

**OFFSHORE WIND** WEBINAR WEEK

**WEBINAR**

**MONDAY 22 SEPTEMBER**  
**14:00-15:00 BST**

# How AI, digitalisation and cybersecurity enhance capability and reduce emissions

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Journal

# PANELLISTS



**Amy Potter**  
Senior Marine Engineer  
**Longitude Engineering**



**Gaute Hjellbakk Pettersen**  
Head of Maritime Cyber, Cyber Resilience  
**Vard Group AS**

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# AI Assisted Power System Optimisation for Green Hydrogen/Methanol SOVs

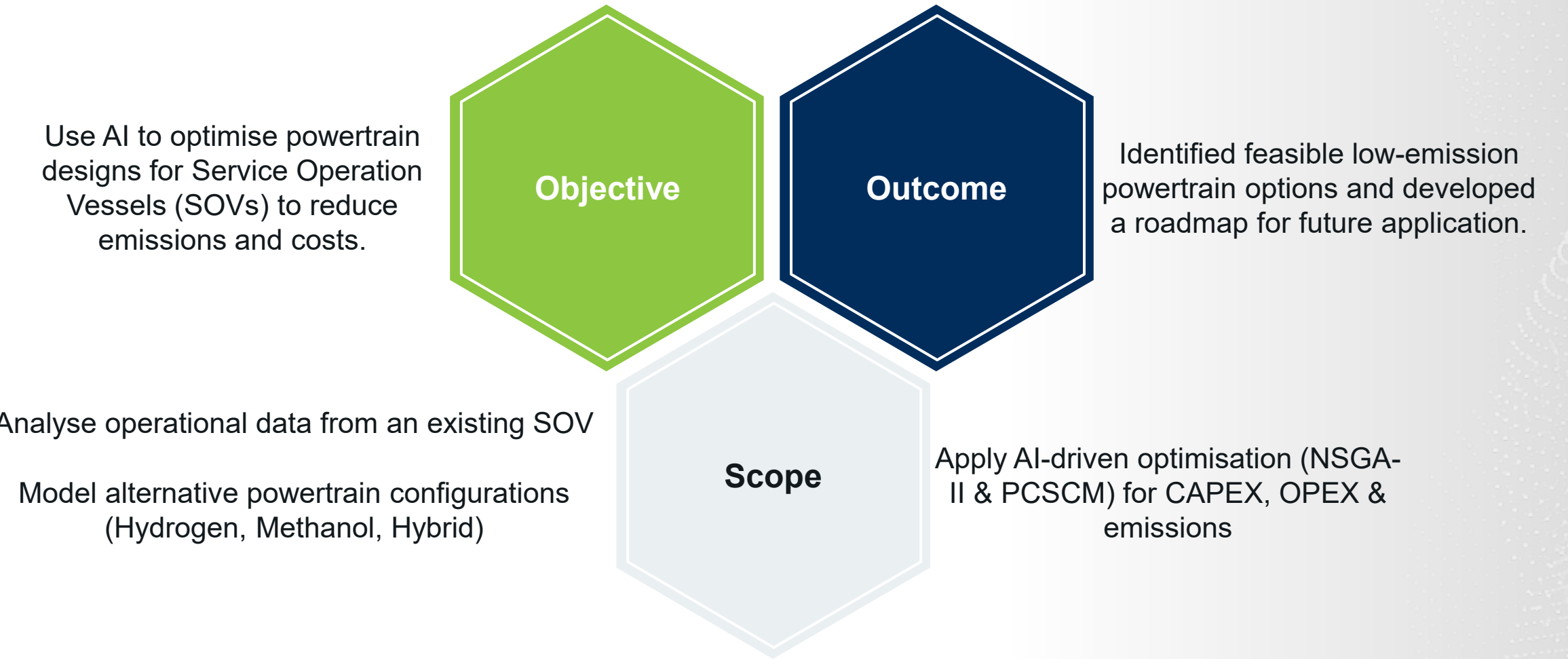
[longitude-engineering.com](https://longitude-engineering.com)







