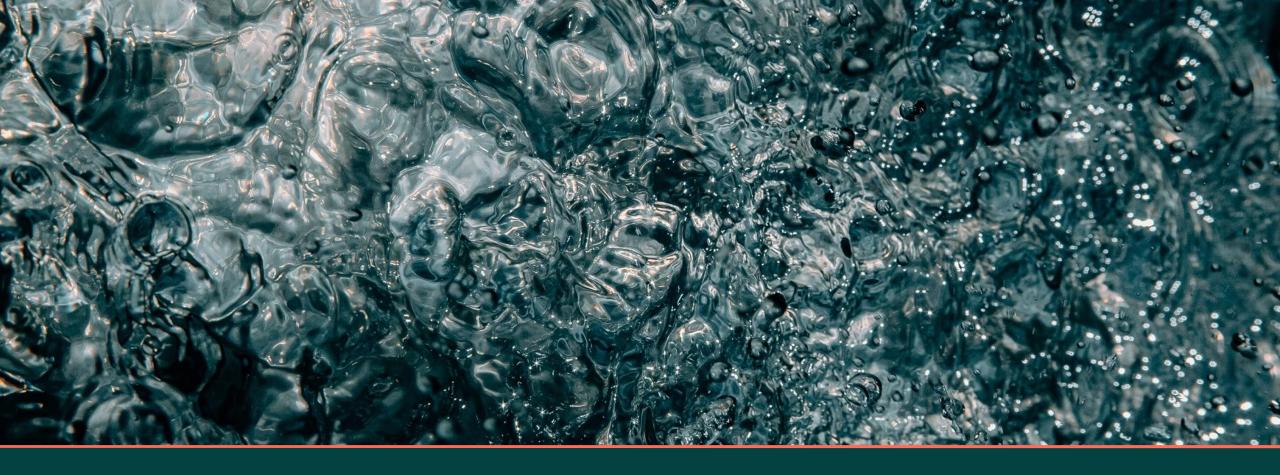
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## Agenda

- I. Introduction: Q2 highlights
- II. Business update
- III. Technology leadership
- IV. Summary





## I. Introduction: Q2 highlights

Hydrogen pro

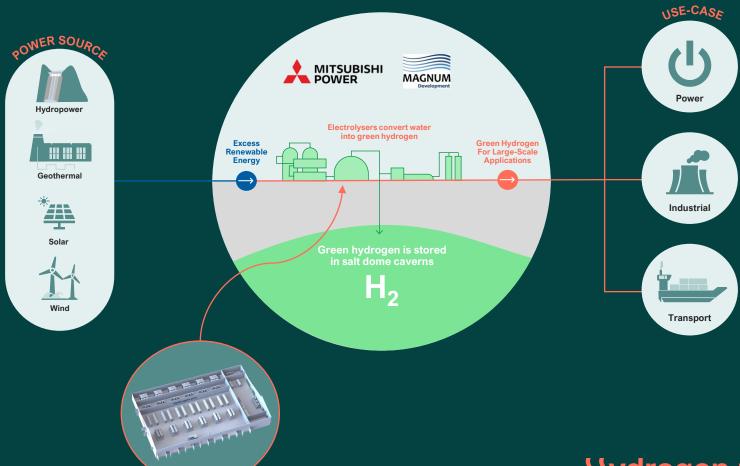
### Transformational development since IPO in October 2020

IPO (October 2020) Q2 2022 **Technology owner Value chain position Distributor** & OEM<sup>1</sup> **Manufacturing capacity (p.a.)** 0 MW **300 MW Backlog** NOK 15 mill NOK 794 mill Active sales pipeline 1.5 GW 15.4 GW # of employees 10 70 Application submitted for up-**Listing venue Euronext Growth** listing to Oslo Stock Exchange<sup>2</sup>

<sup>1)</sup> Original Equipment Manufacturer

# HydrogenPro to deliver to the world's largest green hydrogen energy hub: 220 MW electrolysis plant

- HydrogenPro has also signed a 10-year service and support agreement
- The Advanced Clean Energy Storage Hub will use renewable energy sources
- HydrogenPro will complete the fabrication of the electrolyser systems in Q3 2023, followed by on-site work with completion in late 2024



## BREAKING NEWS: The Inflation Reduction Act is a major trigger for green hydrogen in the U.S.

On 12th of August 2022 the US Congress passed the Inflation Reduction Act (IRA)



