Project partners		
Technical University of Denmark	DK	DTU
Ballard Power Systems Europe	DK	BALLARD
SINTEF	N	SINTEF
CoorsTek Membrane Sciences	N	CoorsTek MEMBRANE SCIENCES
VARD	N	VARD a Fincantieri company
VTT	FIN	VTT

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AEGIR

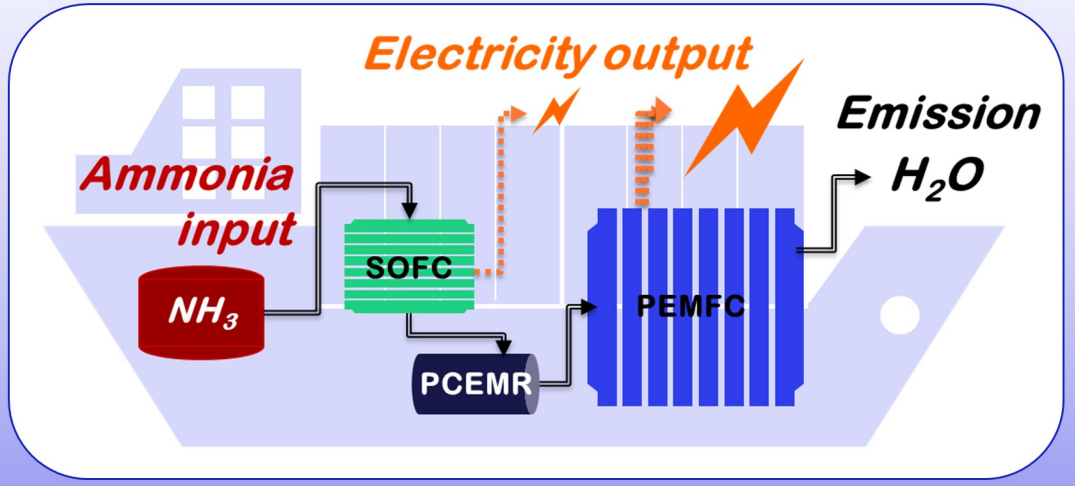
Ammonia electric marine power for GHG emission reduction

This project has received funding from the Nordic Maritime Transport and Energy Research Programme through National Financiers: the Energy Technology Development and Demonstration Program (EUDP) in Denmark, the Norwegian Research Council (RCN) in Norway, and Business Finland in Finland.

Nordic Energy Research EUDP The Research Council of Norway BUSINESS FINLAND

- *Ships are responsible for 90% of international transport, their CO_2 emissions accounting for approximately 2.2% of the global total of such emissions*
- ***The overall target of the Aegir project is to develop, test and evaluate an environmentally friendly technological solution to power large marine vessels by using green ammonia as primary fuel.***

- *The Aegir concept:*
  - *I. Ammonia is cracked to H_2 and N_2 using a solid oxide fuel cell (SOFC);*
  - *II. H_2 is extracted and purified using a proton conducting electrochemical membrane (PCEMR)*
  - *III. Converted to electricity using a polymer exchange membrane fuel cell (PEM).*



- *By combining these three technologies, AEGIR aims at developing an ammonia-fueled ship propulsion system that offers high efficiency in combination with a low total system volume and weight, which is the key innovation of the project.*
- *The Aegir concept avoids emissions of NO_x and allows for a drastic reduction of CO_2 emissions; the product of the fuel cell electricity process is water.*

- *The Aegir project will*
  - *Design the integrated concept,*
  - *Experimentally validate the three key enabling technologies*
  - *Demonstrate a reduction of greenhouse gas emissions by 90% compared to current state in a well-to-propeller analysis, and*
  - *Identify potential scale up issues for a 20 MW maritime system in a concept study.*