# Project Summary





# Key Technical Contributions

## Operational Data Analysis

Processed big data from SOV digital twin to define realistic load profiles

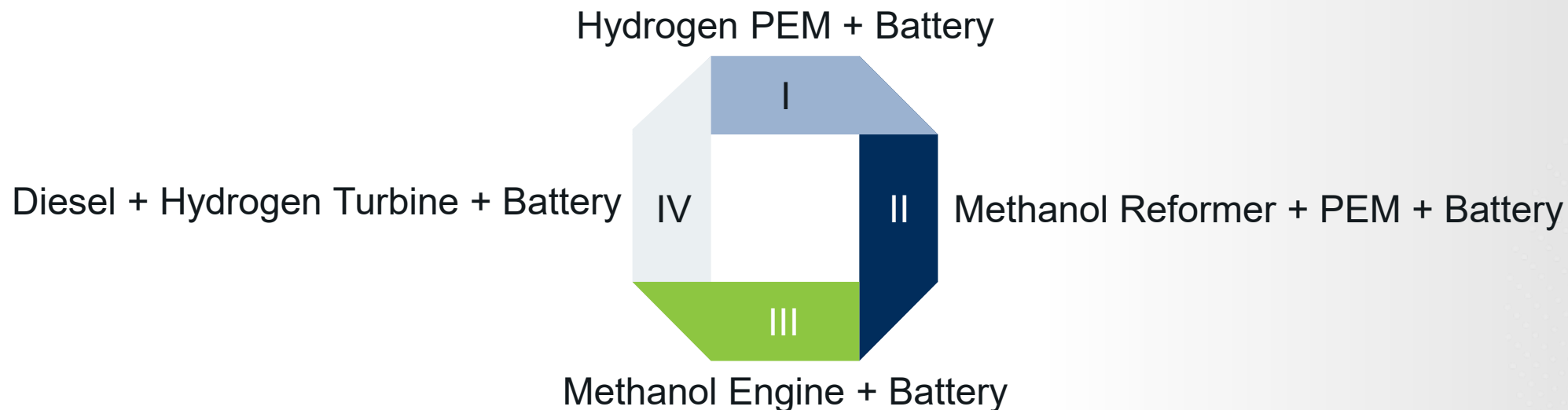
## Hybrid Powertrain Modelling

Developed digital models for engines, fuel cells, batteries, and hydrogen turbines

## AI-Assisted Optimisation

Multi-objective optimisation (CAPEX, OPEX and CII)

## Evaluated Four Scenarios





# Longitude Engineering's Role

Project Lead: Coordinated Consortium and managed delivery

## AI Tool Integration

- Defined constraints



- Obtain data from OMEs to build digital models of powertrain components

## Concept Design Feasibility

- Applied AI outputs to real-world vessel layouts
- Conducted weight, stability and hazardous area assessments
- Additional feasibility factors

## Future Use



Plan to integrate AI tool into Longitude Engineering's design process for new SOV Concepts



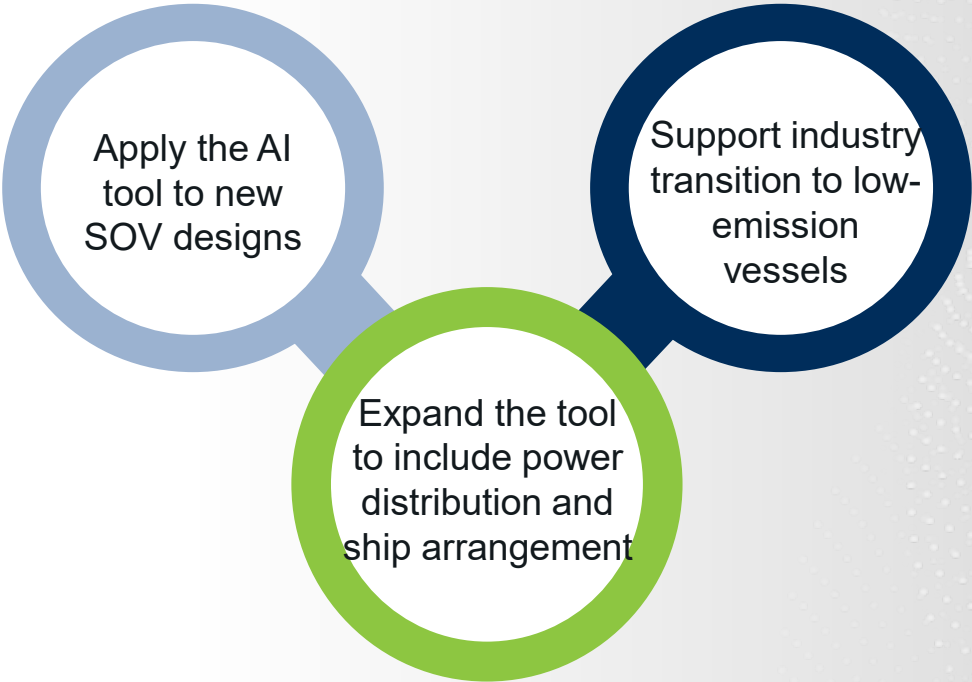
# Feasibility & Next Steps

## Feasibility Findings

Methanol-based solutions most practical for near-term retrofit

Hydrogen fuel cells offer best emissions reduction but face storage & infrastructure challenges

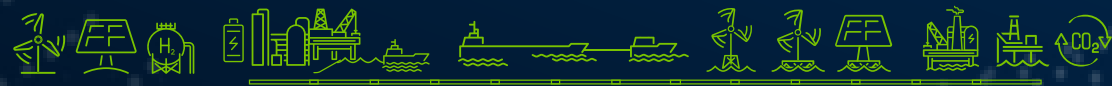
## Next Steps for Longitude Engineering







*Driving Sustainability in Energy and Oceans.*



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# > VARD Maritime Cyber

>> Secure products, from a secure house, in a secure supply chain network

Gaute Hjellbakk Pettersen  
Head of Maritime Cyber  
VARD Group

How AI, digitalisation and cybersecurity  
enhance capability and reduce emissions



