

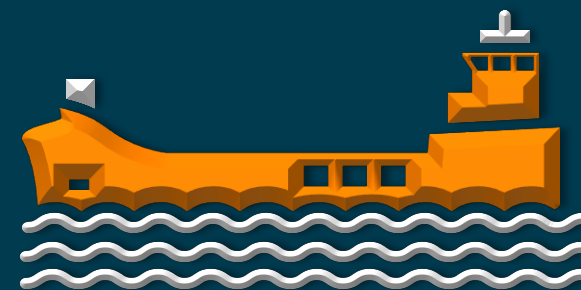


Corvus  Energy

Norsk Hydrogen Forum



Kristian Holmefjord
EVP & Project Director – Fuel Cells
16th of February, 2024



Today's presenter



Kristian Holmefjord

*Executive Vice President
Project Director – Fuel Cells*

Selected experience

Corvus  Energy

 Rolls-Royce  KONGSBERG

 SINTEF



BBC – World-Leading engineer within Clean Energy



The Motorship Award - Brilliant emission-cutting solutions

Specialist on marine fuel cell solutions, energy storage systems and power systems for zero and low-emission vessels.

About Corvus Energy



Key Facts

- Founded in Canada in 2009
- Pioneers in Maritime ESS
- > 50% market share
- Maritime Fuel Cell from 2021



Company

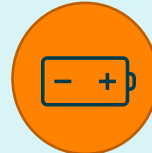
- HQ in Bergen, Norway
- Factories: Norway, USA, Canada
- Worldwide Sales and Service
- 220 Employees
- Strong Partnerships



950
Projects



>9 Million
Running hours



950
MWh sold

TOYOTA



Angel
Investors

Strong Industrial Ownership

Our Role

How Corvus Energy is positioned in the value chain

Battery ESS

High Volume Cell Manufacturer **Corvus Energy** System Integrators, Yards etc.



Fuel Cell

TOYOTA

Corvus Energy

System Integrators, Yards etc.



Corvus Products

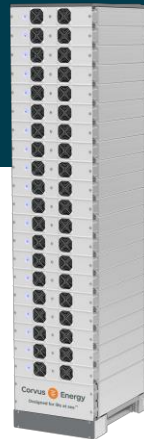
Energy Storage Systems (ESS)



Corvus Orca



Corvus Blue Whale



Corvus Dolphin Energy NxtGen

ESS Battery Room



Corvus BOB
«Battery on Board»

Fuel Cell System (FCS)



Corvus Pelican
Hydrogen Fueled

FCS

Corvus Pelican Fuel Cell System

Extending the range of zero-emission operations

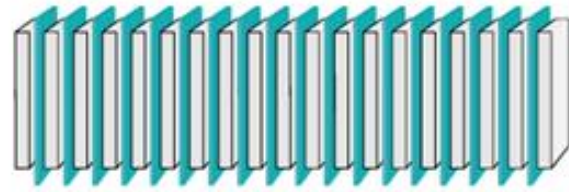
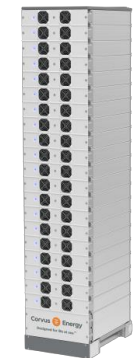


Inherently gas safe design with world-leading Toyota fuel cell technology

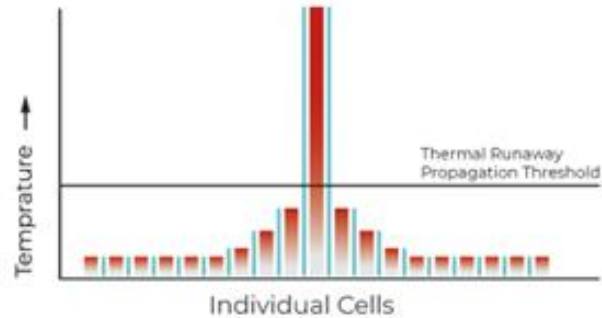
Marine Safety

Energy Storage Systems (ESS)

Passive Single-cell Thermal Runaway Insulation



Cell-level TR insulation



Fuel Cell System (FCS)

Inherently gas safe with type approval

Pressure Safe Enclosure
Inerted Atmosphere



First project: MS Skulebas

Worlds first zero-emission fishing vessel on hydrogen and batteries

- 340kW Corvus Pelican FC
- 125kg Comp. H2
- 1017 kWh Corvus Orca

Delivery
Q2 2024

Start of Operation
Q3 2024



Corvus Pelican Fuel Cell System

Specifications

Pack Power Size	340 kW (4x85 kW FC modules)
System Power Range	340 kWh - 10 MW
Output Voltage	400-750 VDC ^{1,2}
Pack Dimensions	2100(l) x 1400(w) x 2300(h) mm (+/- 5%)
Pack Weight	3100 kg (+/- 15%)
Fuel	Hydrogen gas and air
H2 Inlet Pressure	8 -14 bar.g (lower upon request)
Ingress Protection	IP44
Integrations with ship systems	Hydrogen supply, process air supply, compressed air, cooling water, exhaust, process water, inert gas vent

¹ 550 – 725 recommended operational voltage

² Ongoing development to enable higher output voltage



Innovation

Co-Pilot

Fuel Cell Battery Information System



ESS

Fuel Cell System



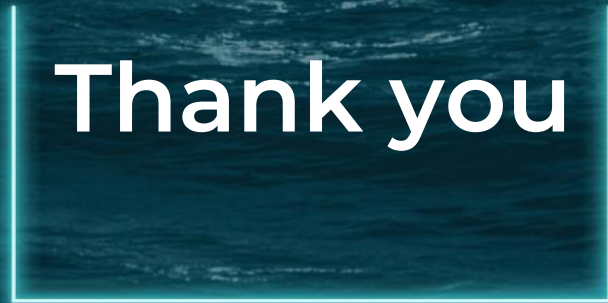
Key Benefits

Co-Pilot real-time advisory system

- Optimize power distribution between the fuel cell and energy storage systems
- Enhance performance and extend system lifetime



Corvus  Energy



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