Wind/solar/hydro power is a pre-requisite to maximize tax credit

**High Pressure Alkaline or PEM electrolysis** 

## HydrogenPro increase its presence in the U.S.

#### Securing local presence

## Mitsubishi Power: Selected supplier for the world's largest green hydrogen energy hub

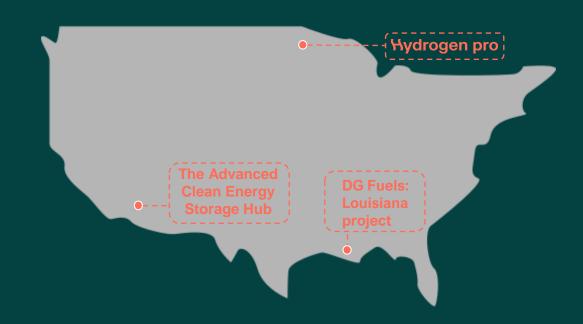
- HydrogenPro will deliver 40 electrolysers with a capacity of 5.5
  MW per electrolyser (220 MW in total)
- Completion of fabrication of the 220 MW order is planned in Q3 2023, followed by on-site work with completion in late 2024

#### **DG Fuels: Further progress regarding offtake agreements**

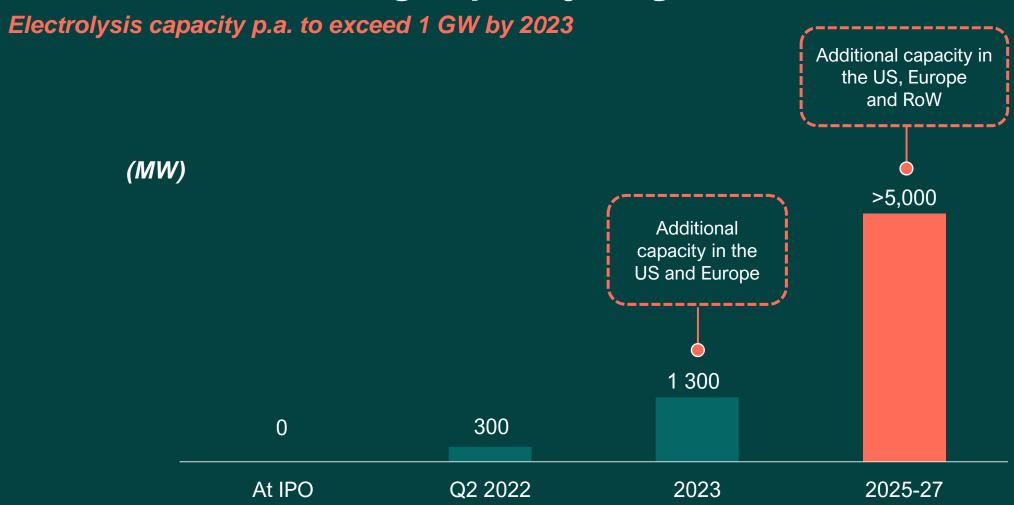
Solid progress on the project in Louisiana (~840 MW electrolyser capacity) with FID estimated in Q1 2023

#### HydrogenPro Inc: Establishment of US subsidiary

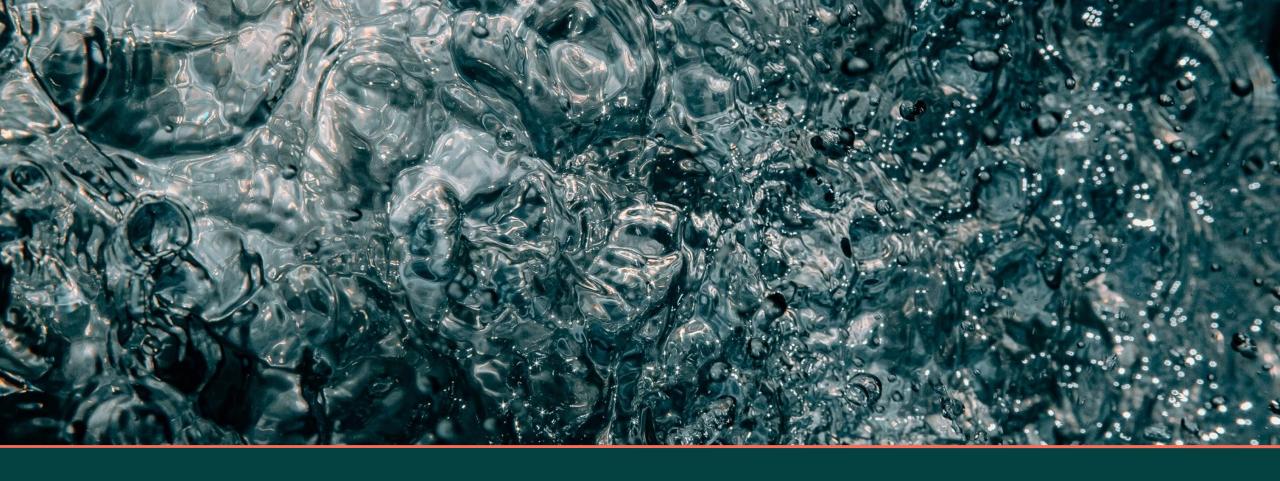
- Currently scaling up our US activities with employing new senior resources in HydrogenPro Inc.
- In accordance with the HydrogenPro's strategy of global footprint and local presence
- Planning for new manufacturing facility in operation by end of 2023