# VARD at a glance

Shipyards

7

Countries

12

HQ in  
Aalesund,  
Norway

Several  
specialised  
entities

Employees

8000+

Order book

Updated Q1 2025

35

Deliveries  
since 2000

400+

VARD is the  
Offshore expert  
in the global  
Fincantieri group

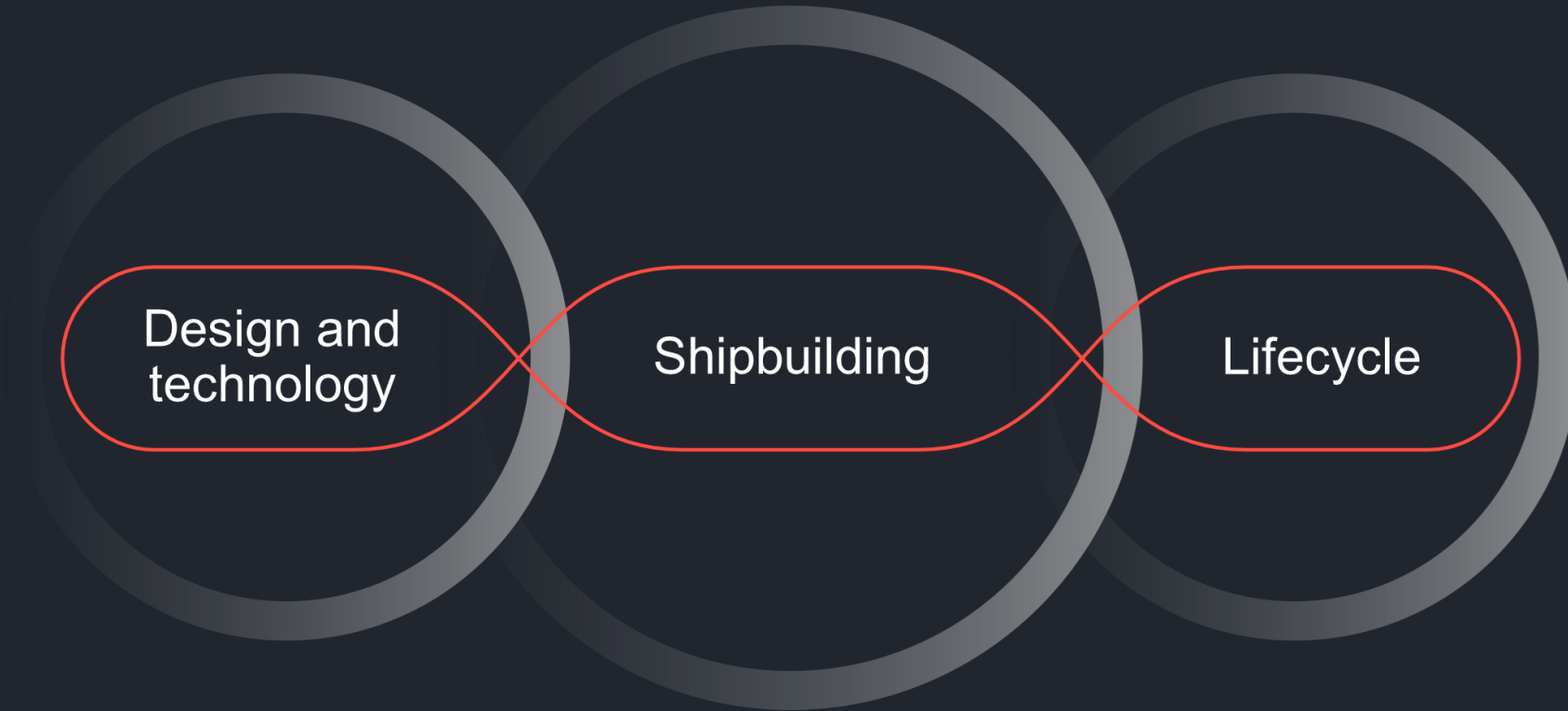




# Cyber Class Notation Approved Vessels

Cyber Resilience in VARD is the capability to **withstand** an attack to **operate** while under attack, and the ability to **recover** from an attack.





**Ideas are worth nothing  
without execution.**

- Expanding the traditional role of the integrator.
- Together we have pioneered new ways of engineering critical systems onboard the vessel.
- Cybersecurity is not a product you can purchase.
- The VARD approach is one that is integrated, proactive, and tailored to protecting physical operations



METHANOL READY

GRAMPIIAN KESTREL



# Thank you for the attention

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Head of Maritime Cyber

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# UPCOMING EVENTS

7-8 OCT 2025 • RIO DE JANEIRO

OFFSHORE SUPPORT  
JOURNAL CONFERENCE  
AMERICAS, BRAZIL



osj offshore support journal

9-10 DEC 2025 • DUBAI

OFFSHORE SUPPORT  
JOURNAL CONFERENCE  
MIDDLE EAST



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2 FEB 2026 • LONDON

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