



ALL ILLUSTRATIONS AND PHOTOS FOR PRESENTATION AND VISUALISATION PURPOSES ONLY

RE-PUBLICATION NOT ALLOWED



Welcome to the territory of world-class maritime solutions



BLUE MARITIME CLUSTER

GLOBAL CENTRE OF EXPERTISE
NORWAY

GCE BLUE MARITIME CLUSTER

- 18 ship owners
- 7 naval architects
- 12 shipyards
- 130 technology manufacturers
- 14 000 employees
- €5 bn revenues
 - 52% export
 - *The cluster administration is hosted by ÅKP*



A COMPLETE CLUSTER

research – finance – commerce – entrepreneurs – authorities



Advanced vessels for complex operations



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World's first full scale net
zero maritime cluster

New BLUE Deal



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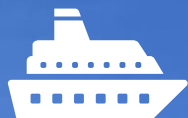


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We are Part of the Solution

2.9% emissions from ships



«Halving Emissions by 2030
is the New Normal»



13 CLIMATE
ACTION





NEXANS AURORA



Hoveddata:

- Navn: «Nexans Aurora»
- Verft: Ulstein Verft
- Byggenummer: 314
- Design: Skipsteknisk ST 297 CLV
- Lengde: 149,9 meter
- Bredde: 31 meter
- Tonnasje: 20 800
- IMO-nummer: 9862059
- Rederi: Nexans
- Motor: 6x Bergen Engines à 3600 kW Tier III
- Thrustere: Brunvoll
- Generator: Pon Power 1432 kW
- Navigasjon & Kommunikasjon: Kongsberg Maritime
- Brannslukningsutstyr: Survitec
- Livbåter: Fr.Fassmer GmbH&Co.KG
- Kabelleggerutstyr: MAATS
- Interiør: Rovde Møbel & Design

NEWBUILD PROGRAM



BRIM EXPLORER

- 25m sightseeing vessel
- 140 passengers
- Electric (diesel back-up)
- 800 KWh battery package
- 10 hrs electric propulsion (8-12 knts)
- Built by Maritime Partner

NEWBUILD PROGRAM



- World's largest plug-in hybrid ferry
- 2000 pax – 500 cars
- 65 ton battery package – 5 MWh
- 33 % reduction of CO₂ emissions
- Advanced energy recuperation
- 70 % local suppliers
- «Ship of the Year 2019»
- Buildt by Ulstein Shipyard



COLOR HYBRID

NEWBUILD PROGRAM



LE COMMANDANT CHARCOT

- World's first icebreaker hybrid cruiseship
- Polar Class 2
- LNG and Battery Package
- 150 m long
- 270 passengers – 180 crew
- Price: €270 million
- Buildt by VARD



NEWBUILD PROGRAM



ROALD AMUNDSEN



- Design: Kongsberg Maritime
- Polar Class 6
- Battery Package 1,36-5MWh
- 140 m long
- 530 passengers – 151 crew
- Price: €270 million
- Buildt by GreenYard KLEVEN

NEWBUILD PROGRAM



REM ENERGY

- Built as PSV by Havyard
- Rebuilt to SOV by Kleven
- Scrubber systems
- Prepared for battery packages (12 MWh) and fuel cells

REFIT PROGRAM



ESVAGT HEIDI

- Built as PSV by Ulstein in 2012
- Rebuilt to SOV by Ulstein 2021
- Shore power system
- Prepared for battery packages

REFIT PROGRAM



NORWIND BREEZE

- Buildt as PSV by VARD
- Rebuildt to SOV by VARD 2022
- Shore power system
- 0.5 MW battery package
- Preparing for 18 MW battery

REFIT PROGRAM

TRENDS IN THE NORWEGIAN MARKETS

- Main segments:
 - Ocean-based Energy
 - Ocean-based Food
 - Ocean-based Tourism