## Global manufacturing capacity target



HydrogenPro's IP ownership enables a rapid global scale-up



## II. Business update

Hydrogen pro

## **Business update Q2 2022**

Q2 2022 financials – positive operating cash flow with well-capitalized balance sheet

>USD50 mill. PO with Mitsubishi; one of the largest electrolyser PO's ever + 10-year service agreement

USD 3 mill. PO with Mitsubishi – *large electrolyser* to Takasago Hydrogen Plant

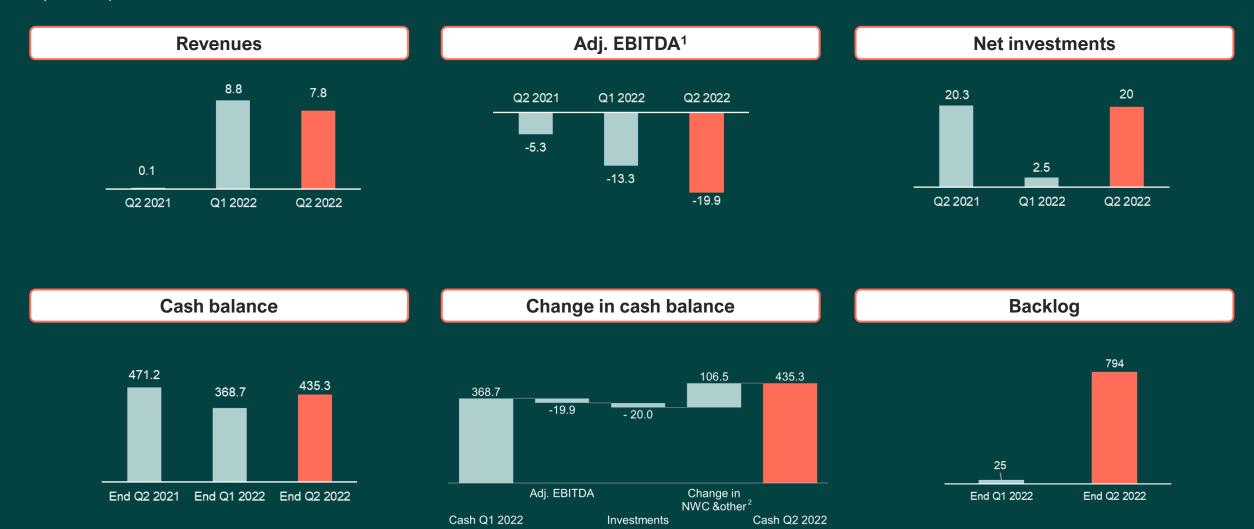
Fabrication of the world's largest single stack high-pressure alkaline electrolyser system completed

Backlog of NOK 794 million and active sales pipeline of 15.4 GW / 109 projects

Submission of application for *up-listing* from Euronext Growth to *Oslo Stock Exchange* 

### Q2 2022 financials

(NOK mill)



Note: HydrogenPro Tianjin CO Ltd (75% owned by HydrogenPro AS) included in consolidated financial figures

- 1) Excl. non-cash impact of incentive program
- 2) Change in NWC/Other: change in acc receivables (NOK71.8m), increase in short term debt in subsidiary (NOK12.6m), other(NOK22.6m)

## Focused investment plan to scale up globally and generate industry-leading returns

#### Overall investment plan

Partnership strategy to fast-track build-up of global presence and market awareness...



