

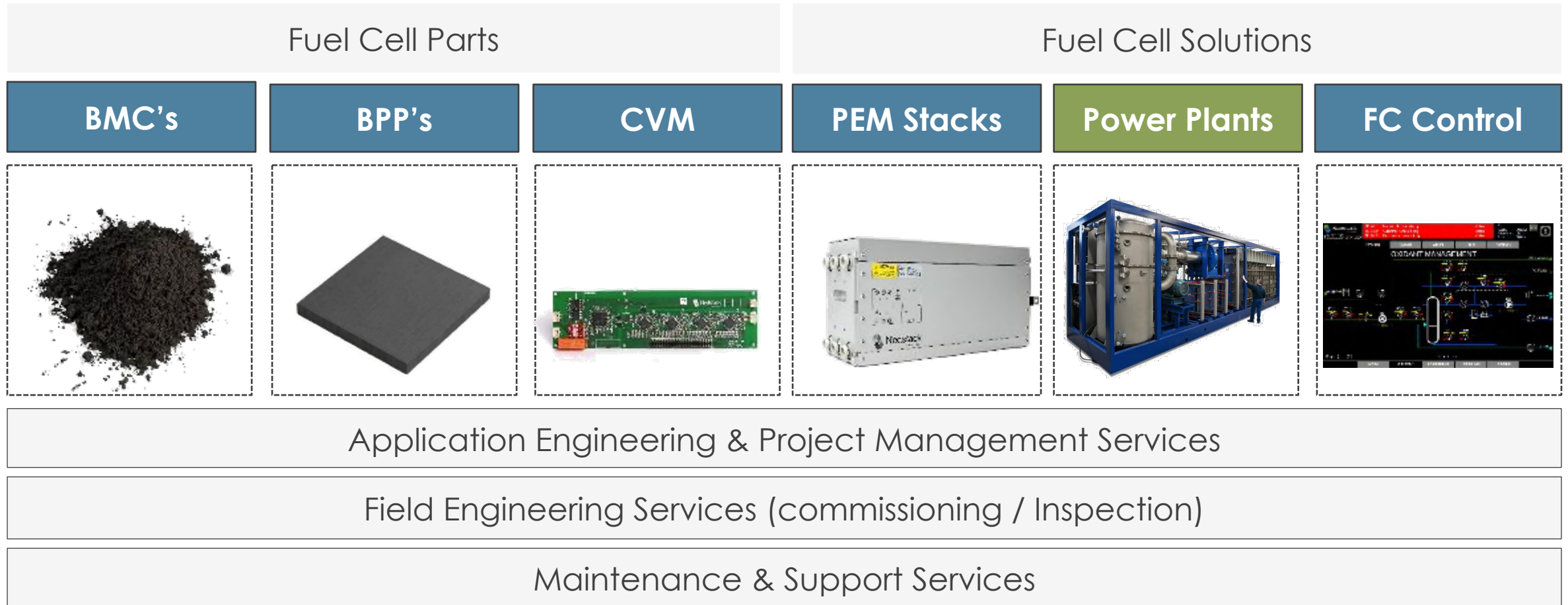
ZES: Ready to go

SHIPZERO 28 @ LISW2023

Technology & Engineering Services Portfolio

PEM Fuel Cell Excellence from Powder-to-Power

PUBLIC VERSION



■ Engineering & IP-ownership by Nedstack / Built Process by Co-Maker

Flagship Demonstrators – Globally Unique Recognitions

Leadership in the High-Power / High-Use Domain

PUBLIC VERSION

Longest Running PEM Power Plant



- **AkzoNobel - Delfzijl (NL)**
- Live since 2007
- Using H2 from Chlor-Alkali
- 70k Running hours accumulated

First MWe Sized PEM Power Plant



- **Solvay - Antwerp (BE)**
- Installed in 2011
- 1MW output power
- Using H2 from Chlor-Alkali

Largest PEM Power Plant



- **Ynnovate - Yinkou (PRC)**
- Installed in 2016
- 3.6MW rated output power
- Developed in DemcoPEM¹ Project



1) DemcoPEM has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under Grant Agreement no. 621265

Fuel cell power installations - references

Ships are sailing with hydrogen fuel cells today

PEMGEN® 120



- Maritime system @ Viking Neptune
- 120 [kW] – End of Life

PEMGEN® 300

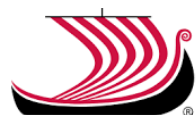


- In commercial operation @ H2 Barge 1
- 300 [kW] – End of life

PEMGEN® 600



- Zero emission dredging @ Port of R`dam
- 600 [kW] – End of Life



Owned by:

VIKING

Owned by:

FutureProof Shipping



Demonstrated by:

Boskalis

Developing a next generation of maritime fuel cells

1. Bunkering and storage systems
2. Hydrogen carriers
3. Fuel cells
4. Data collection and system validation
5. System integration
6. Modular testing
7. Ship design
8. Safety