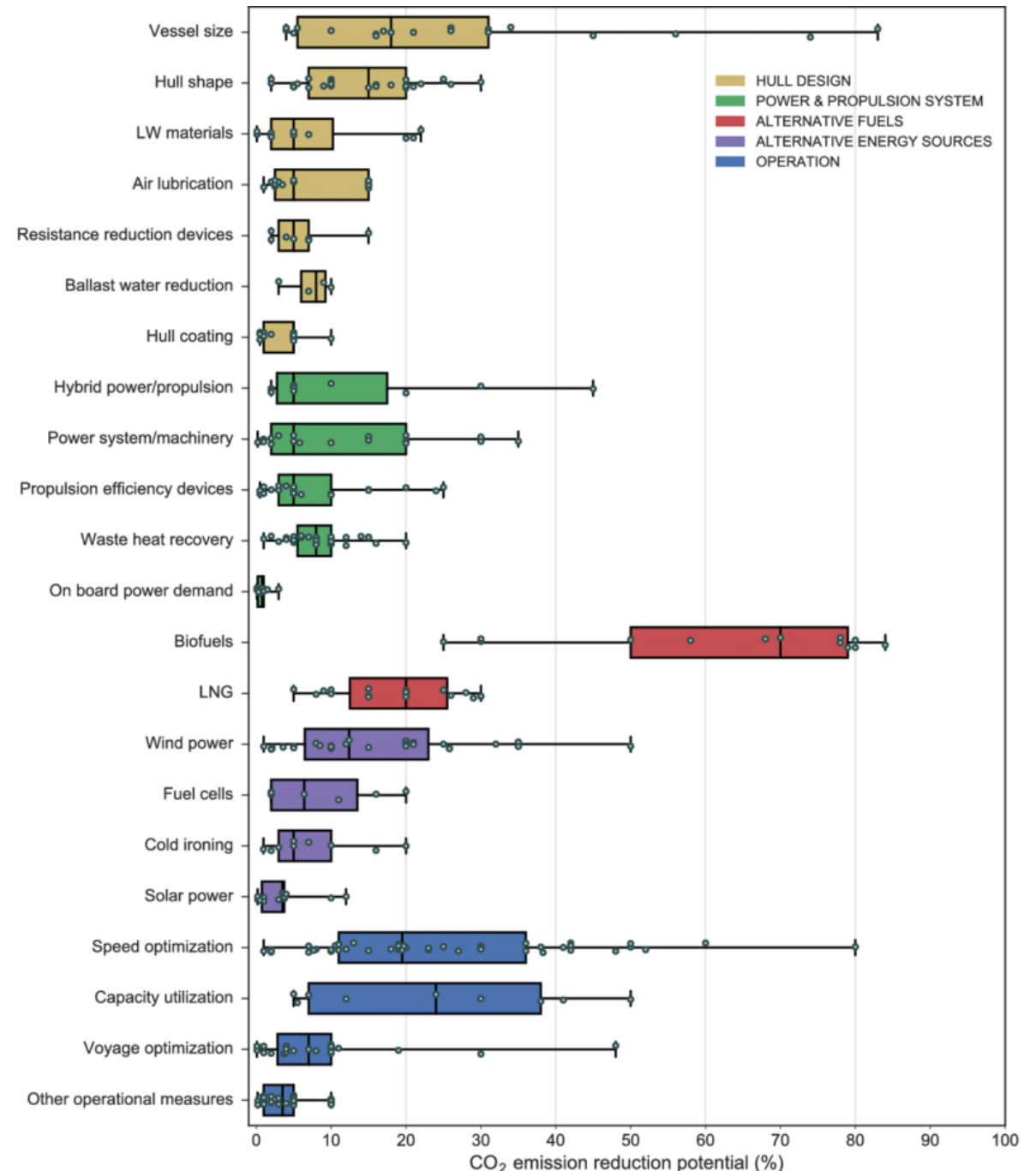
THE SOLUTIONS

- Current massive focus on alternative energy
- Little focus on other areas
- Most alternatives have limited effect alone (typically below 10%)

GCE Blue Maritime cluster has a holistic approach on research, development and innovation on all areas of ship construction and ship operations.

In order to accommodate the existing focus on alternative energy sources, GCE Blue Maritime also includes

- ship operations and business models
- energy consumption
- smarter use of energy



SOURCE: E.A. Bouman et al. / Transportation Research Part D 52 (2017) 408–421

STRATEGIES TOWARDS GREENER OPERATIONS

1. MORE EFFECTIVE VESSEL OPERATIONS

- Capacity utilization
- Optimized routing
- Lower speeds
- Digitalization

3. REDUCE ENERGY CONSUMPTION

- Compact design
- System efficiency
- LED lighting
- Hull coating
- Foils
- Hybrid propulsion
- Ballast-free designs
- Lower weight
- Lower hydrodynamic and aerodynamic resistance
- Air cavity lubrication