## ...combined with a focused capital deployment plan:

- Global manufacturing & assembly capacity
- Technology and innovation: technology frontrunner
- Scale-up of the organization
- Working capital on large-scale projects

#### Main capital uses in H2 2022:

- Fully operational fabrication facility (300 MW) in China (remaining net capex of ~NOK 45 mill.)
- Working capital (inventory and long-lead items) to execute on purchase orders
- Building up systems and organisation

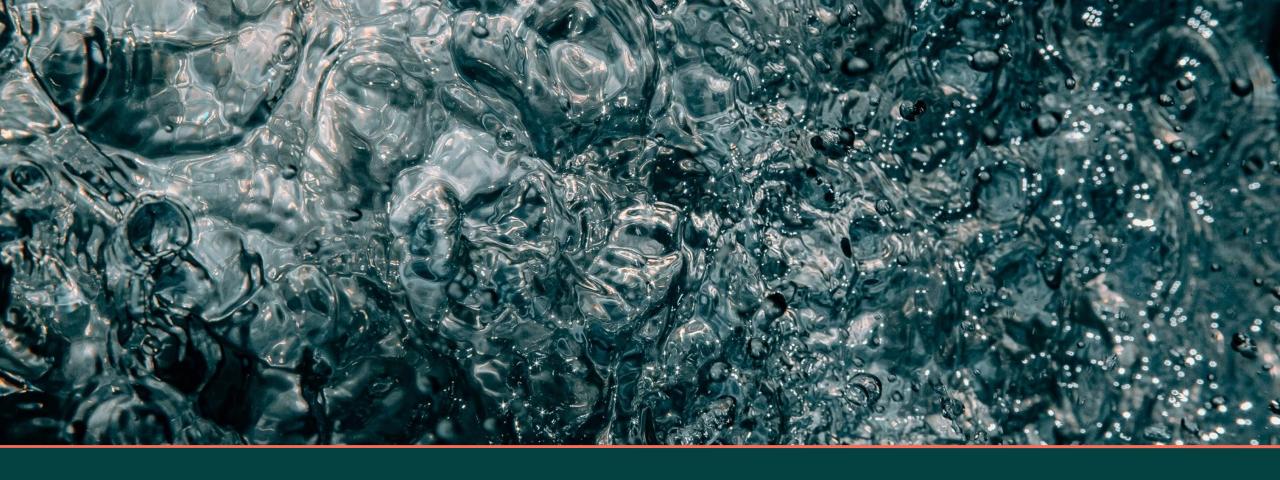
## Active sales pipeline as of end Q2 2022

15.4 gw

109 projects

141 average MW per project

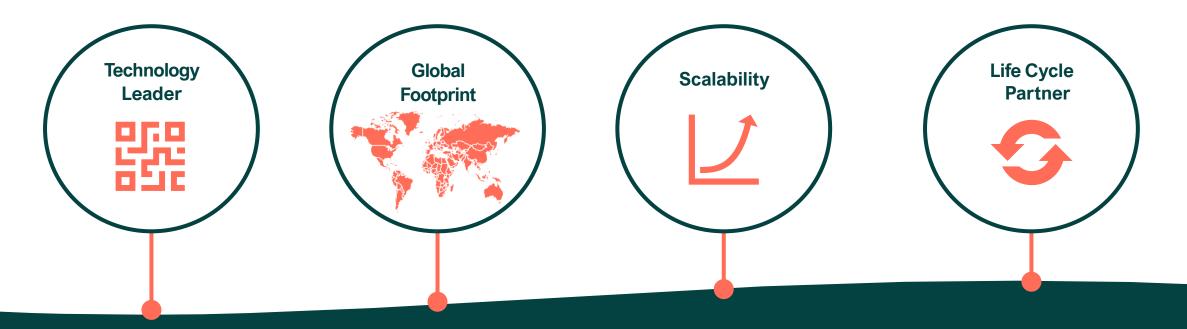
+ on-going FEED studies



## III. Technology leadership

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## Owner of core technology and IP rights