Sustainable Hydrogen Integrated Propulsion Drives (SH2IPDRIVE)
is supported by



Rijksdienst voor Ondernemend
Nederland

Budget: €33.600.000

Future Proof Shipping B.V. | Technische Universiteit Delft | Nedstack Fuel Cell Technology B.V. | Maritiem Research Instituut Nederland | Koedood Dieselservice B.V. | C.V. Scheepvaartonderneming Van Dam | Holland Shipyards B.V. | TNO | Bosch Rexroth B.V. | Cryovat Internationaal B.V. | H2Storage B.V. | H2 Circular Fuel B.V. | H2FUEL Cascade B.V. | Royal Roos B.V. | Solid Hydrogen B.V. | Universiteit van Amsterdam | Voyex B.V. | Encontech B.V. | Technische Universiteit Eindhoven | Universiteit Twente | Rivermaas B.V. | IHC Holland B.V. | Shell Global Solutions International B.V. | Concordia Damen Shipbuilding B.V. | Defensie Materieel Organisatie

Project NextStep – Towards 1 GWe per Annum Capacity

Industrialization Plan – Simultaneous Engineering

PUBLIC VERSION



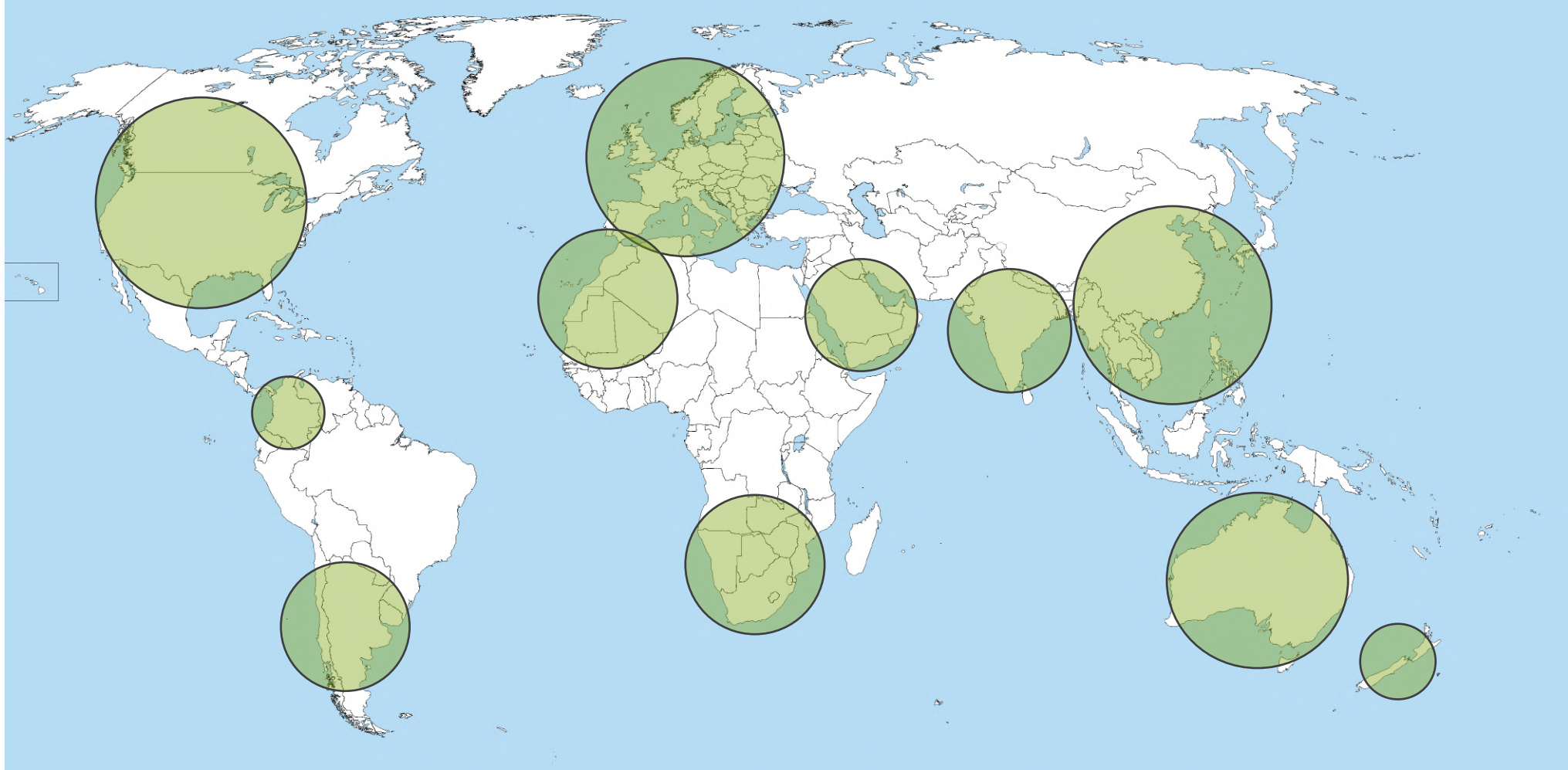
The Fuel Cell Giga Factory is supported by
RVO under ICPEI Grant Scheme



Rijksdienst voor Ondernemend
Nederland

International developments: H2 strategies

Initiatives for H2 production aligned main shipping routes



Key take aways

- We have the knowledge, technology and capacity
- We are ready
- You are ready
- What are we waiting for?



Contact Card



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