2. GREENER ENERGY SOURCES

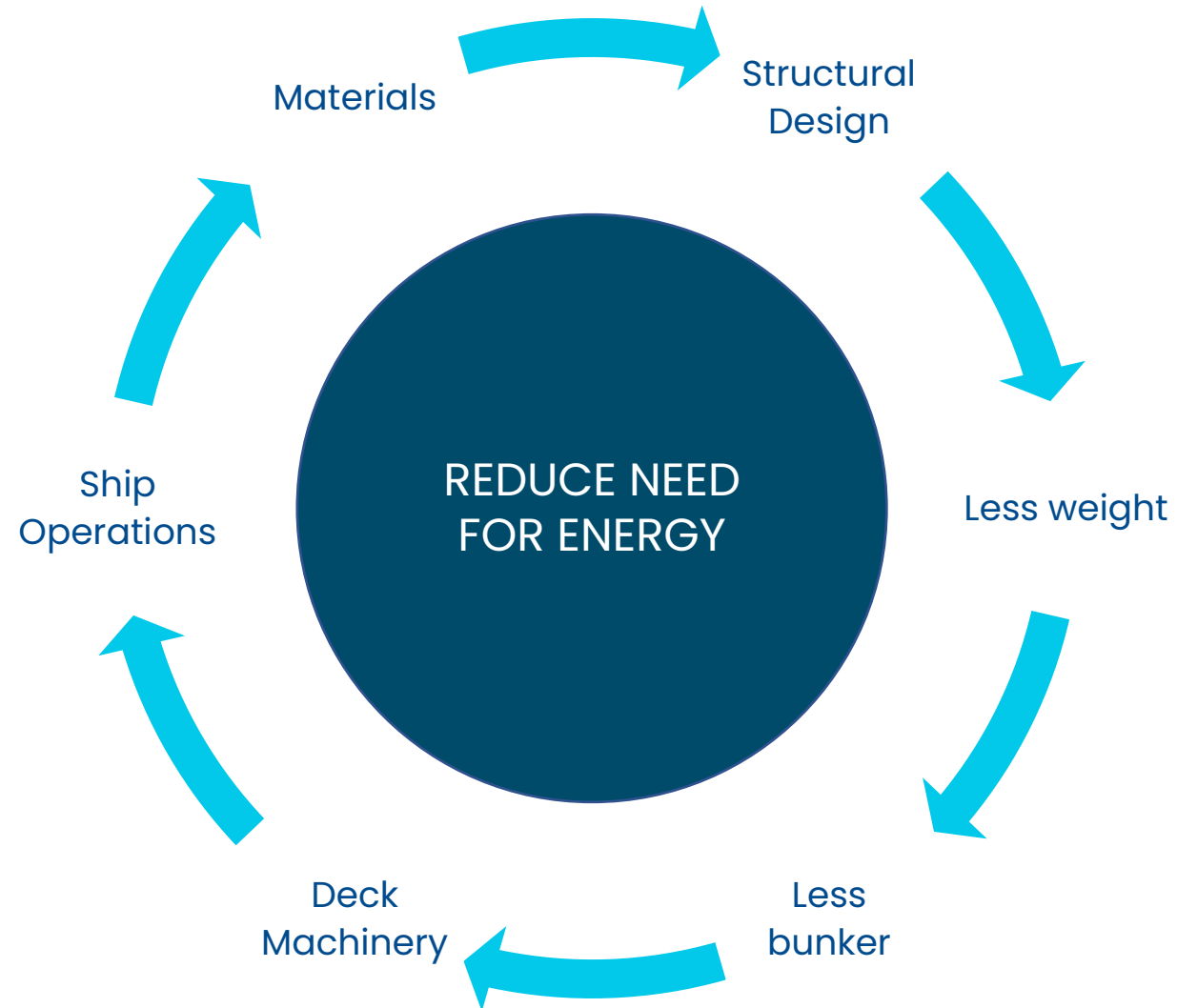
- Wind energy
- Solar energy
- Hydroelectric energy
- Hydrogen (H₂)
- Biofuels
- Methanol (CH₃OH)
- Natural gas (LNG/CNG)
- Ammonia (NH₃)
- Nuclear power

4. SMARTER USE OF ENERGY ONBOARD

- Heat recovery
- Energy management
- Energy storage



LOWER WEIGHT IS IMPORTANT



- FS1 Low emission ships
 - FS4 Study of onboard energy consumption in vessels (SOECiV)
 - FS5 Green refit program
- OPL1 Ships for ocean energy (ocean wind, oil & gas, solar, wave)
 - Markets
 - Technologies
 - Supply Chains
- OPL2 Ships for ocean food (aquaculture, fishery, harvest)
 - Markets
 - Technologies
 - Supply Chains
- OPL3 Ships for ocean travel (cruise, ferries)
 - Markets
 - Technologies
 - Supply Chains
- OPL4 Cross-segment competence
 - Judicial
 - Human Resources
 - Financial
- OPL5 Cross-segment competence
 - Ship Technology Days
 - Industrial Design Conference
 - Cluster Conference
 - Ship Yard Conference
 - Management Conference