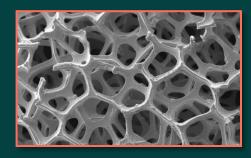


Strategically positioned as Original Equipment Manufacturer

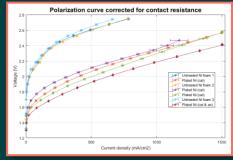
Hydrogen Pro is a full-fledged life cycle partner, and we produce high-pressure alkaline electrolysers with our proprietary, next-generation electrode technology

Currently establishing a global footprint to secure local presence

# HydrogenPro's advanced electrode technology increases efficiency significantly



Advanced electrode technology



Lab tests proving 14 % increased efficiency (HHV)

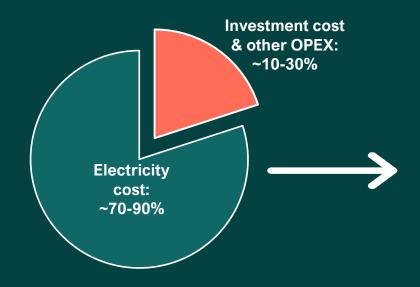


Initial electrolyser test results verified



# Electricity is by far the largest cost - advanced electrodes is a game changer for production of green hydrogen

#### Levelized cost of hydrogen ("LCOH")1

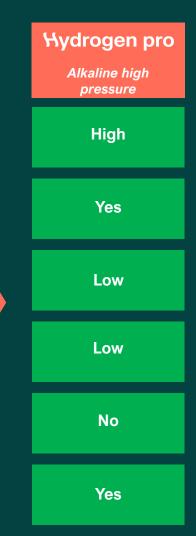


- HydrogenPro's advanced electrode technology reduces consumption of electricity by 14 %
- The reduction in electricity consumption is a significant benefit to the client vs. reducing the capex of the electrolyser
- Increasingly higher advantage with high energy prices

HydrogenPro's high pressure alkaline technology has several

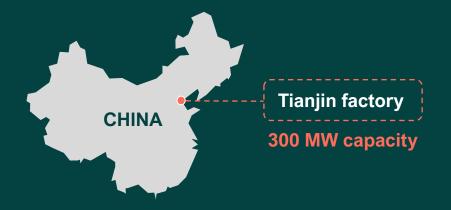
advantages

| arantagoo                           | PEM              | Alkaline             | Alkaline         |   |
|-------------------------------------|------------------|----------------------|------------------|---|
|                                     | High<br>pressure | Atmospheric pressure | High<br>pressure |   |
| Plant efficiency                    | Low              | Medium               | Medium           |   |
| Suitable for renewable energy input | Yes              | No                   | Yes              |   |
| Cooling need                        | High             | Medium               | Medium           | > |
| Overhaul Opex                       | High             | High                 | Medium           | • |
| Use of noble materials              | Yes              | No                   | No               |   |
| High pressure on O <sub>2</sub>     | Medium           | No                   | Yes              |   |



## Manufacturing facilities

**Electrolyser manufacturing** 



**Electrode manufacturing** 



#### **China – Electrolyser factory**







#### **Denmark - Electrode factory**





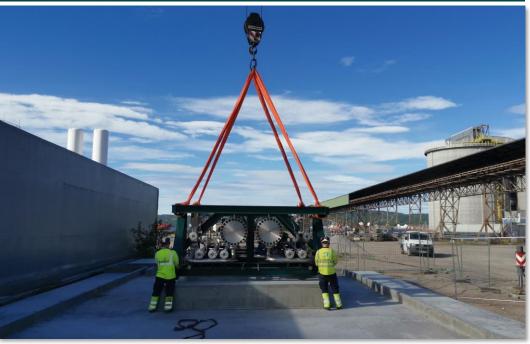
## **Operations in Norway**

**HQ** and test center at Herøya, Porsgrunn



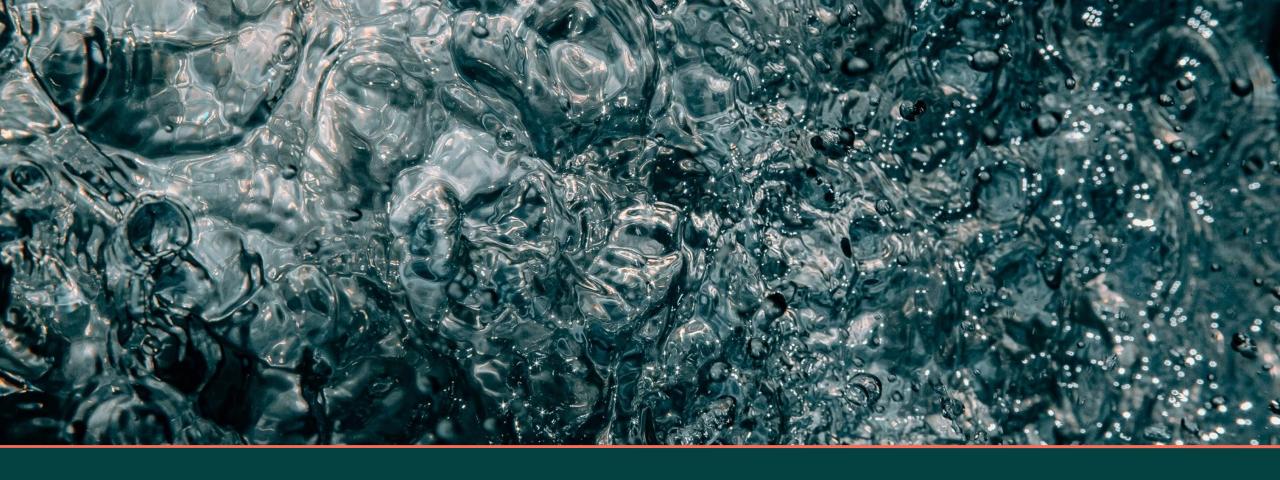
- Currently preparing for test of the world's largest single stack high-pressure alkaline electrolyser system
- Initial test runs show efficiency with advanced electrode technology is in line with simulated results of 93%, long-term test on-going

#### Herøya – Test center





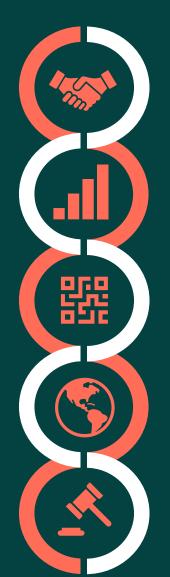




## IV. Summary

Hydrogen pro

## **Executive summary**



Landmark purchase order > USD 50 mill / 40 electrolysers with Mitsubishi, plus a 10 years service and support agreement

Backlog of NOK 794 mill & active sales pipeline of 15.4 GW

Advanced electrode technology reduces energy costs by 14% - long-term verification of results ongoing

Global fabrication expansion and engineering set-ups ongoing

Strong public commitments for hydrogen in the energy transition – recently major announcements in EU and the US

## Hydrogen pro

Pure Performance | Pure Efficiency | Pure Power

## Outlook 2022: Our most important exam yet

#### Second half of 2022

Validation of world's largest high-pressure alkaline electrolyser system

 Arrival of world's biggest electrolyser at Herøya expected in late August

- Assembling, installation and commissioning of the electrolyser at Herøya test facility
- Validation program will begin

- Test results from validation expected
- Expect proof-of-concept of our technology in large scale electrolyser

Long-term testing of advanced electrode technology

Long-term verification test results of electrode technology

**Up-listing to Oslo Stock Exchange** 

 Application submitted for admission to trading on Oslo Stock Exchange

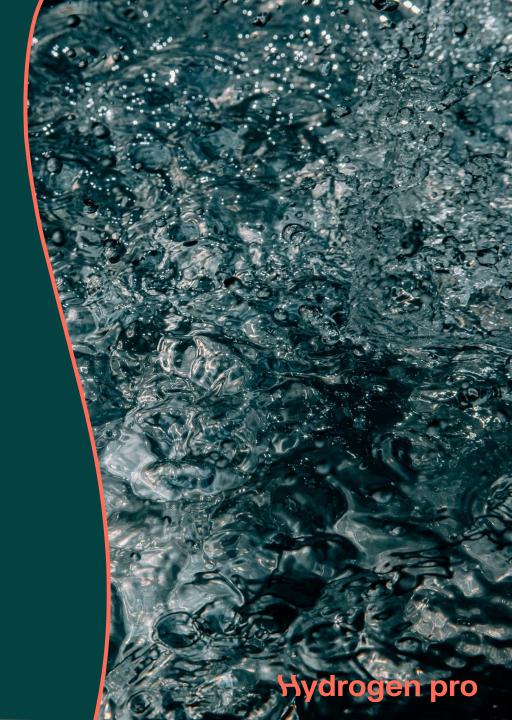
 First trading date on Oslo Stock Exchange.