- FS1 Export: 3rd country barriers
- FS2 Public Purchases
- FS3 Green Newbuild Program
- FS4 Circular Supply Chain for Decommissioning
- FS5 Windfarm Ship Operations
- FS6 Integrated solutions for hydrogen drivetrain – digital twin
- UP1 Study of Onboard Energy Consumption in Vessels (SOECiv)
- UP2 Green Rebuild Program
- UP3 Export Markets
- OPL1 New Technologies and Segments
- OPL2 Cross-segment Generic Topics
- OPL3 Cross-segment Interaction Arenas
 - Ship Technology Days
 - Industrial Design Conference
 - Cluster Conference
 - Ship Yard Conference



2030

WORLD HERITAGE FJORDS

New

Blue

Deal



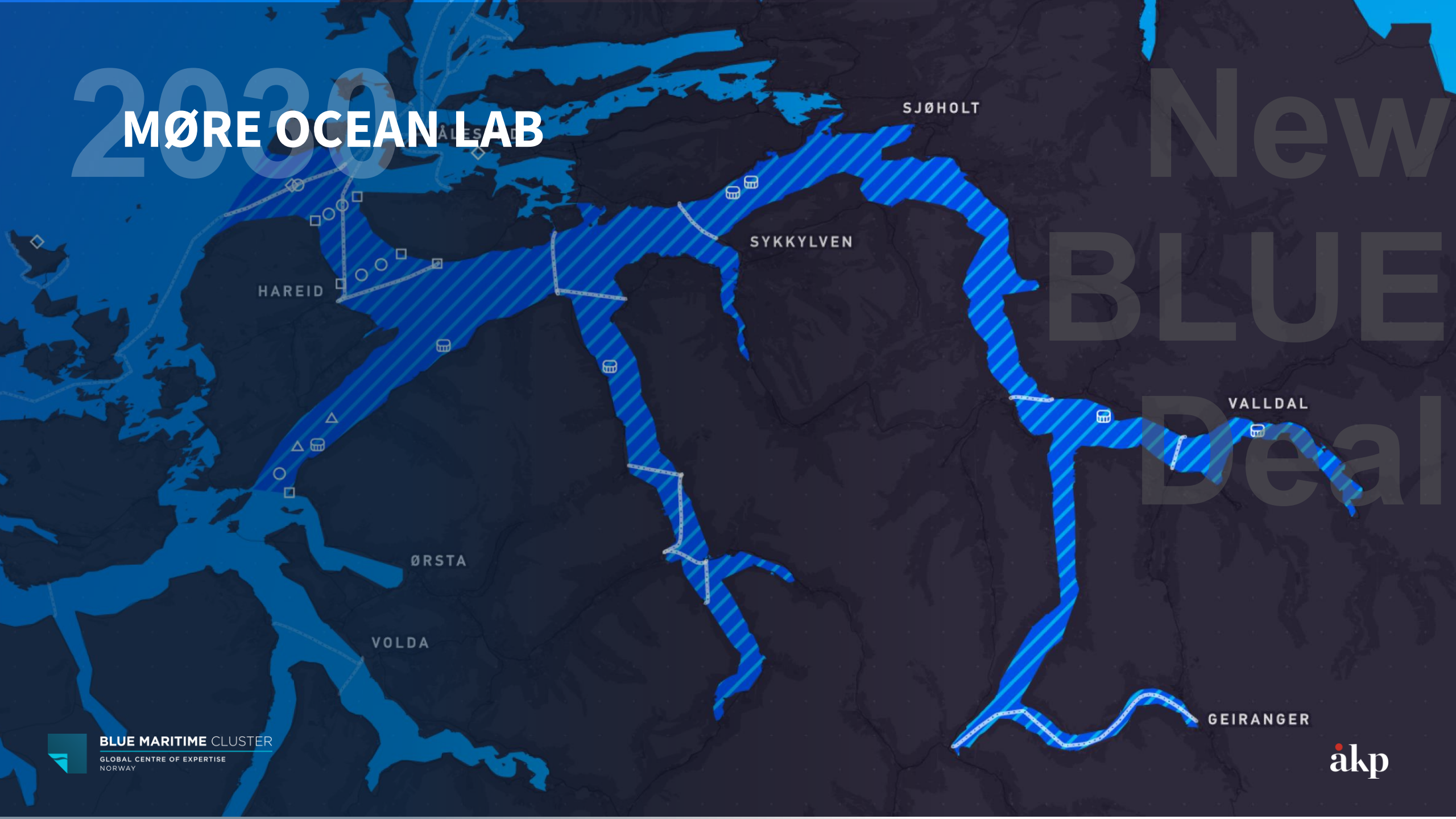
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2030

MØRE OCEAN LAB

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Deal



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