Scale-up of global footprint

- Signing of partnership agreements in the US and Europe
- In total 1 GW capacity



A&Q



# Appendix



# Strong public commitments for hydrogen in the energy transition – recently major announcements in EU and the US

2019

>2020

2022

- Germany, Belgium and France announces hydrogen deployment plans, ranging from EUR 50<sup>1</sup> million to EUR 1.5 billion<sup>2</sup>
- Japan, South Korea and Netherlands release national hydrogen strategies

- 13 new countries have published national hydrogen strategies on all continents
- More than 20 countries are actively developing strategies
- The U.S. committed USD 1.2 trillion infrastructure budget, and USD 8 billion to create four "clean hydrogen hubs"

- The European Commission releases €300 billion investment plan<sup>4</sup>
- Ambition is to end EU's dependence of Russian fossil fuels, while also decarbonizing Europe
- 10 million tonnes of hydrogen is to be produced in the EU by 2030<sup>5</sup>
- Permit processes on renewable projects inside EU is expected to accelerate drastically
- US green hydrogen to become world's cheapest form of H2 if tax-credit plan is cleared in congress – Producers to receive up to \$3 per kg<sup>6</sup>

The latest initiatives in EU and US are major triggers for green hydrogen and HydrogenPro going forward

### Material development geared with national/international funding

#### Overview of funded R&D projects Q1-Q2

- H2UP; Eurostars (Innovation Fund Denmark and Research Council of Norway)
- Dual Flow; H2020
- H2-LEAN; EU-REACT
- 2 x industrial PhD's projects (Innovation Fund Denmark)
- 2 x projects supported by Energy Cluster Denmark
- Project supported by RFF Vestfold and Telemark Regional Research Fund



- ✓ More R&D projects are in the pipeline
- ✓ Several patents have been filed in Q1-Q2
- New ideas to be pursued



### Technology advantages

### HIGH PRESSURE ALKALINE TECHNOLOGY: ADVANTAGES FOR LARGE-SCALE PROJECTS

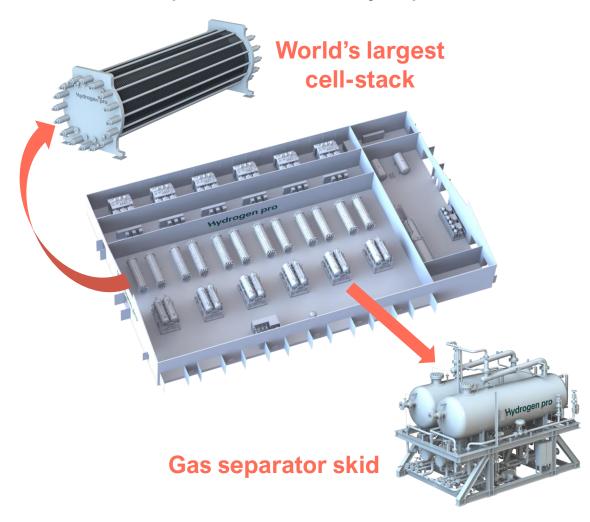
- Standardized technology for electrolyser production trains
- No use of noble metals or polyfluorinated alkyl substances (PFAS)

#### TECHNOLOGY ADVANTAGES UNIQUE TO HYDROGENPRO\*

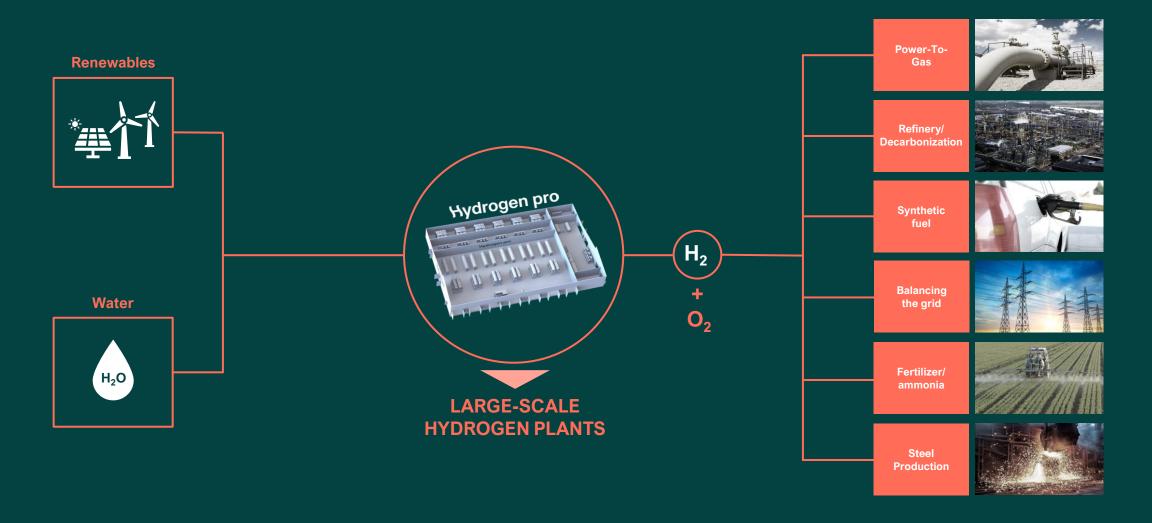
- Electrolyser system efficiency
  - Compact size due to pressure and cell-stack size
- Opex efficiency
  - Advanced electrode technology
  - Reduced need of cooling water
- Capex efficiency
  - Large scale
  - Design limits of components
  - Modular and standardized
  - Easily scalable with customer requirements
- Operation window well suited for renewable energy production

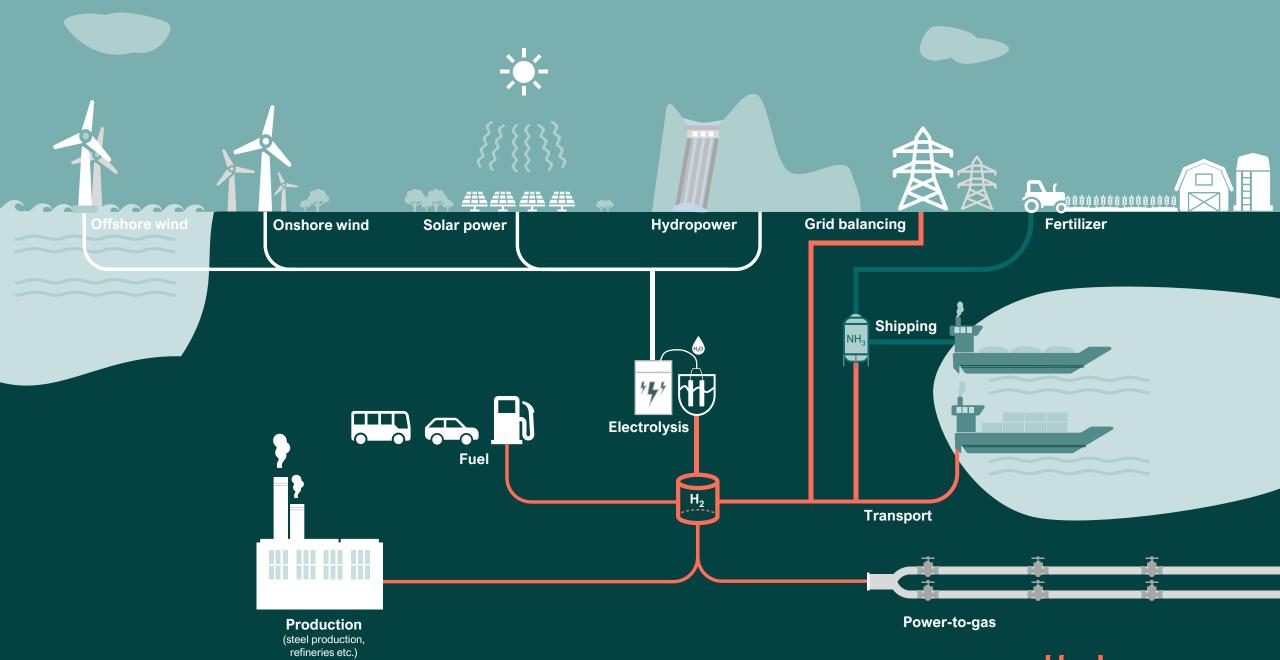
### Large-scale modular hydrogen solution

and core components in the electrolyser production train



## Hydrogen enables the renewable energy transition





Hydrogen's role to reach net zero emissions in

2050

Hydrogen can contribute

20%

of global carbon abatement

Requiring

660 MT

Of renewable and low-carbon hydrogen

Equivalent to

22%

of global final energy demand



# Hydrogen pro

www.hydrogen-pro.com